

Chapter 21: Aviation

Environment Effects Statement



21 Aviation

21.1 Introduction

This chapter summarises the potential impacts on aviation associated with the construction, operation and decommissioning of the Project. This chapter describes how impacts would be avoided, minimised or managed and summarises the outcomes of *Technical Appendix N: Aviation*.

The potential for the Project to impact aviation safety has been assessed with consideration to the *Civil Aviation Safety Regulations 1998* (CASR) and the International Civil Aviation Organisation's (ICAO) Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS).

To understand the potential impacts to aviation safety, certified aerodromes within 30 nautical miles (nm) (55.56 km), and uncertified aerodromes within 3 nm (5.56 km) of the Proposed Easement were assessed. Certified aerodromes refer to those that are regulated by the Civil Aviation Safety Authority (CASA). Considering the predominant agricultural land use surrounding the Project, nearby aviation activities would typically be associated with farming operations, commercial flights, private operations, aerial firefighting and medical evacuation.

The main potential impact identified through the aviation assessment relates to intrusion into protected airspace surfaces around aerodromes. These defined surfaces are established to support the safe operation of aircraft during take-off, landing and other flight procedures by managing the height of structures and other obstacles in the vicinity of an aerodrome.



Key definitions

Civil Aviation Safety Authority (CASA) is the federal government body responsible for civil aviation safety in Australia, and their main role is related to the safety of the public during civil flight operations at, and in the vicinity of certified aerodromes.

The *Civil Aviation Safety Regulations 1998* (CASR) are Australia's primary aviation safety regulations, administered by CASA. CASR establishes the legal requirements for the design, operation and maintenance of aircraft, airports and aviation infrastructure, helping to ensure the safe operation of civil aviation throughout Australia.

Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS) is an international set of aviation safety standards that defines protected airspace for aircraft operating under Instrument Flight Rules (IFR). These standards establish invisible three-dimensional obstacle clearance surfaces used to design safe flight procedures, including departures, approaches and holding patterns, ensuring aircraft maintain adequate clearance from terrain and obstacles.

In addition to the assessing the location of the Proposed Easement, the aviation impact assessment evaluated the two Proposed Easement options at Tragowel and Teddywaddy. No infringement of protected airspace surfaces was identified at surrounding certified aerodromes, with the exception of Kerang Aerodrome, located approximately 5.4 km from the Proposed Easement at Tragowel. Under the current design, the Tragowel eastern easement option would not impact Kerang Aerodrome during operation of the Project, whereas the western easement option has the potential to result in a PANS-OPS infringement (when an object extends into the protected airspace surface). Measures to avoid or minimise impacts to Kerang Aerodrome may include adopting the Tragowel eastern easement option as the preferred route, reducing tower heights, shifting the affected towers outside the relevant protection area, or engaging with the aerodrome operator and relevant aviation authorities regarding changes to instrument approach procedures, subject to feasibility and approvals.

During Project construction, the assessment assumes that cranes would extend approximately 15 metres (m) above final tower heights. On this basis, crane operations for either Proposed Easement option in the vicinity of Kerang Aerodrome would temporarily infringe protected airspace associated with instrument flight procedures. These temporary infringements would be managed by notifying the aerodrome at least seven days prior to construction. Subject to this measure, significant aviation impacts are not anticipated.

An existing uncertified aerodrome and a separate proposed uncertified aerodrome are located adjacent to the Proposed Easement. Under the current design, the Project would constrain the continued operation of the existing airstrip and may limit the feasibility of establishing the proposed airstrip unless avoidance and/or mitigation measures are implemented. Consultation has already commenced with the landholders of these two airstrips to identify alternative solutions and additional mitigation measures, where practical. Outcomes of this consultation with landholders may include alternative airstrip orientations or relocation to a safe alternative location on the landholder's property. In the event that a mutually acceptable outcome cannot be identified, aerial operations at either airstrip would not be possible and the residual impact would be major. In this instance, impacts on aviation operations would need to be considered as part of the compensation process.

Given the identified impacts to protected airspace surfaces at Kerang Aerodrome, the Tragowel eastern easement option would present a lower aviation impact than the Tragowel western easement option. For the Teddywaddy option, the assessment found that aviation impacts are expected to be minimal regardless of the easement option selected, as neither option is predicted to affect nearby certified or uncertified aerodromes.

Overall, there would be suitably low residual impacts to aviation activities as a result of the construction, operation and decommissioning of the Project. The majority of impacts would be managed through design changes and/or engagement with key stakeholders such as Airservices Australia, local councils and landholders. In a few limited localised cases, options for relocation or re-orientation of airstrips may be required. If this cannot be suitably achieved, there may be a major residual impact to uncertified aerial operators impacted by the Project and this would need to be considered as part of the compensation process.

21.2 Assessment scope

The scoping requirements provided by the Minister for Planning for the Project set out the specific environmental matters to be investigated and documented in this EES. The EES Scoping Requirements inform the extent and scope of each EES technical study. The issue identified in the EES Scoping Requirements to be addressed in this aviation assessment includes:

- Potential adverse effects on aerial safety, especially with respect to use of aircraft for farming practices, maintenance and firefighting

Technical Appendix N: Aviation was prepared for this EES. The technical appendix provides more detailed information on the investigation and impact assessment conducted in response to the EES Scoping Requirements.

This chapter should be read in conjunction with other relevant EES chapters. EES chapters related to this impact assessment include:

[Table 21-1 Related EES chapters and relevance to aviation](#)

EES Chapter	Relevance
<i>EES Chapter 12: Bushfire</i>	The bushfire chapter details potential bushfire hazards associated with the construction, operation and decommissioning of the Project. It also considers potential impacts on aerial firefighting operations.
<i>EES Chapter 23: Land use and planning</i>	The land use and planning chapter details potential impacts on existing land uses and planning considerations during construction, operation and decommissioning, including impacts on existing aviation practices.

21.3 Methodology

To achieve the study objective outlined in Section 21.2, the aviation impact assessment adopted the following methodology:

- Definition of the study area and identification of certified aerodromes within 30 nm (55.56 km) of the Project, as well as uncertified aerodromes within 3 nm (5.56 km).
- Identification of relevant civil aviation safety requirements and standards with respect to existing aerodrome conditions and whether these standards are met
- Consultation with nearby landholders and key stakeholders
- Consultation with certified aerodromes and aircraft operating agencies that may be impacted by the Project
- Identification of published air routes near or over the Project, and assessment of potential impacts of Project construction and operation on aircraft using those routes
- Identification of instrument approach and landing procedures at surrounding aerodromes, as well as their protection surfaces
- Identification of any infringements to the protection surfaces during construction and operation of the Project
- Assessment of likely impacts of the Project to aviation navigation facilities
- Assessment of low-level flight operations including agricultural spraying operations, aerial baiting and culling, and aerial firefighting in the area
- Development of EPRs to minimise impacts and ensure aviation safety is maintained throughout the construction, operation and decommissioning of the Project

21.4 Summary of stakeholder and community engagement

Aviation engagement to date has involved consultation with a range of stakeholders to identify aerodromes and airstrips in the Project vicinity to understand their current use and operational requirements. Engagement also included consultation with relevant agencies and service providers with an aviation operational interest in the area to identify any impacts to their operations, flight procedures or facilities.

Initial feedback during the Proposed Easement identification process identified the presence of several aerodromes, including privately owned airstrips on farms. This included Robin's Aviation, a private aviation business located east of Kerang, and Morrl Morrl Airstrip.

Consultation included direct engagement with commercial operators regarding the scale and nature of their activities, as well as with private landholders who own and operate airstrips. Engagement with Robin's Aviation was able to determine a mutually agreeable setback distance of 4 km that was adhered to during the easement identification process. This resulted in the avoidance of Project impacts to Robin's Aviation.

Engagement with the operator of Morrl Morrl Airstrip confirmed that they would not be able to continue to use their airstrip should the Project continue in its planned state. Impacts to Morrl Morrl Airstrip are discussed further in Section 21.7.2.

Another landholder communicated their proposed plans for a new airstrip at Heifer Station Creek. An assessment of this proposed airstrip is presented in Section 21.7.2.

Stakeholders such as Airservices Australia, Department of Defence, Victoria Air Ambulance Services, the Country Fire Authority (CFA) and the Victoria Police Air Wing were also consulted as part of the aviation impact assessment as agencies who have an operational interest in the area with regard to aviation. The outcome of this engagement is summarised below:

- Airservices Australia advised that there would be no impact to their airspace procedures, communications/navigation/surveillance (CNS) facilities or air traffic control operations however, noted that vertical obstacle notification would be required once the Project design is finalised.
- Engagement with the Gannawarra Shire Council supported investigations into impacts to the Kerang Airport, with notification requested prior to construction commencing for the Project.
- Airservices Australia and the Victoria Police Air Wing confirmed that the Project would be of no impact to their operations.
- The CFA did not provide a response directly, however, has been consulted on this assessment as part of the technical reference group for the EES and provided input to *Technical Appendix E: Bushfire* which has informed this assessment.

The outcomes of this engagement have provided important context for assessing potential impacts and developing appropriate EPRs.

21.5 Study area

The study area relevant to this assessment is presented in Figure 21-1. The study area consists of a 30 nm, or 55.56 km buffer encompassing the Proposed Easement, the Tragowel Terminal Station, Bulgana Reactor Station and nine laydown and/or workforce accommodation areas. This impact assessment evaluated two Proposed Easement options at two locations along the Proposed Easement at Tragowel and Teddywaddy.



Key definition

Airservices Australia nominates that a lateral distance of 30 nm is used to assess potential impacts to certified aerodromes by a Project or activity.

This is the distance from an aerodrome where aircraft may operate with a clearance to all obstacles, such as transmission line infrastructure. This clearance represents the lowest altitude that may be used by an aircraft under emergency conditions.

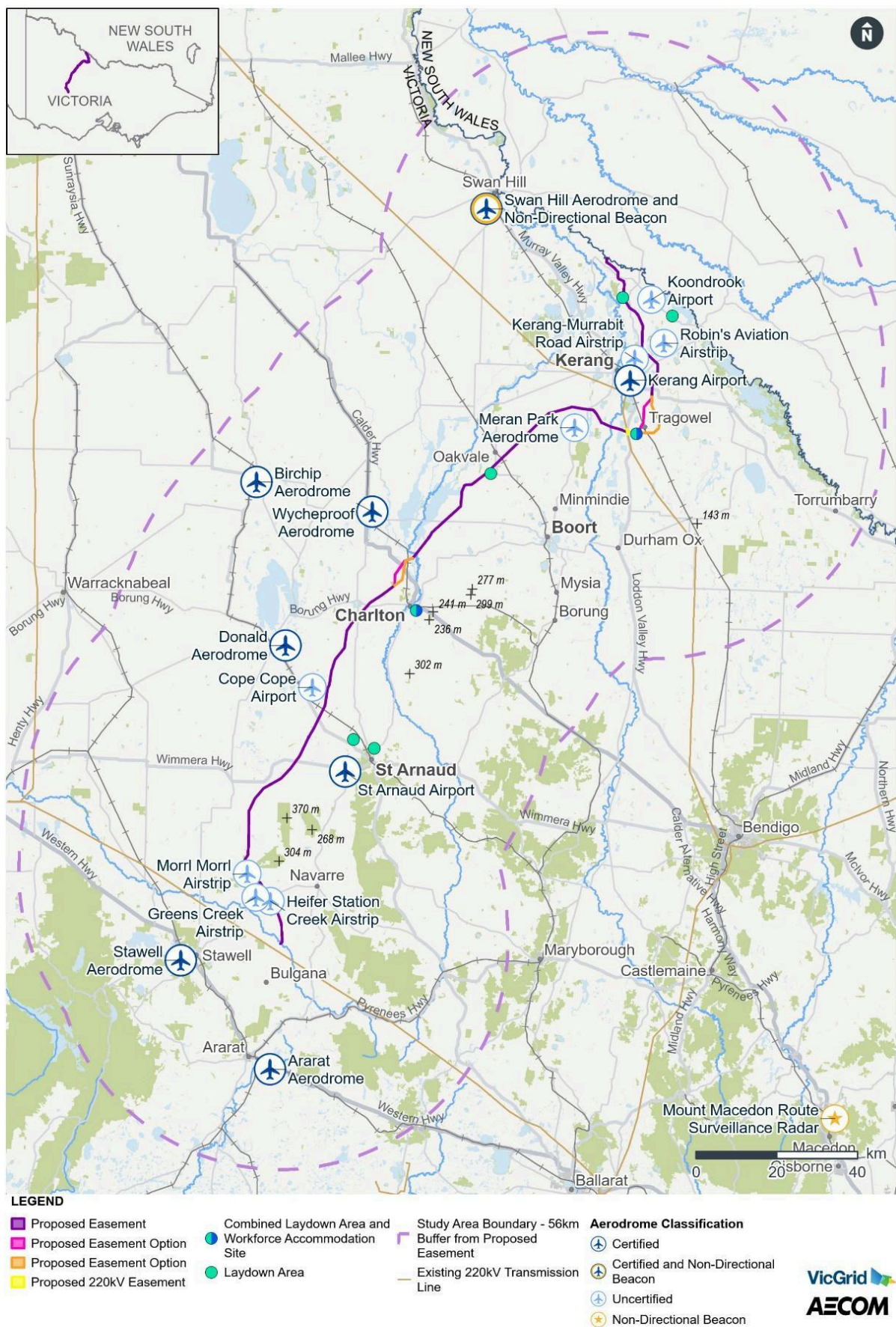


Figure 21-1 Aviation study area

21.6 Existing environment

The study area for the Project has an established potential for aircraft and aviation activities. Given the predominant agricultural land use within the study area, aviation activities would typically be associated with farming operations, commercial flights, private operations, aerial firefighting and medical evacuation.

This section provides a summary of the existing aerodromes within the study area, the protection of airspace surrounding these aerodromes, rules of flight from the existing aerodromes and a summary of the existing aviation operations that may occur.

21.6.1 Certified and uncertified aerodromes

Within 30 nm of the Project, there are eight certified aerodromes. Eight uncertified aerodromes were identified within 3 nm of the Project (refer to Figure 21-1). Certified aerodromes refer to those that are regulated by CASA. There are legislative and regulatory requirements that must be met to operate a certified aerodrome, including an operating manual, safety procedures, and emergency arrangements.



Key definition

Aerodrome – An aerodrome is a location where aircraft operate. In Australia, aerodromes are either certified or uncertified in accordance with the *Civil Aviation Safety Regulations 1998*.

Uncertified aerodromes are defined by CASA as those that are not operated or certified under the *Civil Aviation Safety Regulations 1998* (CASR). These uncertified aerodromes include private airstrips, aircraft landing areas, helicopter landing sites and airstrips other than certified aerodromes. Any pilot or operator intending to use an uncertified aerodrome is responsible for ensuring that the aerodrome is suitable for the safe operation of their aircraft. Uncertified aerodromes beyond 3 nm from the Project were not considered as part of the impact assessment as they are suitably distant and represent lower risk.

The table below summarises the certified and uncertified aerodromes located in the vicinity of the Project.

Table 21-2 Certified and uncertified aerodromes located in the vicinity of the Project

Aerodrome	Classification	Operator	Distance from Project
Ararat Aerodrome	Certified	Ararat Rural City Council	31.1 km (16.8 nm)
Birchip Aerodrome	Certified	Buloke Shire Council	41.3 km (22.3 nm)
Donald Aerodrome	Certified	Buloke Shire Council	12.1 km (6.5 nm)
Kerang Aerodrome	Certified	Gannawarra Shire Council	5.4 km (2.94 nm)
St Arnaud Aerodrome	Certified	Northern Grampian Shire Council	11.5 km (6.2 nm)
Stawell Aerodrome	Certified	Northern Grampians Shire Council	24.6 km (13.3 nm)
Swan Hill Aerodrome	Certified	Swan Hill Rural City Council	31.7 km (17.1 nm)
Wycheproof Aerodrome	Certified	Buloke Shire Council	14.2 km (7.7 nm)
Heifer Station Creek Airstrip*	Uncertified	Private landholder	Within Project boundary
Cope Cope Aerodrome	Uncertified	Private landholder	3.9 km (2.1 nm)
Morrl Morrl Airstrip	Uncertified	Private landholder	450 m (0.24 nm)
Koondrook Aerodrome	Uncertified	Private landholder	4.6 km (2.5 nm)
Meran Park Aerodrome	Uncertified	Private landholder	3.1 km (1.7 nm)
Robin's Aviation Airstrip	Uncertified	Private aviation business	4.0 km (2.2 nm)
Green's Creek Aerodrome	Uncertified	Private landholder	2.4 km (1.3 nm)
Kerang Murrabit Road Airstrip	Uncertified	Unknown operations	1.6 km (1.4 nm)

* This aerodrome is proposed.

Note: The Project is located wholly within a Class G, uncontrolled, airspace and avoids any designated Prohibited, Restricted or Danger areas. The pilot in command of an aircraft is solely responsible for the separation from other aircraft, terrain and obstacles.

21.6.2 Airspace protection

The airspace surrounding certified aerodromes is protected by CASA to allow for the safe take-off, approach and landing of aircraft. This protection is dependent on the specific operations of the aerodrome. The operations at a certified aerodrome which determine how its airspace is protected include:

- Visual operations
- Instrument operations

Visual operations

Visual operations refer to aircraft operations conducted in weather conditions clear enough to allow the pilot to see where they are going. This method of operation is commonly used by helicopters and light aircraft, where the pilot uses visual reference to the ground or water to navigate their flight.

A protected airspace surrounds each certified aerodrome where visual operations are undertaken. This airspace is known as the Obstacle Limitation Surface (OLS). The OLS allows for aircraft to take off, approach and land at an aerodrome using visual navigation by ensuring the airspace immediately surrounding an aerodrome is free from obstacles. The criteria for determining these surfaces are published in CASR. Trees or man-made structures, such as transmission line infrastructure, that intrude into the OLS could constitute obstacles to aircraft safely taking off or approaching to land.

The aim of the OLS is to ensure the safe and continuous use of an aerodrome against surrounding developments. It ensures that all objects that intrude into the OLS can be identified and assessed for their potential impact on aircraft operations. The assessment enables a determination on whether the intrusion is permissible, and if so, a determination on whether any mitigation is required to reduce potential impacts on aircraft operation.

Potential impacts of the Project on the OLS for certified aerodromes within the study area are discussed in Section 21.7.1.

Instrument operations

Some aerodromes may have instrument flight procedures. These are specific procedures for the take-off, approach and landing of aircraft without visual navigation. The protected airspace around an aerodrome for instrument operations is determined by the ICAO's PANS-OPS. These protected airspace surfaces are also known as PANS-OPS surfaces.

The PANS-OPS surfaces are used to establish minimum safe altitudes for take-off, landing and approach procedures at an aerodrome, based only on instrument navigation. They are designed to protect aircraft from colliding with obstacles when weather conditions do not allow pilots to navigate visually. Where an infringement cannot be avoided, changes to the relevant procedure or protected surfaces may be considered subject to agreement and approval by the relevant stakeholders and aviation authorities.

The PANS-OPS surface is generally higher in altitude in comparison to the OLS. PANS-OPS requirements for each certified aerodrome in the study area are discussed in Section 21.7.1.

21.6.3 Flight rules

There are different rules of flight as stipulated by CASR depending on whether an aircraft is conducting visual operations or instrument operations.

Flight rules for visual operations, also known as visual flight rules (VFR), state that an aircraft is restricted to a minimum height of 500 feet (ft) (152.4 m) above the highest feature or obstacle within a horizontal radius of 300 m of the point immediately below the aircraft (refer to Figure 21-2). When flying over a populous area or public gathering, the minimum height requirement is 1,000 ft within a radius of 600 m from the aircraft (refer to Figure 21-3). Under certain circumstances, such as during aerial firefighting, flight below these height restrictions may be permitted.

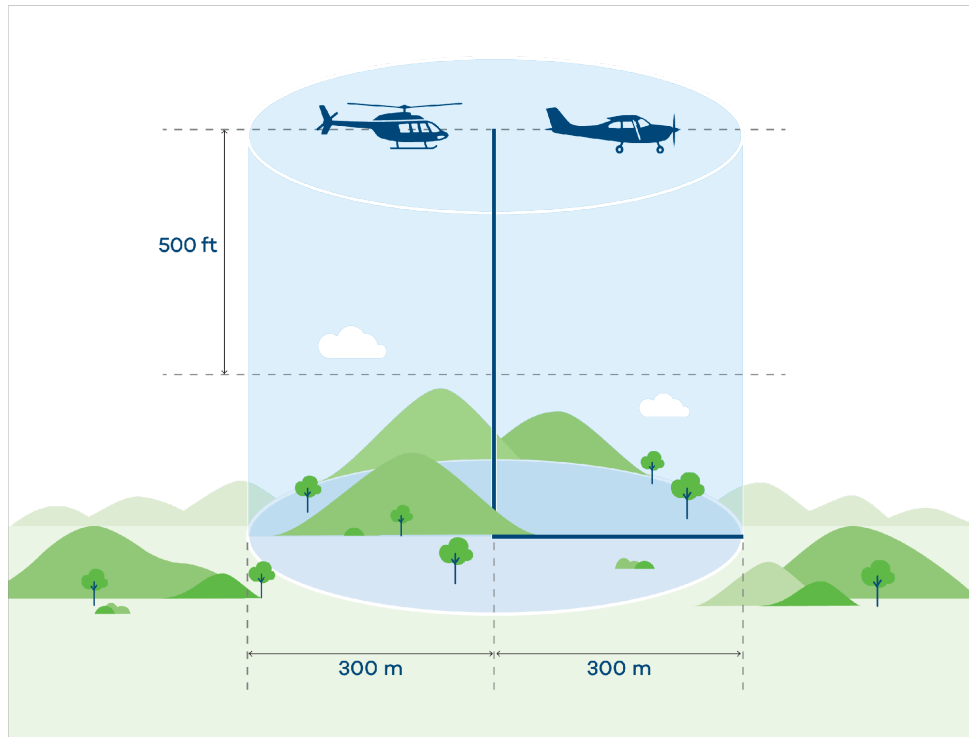


Figure 21-2 Visual flight rules above terrain (Visual flight rules guide, CASA, 2024)

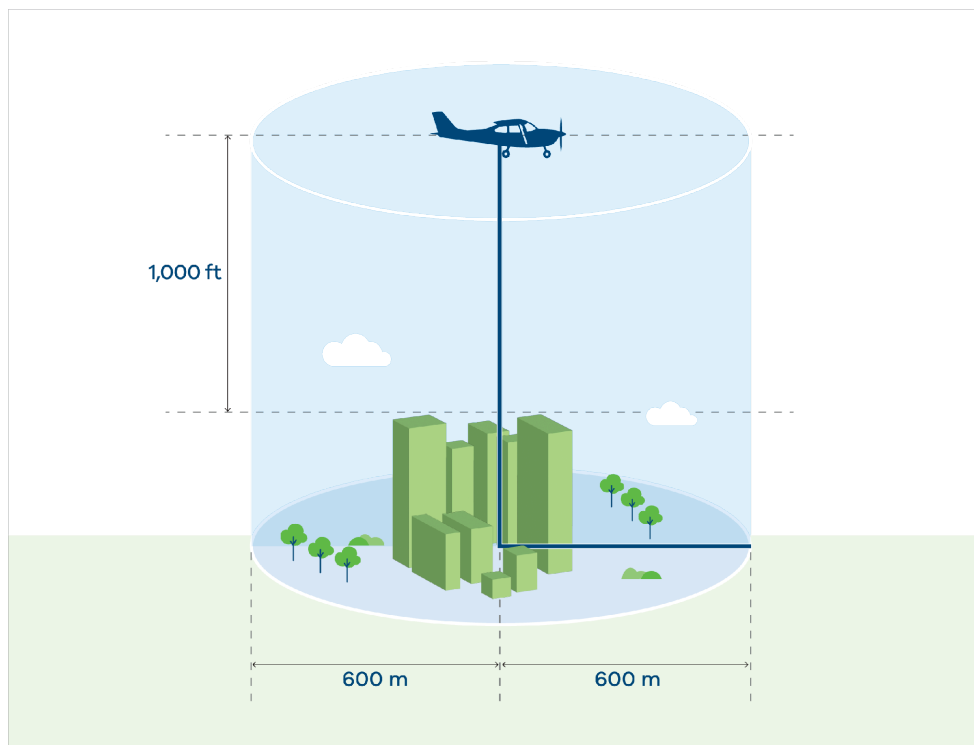


Figure 21-3 Visual flight rules above a populated area (Visual flight rules guide, CASA, 2024)

Under instrument operations, aviation navigation aids, air traffic control radar facilities and communication facilities are used by pilots to navigate their aircraft given that instrument operations do not require navigation using features on the ground or water. Instrument flight rules (IFR) are undertaken in accordance with these aids and facilities. Under IFR, aircraft are required to operate at a height clear of obstacles determined in accordance with an approved method, rather than by reference to the standard minimum heights generally applied to visual operations.

Surrounding the study area, a navigation aid consisting of a non-directional beacon is located at Swan Hill Aerodrome, approximately 32 km northwest of the closest point of the Project. The nearest radar facility is the Mount Macedon Route Surveillance Radar, approximately 144 km to the southwest of the Project. The nearest aviation communication site is located within the Grampians National Park in western Victoria, which is located 47 km from the Project.

Potential impacts to these navigation features are discussed in Section 21.7.4 below.

For pilots operating at or in the vicinity of uncertified aerodromes, CASA provides guidance to ensure that the regulations are complied with. This includes, but is not limited to, standard traffic circuit directions for aircraft landing, approach and take-off. By convention, aircraft should fly the standard traffic circuit at the heights (in feet - ft) and speed (in knots – KT) shown in Figure 21-4 below, which is generally applicable within 3 nm of an uncertified aerodrome.

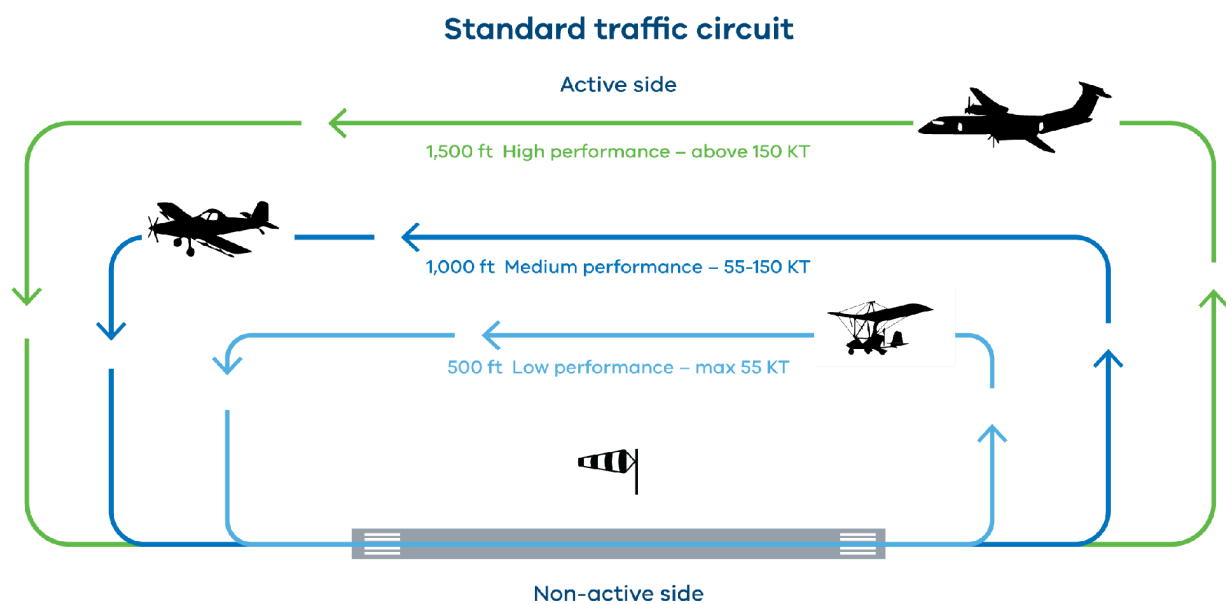


Figure 21-4 Standard traffic circuit (Operations in the vicinity of non-controlled aerodromes, CASA, 2024)

The traffic circuits of uncertified aerodromes have been considered as part of the impact assessment in Section 21.7.2.

21.6.4 Existing aviation operations

The following aviation operations are likely to be conducted in the study area:

- Aviation training
- Scheduled and non-scheduled transport operations
- Private operations
- Military operations

- Aerial application operations (such as fertiliser, pest and crop spraying)
- Aerial medical services
- Aerial firefighting

Aerial application operations such as fertiliser, pest and crop spraying are generally conducted under VFR below 500 ft, between 6.5 ft (2 m) and 100 ft (30.5 m).

While conducted under VFR, aerial firefighting operations (firebombing in particular), may be undertaken below 500 ft and under certain conditions, visibility may be reduced by bushfire smoke. Most aerial firefighting organisations have formal risk management programs to assess the risks associated with their operations and implement applicable treatments to ensure an acceptable level of safety can be maintained. Further information on aerial firefighting is presented in *EES Chapter 12: Bushfire*.

Instrument operations would be conducted during aviation training, scheduled and non-scheduled transport operations and aerial medical services. These operations are protected by specifically determined PANS-OPS.

While there are no known military bases in proximity to the Project, military operations may be conducted in the area. These could include high-speed low-level military jet aircraft, transport aircraft, tactical operations and helicopter operations. Military operations are conducted under separate requirements, however these are comparable to VFR and IFR.

Transmission lines are generally difficult to see, but their associated towers are typically visible and allow pilots to identify where the transmission lines are. Aeronautical charts further assist pilots in identifying the location and direction of the transmission lines relative to their flight path. It is expected that the transmission lines for the Project would be sufficiently visible to pilots conducting VFR operations to allow safe avoidance in accordance with normal aviation practice and training.

21.7 Impact assessment

Potential impacts on aviation from the Project are relevant to all three phases of the Project. For the purpose of this assessment, impacts during construction, operation and decommissioning have been considered together.

Aviation impacts assessed in this assessment include potential impacts on:

- Certified aerodromes and their protection areas
- Uncertified aerodromes
- Aerial application operations and aerial firefighting
- Air routes
- Navigation features

The majority of impacts identified by the assessment are negligible or suitably low. Temporary infringement of protected airspace associated with approach procedures at Kerang Aerodrome during construction would be managed through notification to the aerodrome operator at least seven days prior to the relevant works. This notification would provide sufficient time for the aerodrome operator to implement any necessary safety procedures to manage short-term construction-related hazards.

During operation of the Project, the Tragowel western easement option would infringe the PANS-OPS protection surface at Kerang Aerodrome under the current design. Measures to avoid or minimise this impact may include adopting the Tragowel eastern easement option, reducing tower heights, moving the affected towers so they no longer infringe the relevant protection surface, or engaging with the aerodrome operator and relevant aviation authorities regarding changes to instrument approach procedures, subject to feasibility and approvals.

The assessment identified potential impacts to one existing uncertified aerodrome and one proposed uncertified aerodrome on private properties adjacent to the Project. Ongoing consultation and engagement with the relevant landholders would be required to determine whether a mutually acceptable outcome can be achieved, including whether the Project can coexist with the airstrip arrangement or whether changes to the airstrip layout or location are feasible. If relocation is required, the airstrip must be situated at a safe location and orientation within the landholder's property, be mutually agreed upon by the landholder and VicGrid VNI West and be designed to allow for safe take-off and landing. Where such an outcome cannot be achieved, the Project may result in a major residual impact to affected uncertified aerodrome operators. In those circumstances the impact would need to be considered through the applicable compensation process.

The assessment of easement options found that, from an aviation perspective, the Tragowel eastern easement option would be preferred because it results in fewer aviation impacts during Project operation than the Tragowel western easement option. At Teddywaddy, there is minimal difference between the two Proposed Easement options, as both have a similar area of impact and neither would affect nearby certified or uncertified aerodromes.

21.7.1 Certified aerodromes

As presented in Section 21.6.1, there are eight certified aerodromes within 30 nm of the Project. A study area of 30 nm was selected as this represents the distance from any aerodrome where aircraft may operate with a clearance of 300 m to all obstacles, such as transmission line infrastructure.

Transmission line towers for the project are a maximum height of 80 m. It is assumed that during construction, cranes would extend 15 m above transmission line towers. Transmission line towers have been assessed for their potential impact on the protected airspace of certified aerodromes, with consideration to potential impacts on OLS and PANS-OPS protection areas.

Visual operations

An OLS is established for each certified aerodrome runway where visual operations are undertaken. The OLS includes a conical surface, the area surrounding an aerodrome, and a take-off and approach surface. The take-off and approach surfaces protect the area immediately following and prior to a runway (refer to Figure 21-5).

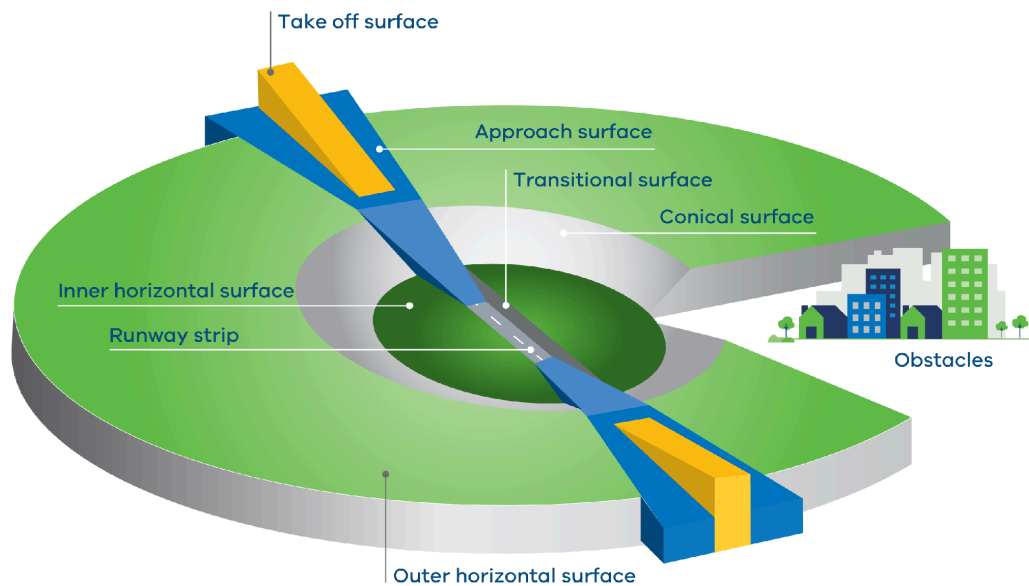


Figure 21-5 An example OLS

A summary of the OLS for each certified aerodrome is provided in Table 21-2 below. This represents the protection area for aerodromes under VFR.

Considering that the Project would be located well beyond the OSL surface for each certified aerodrome, there would be no impact on these protection areas during the construction, operation and decommissioning of the Project.

Table 21-3 Certified aerodrome protection areas

Aerodrome	Obstacle limitation surface	Distance from Project
Ararat Aerodrome	For the Code 1 runway, the maximum lateral extent of the OLS is up to 2.7 km for the conical surface and 1.6 km for the take-off and approach surfaces. This increases up to 3.6 km for the conical surface and 2.5 km for the take-off and approach surfaces for the Code 2 non-instrument approach.	31.1 km (16.8 nm)
Birchip Aerodrome	For the Code 1 runway, the maximum lateral extent of the OLS is up to 2.7 km for the conical surface and 1.6 km for the take-off and approach surfaces. This increases up to 3.6 km for the conical surface and 2.5 km for the take-off and approach surfaces for the Code 2 non-instrument approach.	41.3 km (22.3 nm)
Donald Aerodrome	For the Code 1 runway, the maximum lateral extent of the OLS is up to 2.7 km for the conical surface and 1.6 km for the take-off and approach surfaces. This increases up to 3.6 km for the conical surface and 2.5 km for the take-off and approach surfaces for the Code 2 non-instrument approach.	12.1 km (6.5 nm)

Aerodrome	Obstacle limitation surface	Distance from Project
Kerang Aerodrome	For the Code 1 runway and Code 2 non-instrument approach, the maximum lateral extent of the OLS is up to 4.7 km for the conical surface and 2.5 km for the take-off and approach surfaces. This increases up to 5.5 km for the conical surface and 15 km for the take-off and approach surfaces for Code 3.	5.4 km (2.94 nm)
St Arnaud Aerodrome	For the Code 1 runway, the maximum lateral extent of the OLS is up to 2.7 km for the conical surface and 1.6 km for the take-off and approach surfaces. This increases up to 3.6 km for the conical surface and 2.5 km for the take-off and approach surfaces for the Code 2 non-instrument approach.	11.5 km (6.2 nm)
Stawell Aerodrome	For the Code 3 runway, the maximum lateral extent of the OLS is up to 5.5 km for the conical surface and 15 km for the take-off and approach surfaces. This increases up to 6 km for the conical surface and remains 15 km for the take-off and approach surfaces for the Code 4 runway.	24.6 km (13.3 nm)
Swan Hill Aerodrome	For the Code 3 runway, the maximum lateral extent of the OLS is up to 5.5 km for the conical surface and 15 km for the take-off and approach surfaces. This increases up to 6 km for the conical surface and remains 15 km for the take-off and approach surfaces for the Code 4 runway.	31.7 km (17.1 nm)
Wycheproof Aerodrome	For the Code 2 runway, the maximum lateral extent of the OLS is up to 3.6 km for the conical surface and 2.5 km for the take-off and approach surfaces. This increases up to 5.5 km for the conical surface, 15 km for the take-off and 3 km for approach surface for the Code 3 runway.	14.2 km (7.7 nm)

As the Project does not infringe on any certified aerodrome OLS, there is no regulatory requirement to mark or light transmission line towers or transmission lines.

Instrument operations

Out of the eight certified aerodromes within 30 nm of the Project, three are served by instrument flight procedures. The remaining five do not have PANS-OPS protection areas and therefore assessment of the Project against those protection areas is not required.

The three certified aerodromes with PANS-OPS protection areas are:

- Kerang Aerodrome
- Stawell Aerodrome
- Swan Hill Aerodrome

The PANS-OPS protection areas include minimum sector altitudes and approach procedures.

Minimum sector altitude

Minimum sector altitudes (MSA) are developed using PANS-OPS surfaces and represent the lowest altitude which may be used to provide a minimum clearance of 984 ft (300 m) above all objects located in the area contained within an aerodrome's 55.6 km (25 nm plus a five nm buffer area) and 27.8 km (10 nm plus a 5 nm buffer area) radius.

The difference between the MSA and the minimum obstacle clearance provides the lowest protection surface for a given aerodrome.

Impacts to PANS-OPS protection areas can be assessed by identifying whether the highest point of the Project infringes on the lowest protection surface for a given aerodrome.

A summary of this assessment is presented in Table 21-4 below.

Table 21-4 Lowest protection surface infringements

Aerodrome	Minimum Sector Altitude	Lowest Protection Surface	Project Height (operation)
Kerang Aerodrome	25 nm radius: 609.6 m (2,000 ft)	25 nm radius: 310 m AHD, (1016 ft AMSL)	25 nm radius: 200.5 m AHD (657 ft AMSL)
	10 nm radius: 548.6 m (1,800 ft)	10 nm radius: 248.7 m AHD (816 ft AMSL)	10 nm radius: 186.1 m AHD (610 ft AMSL)
Stawell Aerodrome	25 nm radius: 1,128 m (3,700 ft)	25 nm radius: 827.8 m AHD (2716 ft AMSL)	25 nm radius: 321 m AHD (1054 ft AMSL)
	10 nm radius: 1,524 m (5,000 ft)	10 nm radius: 1,224 m AHD (4,016 ft AMSL)	10 nm radius: 321 m AHD (1,054 ft AMSL)
Swan Hill Aerodrome	25 nm radius: 609.6 m (2,000 ft)	25 nm radius: 309.7 m AHD (1016 ft AMSL)	25 nm radius: 185.5 m AHD (609 ft AMSL)
	10 nm radius: 609.6 m (2,000 ft)	10 nm radius: Not applicable – Project located outside of 10 nm radius	10 nm radius: Not applicable – Project located outside of 10 nm radius

Note: m AHD – metres Australian Height Datum, AMSL – above mean sea level

As presented in Table 21-4, the Project would not impact the MSA for Kerang, Stawell or Swan Hill Aerodromes during construction, operation or decommissioning, given that Project heights are below the lowest protection surface.

The final design of the Project with transmission line and tower coordinates and elevations would be provided to key stakeholders prior to construction (EPR-AV01). This would include Airservices Australia, responsible for providing air traffic control services in Australia and for maintaining the aeronautical and obstacle database, Parks Victoria, CFA, Buloke, Loddon, Gannawarra Shire Council, Northern Grampians Shire Council and Swan Hill Rural City Council. Engagement with key stakeholders would ensure that the aerodromes listed in Table 21-4 have all relevant Project information and that pilots operating at these aerodromes are suitably informed.

PANS-OPS approach procedures

The Project would be located within the protection area of PANS-OPS approach procedures at Kerang Aerodrome and potential infringements to these surfaces were assessed. Approach procedures are a series of predetermined manoeuvres pilots use to land an aircraft under instrument operations. The lowest PANS-OPS surface for the approach of aircraft at Kerang Aerodrome are 299 m AHD and 132.3 m AHD.

In proximity to Kerang Aerodrome at Tragowel, there are two Proposed Easement options. These are (refer to Figure 21-6):

- Tragowel western easement option
- Tragowel eastern easement option

At each of these locations, tower heights during operation of the Project would be 155 m AHD, which assumes a maximum tower height of 73.6 m. While there would be no impact to the PANS-OPS protection surface for the Tragowel eastern easement option, the Tragowel western easement option would impact the required navigation performance runway 32 (RNP RWY 32) PANS-OPS protection surface at Kerang Aerodrome (refer to Figure 21-6).

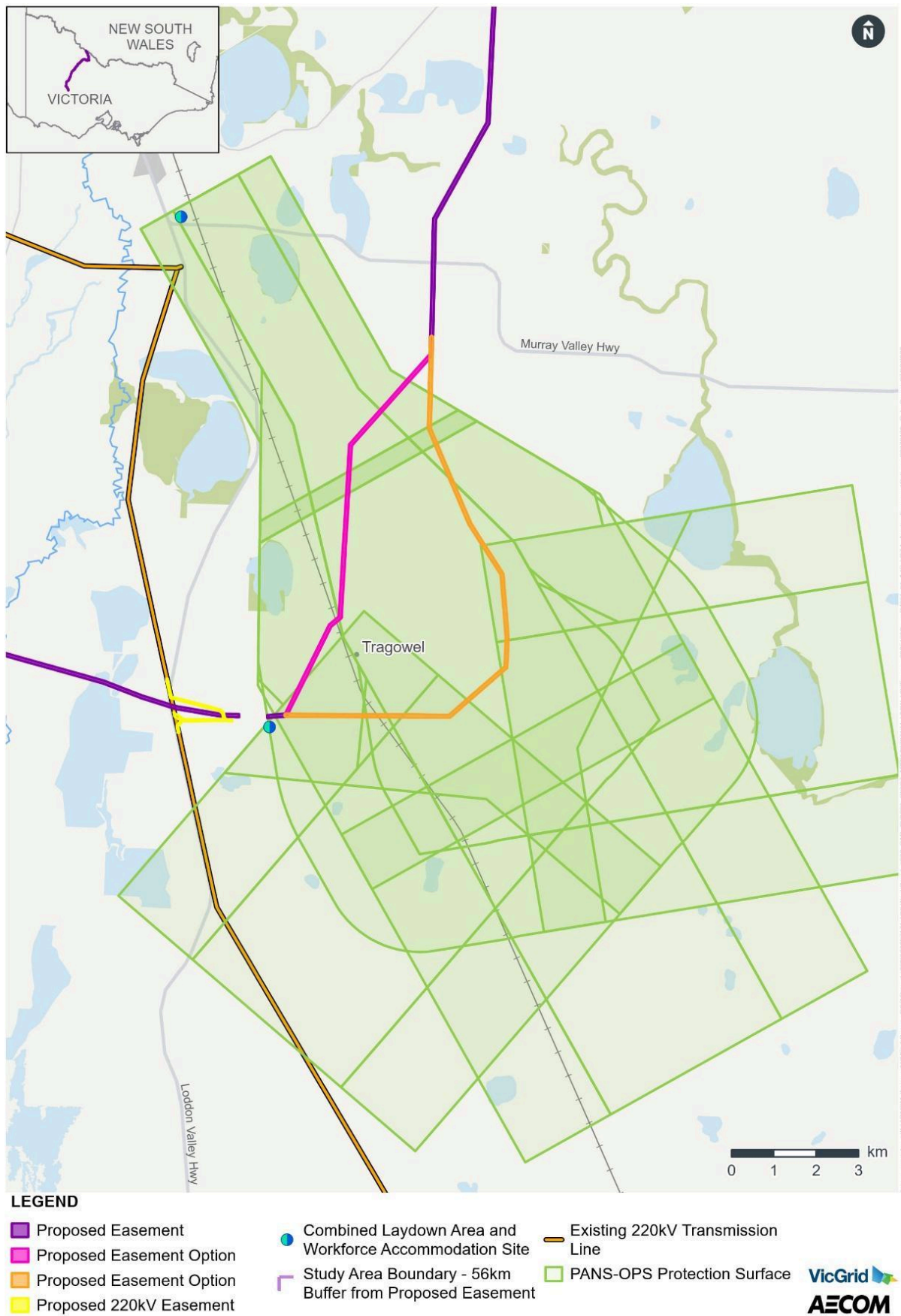


Figure 21-6 Tragowel easement options and Kerang PANS-OPS protection surface

Considering this, one of the following measures will be implemented to ensure that there is no infringement to the PANS-OPS protection surface at Kerang Aerodrome (EPR-AV02):

- Use the Tragowel eastern easement option, which would not impact Kerang Aerodrome; or
- Move the four identified transmission towers outside of the affected protection area; or
- Limit transmission line tower heights to equal to or less than 53.2 m within the RNP RWY 32 PANS-OPS area
- Raise the RNP RWY 32 Minimum Descent Altitude (MDA)
- Create a stepdown fix to push the MDA past the Project

Use of the Tragowel eastern easement option would avoid impacts to the protection surface during operation of the Project and while *Technical Appendix N: Aviation* identified that limiting tower heights to 53.2 m would avoid impacts, this is not a feasible design option for the Project. Regardless, approval to construct towers that potentially infringe on the Kerang Aerodrome will be sought from the aerodrome operator prior to construction commencing (EPR-AV02). *Technical Appendix N: Aviation* identified that four towers would need to move between 35 m and 400 m from their current locations to avoid impacting the protection surface. The feasibility of these tower moves will be considered as part of Project detailed design. Alternatively, engagement with Kerang Aerodrome can be undertaken to raise the impacted protection surface. While this is not an uncommon practice, it would require written permission from Kerang Aerodrome and a redesign of the protection surface which would also be subject to approval from the relevant aviation authority.

During construction of the Project, crane heights would extend up to 15 m above tower heights and there would be a temporary infringement on the PANS-OPS approach surface for either easement option. It would be a requirement under CASR to notify Kerang Aerodrome of construction activities ahead of time (EPR-AV02). Approval to operate construction cranes in the area surrounding Kerang Aerodrome must be obtained from the Kerang Aerodrome manager in advance of the proposed activity. The proponent would provide the aerodrome manager with details of the crane operations at least seven days prior to their commencement to enable notification to aircraft planning to operate in the area via the Notice to Airmen (NOTAM) procedure (EPR-AV02). With the implementation of this EPR, impacts on the Kerang Aerodrome PANS-OPS protection surface would be low and no further mitigation would be required.

The Project would not be located within the protection area of PANS-OPS approach procedures for Stawell or Swan Hill Aerodromes and therefore an assessment against these procedures is not required.

The [Notice to Airmen \(NOTAM\)](#) procedure is a document that provides pilots and other aviation personnel with time-critical information about potential hazards, changes to facilities, or other operational information that is essential for safe flight.

Instrument circling areas

A circling approach is an extension of an instrument approach to the specified circling MDA, at which point the pilot would visually manoeuvre the aircraft to align with the runway for landing. Typically, a circling approach is only conducted when 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 based on ICAO specifications set out in PANS-OPS and are related to the performance category of the design aircraft.

Refer to Table 21-5 for a summary of Kerang, Stawell and Swan Hill Aerodromes instrument circling areas.

Table 21-5 Instrument circling areas

Aerodrome	Most demanding aircraft performance category	Associated radius	Distance to Project
Kerang Aerodrome	Category B	4.85 km (2.62 nm)	5.4 km (2.94 nm)
Stawell Aerodrome	Category C	7.67 km (4.14 nm)	24.6 km (13.3 nm)
Swan Hill Aerodrome	Category C	7.67 km (4.14 nm)	31.7 km (17.1 nm)

Based on the above, the construction, operation and decommissioning of the Project would not affect the instrument circling areas of Kerang, Stawell and Swan Hill Aerodromes.

21.7.2 Uncertified aerodromes

An area of interest within a 3 nm radius of an aircraft landing area was used to assess potential Project impacts to uncertified aerodromes (refer to Section 21.6.1). The 3 nm area of interest generally contains the area in which aircraft manoeuvre after take-off or during landing. Operations within 3 nm are considered to be higher risk than those beyond this distance. The aerodromes located in areas beyond 3 nm of the Project would not be impacted and have not been assessed.

Uncertified aerodromes identified in Section 21.6.1 may be used for aerial application operations (such as fertiliser, pest and crop spraying), or the operation of privately owned aircraft. Commercial flights and medical evacuation flights by fixed wing aircraft are unlikely to operate from these aerodromes due to the higher regulatory framework that they must adhere to.

Landholders located adjacent to, or within 2 km of, the Project would be notified of the final design and location of the Proposed Easement and tower locations to facilitate the flight planning of aerial application operators conducting flight operations (EPR-AV01).

The uncertified aerodromes surrounding the Project are presented in Figure 21-1.

Heifer Station Creek Airstrip (proposed)

At the time of preparing this EES, Heifer Station Creek airstrip is a proposed uncertified aerodrome that is planned to be constructed and operated by a private landholder. It is proposed to be located immediately adjacent to the Project centreline (refer to Figure 2107).

As this airstrip would be considered an uncertified aerodrome, the protections required by the OLS or PANS-OPS do not apply. The runway should be oriented in a way that would allow aircraft to operate parallel to the Project, likely to the west of the airstrip. An example of a proposed normal aircraft circuit area has been assessed in relation to the project in Figure 21-7 below.

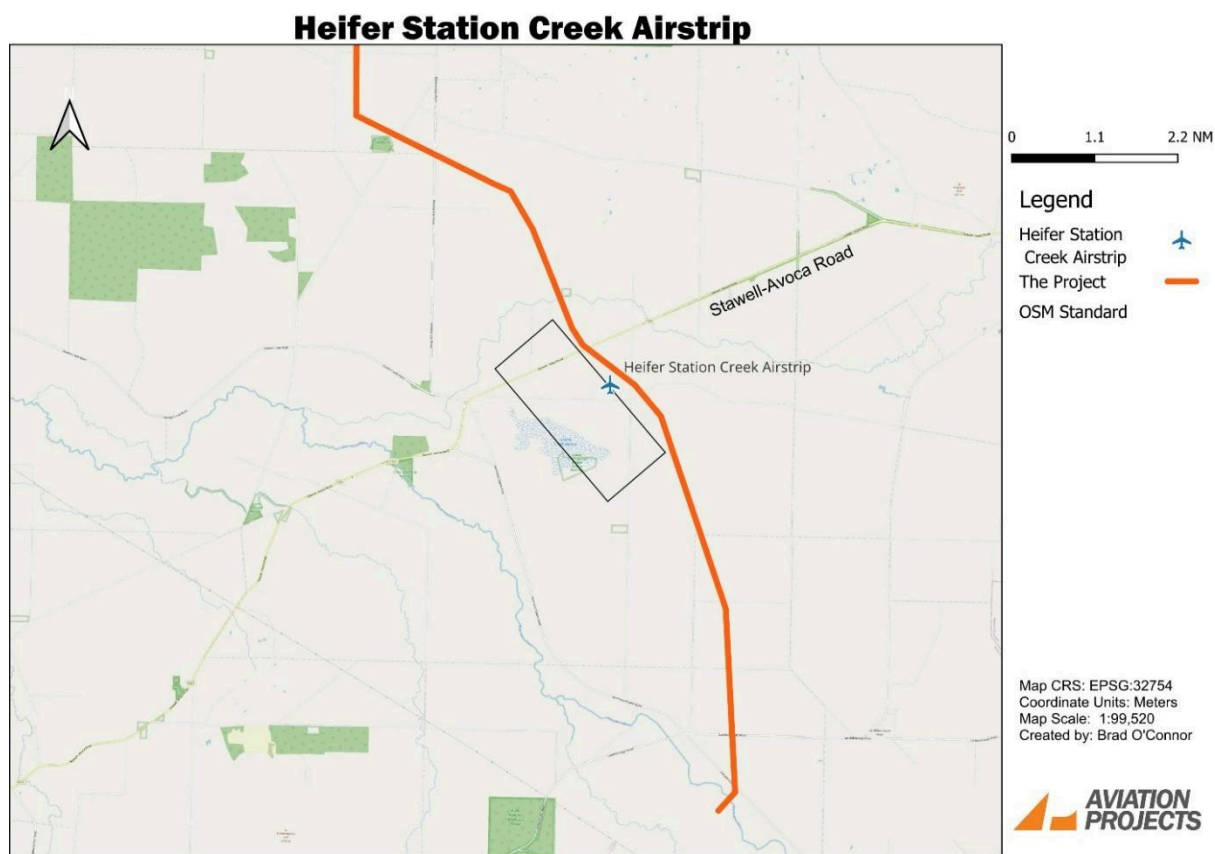


Figure 21-7 Heifer Station Creek airstrip (proposed)

The currently proposed east-west strip at the property would be unable to be used with the current centreline of the Project. With a north-runway that only operates to the west, the aerodrome would be considered as minor impact, meaning the airstrip could still be used with the adjustment of some flight paths.

With the currently proposed east-west runway, there would be a major impact to the airstrip and almost all operations would be compromised. Ongoing consultation with the landholder and operator of the airstrip is required to identify appropriate mitigation arrangements such as alternative airstrip orientations, or the mutually acceptable relocation of the strip (EPR-AV01).

For example, the airstrip may be relocated to another part of the property to avoid impacts. Figure 21-7 depicts a proposed western circuit which reflects an option for a safe operating area for this airstrip. In addition, to facilitate the flight planning of aerial application operators conducting flight operations on any property near to the proposed transmission line, details of the Project, including location and height information of the finalised design of the transmission line and towers should be provided to landowners (EPR-AV01). This would enable the landowner, when asked for hazard information on their property, to provide the aerial application pilot with all relevant information.

It is understood that VicGrid VNI West has commenced engagement with this landholder to identify a mutually acceptable outcome to enable coexistence of the two facilities. No additional EPRs are proposed.

Any additional impact on aviation operations at the proposed Heifer Station Creek Airstrip would need to be considered as part of compensation (either through the options process or *Land Acquisition and Compensation Act 1986*).

Morrl Morrl Airstrip

Morrl Morrl Airstrip is an uncertified aerodrome located on a private property. It is located approximately 450 m from the Project centreline (refer to Figure 21-8 below).



Figure 21-8 Morrl Morrl Airstrip

The minimum climb gradient an aircraft must be able to maintain is 2.5 per cent.

An aircraft taking off to the south at Morrl Morrl Airstrip has approximately 485 m to climb after take-off. An aircraft would only gain 12.1 m of height in this distance at the minimum climb gradient.

Engagement with the landholder in October 2025 confirmed that aerial operations would not be able to continue should the Project continue in its planned state. This would be considered a major impact to the uncertified airstrip.

Ongoing consultation with the operator of the airstrip is required to identify appropriate mitigation arrangements (EPR-AV01) or a mutually acceptable relocation of the strip, however an outcome of the October 2025 engagement was that relocation of the airstrip would be highly constrained. If a mutually acceptable outcome cannot be reached, Morrl Morrl Airstrip would need to be considered as part of compensation (either through the options process or *Land Acquisition and Compensation Act 1986*).

Other uncertified aerodromes

Assessment of the orientation and standard circuit patterns of Cope Cope Aerodrome, Koondrook Aerodrome, Meran Park Aerodrome, Robin's Airstrip and Green's Creek Aerodrome determined that normal operations at these locations could continue without modification. There would be minimal impacts to these aerodromes as a result of the Project. The implementation of EPRs identified in the sections above would further reduce potential impacts.

21.7.3 Aerial application operations and aerial firefighting

Aerial application operations, including activities such as fertiliser, pest and crop spraying, as well as aerial firefighting efforts are often conducted at low altitudes (under VFR below 500 ft (152.4 m) Above Ground Level (AGL)). While aerial firefighting usually maintains an altitude close to 500 ft, agricultural related aerial application operations are conducted much closer to ground level, generally between 6.5 ft (2 m) and 100 ft (30.5 m). As a result, aerial application operations in the Project vicinity would be impacted by the presence of the proposed transmission line and transmission line towers.

Due to the nature of the operations conducted, both aerial application pilots and aerial firefighting pilots are subject to rigorous training and assessment requirements to obtain and maintain their licence to operate under these conditions.

Most aerial firefighting organisations have formal risk management programs to assess the risks associated with their operations and implement applicable treatments to ensure an acceptable level of safety can be maintained.

The Aerial Application Association of Australia (AAAA) recommends a formal risk management program to assess the risks associated with their operations and implement applicable treatments to ensure an acceptable level of safety can be maintained.

The provision of the Project's final design to Airservices Australia and the Department of Defence would ensure that the Project is shown on aeronautical charts, enabling pilots to be aware of the transmission towers and to be compliant with a key AAAA initiative. Similarly, the provision of the data to Department of Defence will ensure that their low-level charts include the transmission towers and transmission lines and that military pilots are aware of them when planning and conducting low level flight operations.

21.7.4 Air routes and grid lowest safe altitudes

CASR requires that the published lowest safe altitude (LSALT), for a particular airspace grid or air route, provides a minimum of 1,000 ft (304.8 m) clearance above the controlling (highest) obstacle within the relevant airspace grid or air route tolerances.

A grid LSALT is provided for aircraft under instrument operations that are not flying along a published air route. CASR prescribes a minimum obstacle clearance of 1,000 ft above the highest terrain or obstacle is maintained within each grid LSALT area to ensure aircraft are kept a safe vertical distance from the obstacle below. Assessment of Project heights in comparison to published grid LSALTs show that the Project would not infringe upon these clearances, and further assessment is not required.

Air routes between aerodromes are provided with a LSALT. There are nine air routes located within 7 nm of the Project. The construction, operation and decommissioning of the Project would not impact any air route LSALT as the Project does not infringe on the protection surfaces for any nearby air routes.

The final design of the Project with transmission line and tower coordinates and elevations would be provided to key stakeholders prior to construction (EPR-AV01):

Notification of these key stakeholders would ensure potential impacts to the airspace, as well as aircraft operating in that airspace are minimised.

21.7.5 Navigation features

Navigation features include navigation aids, air traffic control radar facilities and communication facilities. These features are used in the navigation of aircraft under instrument operations.

The nearest aviation navigation aid is a non-directional radio beacon located at Swan Hill Aerodrome, approximately 32 km northwest of the closest point of the Project. The protection area for this navigation aid is 300 m and there would be no impact as a result of the Project.

The nearest radar facility to the Project is the Mount Macedon Route Surveillance Radar (RSR). Air traffic control radar facilities are used by Airservices Australia and the Department of Defence to facilitate the safe separation and control of aircraft around Australia. Mount Macedon RSR is approximately 144 km to the southeast of the Project and there would be no impact to this facility as a result of the Project.

Aviation safety relies on the constant flow of information between pilots and those controlling activities on the ground. Aviation communication facilities provide services such as radio communications, that allow this information to flow easily between all users.

The nearest aviation communication site is located at the Grampians range in western Victoria, which is located 47 km from the closest point of the Project. This distance is outside the area of interest for Very High Frequency communication sites and there would be no impact as a result of the Project.

The final design of the Project would be provided to Airservices Australia (EPR-AV01). The purpose of notifying Airservices Australia of the final heights of the transmission towers is to enable their details to be available in charts and aeronautical information databases used by pilots, so that the obstacles can be avoided.

21.7.6 Residual impact

There would be negligible or suitably low impacts to aviation as a result of the construction, operation and decommissioning of the Project. Where other impacts have been identified, these would be managed through design changes and/or engagement with key stakeholders such as Airservices Australia, local councils and landholders.

During operation of the Project, impacts to the PANS-OPS protection surface from tower heights at Kerang Aerodrome will be avoided by either:

- Adopting the Tragowel eastern easement option
- Limiting transmission line tower heights to equal to or less than 53.2 m within the RNP RWY 32 PANS-OPS area
- Moving the four identified transmission towers outside of the affected protection
- Raising the RNP RWY 32 MDA
- Creating a stepdown fix to push the MDA past the Project

Any of these measures will ensure that there is no likelihood of impact to the PANS-OPS protection surface, resulting in a suitably low residual impact. It is noted that while *Technical Appendix N: Aviation* identified that limiting tower heights to 53.2 m would avoid impacts, this is not a feasible design option for the Project.

The temporary infringement on the PANS-OPS approach procedure at Kerang Aerodrome, due to the height of cranes during construction, would be managed by notifying the aerodrome at least seven days prior to construction in accordance with CASR requirements and there would be no significant impact.

Airservices Australia maintains a database of tall structures in Australia to inform aeronautical information databases and maps used by pilots so that any obstacles can be avoided. The current design of the transmission line towers for the Project fall above the minimum reporting height, and as a result, all the locations would need to be reported to Airservices Australia once the Project design is finalised (EPR-AV01).

There is the potential for major impacts to the proposed Heifer Station Creek Airstrip and the existing Morri Morri Airstrip. These uncertified aerodromes would be located immediately adjacent to the Project and, should the Project proceed as currently designed, would not be able to undertake operations. Ongoing consultation would be required to identify alternative solutions and additional mitigation measures, where practical. These may include alternative airstrip orientations or a mutually acceptable relocation of the strip. Engagement with the landholders of these two airstrips has already commenced.

In the event that a mutually acceptable outcome cannot be identified, aerial operations at either airstrip would not be possible and the residual impact would be major. In this instance, impacts on aviation operations at the proposed Heifer Station Creek Airstrip and Morri Morri Airstrip would need to be considered as part of compensation (either through the options process or *Land Acquisition and Compensation Act 1986*).

21.8 Obstacle lighting and marking

As the Project does not infringe on any certified aerodrome OLS, there is no regulatory requirement to mark or light transmission line towers or transmission lines. However, consultation with local aerial application operators and uncertified aerodrome operators may identify areas the Project could adversely affect aerial application operations. Strategies such as marking transmission lines or transmission line towers in line with the relevant regulations may be applied to increase the level of awareness to local operators flying near the Project. As the transmission line towers are less than 100 m AGL, there are no legislative requirements or guidelines for specific aviation related lighting. Lighting is not recommended for the Project.

21.9 Cumulative impact assessment

A cumulative impact assessment of aviation impacts was undertaken with other proposed developments in the region. For the purpose of evaluating cumulative impacts, this assessment identified projects that may infringe upon the protection surfaces of certified aerodromes and are located within 3 nm of uncertified aerodromes in the study area. Further information is presented in *Technical Appendix N: Aviation*.

Three proposed windfarms may impact upon the PANS-OPS protection surfaces at Kerang Aerodrome. These include:

- Normanville Energy Park
- Meering West Wind Farm
- Cannie Wind Farm

There is potential for the construction periods of these wind farms to overlap with the construction of the Project, which as identified in Section 21.7.1 would result in an infringement on the 157.3 m AHD PANS-OPS approach surface at Kerang Aerodrome. These proposed projects would be required to give notice to Kerang Aerodrome and gain approval to operate cranes within the protection surface. As such, there would be no cumulative impact with the Project.

Additionally, while the Project would not result in any residual impact to Kerang Aerodrome during its operation, the listed wind farms may infringe on PANS-OPS surfaces or OLS. In this instance, the PANS-OPS surfaces can be increased to accommodate the wind farms without impacting upon flight operations at Kerang Aerodrome. This, however, would be subject to engagement between the wind farms and Kerang Aerodrome.

Two proposed wind farm projects to the south of the Proposed Easement may be located within 3 nm of uncertified aerodromes identified in this assessment:

- Watta Wella Wind Farm
- Navarre Green Power Hub

The proposed Watta Wella Wind Farm project consists of a co-located wind farm and battery energy storage facility. The proposed location for the wind farm project is approximately 16 km northeast of Stawell, in northwest Victoria. Environmental and technical studies are currently being finalised, and project construction is anticipated to commence in 2026. Greens Creek Aerodrome is located just within 3 nm of the northern area of the proposed Watta Wella Wind Farm project, however the normal daily operations at the aerodrome would not be impacted. The Project route does not have an adverse impact on the operation of the aerodrome as discussed in Section 21.7.1. Therefore, there would be no cumulative impact to the Greens Creek Aerodrome.

Whilst there is potential for the Project to have a major impact upon the proposed Heifer Station Creek Airstrip, depending on its final orientation, the proposed Navarre Green Power Hub, located to the north of Navarre township is not likely to create an adverse impact on the operation of the proposed aerodrome as it is likely to be outside the 3 nm area of interest surrounding the proposed aerodrome site. A more likely cumulative impact would exist with the proposed corridor for the proposed 220 kilovolt transmission line connecting Navarre Green Power Hub with the existing Bulgana Terminal Station that is currently located to the east of the airstrip. The exact location and details of the proposed transmission line within this corridor is currently unknown. Consultation with this landholder would need to be conducted by VicGrid VNI West and the wind farm developer, should their proposal progress as currently planned, to reach a mutually agreeable outcome.

Given that the Project would not have an impact on remaining certified and uncertified aerodromes, there are unlikely to be any cumulative impacts to aviation as a result of the construction, operation and decommissioning of the Project.

21.10 Summary of mitigation measures

21.10.1 EPRs

Table 21-6 outlines the EPRs and recommendations developed to avoid and minimise potential impacts during construction, operation and decommissioning of the Project.

No monitoring or contingency measures are proposed as part of this impact assessment as the EPRs are considered appropriate to minimise impacts.

Table 21-6 Proposed EPRs

Measure ID	EPR	Phase
AV01	Aviation stakeholder notification and consultation During detailed design and prior to the commencement of construction, the Principal Contractor will provide final Project design information relevant to aviation safety and operations to relevant aviation stakeholders and affected parties and will consult where Project infrastructure may materially affect existing aerial operations, including agricultural aviation and drone-based agricultural activities. This will include, at a minimum: • Provision of final transmission line and tower coordinates, and where relevant elevations, to the following stakeholders: - Airservices Australia - Department of Defence - Gannawarra Shire Council and other landowners of existing and proposed aerodromes/airstrips located within 3 nm of the project - Ambulance Victoria - Victoria Police Air Wing - Country Fire Authority - Royal Flying Doctor Service - Department of Energy, Environment and Climate Action (Forest Fire Management Victoria) - Other relevant aviation stakeholders identified during detailed design • Provision of relevant Project information, including location and height information for the final transmission line and towers, to nearby landholders where aerial agricultural operations or drone-based agricultural activities may be materially affected, where the term “nearby landholders” refers to all owners and occupiers of the following land: - Land that hosts the Project, or adjoins the Project and where aerial agricultural operations are occurring, or will occur, based on information available to the proponent; and - Land that is not located within a township zone or other urban zone according to the applicable Planning Scheme, and that is located within 2 km of the proposed final route of the Project.	Design Pre-construction Construction

Measure ID	EPR	Phase
	- Engagement with relevant landholders where the Project may materially affect existing aerial farming operations, including low-level aerial spraying, mapping, mustering, surveillance, precision agriculture or drone-based agricultural activities - Identification of appropriate management arrangements, such as alternative airstrip orientations, notification protocols, updated farm operation information, marking or communication of hazards, or other mutually agreed measures - Notification of crane use and other temporary tall plant or equipment to relevant aerodrome operators, local authorities and other stakeholders where required for safe aviation operations, including owners of uncertified aerodromes within 3 nautical miles where relevant - Provision of at least seven days' notice of crane operations, where required, to enable notification through the Notice to Airmen (NOTAM) procedure - Further notification where final Project design or temporary works materially alter previously provided aviation-related information.	
AV02	Kerang Aerodrome/PAN-OPS protection During detailed design and prior to the commencement of construction, the Principal Contractor will ensure that the Project avoids infringement of applicable PAN-OPS protection surfaces at relevant aerodromes, such as Kerang Aerodrome, or otherwise obtains any required agreement or approval from the relevant aerodrome manager before construction proceeds. To address the potential PAN-OPS impact at Kerang Aerodrome, the Delivery Partner/Principal Contractor will ensure one of the following measures is implemented: - Use the Tragowel eastern easement option, which would not impact Kerang Aerodrome; or - Move the four identified transmission towers outside of the affected protection area; or - Limit transmission line tower heights to equal to or less than 53.2 metres within the RNP RWY 32 PAN-OPS area. - Raise the RNP RWY 32 Minimum Descent Altitude (MDA); or - Create a stepdown fix to push the MDA past the Project. Detailed design will demonstrate how this requirement has been addressed. Where approval is required to construct towers or operate cranes in an area that may affect Kerang Aerodrome operations, the Principal Contractor will obtain the relevant approval from the Aerodrome Manager prior to the relevant works commencing. The Principal Contractor will provide the Aerodrome Manager with details of the proposed crane operations at least seven days prior to their commencement to enable notification through the NOTAM procedure.	Design Pre-construction Construction

21.11 Conclusion

An aviation impact assessment was undertaken to assess the potential adverse effects on aerial safety, especially with respect to use of aircraft for farming practices, maintenance and firefighting.

The aviation impact assessment evaluated the Proposed Easement and Proposed Easement options at Tragowel and Teddywaddy. At Teddywaddy, the assessment found there is minimal difference in terms of aviation impacts, as each of the easement options covers a similar area of impact and neither affects nearby certified or uncertified aerodromes. At Tragowel, the eastern easement option would result in fewer aviation impacts than the western easement option, as it would avoid the identified operational impact to the Kerang Aerodrome.

Eight certified aerodromes were identified within 30 nm of the Proposed Easement. Potential impacts to certified aerodromes from the Project include infringements of protected surfaces that support the safe take-off, landing and operation of aircraft. The aviation impact assessment determined that, with the exception of Kerang Aerodrome during Project construction, the Project would not infringe the protected surfaces of any certified aerodrome.

Kerang Aerodrome is located approximately 5.4 km from the Proposed Easement. During construction there would be an infringement of the 157.3 m AHD protection surface for aircraft using instrument approach procedures at the aerodrome. This impact would be managed by notifying Kerang Aerodrome in advance of the relevant construction activities, in accordance with applicable requirements, enabling notification to aircraft operating in the area via the NOTAM procedure. This would allow temporary hazards to be safely managed.

During operation of the Project, towers in the Tragowel western easement option would potentially infringe the relevant protection surfaces at Kerang Aerodrome. Measures will be implemented to avoid or minimise this impact may include adopting the Tragowel eastern easement option, moving the affected towers, or engaging with the aerodrome operator and relevant aviation authorities regarding changes to instrument approach procedures.

These impacts will be addressed through the EPRs proposed in this impact assessment. The EPRs measures will be enshrined in the Environmental Management Framework which is referenced in the Incorporated Document developed for the Project.

There were eight uncertified aerodromes identified within 3 nm (5.56 km) of the Proposed Easement. Of these, the Project would potentially impact the proposed Heifer Station Creek Airstrip and the existing Morrl Morrl Airstrip. Ongoing consultation would be required to identify alternative solutions and additional mitigation measures, where practicable. These may include alternative airstrip orientations or a mutually acceptable relocation of the airstrips. VicGrid VNI West has already begun engagement with the landholders of these two airstrips. If the mutual relocation of airstrips cannot be achieved, there may be a major residual impact to the uncertified aerodrome operators impacted by the Project and this would need to be considered as part of compensation (either through the options process or *Land Acquisition and Compensation Act 1986*).

The assessment of firefighting in proximity to Project infrastructure is presented in *Technical Appendix E: Bushfire* which concluded that overall, it is common for firefighting operations to be conducted near transmission line infrastructure and the Project is unlikely to have a significant impact on aerial bushfire suppression. Potential impacts to air routes and aircraft navigation features were also assessed as part of the aviation impact assessment, and no impacts were identified.

