

Chapter 12: Environmental Management and Monitoring Plan (EMMP)

Environmental Management and Monitoring Plan

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12. Environmental Management and Monitoring Plan

This chapter summarises the various mitigation measures, as outlined previously in this report that will be implemented during the construction operational and de-commissioning stages of the project. It does not discuss further the mitigation measures which have been adopted within the design and planning of the project, as these are comprehensively covered within the report.

12.1 Environmental Management and Monitoring Plans

Many of the mitigation measures identified within this Development Application will be implemented through a series of environmental management plans. Where appropriate monitoring programs may also be required to record and report on the effectiveness of the mitigation and management measures. A series of Environmental Management and Monitoring Plans (EMMP) will therefore be implemented at each stage of the project's life cycle. EMMP will ensure compliance with all legislative and planning requirements as well as Pacific Hydro's Health, Safety and Sustainability Policy¹.

The aims and commitments of each of these plans are provided in Tables 12.1, 12.2 and 12.3 below.

The Development Application Report and this Chapter in particular, outline the general approach and intent of the various EMMPs which the project, if approved, will be constructed, operated and ultimately decommissioned in accordance with. General management measures and mitigations have been outlined, however it is acknowledged that more detailed EMMPs will be required prior to construction commencing. These will be developed at detailed design and in conjunction with the relevant contractors and statutory authorities. It is expected that if the project is approved, the conditions of approval will re-iterate the requirement for EMMPs.

The following specific plans will be included within the project's Construction Environmental Management and Monitoring Plan (CEMMP):

- Pollution Prevention Plan (including stormwater management, sedimentation and erosion prevention)
- Noise Environmental Management and Monitoring Plan
- Traffic Management and Monitoring Plan
- Fire and Emergency Management Plan
- Native Vegetation Management and Monitoring Plan
- Weed Management and Monitoring Plan
- Cultural Heritage Management and Monitoring Plan
- Site Rehabilitation Management Plan

¹ <http://www.pacifichydro.com.au/english/sustainability/our-approach/?language=en>

During operations, the focus of EMMPs tends to shift towards on-going monitoring to ensure that the measures and mitigations established during construction are continuing to be effective. The Operations EMMPs generally draw on the measures and mitigations established in the corresponding Construction EMMPs, but also establish protocols for regular monitoring, maintenance and to ensure proactive on-going management of the site.

Pacific Hydro has a certified ISO14001:2004 Environmental Management System (EMS) which overarches the management of all operating sites. To retain this certification, Pacific Hydro is required to show a process of review and continual improvement. This requirement is externally audited annually.

With relation to site specific environmental obligations, Pacific Hydro integrates the EMMPs approved as part of the planning process, within its overarching EMS through the environmental; aspect register.

The Operations Environmental Management and Monitoring Plan (OEMMP) will contain the following plans:

- Pollution Prevention Plan (including stormwater management, sedimentation and erosion prevention)
- Noise Environmental Management and Monitoring Plan
- Traffic Management and Monitoring Plan
- Fire and Emergency Management Plan
- Native Vegetation Management Plan
- Weed management and Monitoring plan

In addition the following plans will be implemented during operations:

- TV reception plan
- Aviation risk
- Bird and bat management plan

The Decommissioning EMMPs (DEMMP) will focus on site rehabilitation and traffic management.

12.2 Complaints Procedure

Pacific Hydro's existing complaints procedure will be implemented across all stages of the project. The purpose of this procedure is to ensure that all complaints from the community and external parties are correctly recorded, investigated and mitigated as required and ensures that Pacific Hydro:

- Promptly acknowledges complaints from members of the public and keeps the complainant informed of any progress, findings and outcomes
- Deals with any complaints constructively and in a co-operative manner
- Keeps accurate records of the investigation process and communications with both the person making the complaint and any regulatory body that may require notification

- Maintains positive relationships and encourages constructive, two way communication with the community and external parties

12.3 Training and Induction

All personnel including staff, employees and any contractors will undertake appropriate training prior to construction to ensure they are aware of their on-site responsibilities in respect of all environmental issues. This will be achieved through the implementation of on-site induction and specific training programs designed to ensure that all on-site personnel are competent and aware of any environmental management procedures relevant to their activities.

All staff and contractors working on site will be inducted into an environmental management program as a condition of site entry. The induction process covers all details of the CEMMP, OEMMP or DEMMP as relevant to the attendees' role and activities on the site.

12.4 Auditing

Self-audits shall be undertaken during the life of the project. Audits will involve reviewing all environmental documents, records and monitoring results to ensure compliance with the requirements of legislation, licences, permits, approvals, the requirements of the EMMPs. If any deficiency is detected, the appropriate corrective action will be taken to rectify the situation.

12.5 Construction

Table 12.1: Environmental management procedures and monitoring requirements during the construction stage of the wind farm

Issue	Mitigation Commitments	Monitoring Requirements	Timing
Construction Environmental Management and Monitoring Plan (CEMMP)			
Pollution Prevention Plan (PPP)			
PPP	The PPP will outline procedures to: <ul style="list-style-type: none"> • Prevent spills • Manage the use of fuels and chemicals on site • Prevent and manage sediment runoff and erosion 	<ul style="list-style-type: none"> • Monitoring to form part of plan • Maintain monitoring records 	<ul style="list-style-type: none"> • Construction
Sediment and Erosion Control	<ul style="list-style-type: none"> • This component of the plan will outline procedures to manage the drainage of stormwater on the site and reduce the risk of wind farm activities giving rise to (or exacerbating existing) soil erosion by effectively controlling run-off with appropriate erosion and sediment control measures. 	<ul style="list-style-type: none"> • Monitoring provisions e to form part of plan e.g. regular checking of watercourses and post rainfall event inspections • Maintain monitoring records 	<ul style="list-style-type: none"> • Construction
Sediment and Erosion Control	The following methods are typical of those adopted during construction to prevent and manage soil erosion and run off which will in turn protect water quality within the catchment: <ul style="list-style-type: none"> • Minimise the removal of vegetation • Wherever possible avoid clearing areas of highly erodible soils and steep slopes prone to water and wind erosion • Divert surface water run-off from exposed soil • Stage work to reduce the amount of exposed soil 	<ul style="list-style-type: none"> • Carry out routine inspections to ensure runoff is not occurring • Routinely inspect sediment pits and / or pollutant traps to ensure they are operating correctly • After rain events check watercourses on site for discolouration • Maintain monitoring records 	<ul style="list-style-type: none"> • Construction

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	<ul style="list-style-type: none"> • Stabilise earthworks as early as possible (e.g. – revegetate areas of exposed soil as soon as possible after disturbance) • Use of appropriate erosion controls such as straw bales and/or silt fencing • Appropriate use of sediment traps from materials such as gravel filled bags, cement stabilised sandbags, stones held under geotextiles, straw bales or crushed rock • Provision of settlement pits/ponds and sediment traps • Ensure vehicles keep to well-defined access tracks through the clear delineation of roadway boundaries • Minimise dust blown from access tracks or stockpiles by regular spraying of water • Locate all stockpiles of excavated material, cement or any other fine loose material away from drainage lines unless adequately protected by diversion drains, bunds or other similar works. • Any concrete batching to be conducted at appropriate distance from waterways 		
Pollution Prevention	<ul style="list-style-type: none"> • Arrangements for management of all machinery and vehicles on site, including refuelling and storage to minimise potential for hydrocarbon and other leaks spills to be documented in PPP. 	<ul style="list-style-type: none"> • Periodic checks carried out. 	<ul style="list-style-type: none"> • Construction and Operations
Hazardous goods and chemical	<ul style="list-style-type: none"> • All hydrocarbons and hazardous substances will be transported, stored, handled and disposed of in accordance with AS 1940-2004 	<ul style="list-style-type: none"> • Audit of chemicals on site. 	<ul style="list-style-type: none"> • Construction and Operations
Spill Response plan	<ul style="list-style-type: none"> • Preparation of Spill Response Plan as a component of both PPP. 	<ul style="list-style-type: none"> • Periodical review of plan. 	<ul style="list-style-type: none"> • Construction and

Issue	Mitigation Commitments	Monitoring Requirements	Timing
			Operations
Training and induction	<ul style="list-style-type: none"> Induct and train all employees/ contractors working on site the Spill Response Plan. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Construction and Operations
Noise Management and Monitoring Plan (NMMP)			
NMMP	<ul style="list-style-type: none"> A NMMP will be prepared to address and manage construction noise, and methods to manage impacts. The NMMP would be prepared in consultation with construction contractors, and aim to ensure work practices are conducted to minimise potential noise impacts. Ensure all construction equipment used is in good condition, is well maintained and up to date service records are available for inspection 	<ul style="list-style-type: none"> A monitoring program to ensure that construction noise emissions are controlled and that the best possible practices are implemented. 	<ul style="list-style-type: none"> Construction
Informing local residents about activities	<ul style="list-style-type: none"> The NMMP will include a community relations program to inform residents and the community of the progress of activities and potential noise impacts of each phase of the project. 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Prior to commencement of construction
Noise complaints	<ul style="list-style-type: none"> Subject to Pacific Hydro's existing Complaints Procedure 	<ul style="list-style-type: none"> Complaints Procedure includes requirement to monitor complaints received and dealt with 	<ul style="list-style-type: none"> Construction
Protection of noise amenity for residential properties – construction stages	<ul style="list-style-type: none"> Hours of work will normally be 7:00am to 6:00pm on weekdays and Saturday unless special circumstances arise. Special circumstances include the possibility of very windy conditions necessitating the timing of crane lifts (mounting the rotor on the tower) for whenever the wind abates. In some cases this may be after normal hours and at night. No movements of 	<ul style="list-style-type: none"> Period checks carried out 	<ul style="list-style-type: none"> Construction

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	<p>large vehicle are needed for these lifts.</p> <ul style="list-style-type: none"> • Work outside of the proposed hours would only occur when: <ul style="list-style-type: none"> – activities do not cause a noise nuisance at any nearby residential building/s – delivery of materials which are required outside of normal hours for safety reasons as required by the DPTI permit process, requested by Police or other authorities (e.g. over-dimensional loads) or – emergency work to avoid loss of lives and/or property. 		
Traffic Management and Monitoring Plan (TMMP)			
TMMP	<ul style="list-style-type: none"> • The Contractor awarded the construction contract will be responsible for developing a detailed TMMP • DPTI, Mid Murray and Barossa Valley Councils' will be consulted during the development and implementation of this detailed TMMP • Control measures to ensure public safety on roads which may be used for construction traffic will be put in place • A range of traffic management measures will be implemented as required (further to those nominated by the DPTI permit process) such as additional speed limits, signage, traffic control at intersections, public notifications etc 	<ul style="list-style-type: none"> • Adherence to plan and controls will be checked for compliance on a regular basis • Adherence to plan and controls will be checked for compliance on a regular basis 	<ul style="list-style-type: none"> • Construction and operations
TMMP – Local community	Full contact details of the Construction Manager will be provided to residences along the local road network proposed to be used for access and adjacent to the site in order that any issues arising can	<ul style="list-style-type: none"> • Adherence to plan and controls will be checked for compliance on a 	<ul style="list-style-type: none"> • Construction

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	be addressed as soon as possible	regular basis	
TMMP - obligations	<p>As a minimum, Pacific Hydro will ensure the Contractor fulfils the following obligations:</p> <ul style="list-style-type: none"> • The existing public access roads used during the period of the construction of the Wind Farm will be maintained to the appropriate standard during this period. Maintenance will include filling of potholes, grading corrugations and dust suppression as required. All construction vehicles will be required to give way to farm animals and wild life on the site and the surrounding roads. • All construction vehicles will give way to vehicles using public roads when entering public roads from site roads (all road rules apply). • All posted stop and give way signs must be obeyed on and off the site. • Adequate signage will be provided by the Contractor, on public roads, to warn other road users of any construction activities or transportation activities that may impact on other road users. • Over-mass and over-size vehicles will be controlled by the DPTI permitting system which specifies conditions that the Contractor must legally comply with – such as escorts, speed restrictions etc. 	<ul style="list-style-type: none"> • Regular monitoring and maintenance of local roads used during construction. 	<ul style="list-style-type: none"> • Construction
Fire and Emergency Management Plan (FEMP)			
FEMP	A Fire and Emergency Management Plan will be developed in consultation with the Country Fire Service for both the construction and operation of the wind farm. In particular the following rules and	<ul style="list-style-type: none"> • Periodic monitoring and review of plan in conjunction with CFS 	<ul style="list-style-type: none"> • All phases

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	<p>measures are proposed:</p> <ul style="list-style-type: none"> • Smoking will not be permitted on days of total fire ban except at crib huts during breaks. Smoking on the site will only be permitted on formed surfaces or at the Site Compound and all butts will be removed from site. • Burning of waste materials on site will be forbidden. • All welding and burning operations must be authorised by the Site Manager prior to commencement. • No Hot Work will be undertaken on days of Total Fire Ban unless permitted by CFS. • All “hot” work such as welding must be authorised by the Site Manager prior to commencement. During the Fire Danger Season (1st November to 30th April), the Site Manager will seek permission prior to hot works being undertaken. • During the construction phase, on days of catastrophic fire danger, personnel numbers on site will be restricted to those essential for security purposes. During operations, the Fire and Emergency Management Plan will also state that only essential staff are allowed on site. • Fire extinguishers are in all construction, contractor vehicles and plant. In addition there will be a trailer mounted fire tender with 1000 litre fire fighting reserve. The turbines also have fire extinguishers at the base level and in the nacelle. 		
FEMP	<ul style="list-style-type: none"> • Emergency services (including the CFS) representatives will be consulted prior to construction commencing in order to gain their input into the Fire and Emergency Management Plan 	N/A	<ul style="list-style-type: none"> • All phases

Issue	Mitigation Commitments	Monitoring Requirements	Timing
FEMP	<ul style="list-style-type: none"> Prior to the construction of access tracks, only diesel vehicles will be permitted on site. 	N/A	<ul style="list-style-type: none"> Pre-construction and construction
FEMP	<ul style="list-style-type: none"> Once access tracks have been constructed, petrol vehicles will also be permitted on site, however petrol vehicles will not be permitted to drive 'off-road' except in the case of an emergency. 	N/A	<ul style="list-style-type: none"> Construction
Emergency response	<ul style="list-style-type: none"> In the event of a fire on site, an Emergency Response Plan will be enforced. This plan covers any incident on site which may threaten life or limb. It covers, amongst other things, fire, explosion, severe weather and earthquake response actions. If a fire originates on site, personnel at the scene will call 000 for unit dispatch immediately. All vehicles will have radio and phone contact with the site office. Appropriate channels / frequencies for communications will be established within the Fire and Emergency Management Plan prior to the commencement of construction. As all vehicles carry fire extinguishers, site personnel will attempt to extinguish the fire after calling 000. The Site Manager will also be informed and, if required, all personnel will be mustered at a safe (yet to be nominated) evacuation point in accordance with the Emergency Response Plan. If a fire originates off site, but threatens the site, the Emergency Response Plan will be enacted 	N/A	<ul style="list-style-type: none"> All phases
Emergency response	<ul style="list-style-type: none"> During construction and operations, the local emergency services will be provided with up to date: 	<ul style="list-style-type: none"> Periodic monitoring and review of plan in conjunction with CFS 	<ul style="list-style-type: none"> All phases

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	<ul style="list-style-type: none"> - Tower identification mapping - Security gate numbers and key sets - Wind farm all-hours emergency contact telephone number - Requirements on Wind Farm Company Staff 		
Emergency response	<ul style="list-style-type: none"> • All site staff likely to respond into the project area will be provided with the following: <ul style="list-style-type: none"> - Reliable radio or telephone (mobile) communications to enable contact from site to emergency services - Crews receive bushfire and other emergency reporting training, and have available at all times a contact and procedures manual. • A working knowledge of and be compliant with SA Country Fire Service legislation (use of tools during the Fire Danger Season) and contacts for fire ban advice (CFS and local government). 	<ul style="list-style-type: none"> • Periodic monitoring and review of plan in conjunction with CFS 	<ul style="list-style-type: none"> • All phases
Training and induction	<ul style="list-style-type: none"> • All onsite staff and contractors will be made aware of the Fire and Emergency Response Plan and the procedures that should be followed in the event of an emergency. 	<ul style="list-style-type: none"> • Keep records of training and register of attendees 	<ul style="list-style-type: none"> • All phases
Native Vegetation Management and Monitoring Plan (NVMMP)			
NVMMP	<ul style="list-style-type: none"> • NVMMP to be developed to calculate native vegetation losses and monitor implementation of Significant Environmental Benefits obligations. 	<ul style="list-style-type: none"> • Monitoring of obligations to form part of NVMMP 	<ul style="list-style-type: none"> • All phases
NVMMP – Losses	<ul style="list-style-type: none"> • Following the completion of detailed design, the level of native vegetation clearance associated with the project will be confirmed 	<ul style="list-style-type: none"> • Losses predicted at final design stage • Following construction on-ground 	<ul style="list-style-type: none"> • Prior to commencement

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	to ensure any native vegetation approvals and SEB obligations are met.	assessment of actual losses carried out	of construction / construction
SEB Obligations	<ul style="list-style-type: none"> • Prior to construction SEB obligations require to be established. These may include: <ul style="list-style-type: none"> – the protection of remnant habitat within the survey area (i.e. heritage agreements) – the protection of remnant vegetation on suitable properties in the region (i.e. heritage agreements) – the establishment of an exotic flora control program in the survey area complimented by the bush-regeneration of native vegetation remnants – the establishment of a revegetation program in degraded parts of the survey area – the establishment of a vertebrate pest control program in the survey area to reduce the effect of pest animals, such as foxes and rabbits, on the native fauna in the region, or – a payment to Native Vegetation Fund administered by the Native Vegetation Council. 	<ul style="list-style-type: none"> • Monitoring program to be established as per the SEB Obligations 	<ul style="list-style-type: none"> • Prior to commencement of construction
Management of NV during Construction	<ul style="list-style-type: none"> • During construction, areas of native vegetation within 100m of any working area will be demarcated as ‘vegetation protection zones’. Vegetation protection zones will be appropriately signed and all personnel, machinery and earthworks excluded from these areas. • Stockpiling of soil will occur outside areas of native vegetation, 	<ul style="list-style-type: none"> • All environmental controls will be checked for compliance on a regular basis 	<ul style="list-style-type: none"> • Construction

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	preferably on areas of cultivated land or introduced pasture.		
Bird and Bat Management and Monitoring Plan			
Nest Sites	<ul style="list-style-type: none"> Where construction is planned between 500 and 1000 m (it is noted that no turbines are within this buffer zone) of known Wedge-tailed Eagle and Peregrine Falcon nests respectively during their breeding seasons, nest checks should be employed to determine their breeding status and if necessary buffers put in place. Where possible, it is recommended that construction within these distances be undertaken outside of the peak breeding times (egg-laying and chick fledging) for both the Peregrine Falcon and Wedge-tailed Eagle. 	<ul style="list-style-type: none"> Pre-construction nest checks 	<ul style="list-style-type: none"> Pre- construction
Bird Strike Monitoring	<ul style="list-style-type: none"> It is recommended that scavenger and detectability trials are performed at the wind farm prior to the construction of turbines. <i>These trials will measure the influence of scavenging activity and the detectability of bird carcasses at the Keyneton site. Results from bird-strike monitoring programs conducted during the operation of a wind farm are more accurate when the detectability of bird carcasses and the extent of scavenging activity at the site are determined pre-construction, and are factored into the bird-strike monitoring results.</i> 	<ul style="list-style-type: none"> See OEMMP for monitoring requirements 	<ul style="list-style-type: none"> Pre-construction and operation
Weed Management and Monitoring Plan (WMMP)			
WMMP	<ul style="list-style-type: none"> Procedures will be outlined to minimise the spread of weeds and pathogens from earth moving equipment and associated machinery, including tip trucks and low loaders, and the use of 	<ul style="list-style-type: none"> Monitoring of weeds to be carried out on a regular basis and monitoring program to form part of the 	<ul style="list-style-type: none"> All phases

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	road-making material of clean fill that is free of weeds.	management plan	
Weed Control	<ul style="list-style-type: none"> • Appropriate weed control will be carried out in disturbed areas during and after construction to control any weed outbreaks and prevent invasion of adjacent bushland. • All machinery employed in earthworks will be cleaned before being brought onto site to ensure it is weed and pathogen free. • Construction contractors will be inducted into an environmental management program for construction works. 	<ul style="list-style-type: none"> • All environmental controls will be checked for compliance on a regular basis 	<ul style="list-style-type: none"> • Construction
Cultural Heritage Management and Monitoring Plan (CHMMP)			
CHMMP	<ul style="list-style-type: none"> • A Cultural Heritage Management and Monitoring Plan will be developed to provide for the long term relationship between the development and heritage in the area. • As part of the Cultural Heritage Management Monitoring Plan, a site discovery procedure will be developed. 	<ul style="list-style-type: none"> • Monitoring and discovery procedure plan to be established as part of the CHMMP 	<ul style="list-style-type: none"> • Pre-construction
Protection of Aboriginal heritage	<ul style="list-style-type: none"> • All sites and potential sites recorded during the site inspection and during future surveys will be treated in accordance with the requirements of the South Australian <i>Aboriginal Heritage Act 1988</i> (i.e. should not be damaged, disturbed or interfered with without Ministerial approval) 	<ul style="list-style-type: none"> • Monitor and record all sites and potential sites pre and during construction 	<ul style="list-style-type: none"> • Pre-construction and Construction
Protection of Aboriginal heritage	<ul style="list-style-type: none"> • Avoid areas of high archaeological sensitivity • Impact to areas accorded medium archaeological sensitivity 	<ul style="list-style-type: none"> • Map areas and ensure appropriate site procedures in place during construction to ensure avoidance of 	<ul style="list-style-type: none"> • Construction and operations

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	should also be avoided where possible	sensitive areas	
Protection of Aboriginal heritage	<ul style="list-style-type: none"> Undertake a thorough archaeological pedestrian cultural heritage survey of the final infrastructure footprint in conjunction with detailed design 	<ul style="list-style-type: none"> Pre-construction survey 	<ul style="list-style-type: none"> Pre-construction
Protection of Aboriginal heritage	<ul style="list-style-type: none"> Where infrastructure is proposed within high and medium sensitivity areas, on-site monitoring is proposed during initial ground disturbing works (subject to any recommendations / agreements determined during the final archaeological pedestrian cultural heritage survey at detailed design) 	<ul style="list-style-type: none"> On-site monitoring during initial ground disturbing works 	<ul style="list-style-type: none"> Construction
Protection European cultural heritage	<ul style="list-style-type: none"> Whilst the dry stone walls present on site are not currently registered or protected, disturbance of historic dry stone walls within the project site will be avoided wherever possible 	<ul style="list-style-type: none"> Map walls and avoid wherever possible Demarcate walls for avoidance during construction 	<ul style="list-style-type: none"> Construction
Protection European cultural heritage	<ul style="list-style-type: none"> Where impact to the dry stonewalls is unavoidable, the level of disturbance should be mitigated by use of careful de-construction methods. The walls will be re-established at the conclusion of construction and Pacific Hydro will seek the assistance of the Dry Stone Walling Association of Australia or other experienced "wallers" to repair or reconstruct any areas of dry stone wall that have been disturbed. 	<ul style="list-style-type: none"> Monitor damage or removal of walls Repair or reconstruct walls following construction 	<ul style="list-style-type: none"> Construction and post construction

Issue	Mitigation Commitments	Monitoring Requirements	Timing
Site Rehabilitation Management Plan			
Site rehabilitation	<ul style="list-style-type: none"> • Site restoration works will be undertaken at the completion of construction, including revegetation of disturbed ground, weed management and control of any erosion and sedimentation. • Site rehabilitation will be included in the overall site EMMP in order to appropriately integrate requirements of bushfire protection, weed management, potential for pest harbourage, soil and erosion control. 	<ul style="list-style-type: none"> • Management and maintenance is a permanent issue for the Project 	<ul style="list-style-type: none"> • Construction, post construction and operation

12.6 Operation and Maintenance

Table 12.2 Environmental management procedures and monitoring requirements during the operational and maintenance stage of the wind farm

Issue	Mitigation Commitments	Monitoring Requirements	Timing
Operational Environmental Management and Monitoring Plans			
Pollution Prevention	<ul style="list-style-type: none"> • PPP - measures outlined in Table 12.1 above 	<ul style="list-style-type: none"> • Monitoring as per PPP requirements 	<ul style="list-style-type: none"> • Operations
Traffic	<ul style="list-style-type: none"> • TMMP - measures outlined in Table 12.1 above 	<ul style="list-style-type: none"> • Monitoring as per TMMP requirements 	<ul style="list-style-type: none"> • Operations
Fire & Emergency	<ul style="list-style-type: none"> • FEMP - measures outlined in Table 12.1 above 	<ul style="list-style-type: none"> • Monitoring as per FEMP requirements 	<ul style="list-style-type: none"> • Operations
Native Vegetation	<ul style="list-style-type: none"> • NVMP - measures outlined in Table 12.1 above • Post construction offset implementation and monitoring required during operations 	<ul style="list-style-type: none"> • Monitoring as per NVMMP requirements 	<ul style="list-style-type: none"> • Operations
Weed	<ul style="list-style-type: none"> • WMMP - measures outlined in Table 12.1 above 	<ul style="list-style-type: none"> • Monitoring as per WMMP 	<ul style="list-style-type: none"> • Operations
Site restoration	<ul style="list-style-type: none"> • Restoration and rehabilitation requirements ongoing from construction 	<ul style="list-style-type: none"> • Monitoring effectiveness of restoration measures 	<ul style="list-style-type: none"> • Operations
Noise Management and Monitoring Plan			
Noise Compliance Monitoring	<ul style="list-style-type: none"> • Post-construction noise monitoring will be carried out at designated dwellings 	<ul style="list-style-type: none"> • Monitoring regime in accordance with EPA and Development Consent requirements 	<ul style="list-style-type: none"> • Post-construction

Issue	Mitigation Commitments	Monitoring Requirements	Timing
Noise complaints	<ul style="list-style-type: none"> Subject to Pacific Hydro's existing Complaints Procedure 	<ul style="list-style-type: none"> Complaints Procedure includes requirement to monitor complaints received and dealt with 	<ul style="list-style-type: none"> Operations
Television Reception			
TV reception survey	<ul style="list-style-type: none"> Consultant to undertake a television reception analysis to identify any specific houses that may experience interference and then undertake a specific survey of those houses potentially impacted in order to establish the quality of TV reception. 	<ul style="list-style-type: none"> TV reception survey. 	<ul style="list-style-type: none"> Prior to Construction
Complaints procedure	<ul style="list-style-type: none"> Subject to Pacific Hydro's existing Complaints Procedure 	<ul style="list-style-type: none"> Complaints Procedure includes requirement to monitor complaints received and dealt with 	<ul style="list-style-type: none"> Operations
Mitigation	<p>In the event that the wind farm is deemed to have caused deterioration in radio or television reception apply one of the following measures:</p> <ol style="list-style-type: none"> Adjusting TV antenna directly towards the transmitter Relocating of antenna to achieve a better signal to noise ratio Installing a more directional or higher gain antenna for those residences that have been impacted Installation of an amplifier Installing a digital set top box Installing cable / satellite TV 	<ul style="list-style-type: none"> Address and close out complaint. 	

Issue	Mitigation Commitments	Monitoring Requirements	Timing
Aviation Risk			
Manage aviation risk	<ul style="list-style-type: none"> Inform aviation stakeholder of developments and construction time frames (nearby aviation clubs and flying schools, BOM², CASA³, RAAF⁴ Base Edinburgh, RAAF-AIS⁵, DoD⁶ and ASA⁷). 	<ul style="list-style-type: none"> Update as appropriate and monitor responses. 	<ul style="list-style-type: none"> All phases
Manage aviation risk	<ul style="list-style-type: none"> Inform ASA of the turbine's locations and height details, for them to advise pilots of the presence of the wind farm by way of a Notice to Airmen (NOTAM). 	<ul style="list-style-type: none"> N/A 	<ul style="list-style-type: none"> Pre-construction
Manage aviation risk	<ul style="list-style-type: none"> ASA and RAAF-AIS will permanently mark the wind farm's location on World Aeronautical Charts, Tall Structures Database and Military Maps. 	<ul style="list-style-type: none"> Ensure Charts and maps marked appropriately. 	<ul style="list-style-type: none"> Post-construction
Bird and Bat Management and Monitoring Plan (BBMMP)			
BBMMP	<ul style="list-style-type: none"> BBMMP to be prepared for the approval of Department of Environment and Natural Resources prior to the commencement 	<ul style="list-style-type: none"> Establish methodology, parameters and timeframes for a monitoring 	<ul style="list-style-type: none"> Pre-construction

² Bureau of Meteorology.

³ Civil Aviation Safety Authority

⁴ Royal Australian Air Force.

⁵ Royal Australian Air Force- Aeronautical Information Services; Responsible for maintaining a database of tall structures.

⁶ Department of Defence.

⁷ AirServices Australia

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	of construction	program	
Bird monitoring	<ul style="list-style-type: none"> Breeding Wedge-tailed Eagle and Peregrine Falcon will be undertaken during and after construction. 	<ul style="list-style-type: none"> Eagle and falcon breeding surveys during and post construction 	<ul style="list-style-type: none"> Construction
Bird and bat monitoring	<ul style="list-style-type: none"> Undertake bird and bat strike monitoring Programs to be conducted by suitably trained on-ground staff 	<ul style="list-style-type: none"> Establish and implement monitoring plan Monitoring results used to help assess whether the mitigation measures have been appropriate 	<ul style="list-style-type: none"> Operations
Bird and bat monitoring	<ul style="list-style-type: none"> Scavenger and detectability trials will be carried out to correct bird-strike monitoring results Trials will measure the influence of scavenging activity and the detectability of bird carcasses at the Keyneton site 	<ul style="list-style-type: none"> Conduct scavenger trials 	<ul style="list-style-type: none"> See Construction
Bird and bat monitoring and reporting	<ul style="list-style-type: none"> Incorporate a formal reporting procedure to an external environmental agency 	<ul style="list-style-type: none"> Report monitoring results 	<ul style="list-style-type: none"> Operations
Bat diversity	<ul style="list-style-type: none"> Long-term monitoring program to assess the ongoing utilisation of the wind farm by bats Activity levels and species diversity within and surrounding the site to assess the mitigation measures Monitoring to include the study of turbine avoidance behaviour, bat flight paths, and bat flight heights in relation to the rotor swept area 	<ul style="list-style-type: none"> Establish long-term monitoring of bat diversity and activity at the project site 	<ul style="list-style-type: none"> Operations

12.7 Decommissioning Stage

Table 12.3: Environmental management procedures and monitoring requirements during the decommissioning stage of the wind farm

Issue	Mitigation Commitments	Monitoring Requirements	Timing
Decommissioning Environmental Management and Monitoring Plans			
Decommissioning and Reinstatement Plan			
Decommissioning & Reinstatement Plan	<ul style="list-style-type: none"> • Within 18 months of cessation of the operation of the project, the site shall be decommissioned and returned, as far as practical and in accordance with a Decommissioning Environmental Management Plan, to its condition prior to the commencement of construction. 	<ul style="list-style-type: none"> • Monitoring to evaluate the success of site restoration works will form part of the plan 	<ul style="list-style-type: none"> • Decommissioning
Decommissioning & Reinstatement Plan	<ul style="list-style-type: none"> • Plan will set out site decommissioning and rehabilitation aims and targets • It is expected at this stage that the portions of the site used for the wind farm would be re-instated for agricultural use • Sub-surface concrete foundations would be left in-situ, exposed concrete plinth would be removed to a depth of approximately 1 meter and the entire foundation graded over with soil and either replanted or the vegetation allowed to regenerate naturally • The access tracks may be left on site subject to the requirements of the landowners • All materials removed from the site will be either recycled (e.g. steel) or disposed of in accordance with statutory requirements and best practice current at the time of decommissioning 	<ul style="list-style-type: none"> • As above 	<ul style="list-style-type: none"> • Decommissioning
Traffic Management	<ul style="list-style-type: none"> • A TMP will be prepared to cover the decommissioning phase of 	<ul style="list-style-type: none"> • Adherence to plan and controls will be 	<ul style="list-style-type: none"> • Decommissioning

Issue	Mitigation Commitments	Monitoring Requirements	Timing
	the project	checked for compliance on a regular basis	