APPENDIX D

Mitigation measures summary

AMPYR

Shell ENERGY

EMM creating opportunities

Impact/risk	ID	Measure	Timing
Biodiversity			
Removal of Box Gum Woodland and derived native grassland	BIO01	Retain vegetation where possible within the transmission line connection. Limit the removal of vegetation to necessary trees and trimming of branches.	Construction; Post-construction
	BIO02	Locate the access of the BESS on most of the existing access track within the project boundary.	Design
	BIO03	Following construction, include species consistent with PCT 266 into landscaping and vegetation screens.	Post-construction
Removal of hollow-bearing trees	BIO04	Minimise removal of hollow-bearing trees which occur within the project boundary, where possible. A visual screening area is included in the project boundary, where efforts to retain the 7 remaining trees will be made. Although this is the aim of AMPYR and SHELL, impacts to hollow-bearing trees include the removal of the 7 trees within the subject land for the purpose of this assessment.	Design
	BIO05	Install 7 nest boxes or equivalent within the cadastral boundary of the site in remnant woodland. As a priority, the removed hollows should be retained to be re-installed on remnant trees within the site. Where this is not possible, nest boxes can be used.	Construction
Removal of potential habitat for native fauna (hollow-bearing trees) (for all species including the Superb Parrot)	BIO06	Pre-clearance surveys to be conducted prior to removal of hollow-bearing trees (at the locations specified in the BDAR).	Pre-construction
	BIO07	If the Superb Parrot is found to be utilising a hollow, a hollow inspection will be undertaken using an elevated work platform, tree climber and/or inspection camera. If eggs are present in the hollow, these eggs will be collected and provided to a wildlife carer for raising, prior to release. If hatchlings are present, removal of the hollow-bearing tree must be postponed until birds have fledged and left the hollow for the breeding season (September to December).	Pre-construction
Removal of logs and debris from the subject land	BIO08	Retain hollow logs and debris to be used post construction in remnant woodland.	Post-construction
Indirect impacts on White Box woodland to be retained	BIO09	Retained trees will be marked for their protection during construction, where required. Markings will be monitored and reapplied where necessary during construction.	Pre-construction
	BIO10	All workers to be made aware of ecologically sensitive areas and the need to avoid impacts. This includes adjacent native vegetation.	Pre-construction
Erosion and sedimentation to the indirect impact area	BIO11	Sediment controls, including fencing and sediments traps, should be installed in any areas where works will occur in proximity to low lying vegetation. This includes along the boundary of the unnamed watercourse.	Pre-construction
Weed introduction and spread	BIO12	Remove weeds prior to clearing. Weeds are to be stockpiled appropriately prior to removal from the subject land to avoid the spread of seed and other propagules.	Construction
	BIO13	Weed hygiene protocols are in place prior to entering the subject land. This includes wash-down procedures to all plant and machinery.	Construction
Disturbance	BIO14	Monitor dust levels and implement suppression strategies where required such as wetting down dirt roads or reducing vehicle speeds.	Construction

Impact/risk	ID	Measure	Timing
Ground disturbance	ACHA01	All site personnel should be made aware that there are registered Aboriginal sites within the vicinity of the project area and therefore must not undertake ground disturbance outside of approved areas. Appropriate signage and temporary fencing should be erected around AHIMS 36-4-0203 to ensure no inadvertent impacts occur to this site.	Prior to ground disturbance
Impact to known heritage items	ACHA02	Appropriate signage and temporary fencing should be erected around AHIMS 36-4-0203 to ensure no inadvertent impacts occur to this site.	Pre-construction
Reporting and record keeping	ACH03	Prior to ground disturbance, an Aboriginal cultural heritage management plan (ACHMP) must be developed by a heritage specialist in consultation with the Aboriginal stakeholders and consent authority to provide the post-approval framework for managing Aboriginal heritage within the project area. The ACHMP should include the following aspects: • A workshop between the archaeologists and the RAPs prior to undertaking the ACHMP to develop the approach to the document as requested by WVWAC during the ACHA review period. • Liaise with the RAPs in developing suitable visual strategies to minimise impacts of the project to the broader cultural landscape (eg cultural plantings, screening, paint styles, etc). • Process, timing, and communication methods for maintaining Aboriginal community consultation and participation through the remainder of the project. • Description and methods for undertaking further Aboriginal heritage assessment, investigation and mitigation of any areas of the project area that have changed following completion of the Aboriginal heritage assessment and/or during the final design and construction phases of the project. • Procedures for managing the unexpected discovery of Aboriginal objects, sites and/or human remains during the project and delivered through an Aboriginal Cultural Heritage Induction Program developed and delivered by the RAPs onsite to ensure culture, heritage and artefactual materials are identified and managed appropriately. • Procedures for the curation and long-term management of cultural materials if recovered as part of unexpected finds. • Processes for reviewing, monitoring, and updating the AHMP as the project progresses.	Pre-construction
Reporting and record keeping	ACH04	The Construction Environment Management Plan (CEMP), or equivalent, should reinforce how the cultural landscape is considered throughout the project and detail the rehabilitation of the project area. This should be undertaken in consultation with the RAPs. The CEMP should be distributed to the RAPs for their records.	Pre-construction
Consultation	ACH05	Consultation should be maintained with the RAPs during the finalisation of the assessment process and throughout the construction phase of the project. Details for how this consultation should be undertaken will be outlined in the ACHMP.	Pre-construction
Consultation	ACH06	A copy of the ACHA should be lodged with AHIMS and provided to each of the RAPs.	Pre-construction
Information management	ACH07	Where the heritage consultant changes through the project, suitable hand over should occur to minimise loss or mistranslation of the intent of the information, findings and future steps in heritage management.	Pre-construction

Impact/risk	ID	Measure	Timing
Noise and vibration			
Construction noise and vibration	NV01	Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration amongst construction personnel.	Construction
Construction noise and vibration	NV02	Use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby residents will be avoided.	Construction
Construction noise and vibration	NV03	Routes for the delivery of materials and parking of vehicles to minimise noise will be developed.	Construction
Construction noise and vibration	NV04	Where possible, use of equipment that generates impulsive noise will be avoided.	Construction
Construction noise and vibration	NV05	Nearby residents will be notified prior to the commencement of intensive works.	Construction
Plant and equipment noise and vibration	NV06	Where possible, quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks will be selected.	Design and construction
Plant and equipment noise and vibration	NV07	Plant and equipment to be operated in the quietest and most efficient manner.	Design and construction
Plant and equipment noise and vibration	NV08	Plant and equipment will be regularly inspected and maintained to minimise noise and vibration level increases and to ensure that all noise and vibration reduction devices are operating effectively.	Construction and operation
Operational noise and vibration	NV09	To address the residual noise exceedance at R1 negotiations have commenced between the applicant and the landholder for treatment to the dwelling (upgraded glazing and where necessary alternative ventilation) to ensure equivalent internal noise levels are achieved (-10dB or more) below the relevant external PNTL and will be documented in the form of a negotiated agreement. It is recommended that the treatment to the dwelling contained in the agreement be implemented during the early stages of Phase 1 construction in order to further mitigate construction noise impacts.	Construction and operation
Operational noise and vibration	NV10	During the detailed design phase of the project all plant and equipment will be reviewed to ensure noise levels predicted in the NVIA can be achieved through: • selection of plant and equipment; • site layout and orientation of equipment; • provision of acoustic barrier (wall/retaining wall and batter or earth mounds) four metres in height to the north, east, south and west with site access provision provided in north-west corner; • utilisation and operational procedures consistent with the assumptions in this NVIA; • consideration of additional earth mound to the north-east three metres in height adjacent the Twelve Mile Road site boundary; or • a combination of the above measures.	Design

Impact/risk	ID	Measure	Timing
Operational noise and vibration	NV11	An EMP will be prepared to manage environmental impacts during the operational phase of the project. For operations, the EMP will address noise management and mitigation options (where required) prior to commencement of operations. The EMP will outline a procedure to: • Measure operational noise levels at early stages during commissioning or within 3 months of operation to validate the predicted operational noise levels. • Re-evaluate the predicted operational noise levels at assessment locations, and where required review noise management, mitigation measures and site management to reduce levels where required. This may include (but is not limited to): – equipment noise controls; – provision of additional or amended acoustic barriers; – at receiver noise treatment; – negotiated agreement; and – measuring operational noise levels at assessment locations, especially during the evening and night-time period, if relevant, and implementing further noise management and mitigation measures where an exceedance of approved noise levels is identified.	Pre-construction
Historic heritage			
Unexpected finds	HER01	If unexpected finds of historical nature are discovered during any work, work within 5 m of the find must cease and the following steps taken: • an archaeologist will be contacted to assess the find, where relevant, and determine if it is clearly a relic or has moderate to high potential to be a relic (this may require additional research); • if the find is determined to be a relic, a s146 (of the Heritage Act) is to be forwarded to the Heritage Council who will be consulted on the appropriate management measure; and • if the find is assessed and is not a relic, work inside the area that was made a no-go area can re-commence.	Construction and operation

Impact/risk	ID	Measure	Timing
Human remains	HER02	In the event that known or suspected human remains (generally in skeletal form) are encountered during the activity, the following procedure will be followed immediately upon discovery: • all work in the immediate vicinity will cease and the find will be immediately reported to the work supervisor who will advise the Environment Manager or other nominated senior staff member; • the Environment Manager or other nominated senior staff member will promptly notify the police (as required for all human remains discoveries); • the Environment Manager or other nominated senior staff member will contact Heritage NSW for advice on identification of the human remains; • if it is determined that the human remains are Aboriginal ancestral remains, the Local Aboriginal Land Council will be contacted, and consultative arrangements will be made to discuss ongoing care of the remains; and • if it is determined that the human remains are not Aboriginal ancestral remains, further investigation will be conducted to determine if the remains represent a historical grave or if police involvement is required.	Construction and operation
Hazards and risks			
Offsite safety incidents	HAZ01	AMPYR to consult with Fire and Rescue NSW (FRNSW) during detailed design of the facility to ensure that the relevant aspects of fire protection measures have been included. These may include: 1. type of firefighting or control medium; and 2. demand, storage and containment measures for the medium. The above aspects will form an input to the Fire Safety Study which may be required as part of the development consent conditions, for review and approval by FRNSW.	Design
Offsite safety incidents	HAZ02	AMPYR to review the investigation reports on the Victorian Big Battery Fire (occurred on 31 July 2021) and implement relevant findings for the project. The publicly available investigation reports include: • Energy Safe Victoria: Statement of Technical Findings on fire at the Victorian Big Battery. • Fisher Engineering and Energy Safety Response Group: Report of Technical Findings on Victorian Big Battery Fire.	Design

Impact/risk	ID	Measure	Timing
Land resources			
Impacts to land and soil capability	LR01	As part of the CEMP, soil management measures are recommended to ensure the preservation of soil resources, including: • assessment of topsoil depths to be stripped prior to stripping to minimise the mixing of topsoil and subsoil; • attempt to strip and manage different soils types separately; • avoid mixing topsoil with subsoil during stripping operations; • avoid stripping topsoil following heavy rain periods that leaves the soil structure saturated; • avoid compaction of topsoil during stripping and stockpiling operations; • amelioration of topsoil and, where necessary, subsoil during stripping operations in accordance with a soil scientists recommendations. Ameliorants should be applied prior to stripping of their respective layers, to maximise mixing of the ameliorants during the stripping process; • stockpile topsoil separately from subsoil (if it is necessary to strip subsoil); • where practical and possible, the subsoils and topsoils should be located so that stockpiled material is placed on the same underlying soil unit; protection of stockpiles from erosion using soil stabilising polymers, cover crops or other forms of stabilisation; • revegetation of long-term topsoil stockpiles with native plant community types to minimise stockpile water logging, the generation of anaerobic conditions, help maintain topsoil biological viability and to create a seed store; and • test stockpiled subsoil and topsoil to determine amelioration requirements prior to reinstatement.	Design
Erosion and sedimentation	LR02	Drainage and landform design to: • avoid concentration of flow and maintain sheet flow conditions where practicable; • avoid excavating drains in dispersive soils and locate roads, hardstands and pads to utilise the natural slope so that water drains away as required; • maintain the velocity of flows below 0.3m/s; • avoid the use of structures that pond water and can cause tunnel erosion such as check dams and channel banks in concentrated flows and benches on cut and fill batters; • use back-push diversion in lieu of channel banks if it is necessary to divert flow; • ameliorate dispersive soils particularly in cable trenches and fill embankments where there is a high risk of tunnel erosion; and • use high efficiency sediment basins (Type B) with flow activated dosing systems to treat turbid runoff to protect downstream receivers.	Design
Land disturbance extent and duration	LR03	As part of the CEMP, land disturbance processes will be developed to ensure unnecessary land disturbance does not occur, including provision for site inspection by the site Environmental Manager or delegate prior to disturbance to identify any necessary environmental, cultural, drainage and erosion and sediment controls are planned and implemented as required.	Design

Impact/risk	ID	Measure	Timing
Land disturbance extent and duration	LR04	Initial earthworks and major land disturbing activities to avoid high rainfall erosivity period (summer storm season) November through to March where practical to minimise erosion. Where major land disturbing works need to occur in high rainfall erosivity periods then a commensurate level of erosion and sediment control will be adopted.	Design
Land disturbance extent and duration	LR05	The timing of stabilisation and rehabilitation works are to consider: • proximity to sensitive receptors • soil erosivity; • slope gradient and length; • time of year (rainfall risk); and • site access.	Design
Water movement through the site	LR06	Clean upslope run-on should be diverted around areas of ground disturbance to minimise the erosion potential and volume of turbid runoff that needs to be treated.	Design
Water movement through the site	LR07	Access tracks should be designed and constructed to avoid the concentration of flow where possible. The roads should have a crowned profile in most instances with a minimum cross fall of 4% to minimise the formation of corrugations, with infall and outfall drainage only where necessary.	Design
Water movement through the site	LR08	Track drainage should be turned out using back push diversion banks or trapezoidal mitre drains where possible. Drains will need to be lined (generally rock) where flow velocities exceed the maximum permissible velocity of the soil.	Design
Water movement through the site	LR09	Track surfaces should be stabilised using a soil stabilising polymer emulsion design to minimise erosion, turbid runoff, dust emissions, watering and maintenance.	Design
Water movement through the site	LR10	The waterway crossings should be a low-level concrete causeway with low flow culverts and a stilling pond type energy dissipator to minimise erosion of the watercourse downstream of the crossing.	Design
Water movement through the site	LR11	Early installation of the causeway should be a priority during track construction to allow the safe passage of clean run-on water.	Construction
Water movement through the site	LR12	Rainfall falling onto the roofs of offices and workshop facilities is clean water and should be captured using gutters and stored in tanks for re-use and overflows directed away from active construction areas.	Operation
Water movement through the site	LR13	Turbid water runoff from the substation/BESS, laydown and where practicable, access tracks should be diverted to Type B sediment basins for treatment.	Design
Water movement through the site	LR14	Sediment Basins should be constructed as a priority before any other land disturbances to maximise the capture of sediment and turbid runoff.	Construction
Water movement through the site	LR15	Fuel storages should be self-bunded and other hydrocarbon and chemical storages bunded in accordance with AS1940.	Design

Impact/risk	ID	Measure	Timing
Stabilisation	LR16	Progressive stabilisation and rehabilitation of disturbed areas should be undertaken to minimise erosion and the generation of sediment and turbid runoff. Due to the gentle slope gradients on site and presence of suitable quality topsoil, bonded fibre matrix hydro-mulches (BFM) are considered appropriate for site rehabilitation purposes. For slopes steeper than 1:2 a hydraulically applied growth medium (HGM) is recommended.	Construction
Stabilisation	LR17	Ensure that non-water soluble, mineral based, biologically inoculated fertilisers are used in any revegetation works to not impact on background landowners participating in organic or carbon farming initiatives.	Construction
Sediment retention	LR18	Type B high efficiency sediment basins with flow activated dosing systems are recommended where calculated soil loss exceeds 150 t/ha/y (Substation/BESS and Laydown Area) or control of turbidity is required to protect creek systems.	Design
Sediment retention	LR19	In-stream sediment controls should be avoided where possible by scheduling works in creeks to avoid the summer storm season.	Construction
Sediment retention	LR20	As part of the CEMP, water movement processes will be developed to minimise the potential for accidental turbid water discharge during pumping and dewatering activities on site.	Design
Erosion and sedimentation	LR21	Drainage, erosion and sediment control measures at all times until their function is no longer required.	Construction and operation
Erosion and sedimentation	LR22	Inspections of control measures need to be undertaken following rainfall that causes run-off or monthly during dry conditions.	Construction and operation
Erosion and sedimentation	LR23	Inspections should be undertaken by the site Environmental Manager or delegate. That person shall have the following knowledge: • an understanding of site environmental values that could be impacted by site construction and operation; • an understanding of the requirements of the Ministers Conditions of Approval and Environmental Protection Licence that are relevant to drainage, erosion and sediment control; • a good working knowledge of drainage, erosion and sediment control fundamentals and the project specific application thereof; • ability to provide advice and guidance on appropriate measures and procedures to maintain the site at all times in a condition representative of regionally specific best practice, and that is reasonably likely to achieve the required standards; and • a good working knowledge of the correct installation, operation and maintenance procedures for the full range of drainage, erosion and sediment control measures used on the project.	Construction and operation
Erosion and sedimentation	LR24	Control measures to be maintained to the maximum practicable extent so that control measures: • will best achieve the sites required environmental protection including achieving the water quality criteria specified in the Environmental Protection Licence in the nominated design storm event; • are in accordance with the specified operational standard for each drainage, erosion and sediment control measure; and • prevents or minimises safety risks.	Construction and operation

Impact/risk	ID	Measure	Timing
Erosion and sedimentation	LR25	All water, debris and sediment removed from control measures shall be disposed of in a manner that will not create an erosion or pollution hazard.	Construction and operation
Erosion and sedimentation	LR26	It is recommended that a hierarchical ESC planning system be adopted for construction and operation of the project consisting of an overarching project wide ESCP with Progressive ESCP's for all disturbance areas to ensure that the projects ESCP's are living documents that can and will be modified as site conditions change, or if the adopted control measures fail to achieve the desired treatment standard.	Design
Erosion and sedimentation	LR27	The ESCP's are recommended to be prepared and certified by a suitably qualified and experienced Certified Professional in Erosion and Sediment Control.	Design
Erosion and sedimentation	LR28	If a site inspection or environmental monitoring identifies a significant failure of the adopted drainage, erosion and sediment control measures, a critical evaluation of the failure should be undertaken to determine the cause and appropriate modifications made to the control measures on site and ESCP's amended.	Construction and operation
Erosion and sedimentation	LR29	All project personnel including contractors are recommended to have an appropriate level of drainage, erosion and sediment training. Three levels of competency training for personnel are recommended: Level 1 – basic awareness level training and provided during the site induction. Level 2 – half day training for foreman, engineers, project managers etc on the legal aspects of drainage, erosion and sediment control, fundaments and site-specific strategies, techniques and requirements. Level 3 – detailed one day training course where drainage, erosion and sediment control is a regular component of their daily activities and competence is required.	Construction and operation
Social			
Amenity related to traffic noise	SOC01	Implement ongoing community engagement mechanism (ie dedicated project phone number and email), which provides the opportunity for stakeholders to raise complaints, grievances, and provide feedback.	Construction and operation
Community related to community investment, social cohesion, and resilience	SOC02	Develop funding and grant opportunities within the local and regional area where need is determined.	Pre-construction and operation
Community related to community investment, social cohesion, and resilience	SOC03	Develop a strategy for the enhanced identification and implementation of shared value opportunities within the local area.	Pre-construction and operation
Community related to community investment, social cohesion, and resilience	SOC04	Utilise a community and stakeholder engagement strategy to facilitate funding decisions that are informed by the local community, including regular meetings with local MP's, Dubbo Regional Council, local community groups, and local community members.	Pre-construction and operation

Impact/risk	ID	Measure	Timing
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC05	Action the recommendations of the TIA to improve road safety objectives along the Goolma Road.	Pre-construction and construction
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC06	Liaise with Dubbo Regional Council and TfNSW to explore the potential and utility of a reduction in the speed limit along Goolma Road as well as for an increase in road maintenance. AMPYR should look to implement a corporate policy that restricts its heavy vehicle fleet to travelling a maximum of 80 km/h along Goolma Road.	Pre-construction and construction
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC07	Implement driver inductions, including a driver code of conduct, requiring compliance with road safety procedures and prohibiting unsafe driving practices such as tailgating, convoying, and speeding. Explore carpooling and utilisation of a bus service as a way to mitigate public safety impacts and manage driver fatigue.	Pre-construction and construction
Public safety related to increased traffic on Goolma Road and through Goolma Road and Twelve Mile Road intersection	SOC08	Continue community engagement to monitor compliance with road safety measures and encourage local residents to report any instances of unsafe driving of construction vehicles using community engagement grievance mechanisms.	Pre-construction and construction
Public safety related to increased truck movements along school bus route on Goolma Road	SOC09	Implementing a risk prevention strategy to limit heavy vehicle traffic occurring along the school bus route during school commuting times. The school bus route occurs between 7.52 am – 8.47 am and 3.07 pm – 4.18 pm and it is recommended that heavy vehicles are restricted from travelling during these times. As a precaution, AMPYR should ensure that there is a reduction in heavy vehicle speed along the school bus route on Goolma Road during school commuting hours.	Pre-construction and construction
Public safety related to increased truck movements along school bus route on Goolma Road	SOC10	Liaison between AMPYR, TfNSW, local Council and the bus operator is recommended to establish safe rural bus stops to enable the bus to draw fully off the road in conjunction with school bus zone signage.	Pre-construction and construction
Public safety related to increased truck movements along school bus route on Goolma Road	SOC11	Implementation a Driver's Code of Conduct which would manage AMPYR's contribution to these safety issues. The Driver's Code of Conduct should include a requirement for all truck drivers to give way to school bus movements.	Pre-construction and construction
Public safety related to increased truck movements along school bus route on Goolma Road	SOC12	AMPYR to be involved in consultation with other developments in the area, namely the proponents of Wellington North Solar Farm and Uungula Wind Farm as well as Dubbo Regional Council, Wellington schools and bus service operator to establish community meetings if required to serve as a consistent means of monitoring the safety of school bus route during construction.	Pre-construction and construction

Impact/risk	ID	Measure	Timing
Public safety related to fire hazards	SOC14	Action the recommendations stated in the PHA to mitigate any potential public safety risks stemming from fire hazards.	Pre-construction and construction
Public safety related to fire hazards	SOC15	Consult with Fire and Rescue NSW (FRNSW) during detailed design of the facility to ensure that the relevant aspects of fire protection measures have been included.	Pre-construction and construction
Public safety related to fire hazards	SOC16	Consult with the local Wellington Fire Service and the Rural Fire Service to implement a Fire Management Plan.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC17	Seek to appoint a construction contractor(s) who adopts a preferential approach to hiring which prioritises employment of workers with relevant skills residing within the local area, then the regional area, followed by hiring outside of these areas.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC18	AMPYR and/or its construction contractor(s) to work with local employment, apprenticeship and training agencies to enhance the potential of hiring of local and regional workers thereby minimising the need to hire workers from outside of the local and regional areas.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC19	Partnership with local employment and training agencies could create specific benefits for at-risk youth and people struggling to find employment by providing direct employment opportunities.	Pre-construction and construction
Livelihood related to increased local employment opportunities	SOC20	Provision of apprenticeship and training opportunities.	Pre-construction and construction
Livelihood related to training and apprenticeship opportunities	SOC21	To maximise potential benefits, it is recommended that AMPYR and/or its construction contractor(s) partner with local employment training agencies to provision for apprenticeships and training programs that are tailored to the local community and promote skilled employment pathways for the project.	Pre-construction and construction
Livelihood related to training and apprenticeship opportunities	SOC22	It is recommended that AMPYR and/or its construction contractor(s) explore the opportunity to sponsor the licenses required for employment in the construction industry, which would enable youth, particularly in the regional area, to gain meaningful employment as well as increase their employability.	Pre-construction and construction
Livelihood related to training and apprenticeship opportunities	SOC23	Apprenticeship and employment opportunities can be further enhanced through the implementation of vocational education and training (VET) programs and work experience for schools in the local and regional area. This could encourage pathways to local employment, thereby encouraging youth retention.	Pre-construction and construction
Traffic and transport			
Traffic safety	T01	Install an auxiliary short left turn bay (AUL(S)) and a channelised right turn bay (CHR) at the Goolma Road/Site Access road intersection.	Pre-construction
Traffic safety	T02	A detailed construction traffic management plan (CTMP) will be developed by the construction contractor in consultation with Dubbo Regional Council prior to the commencement of works.	Pre-construction
Traffic safety	T03	Obtain a permit (from NHVR) to allow OSOM vehicles to use the road network as part of construction.	Pre-construction

Impact/risk	ID	Measure	Timing
Traffic safety	T04	Consider removal of tree hence allowing visibility to a greater distance. Construction stage traffic management measures such as warning signs for trucks entering (sign no. t2-25, to be confirmed in the CTMP).	Pre-construction
Visual			
Visual impacts	VIS01	Development of the project design has included and will continue to include general measures to reduce the degree of contrast between project infrastructure and the surrounding rural landscape, having regard to the form, scale, height, colour and texture of materials incorporated as part of the project.	Design
Visual impacts	VIS02	Where possible, suitable colours and finishes will be chosen for project infrastructure to minimise visual impacts (including glare/reflectivity), including the O&M buildings/facilities and the acoustic wall surrounding the BESS area. These buildings and materials will be designed to blend in with the local rural/farming landscape. If practicable, the wall may be painted in a neutral colour (eg khaki, beige, green or similar) rather than white, so as to better blend in with the local rural landscape.	Design
Visual impacts	VIS03	Landscaping to be installed along all boundaries of the BESS compound in accordance with the conceptual landscape plan, including use of suitable vegetation species identified in the VIA. The final location and extent of landscaping will be determined during detailed design and following subsequent discussions with the property owners of R23 and local suppliers as part of preparation of the environmental management plan (EMP).	Design
Surface water			
Impacts to watercourses and riparian corridors	SW01	Final project layout to be adjusted, where possible, during detailed design to avoid encroachment into the inner 50% of the vegetated riparian zone along Watercourse A. This should apply to permanent works as well as any temporary works required during construction.	Design
Impacts to watercourses and riparian corridors	SW02	Detailed design to develop a bed level or culvert waterway crossing design for Watercourse A that is consistent with guidance in DoPI (2012).	Design
Impacts to water quality	SW03	Implementation of erosion and sediment control measures and site rehabilitation and revegetation in accordance with best practice. The LSEA (EMM 2020) describes a range of proposed measures for adoption. Proposed measures will be considered further and formalised as part of detailed design and documented in the CEMP. Access tracks to incorporate appropriate water quality treatment measures such as vegetated swales to minimise the opportunity of dirty water leaving the site and entering waterways. Implementation of procedures for hazardous material storage and spill management to be prepared and documented within the CEMP.	Design and pre-construction
Flood impacts	SW04	Construction site planning at detailed design stage to: • consider flood risk and locate temporary site works, compounds, storage areas and plant/equipment away from flood prone areas where practicable; • ensure connectivity of temporary drainage to Watercourse A and retention of overland flow paths from the site; and • maintain riparian corridor setbacks along watercourses.	Design and pre-construction

Impact/risk	ID	Measure	Timing
Water security	SW05	A water supply work approval is to be obtained to convert the existing landholder bore to a water supply bore and a WAL is to be obtained for the required construction water take, should onsite groundwater sources be utilised to supplement other water sources.	Pre-construction
Impacts to watercourses and riparian corridors	SW06	Monitoring of watercourse and riparian corridor condition for Watercourse A immediately adjacent to the project will be undertaken at an appropriate frequency, with maintenance undertaken as required to minimise scouring and erosion in particular in the vicinity of the new watercourse crossing.	Construction and operation
Impacts to water quality	SW07	Continuation of erosion and sediment control and site rehabilitation and revegetation measures as appropriate, and monitoring and maintenance of ground cover vegetation and other stabilised surfaces throughout operation to limit erosion and transport of sediment to watercourses. The LSEA (EMM 2020) describes a range of proposed measures for adoption. Proposed measures will be considered further and formalised as part of detailed design and documented in the OEMP. Implementation of procedures for hazardous material storage and spill management to be prepared and documented within the OEMP.	Construction and operation
Flood impacts	SW08	Detailed design of project to minimise potential for offsite flooding impacts up to and including 1% AEP event by: • ensuring finished ground levels are constructed at-grade and not materially higher than existing levels, in particular along potential hydraulic controls that could be formed by the proposed internal access roads; • maintaining connectivity of internal stormwater drainage to Watercourse A and retention of overland flow paths from the site; • incorporation of a detention function for the site water management basin, to maintain predeveloped storm flows to existing conditions up to the 1% AEP event; and • maintaining riparian corridor setbacks along watercourses. Flood emergency management protocols and procedures to be developed and documented in a FERP (or equivalent).	Design
Water security	SW09	The WAL obtained for the required construction water take, will also be required to cover nominal water use for potential irrigation of the visual screening during operation.	Pre-operation
Air quality			
Reporting and record keeping	AQ01	Develop appropriate communications to notify the potentially impacted residences of the project (duration, types of works, etc), relevant contact details for environmental complaints reporting.	Pre-construction
Reporting and record keeping	AQ02	A complaints logbook will be maintained throughout the construction phase which should include any complaints related to dust; where a dust complaint is received, the response actions should be detailed in the logbook.	Construction
Reporting and record keeping	AQ03	Record any exceptional incidents that cause dust and/or air emissions, either on or off site, and the action taken to resolve the situation in the logbook.	Construction
Reporting and record keeping	AQ04	Carry out regular site inspections, record inspection results, and make the logbook available for review as requested.	Construction

Impact/risk	ID	Measure	Timing
Dust	AQ05	Erect shade cloth barriers to site fences around potentially dusty activities such as trench excavations and material stockpiles where practicable.	Construction
Dust	AQ06	Keep site fencing and barriers clean using wet methods.	Construction
Dust	AQ07	Deploy water carts to ensure that exposed areas and topsoils/subsoil are kept moist.	Construction
Dust	AQ08	Provide an adequate water supply on the construction site for effective dust/particulate matter suppression/mitigation.	Construction
Dust	AQ09	Modify working practices by limiting activity during periods of adverse weather (hot, dry and windy conditions) and when dust is seen leaving the site.	Construction
Dust	AQ10	Minimise drop heights from loading or handling equipment.	Construction
Site inspections – dust monitoring	AQ11	Undertaking daily on-site and off-site inspections, where receptors are nearby, to monitor dust. The inspection results should be recorded in a specific log. Inspection should include regular dust soiling checks of surfaces such as street furniture and cars.	Construction
Site inspections – dust monitoring	AQ12	At the commencement of each day's activities, the local meteorological forecast should be reviewed, including the timing of notable increases in wind speed and/or temperature. Appropriate increased intensity or additional mitigation measures should be planned for the day based on this forecast review. The likely meteorological conditions and implications for dust emissions and impacts should be discussed at the morning toolbox meeting.	Construction
Site inspections – dust monitoring	AQ13	Increasing the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Should notable visual dust emissions be observed leaving the site boundary, increased intensity or additional mitigation measures should be deployed.	Construction
Site inspections – dust monitoring	AQ14	Undertaking daily on-site and off-site inspections, where receptors are nearby, to monitor dust. The inspection results should be recorded in a specific log. Inspection should include regular dust soiling checks of surfaces such as street furniture and cars.	Construction
Site inspections – dust monitoring	AQ15	At the commencement of each day's activities, the local meteorological forecast should be reviewed, including the timing of notable increases in wind speed and/or temperature. Appropriate increased intensity or additional mitigation measures should be planned for the day based on this forecast review. The likely meteorological conditions and implications for dust emissions and impacts should be discussed at the morning toolbox meeting.	Construction
Site inspections – dust monitoring	AQ16	Increasing the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Should notable visual dust emissions be observed leaving the site boundary, increased intensity or additional mitigation measures should be deployed.	Construction
Speed limit	AQ17	Impose a maximum-speed-limit of 20 km/h on all internal roads and work areas during construction.	Construction
Vehicle fuel combustion emissions	AQ18	Ensure proper maintenance and tuning of all equipment engines.	Construction

Impact/risk	ID	Measure	Timing
Clearing	AQ19	Limit the extent of clearing of vegetation and topsoil to the designated footprint required for construction and appropriate staging of any clearing.	Construction
Exposed soils	AQ20	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	Construction
Materials handling	AQ21	Minimise drop heights from loading or handling equipment.	Construction
Track out from vehicles	AQ22	Access gates to be located at least 10 m from receptors where possible.	Construction
Track out from vehicles	AQ23	Use water-assisted dust sweeper(s), to remove, as necessary, any material tracked out of the site onto public roads.	Construction
Track out from vehicles	AQ24	Avoid dry sweeping of large areas.	Construction
Track out from vehicles	AQ25	Ensure vehicle loads entering and leaving sites are covered to prevent escape of materials during transport.	Construction
Track out from vehicles	AQ26	Trips and trip distances should be controlled and reduced where possible, for example by coordinating delivery and removal of materials to avoid unnecessary trips.	Construction
Contamination			
Contamination	CON01	An unexpected finds protocol will be developed and contained within the CEMP to include procedures to identify potentially contaminated land, such as: • the observation of discolouration or staining of soils; • visible signs of plant stress, presence of drums or other waste material; • stockpiles or fill material, or odours. Where signs of contamination are identified, whether from known or unexpected sources, construction work within the affected areas would cease until a contamination assessment was undertaken to advise the need for further investigation or remediation.	Construction
Handling and storing waste	CON02	Procedures for handling and storing waste be developed and implemented and contained within the CEMP, including detail on the handling of potentially or known contaminated material and protocols for waste classification and disposal.	Duration of project
Waste			
Waste classification	W01	All waste will be assessed, classified, managed, and disposed of in accordance with the Waste Classification Guidelines (NSW EPA 2014).	Construction

Impact/risk	ID	Measure	Timing
Reporting and record keeping	W02	a construction waste and resource management plan will be developed and contained within the CEMP to outline appropriate management procedures and include, but not be limited to: • identify waste types and volumes that are likely to be generated by the project; • adherence to the waste minimisation hierarchy principles of avoid/reduce/reuse/recycle/dispose; • waste management procedures to manage the handling and disposal of waste, including unsuitable material or unexpected waste volumes; and • identification of reporting requirements and procedures for tracking of waste types and quantities.	Pre-construction