Hexham
Wind Farm

Chapter 29

Conclusion

WIND PROSPECT

29.1 Overview

This chapter provides an overview of how the Hexham Wind Farm (the project) has responded to the Scoping Requirements for Hexham Wind Farm Environment Effects Statement (scoping requirements) issued by the Minister for Planning (the Minister) in September 2024. The scoping requirements outline the evaluation objectives for the project and guide the integrated assessment of environmental effects and evaluation of the overall implications of the project.

The project would harness strong and reliable winds to generate renewable energy through the construction and operation of up to 106 wind turbines. The project represents the potential for a new and significant contribution to the National Electricity Market that will help reach Victoria's renewable energy targets of 65% by 2030 and 95% by 2035, and the Commonwealth Government's target of achieving net-zero emissions by 2050. Wind energy is considerably cheaper than fossil fuel generation and is expected to remain so into the future. When combined with energy storage via large scale batteries, the project can provide reliable power and affordable electricity prices for consumers. This is able to occur while also minimising the impacts and maximising the benefits from the project.

The key reasons for an EES being required for the project, as contained in the Minister's decision, were due to potentially significant effects to:

- *"biodiversity values, including threatened species and communities listed under the Flora and Fauna Guarantee Act 1988 [FFG Act] and Environment Protection and Biodiversity Conservation Act 1999 [EPBC Act]*
- *native vegetation and ecology of the area's terrestrial environments and freshwater environments, including wetlands and creeks;*
- *Aboriginal cultural heritage;* and
- *landscape and visual amenity".*

The Minister also determined the project has the potential for cumulative adverse effects (particularly on local and regional biodiversity, social and landscape values) due to other proposed, operating and approved wind farms in the vicinity.

29.2 Summary of assessment against evaluation objectives

The scoping requirements, developed with input from the public, specified the matters to be investigated and documented within the EES and contained seven evaluation objectives. Eighteen specialist studies (listed in Chapter 1 – ***Introduction***) addressed these evaluation objectives by identifying and assessing a broad range of potential impacts associated with the construction, operation and decommissioning of the project. All studies assessed the potential effects from the project as described in Chapter 6 – ***Project description***. The outcomes of these assessments informed the project design development and, where potential adverse impacts were identified, management measures have been proposed to avoid, minimise and mitigate these impacts. These measures are listed in Chapter 28 – ***Environmental Management Framework***.

The following sections provide an assessment of the project against the evaluation objectives based on the findings of the relevant specialist assessments.

29.2.1 Biodiversity and habitat

Evaluation objective: *To avoid, and where avoidance is not possible, minimise potential adverse effects on biodiversity values within and near the site including native vegetation, listed threatened species and ecological communities, and habitat for these species. Where relevant, offset requirements are to be addressed consistent with State and Commonwealth policies.*

The evaluation objective relevant to 'biodiversity and habitat' was assessed in the following specialist reports, with the findings summarised in Chapter 8 – ***Biodiversity and habitat***, Chapter 9 – ***Bats*** and Chapter 10 – ***Brolga***:

- Appendix D – ***Flora and Fauna Assessment***
- Appendix C1 – ***Brolga Impact Assessment***
- Appendix C2 – ***Bat Assessment***.

Flora and fauna

Most of the project site has been highly modified by past and ongoing agricultural practices, with land cleared of original native vegetation to facilitate grazing and cropping. As such, native vegetation is largely restricted to roadsides, waterways and wetland areas. Many of these areas are also highly modified, and some contain a high abundance of invasive species.

The entirety of the project, including facilitating the transport of project infrastructure along the transport route, will result in between 8.238 and 8.533 hectares of native vegetation being removed, including four to nine large trees in patches and six scattered trees.

Vegetation removal will also impact one listed flora species, Purple Blown-grass, listed as Endangered under the FFG Act. Between one and five individuals will be impacted (depending on the preferred transport route), resulting in a **low** to **moderate** impact to the species. Regardless of which transport route is chosen, native vegetation removal represents approximately 10% of all mapped native vegetation, and only 1.4% of the total area within the project construction footprint. Native vegetation to be retained will be included on site maps, marked, and protected during construction.

A range of fauna species listed as threatened or migratory under the EPBC Act and/or FFG Act are either known to reside within or are likely to use the project site, roadside upgrade locations, and along transport route investigation areas. Depending on the species, impacts are assessed as being **very low** to **moderate** following the application of design mitigations (such as habitat buffers) and both general and species-specific management measures. These measures include (for example) seasonal scheduling of specific construction activities, implementation of protection zones, and the establishment of bird nest boxes where breeding locations cannot be avoided.

Some bird species are susceptible to collision with turbine blades based on their flying behaviour and others may avoid the area. A range of management measures have been proposed in response to these potential impacts and are described within Attachment V - ***Bat and Avifauna Management Plan***, which is being exhibited alongside this EES. With the implementation of this plan, residual risks of collision to bird species are assessed as **very low** to **moderate** (depending on the species).

Threatened bats

A bat impact assessment was undertaken by Nature Advisory to identify potential impacts of the project's construction and operation on three bat species, protected under Commonwealth and/or Victorian legislation: Southern Bent-wing Bat (*Miniopterus orianae bassanii*), Grey-headed Flying-fox (*Pteropus poliocephalus*) and Yellow-bellied Sheath-tailed Bat (*Saccolaimus flaviventris*).

Calls from nine bat species were recorded during bat detector surveys, including the Southern Bent-wing Bat and the Yellow-bellied Sheath-tailed Bat. Targeted surveys were also undertaken to understand the movement of Grey-headed Flying-fox from a temporary camp at a pine plantation to the east of the project site, however no flights towards to the project site were observed.

During construction, human presence and construction noise from project activities may result in temporary disturbance of local bat populations. Construction may also result in foraging habitat being removed. The main impact pathway for bats relevant to the project is the direct collisions with operating wind turbine blades, leading to bat mortality.

To minimise the impact of the project on threatened bat species, proactive avoidance and minimisation strategies were developed during the design development process in consultation with Department of Energy, Environment and Climate Action (DEECA) and Department of Climate Change, Energy, the Environment and Water (DCCEEW). This included turbine design and micro-siting to avoid impacts to threatened Southern Bent-wing Bat and Yellow-bellied Sheath-tailed Bat populations. A mitigation hierarchy was developed to preferentially avoid high-quality habitat and areas where proportionally higher levels of Southern Bent-wing Bat activity were recorded.

As most Southern Bent-wing Bat movements are expected to be closer to non-breeding caves (which are located at least 25 kilometres from the project site) and the species primarily flies at lower heights (between zero and 30 metres), if individuals were to cross the project site, the risk of turbine collision is considered low. Given the very small number of Yellow-bellied Sheath-tailed Bat calls recorded within the investigation area, and that no Grey-headed Flying-fox were observed flying towards to the project site, it is considered unlikely that the project would result in levels of mortality sufficient to cause a significant impact on these species.

Attachment V - ***Bat and Avifauna Management Plan*** will include measures to avoid and minimise impacts to threatened bat species, including curtailment strategies during periods when Southern Bent-wing Bat are most active across the landscape, ongoing monitoring of blade strike mortality, post-commissioning acoustic bat surveys, and a Grey-headed Flying-fox monitoring program.

While the likelihood of bat collisions with project wind turbines has been minimised as far as practical, a **low** to **very low** level of bat mortality is anticipated.

Brolga

A brolga impact assessment was undertaken in accordance with the Interim Guidelines for the Assessment, Avoidance, Mitigation and Offsetting of Potential Wind Farm Impacts on the Victorian Brolga Population (Interim Brolga Guidelines) (DSE, 2012), and included a review of existing database records, landowner consultation, aerial surveys, field surveys and hydrological modelling to assess wetland suitability as Brolga breeding habitat.

To minimise the impact of the project on the Brolga population, habitat-based turbine-free buffers have been applied. These buffers incorporate wetlands with confirmed or valid historical records to indicate they have been used for breeding and night-roosting. The buffers also include wetlands that could provide habitat used for foraging and/or alternative night-roosting within 2,000 metres of breeding site wetlands, non-wetland areas around breeding wetlands, and movement corridors between breeding wetlands and other wetlands.

A Brolga Compensation Plan, developed in accordance with the Interim Brolga Guidelines, will require impacts on the Victorian Brolga population (predicted in the Population Viability Assessment) to be fully offset to ensure that the expected minimum population size remains the same. It is expected that, by adhering to the Interim Brolga Guidelines, the project will not significantly or cumulatively impact the Victorian Brolga population in south-western Victoria. During the project's operation, monitoring protocols and responsibilities will be implemented in accordance with Attachment V - ***Bat and Avifauna Management Plan***.

29.2.2 Catchment values and hydrology

Evaluation objective: *To maintain the functions and values of aquatic environments, surface water and groundwater quality and stream flows and avoid adverse effects on protected environmental values.*

The evaluation objective relevant to 'catchment value and hydrology' was assessed in the following specialist reports, with the findings summarised in Chapter 11 – ***Groundwater***, Chapter 12 – ***Surface water*** and Chapter 13 – ***Landform and soils***:

- Appendix A – ***Soil and Landform Assessment***
- Appendix B – ***Surface Water and Groundwater Impact Assessment***.

Groundwater

A groundwater impact assessment was undertaken to determine key groundwater features and values within and surrounding the project site, and to identify potential project impacts on these values and measures to be taken to avoid and minimise these impacts.

The potential for groundwater-related issues associated with the project relates to the potential for adverse impacts to existing users of groundwater and to Groundwater Dependent Ecosystems (GDEs) (including stygofauna) due to reduced groundwater levels or impacts to groundwater supply. Impacts may also occur due to reduced groundwater quality.

Design measures were implemented to avoid potential impacts to local groundwater users and environmental values, including applying a 100-metre buffer around all mapped aquatic GDEs and DEECA wetlands, and a 25-metre buffer around all mapped terrestrial GDEs to exclude turbine foundations within the buffered area, except crossing of waterways where this cannot be avoided.

All potential aquatic and terrestrial GDEs are located outside the predicted quarry drawdown extent. As such, impacts to GDEs are not expected due to quarry pit dewatering. Once the quarry is backfilled, the water table is expected to recover to its pre-quarrying level. At the location of turbine foundation and cable excavations, with the application of buffer distances, the impact of groundwater drawdown near potential aquatic GDEs, DEECA wetlands and potential terrestrial GDEs is considered very low.

Management measures have been proposed for the construction, operational and decommissioning phases of the project to further manage potential groundwater impacts. Any proposed dewatering activities are to be captured in a Water Management Plan. The occurrence of groundwater in foundation excavations and potential dewatering volumes (should this be required) will be assessed during the pre-construction works, with the findings of this assessment and management implications will be detailed in the Construction Environmental Management Plan. With these measures in place, the impacts to groundwater users and groundwater quality were assessed to be **very low** to **low**.

Surface water

A surface water impact assessment was undertaken to characterise the surface water environment within and surrounding the project site, including identifying key surface water features and environmental values. The assessment considered potential construction and operational impacts of the project on these values and identified measures to avoid and minimise these impacts.

The greatest likelihood of project impacts to waterways and wetlands is from construction activities associated with watercourse crossings, and to a lesser extent, from general construction activities. These activities have the potential to result in physical streambed disturbance and water quality impacts from stormwater runoff containing sediments entering waterways. Additionally, the construction of access tracks and hardstand areas has the potential to alter existing drainage patterns if not accounted for during design.

Flood behaviour within the project catchments was used to inform the siting of infrastructure to avoid areas of potential flooding. Other design mitigations included designing the project with buffers around all mapped wetlands, and minimisation of watercourse crossings through siting of access tracks. Detailed drainage designs would be completed in accordance with best practice guidelines and in consultation with relevant authorities to minimise impacts to surface waters and supported ecosystems. Where essential wind farm infrastructure (e.g., access tracks and electrical cables) crosses a creek, measures for avoiding and minimising impacts will be documented in the Construction Environmental Management Plan, and monitoring surface water quality upstream and downstream of the works area would be undertaken in accordance with the Sediment, Erosion and Water Quality Management Plan.

With the implementation of management controls, residual effects of watercourse crossings and to a lesser extent reduced water quality from construction works were assessed to be localised and temporary resulting in impacts ranging from **very low** to **low**. Residual effects to the hydrology and water quality of ephemeral wetlands were assessed as negligible.

Landform and soils

The construction of the project has the potential to impact existing landforms and result in soil-related issues from the earthworks associated with the foundations for wind turbines, cable trenches and other structures (e.g., concrete batching plants and on-site terminal station), proposed on-site quarry development, and construction of access tracks and hardstand areas. These impacts may include ground settlement following construction due to unstable soils, erosion of exposed soils, and exposure and disposal of waste or hazardous soils. While some of these impacts would be temporary, others would be restricted to the construction phase or occur over the life of the project.

The local geotechnical conditions will be determined through a site-specific geotechnical investigation, undertaken prior to the finalisation of the detailed design, which will inform the design of infrastructure foundations for wind turbines and other structures, excavation methods, and pavement requirements for access tracks and hardstand areas.

With the incorporation of recommended management measures, the significance of impacts to landform and soil values are predominately considered to be **very low** or **low**. However, should preparation of access road pavements and hardstand areas occur during the wetter months of the year, surface drainage paths or ponded water may result in poorer performance of the surface beneath these areas and lead to increased ongoing maintenance of roads and access tracks. As construction during dry weather is not always possible, the significance of impacts associated with the preparation of these areas are considered **low** to **medium**.

29.2.3 Landscape and visual

Evaluation objective: *Avoid and, where avoidance is not possible, minimise and manage potential adverse effects on landscape and visual amenity.*

The evaluation objective relevant to landscape and visual was assessed in the following specialist reports, with the findings summarised in Chapter 14 – ***Landscape and visual*** and Chapter 15 – ***Shadow flicker and blade glint***:

- Appendix F1 – ***Landscape and Visual Impact Assessment***
- Appendix M – ***Shadow Flicker and Blade Glint Impact Assessment***.

Landscape and visual

Wind farm developments have the potential to cause visual impacts through changes to the landscape character and visual amenity. The project has the potential to cause visual impacts to landscape character and visual amenity from publicly available viewpoints and private dwellings, as well as from night lighting on nacelle of wind turbines and from ancillary structures (e.g., site offices).

An assessment of the visual scale and prominence of the project wind turbines over a range of distances was used to determine whether they are likely to be dominant, noticeable, discernible or insignificant in the project 'visual catchment' (or viewshed). Although the project is likely to be discernible from some nearby townships, it would not dominate the visual catchment. Existing vegetation and built form within the townships are likely to fragment or screen views. Given the highly modified landscape, it is likely that the broader character of the project investigation area would remain intact.

Management measures have been proposed for the design, construction and operational phases of the project to minimise potential landscape and visual impacts, including incorporation of a 1.5-kilometre buffer of non-involved dwellings (i.e., neighbouring dwellings not participating in the project) and landscape screening. With the implementation of the recommended design and management measures, it is considered that residual visual impacts at all non-involved dwellings would be significantly reduced and once vegetation screening is established any visual impacts of the project would be low.

There are other operating, approved and proposed wind farms within the project investigation area. Viewers travelling along highways and local roads within the investigation area may experience sequential visual impact from the project – that is, views driving along roads may include a number of wind farms, seen one after another, impacting the viewer's perception of the landscape they are travelling through. Due to the proximity of the proposed Mt Fyans Wind Farm to the project, it is likely that the project will be viewed as an extension of the Mt Fyans project. Simultaneous views to both the project and Mt Fyans, Mortons Lane and Salt Creek wind farms would be possible along some local roads. However, these views would be limited due to roadside vegetation screening, direction and speed of travel.

Shadow flicker and blade glint

The shadow flicker assessment modelled the 'theoretical' worst-case shadow flicker by applying parameters recommended by the National wind farm development guidelines – draft (Environment Protection and Heritage Council, 2010). However, as cloud cover is one of the most significant factors that reduces shadow flicker, modelling was also undertaken based on an assumed average cloud cover of 63%, as determined from nearby Bureau of Meteorology weather stations, to provide a more realistic (yet still conservative) assessment of the potential shadow flicker impacts.

Avoidance by design has been the primary measure to limit shadow flicker impacts on non-involved (neighbouring) dwellings. Based on theoretical and actual shadow flicker modelling, all non-involved (neighbouring) dwellings are compliant with the Planning Guidelines for Development of Wind Energy Facilities (Planning Guidelines) (DTP, 2023). Twenty-one stakeholder dwellings are predicted to experience theoretical shadow flicker above the 30 hours per year recommended in the Planning Guidelines, and six are predicted to experience shadow flicker durations greater than the recommended limit when considering average cloud cover estimates. However, the proponent has sought agreements with stakeholder dwellings to shadow flicker exceeding this limit. As such, the limit on shadow flicker does not apply at these dwellings.

A pre-construction assessment of the potential effects of shadow flicker from turbines on existing dwellings will be undertaken for the final turbine layout. If measured shadow flicker is recorded above the 10-hour limit per year at non-stakeholder receptors during project operation, management measures including strategic screen plantings may be required.

29.2.4 Amenity

Evaluation objective: *To minimise and manage adverse air quality and noise and vibration effects on residents and local communities as far as practicable during construction, operation and decommissioning having regard to applicable limits, targets or standards.*

The evaluation objective relevant to 'amenity' was assessed in the following specialist reports, with the findings summarised in Chapter 16 – ***Air quality and greenhouse gas*** and Chapter 17 – ***Noise and vibration***:

- Appendix L1 – ***Air Quality Impact Assessment***
- Appendix L2 – ***Greenhouse Gas Impact Assessment***
- Appendix E1 – ***Environmental Noise and Vibration Assessment***.

Air quality

Air quality across the project region is expected to be good in comparison to that of urban areas. The primary air quality impact for the project is expected to be due to the generation of dust from construction activities such as materials handling, concrete batching activities, and materials extraction, treatment and transport from the proposed on-site quarry. Limited dust may be generated by maintenance activities and from vehicle movements on unsealed access tracks during project operation. Dust impacts during project decommissioning are expected to be less than what is expected during construction. Exhaust emissions (including nitrogen oxides, carbon monoxide, sulfur dioxide and fine particulates (PM_{10} and $PM_{2.5}$)) from the combustion of fossil fuels in vehicles, plant and equipment during construction, operation and decommissioning may also impact local air quality.

The project has been designed to maintain a separation distance of at least 140 metres from the nearest sensitive receptor (occupied dwelling) to construction activities. The closest sensitive receptor to the proposed on-site quarry is around 2,300 metres from the quarry boundary and around 600 metres from any of the concrete batch plants. These distances are both greater than the minimum separation distances for these activities of 500 metres and 100 metres, respectively, specified in Environment Protection Authority (EPA) Victoria Publication 1949: Separation distance guideline.

Based on an assessment of the hazard potential of nuisance dust sources from project activities, the effectiveness of the exposure pathway and sensitivity of the receiving environment against the criteria outlined in EPA Victoria Publication 1943, there is a 'high' risk of dust-related impacts during construction if emissions to air are not mitigated or otherwise effectively managed. Impacts to sensitive receptors from dust generated during project operation are not expected, and dust impacts during project decommissioning are expected to be less than what is experienced during construction.

Given the relatively minor exhaust emissions from construction vehicles, plant and equipment and the separation distances to sensitive receivers, impacts to sensitive receivers from vehicle emissions are not expected.

A site-specific Air Quality Management Plan would outline best practice design controls and management practices to minimise dust, and contingency measures to be implemented if dust plumes are observed and/or credible dust related complaints are received. The final Quarry Work Plan would contain measures for the control of emissions of dust or other particulates, and the carriage and deposition of dust, silt and clay by vehicles exiting the work authority area.

With the implementation of management measures, it is expected that residual impacts of dust during construction would be **moderate** (i.e., air quality impacts very unlikely and only occurring on rare occasions). The potential impact to air quality for nearby sensitive receptors due to dust during operation and decommissioning, and exhaust emissions during all project phases, is considered **low**.

Greenhouse gas

Greenhouse gas (GHG) emissions projected to result from the project include energy related emissions (e.g. from the use of fuels) and non-energy related emission (e.g. embedded emissions from the production of construction materials).

Embedded emissions (non-energy related) in project construction materials would form the majority of overall construction emissions for the project (comprising approximately 93% of overall construction emissions). The annual, unmitigated emission contributions of the project construction towards the total annual emissions of Victoria and Australia would constitute less than 1% of both Victoria and Australia's overall GHG emissions.

Energy-related emissions associated with the operation of the project include those from the battery energy storage system (comprising approximately 98% of total operational emissions), which would be powered by the grid and not the wind farm. During periods of low demand, the battery energy storage system would charge with grid energy then discharge that energy back into the grid during peak periods, with some electricity lost in the charge/discharge process. This accounts for the emissions associated with the battery energy storage system operation. Over the expected 25-year life of the project, emissions from wind farm operations requiring electricity should reduce to zero. The operation of the project would constitute between 0.1% to less than 0.001% of Victoria's overall GHG emissions, and between 0.02% to less than 0.001% of Australia's overall GHG emissions.

A Sustainability Management Plan, containing measures to meet the sustainability targets and specified ratings, would be developed and implemented to manage construction and operation GHG emissions. The selection of construction materials would be considered in the detailed design, along with monitoring of energy and carbon usage during construction to reduce GHG emission impacts of materials and energy consumption, as far as practicable.

While proposed the management measures may assist in reducing the overall construction, operation and decommissioning GHG emissions, the residual rating is considered **moderate** due to the extent of operation-related emissions. However, as grid decarbonisation continues, emissions from the use of grid electricity will progressively reduce and this would reduce the significance rating to **negligible**.

Noise and vibration

During project construction, potential noise- and vibration-generating activities would include works associated with access track construction, civil works, excavation, foundation construction, electrical infrastructure works and turbine erection. Construction activities that may generate noise and vibration impacts at the project's proposed on-site quarry include rock crushing, material handling operations and heavy goods vehicle movements, and noise sources at the concrete batching plants would include batching plant, pumps and concrete mixing trucks. A detailed assessment of the noise from these construction activities, based on maximum overall sound power levels, was undertaken as part of the project's Construction Noise Assessment in accordance with EPA Victorian Publication 1834.2 Civil construction, building and demolition guide.

Noise during project operation may result from the wind turbines (from wind turbine generators and the movement of rotor blades), and the on-site substation, battery facility and ancillary activities (which include noise-generating equipment such as transformers, inverters and cooling management systems). Noise from wind turbines was modelled in accordance with the New Zealand Standard (NZS) 6808:2010 Acoustics – Wind Farm Noise, while noise from the on-site substation, battery facility, concrete batching plant and on-site quarry was undertaken in accordance with EPA Victoria Publication 1826.4 *Noise Protocol*. Noise impacts at the proposed on-site quarry and concrete batching plants were assessed in accordance with EPA Victoria Publication 1826.4: Noise limit and assessment protocol (the Noise Protocol).

The on-site quarry has been located as far away from occupied dwellings as possible, with the closest occupied dwelling (owned by a project stakeholder) around 1,400 metres from the quarry boundary. The closest sensitive receptors (dwellings) to a proposed concrete batch plant are approximately 1,100 metres (stakeholder dwelling) and 1,800 metres (non-stakeholder dwelling).

The proposed wind turbines are predicted to achieve compliance with the applicable noise limits determined in accordance with NZS 6808:2010 for all receivers based on a candidate wind turbine model. Operational noise levels from the on-site terminal station and battery energy storage system, and construction noise associated with the on-site quarry and concrete batching plants are also predicted to be below the noise limits determined in accordance with the Noise Protocol. Potential vibration impacts during construction were assessed to be below relevant standards, and vibration monitoring is not expected to be required.

With the implementation of identified management controls, the residual impacts associated with the project's construction, operation and decommissioning are anticipated to be **low**, with the exception of impacts related to off-site traffic noise, which were rated **medium**. The Construction Noise and Vibration Management Plan will address the effects of construction noise related to on-site activities and off-site traffic movements.

29.2.5 Cultural heritage

Evaluation objective: *Protect, avoid, or minimise where avoidance is not possible, adverse effects on historic heritage values, and tangible and intangible Aboriginal cultural heritage values, in partnership with Traditional Owners.*

The evaluation objective relevant to cultural heritage was assessed in the following specialist reports, with the findings summarised in Chapter 18 – ***Aboriginal cultural heritage*** and Chapter 19 – ***Historical cultural heritage***:

- Appendix J – ***Aboriginal Cultural Heritage Impact Assessment***
- Appendix K – ***Historical Heritage Impact Assessment***.

Aboriginal cultural heritage

Under the *Aboriginal Heritage Act 2006*, a Cultural Heritage Management Plan (CHMP) is to be prepared for projects where an EES is required. CHMP no. 19602 has been prepared for the project in accordance with Part 4 of the *Aboriginal Heritage Act 2006* and will be submitted to the relevant Registered Aboriginal Party (RAP), the Eastern Maar Aboriginal Corporation, for evaluation and approval prior to commencing project construction. The CHMP included three levels of assessment, comprising:

- a background review (desktop assessment)
- field survey (standard assessment, undertaken in two phases)
- subsurface excavation (complex assessment).

The standard and complex assessments identified five stone artefacts within the investigation area. Consultation with the Eastern Maar Aboriginal Corporation also identified intangible Aboriginal cultural heritage values, being the Wedge-tailed Eagle and Southern Bent-wing Bat, and culturally significant flora, hydrology and ephemeral wetlands.

Avoidance by design has been the primary means to limit impacts to Aboriginal cultural heritage places, and protective measures would be implemented during project construction, operation and decommissioning to further avoid and minimise impacts to Aboriginal cultural heritage values.

With the implementation of design measures and management controls, harm to the identified Aboriginal places will be avoided, and no harm minimisation measures are required. If critical infrastructure is unable to be moved, CHMP conditions will be formulated in consultation with the Eastern Maar Aboriginal Corporation to minimise or manage harm. The residual impacts on identified Aboriginal cultural heritage associated with the construction, operation and decommissioning of the project is assessed as negligible.

Impacts to intangible cultural heritage values including the Wedge-tailed Eagle, and Southern Bent-wing bat, and culturally significant flora, hydrology and ephemeral wetlands can be effectively managed by the CHMP process, with the implementation of design mitigation and additional management measures in consultation with the Eastern Maar Aboriginal Corporation.

Historic heritage

The historical heritage assessment identified and assessed historic heritage and archaeology relevant to the project based on a desktop review of heritage registers and databases, and previous archaeological and heritage studies. Field surveys, involving inspection from a vehicle of existing trafficable roads within the project site and a ground surface survey on foot, were also undertaken to investigate the presence of historic heritage.

Through the design process the project has avoided impacts on all identified historical heritage places. It is considered that the construction and operation of the proposed project is consistent with maintaining the historical heritage value of the project site, and the residual effects from the construction and operation of the project were assessed as negligible.

To mitigate the risk of impacts on yet unknown historical heritage values, an unexpected finds protocol would be adhered to throughout project construction. If unknown historical heritage sites are encountered during construction, works would cease within the area of concern until a heritage advisor can assess the site and take necessary actions to maintain the identified heritage values.

29.2.6 Land use and socio-economic

Evaluation objective: *To avoid and minimise adverse effects on land use (including agricultural and residential), social fabric of the community (with regard to wellbeing and community cohesion), local infrastructure, electromagnetic interference, aviation safety and to neighbouring landowners during construction, operation and decommissioning of the project.*

The evaluation objective relevant to land use and socio-economic was assessed in the following specialist reports, with the findings summarised in Chapter 20 – ***Land use and planning***, Chapter 21 – ***Socio-economic***, Chapter 22 – ***Aviation***, Chapter 23 – ***Fire risk*** and Chapter 24 – ***Electromagnetic interference***:

- Appendix H – ***Land Use and Planning Report***
- Appendix I – ***Social and Economic Impact Assessment***
- Appendix O – ***Aviation Impact Assessment***
- Appendix N – ***Electromagnetic Interference Impact Assessment***.

Land use

The land use and planning assessment considered the land use values of the project site and surrounding area, the applicable planning framework, and the potential implications of the project during its construction, operation and decommissioning phases.

Through the design process, a range of environmental, social and infrastructure constraints were considered as part of the planning and design process and, in many cases, buffers were applied to known or modelled sensitive areas (including townships and dwellings, and land where the agricultural activities can continue around the turbines). The project has also been designed to retain access to properties during the construction phase with access tracks following fence lines and property boundaries, where practicable. The proposed on-site quarry has been proposed in a part of the project site away from occupied dwellings and concrete batching plants have also been located away from sensitive receivers, such as dwellings and waterways.

Potential impacts to residential land use due to blasting and extraction at the proposed on-site quarry will be managed through an approved Quarry Work Plan. Following construction, the quarry would be remediated to service future agricultural operations.

The potential impacts on the continuation or disruption of the residential land use of existing dwellings during construction would be **negligible** with minor potential for short-term and localised impacts which can be managed. Project wind turbines and underground cabling would not result in ongoing restrictions to current land-based agricultural land uses, with grazing and cropping able to continue alongside the project. The quarry will be rehabilitated as a farm irrigation dam following the completion of mining works and construction.

The residual impacts identified by the impact assessment can be managed via management measures including the use of construction and decommissioning management plans. It is recommended that coordination between nearby approved and yet to be constructed projects is undertaken to minimise the individual expected impacts of projects occurring simultaneously.

Socio-economic

The social and economic impact assessment provides an overview of the social locality and context in which the project is situated and identifies potential social and economic impacts relevant to the project as determined through stakeholder engagement. It provides potential strategies to enhance positive social and economic impacts associated with the project and mitigate potential negative impacts.

During construction, temporary negative impacts to the current way of life, community, culture, health and wellbeing, and environment and amenity are anticipated. These impacts are associated with the generation of dust, noise and vibration, changes to the visual character of the landscape, increased traffic on local roads, and the presence of a construction workforce that affects the community's sense of place. Potential impacts to environment and amenity, culture and way of life are also predicted during the operation of the project, particularly cumulative noise and visual impacts resulting from the nearby existing and approved wind farms.

The construction workforce would likely have a positive effect on local and regional businesses, with increased expenditure on services such as accommodation, hospitality, retail and medical from local wage spending. The construction phase is expected to support 360 full-time equivalent work hours (FTEs) direct jobs and 192.6 FTEs indirect jobs in the region during the construction period, with $249.8 million expected to be invested locally during this phase. During project operation, $13.4 million is expected in local operation expenditure over the life of the project. In an average year in the operational phase, the project is expected to support 32.7 FTEs jobs in the region directly related to the operations and to employment generated from supplying industries in the region.

Through the design process, the project has sought to avoid and minimise potential impacts to people and the local community. Management controls will be implemented as part of the project delivery to reduce social and economic impacts associated with the construction and operation of the project. However, given the scale of the project, social and economic impacts (both positive and negative) are predicted to occur.

A Neighbour Benefit Sharing Program has been developed that provides financial compensation to eligible dwellings and retail premises within six kilometres of the project site, as well as financial benefits to the local community. The program is expected to contribute $1.2 million per annum to the local community based on a 106-wind turbine project.

With the implementation of these and other design and management measures, the social impact significance ratings during both the construction period and operation were assessed to be **low** to **medium**.

Electromagnetic interference

Based on a review of the Australian Communication and Media Authority Register of Radiocommunication Licences database, there are limited radiocommunication services are in the vicinity of the project, with five point-to-point links (operated by AusNet Services, VerTel and NBN Co) passing over the project site and two point-to-multipoint stations located within 20 kilometres of the site (operated by Aussie Broadband and Wannon Region Water Corporation).

To determine the potential for electromagnetic interference, consultation was conducted with relevant radiocommunications service providers, emergency services, mobile phone and internet providers, Bureau of Meteorology, and operators of fixed point-to-point and point-to-multipoint communication links. The operators of these services were asked to assess if the proposed project would interfere with their services and to provide possible mitigation measures where they deemed them necessary. Respondents typically advised that negligible levels of impact were expected. Where they advised of potential impacts, respondents provided a range of feedback on conditions they require the project adopt (e.g., Bureau of Meteorology).

The project has sought to eliminate potential electromagnetic interference impacts from the project, including relocating turbines away from fixed point-to-point links operated by AusNet Services, VerTel and NBN Co, and the adoption of a buffer to further avoid any potential interference. To ensure mobile phone, NBN, broadcast radio and broadcast television are not negatively impacted, a Signal Strength Survey at neighbouring dwellings would be conducted prior to construction, and then after construction if issues are identified. The proponent would undertake measures necessary to rectify any impacted services.

The assessment of electromagnetic interference concluded that, following the implementation of design and management controls, the project is unlikely or has a **low** potential to cause interference. Further consultation with the operators of communications and other service providers would occur during detailed design to confirm the avoidance of electromagnetic interference impacts, and to address any impacts identified.

Aviation

The aviation impact assessment identified existing aviation operations and activities within 30 nautical miles (or 56 kilometres) of the project site to determine the potential impact to aviation safety.

The project has the potential to impact on the operation of aerodromes and local airstrips due to the introduction of new obstacles, including wind turbines and meteorological masts. In particular, there is a potential safety risk relating aircraft operating at low levels in accordance with the Visual Flight Rules, including for aerial agricultural operations and aerial firefighting. Wind turbines can also impact communications, navigation, and surveillance (radar systems) used for air traffic control due to electromagnetic interference.

Avoidance by design has been the primary measure to limit aviation impacts, which included establishing buffers around local airstrips in the concept design, incorporating the recommendations of the Country Fire Authority (2025) Design Guidelines and Model Requirements for Renewable Energy Facilities in the project design and management measures, and committing to marking the meteorological monitoring masts in accordance with the National Airports Safeguarding Framework Guideline D: Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation to improve visibility of these structures for pilots of low-flying aircraft.

The project would not impact the Obstacle Limitation Surface or the Procedures for Air Navigation Services – Aircraft Operations surfaces protected airspace of the Instrument Approach Procedures for the Hamilton Aerodrome. The project would also not impact the Obstacle Limitation Surface for the Warrnambool Aerodrome.

While the proposed turbines are beyond the 10 nautical mile Minimum Safe Altitude of the Warrnambool Aerodrome, there are turbines within the five nautical mile buffer zone used to calculate this Minimum Safe Altitude. To enable the proposed maximum wind turbine tip height to be accommodated, the 10 nautical mile Minimum Safe Altitude would need to be raised by 100 feet from 2,200 feet to 2,300 feet to ensure minimum factors of safety are maintained for aircraft using the Warrnambool Aerodrome Instrument Approach Procedures.

The project would result in some limitations on aerial agricultural operations immediately surrounding wind turbines and meteorological monitoring masts, however, these limitations would largely be experienced by stakeholder (participating) landowners. With the implementation of design mitigation measures (i.e., turbines appropriately painted to ensure they are visible by day) the impact to aerial agricultural operations is considered low. It should be noted that aerial agricultural operations are possible within wind farms. Risk to aerial firefighting is expected to be **low** to **negligible**. The project would not impact on the performance of navigation aids and communication facilities or the performance of any surveillance radars and satellite facilities.

Overall, the impact assessment concluded the potential risk to aviation in the project region is **low** and does not pose a hazard to aircraft safety.

29.2.7 Traffic and roads

Evaluation objective: *To avoid and minimise adverse effects on roads and road users during construction, operation and decommissioning of the project.*

The evaluation objective relevant to 'traffic and roads' was assessed in the specialist report provided in Appendix G – ***Traffic and Transport Impact Assessment***, with the findings summarised in Chapter 25 – ***Traffic and transport***.

Wind farm developments have the potential to cause traffic and transport impacts through the addition of construction and delivery vehicles to the roads approaching the project site. These additional vehicles can cause damage to the road surface from repeated heavy vehicles use, as well as pose a safety risk to other road users due to increased amount of traffic movements and changed road conditions.

An assessment of existing road and traffic conditions surrounding the project and the proposed transport routes was undertaken to determine the potential impacts of the project on the surrounding road network and road users, and identify measures to avoid, minimise and mitigate these impacts.

The project's internal access tracks have been designed to minimise the amount of project-related traffic that needs to use external public roads. Project traffic generated to external roads during construction will comprise staff vehicles, heavy vehicle traffic associated with external bulk materials haulage, and oversize and overmass vehicles associated with wind turbine and other major component delivery.

The additional road use for construction traffic would require the implementation of management measures including upgrading some sections of roads to maintain the existing level of service that the road network currently provides the community. To transport large project components to the project site from the Port of Portland (the preferred port of entry for all wind turbine generator and other major imported componentry) or the Port of Geelong, several intersections along the selected route would be modified to accommodate the

long vehicles and their wider turning circles.

A Traffic Management Plan would be prepared prior to construction to identify, assess and minimise impacts on road operations and road safety for road users, and road maintenance and management agreements would be established with Moyne Shire Council and Department of Transport (Regional Roads Victoria). The Traffic Management Plan will require engagement with DTP (Public Transport Victoria) and the relevant bus operator(s) to ensure haulage activity does not unreasonably delay bus services. The plan will also include a provision to avoid heavy vehicle movement during school bus times as far as practicable. Consultation with affected and interested stakeholders would be undertaken in accordance with the Stakeholder Engagement Plan.

Based on the existing traffic volumes and usage and proposed public road upgrades, with the implementation of management controls, the standard and capacity of existing road infrastructure is appropriate to accommodate project traffic and the potential impact of project generated traffic on road function and safety. Similarly, local traffic impacts within the project site during all project phases can be suitability and safely managed. Subject to the resolution of specific traffic management requirements, the identified over-dimensional vehicle route option from the Port of Portland or Port of Geelong to the project site for the transport for wind turbine and other imported major components has been assessed and is suitable for oversize and overmass transport vehicles. Residual impacts were considered **negligible** or **minor**.

29.3 Environmental management framework

The scoping requirements state that "*the environmental management framework (EMF) in the EES should describe a transparent governance framework with clear accountabilities for complying with approvals and managing and monitoring the environmental effects and risks associated with the design, construction, operations and decommissioning phases*."

The EMF contains clear accountabilities for the delivery of the environmental management measures (EMMs) and how the project will comply with all relevant environmental laws, approvals, approval conditions and management plans and procedures to ensure that the environmental effects and any hazards associated with all phases of the project can be effectively managed. The EMF commits the proponent to the auditing of the Construction Environmental Management Plan and sub-plans by an Independent Environmental Auditor.

Implementation of the EMF and EMMs would be effective in avoiding or minimising adverse effects associated with the project. Successful implementation would also support beneficial outcomes for the community and the broader environment. The EMF is a clear, transparent, robust and comprehensive blueprint for managing the project using sound governance and accountability arrangements.

29.4 Next steps

The EES will be on public exhibition for 30 days, during which time the public can view the EES and make written submissions. Following public exhibition of the EES, it is expected that an independent Inquiry and Advisory Committee will be appointed by the Minister for Planning to administer a public hearing, and review and report on the environmental effects of the project.

Following receipt of the Committee's report, the Minister for Planning would assess the environmental effects of the project, having regard to all relevant considerations, including the report of the Inquiry, all associated submissions and evidence, the EES chapters and supporting technical reports, public submissions, and the proponent's response to the public submissions.

The assessment will be provided to the Commonwealth Minster for the Environment to decide whether to approve the project under the EPBC Act. The Minister for Planning's assessment of the EES will provide advice on the appropriateness of the Environmental Management Framework and associated mitigation measures.

After the assessment and determination of the EES by relevant State and Commonwealth departments, it is anticipated that the Minister for Planning would exercise their powers under the *Planning and Environment Act 1987* to approve the project and issue a planning permit.