Appendix 5 – Mitigation and Management Measures Table

Lightsource bp will be responsible for implementing the management and mitigation measures identified in the EIS. Under the terms of the Engineering, Procurement and Construction (EPC) Contract, the EPC Contractor has control and is responsible for the management of the Project Area during construction and initial operations. This will be followed by the Operation and Maintenance Contractor being responsible during operation. The management and mitigation measures will be implemented through a construction environmental management plan, operational environmental management plan and decommissioning environmental management plan. These plans will be prepared sequentially, prior to each stage of the Project by Lightsource bp and the relevant contractor, and in consultation with relevant Government Agencies. The following table provides a consolidated list of the management and mitigation measures applicable to the Project and relevant timing for implementation.

Aspect	Management/Mitigation Measure	Timing
Terrestrial biodiversity	Maintain a wildlife corridor across the Project Area through retention of large areas of suitable habitat for the regent honey eater (*Anthochaera phrygia*) and White Box – Yellow Box – Blakely's Red Gum Grassy woodland and derived native grassland.	Construction and Operation
	Implement the following specific control measures to minimise the impacts of the Project on biodiversity: • workforce education and training • implementation of vegetation protection zones for areas to be retained • ecologist pre-clearance surveys and supervision of works • erosion and sedimentation control measures • weed management • fencing, access control and fauna exclusion measures. Each of these mitigation measures will be included within the CEMP, OEMP and DRMP.	Construction and Operation
	Develop a Biodiversity Offset Strategy (BOS) in consultation with Biodiversity Conservation Division (BCD), DPE and DCCEEW based on the credits required to be retained to offset the impacts of the Project.	Prior to construction commencing

Aspect	Management/Mitigation Measure	Timing
Aquatic biodiversity	During construction: • implementation of appropriate erosion and sediment controls • avoidance of waterfront land during construction works • provision of onsite spill kits for construction works within 100 metres of a watercourse • undertaking instream construction works (for access tracks) when watercourses are dry (where practicable) • design of any instream structures using relevant guidelines (to maintain fish passage and minimise impacts to natural flow regimes), particularly on watercourses mapped as KFH • rehabilitation of disturbed bed and banks of watercourses mapped as KFH with stabilising vegetation • implementation of pre-clearance surveys carried out prior to construction, undertaken by a suitably qualified ecologist • implementation of an unexpected species finds protocol.	Construction
	During operation and decommissioning: • routine maintenance of vehicles (to reduce the risk of oil spills etc) • routine maintenance of culverts (to ensure they are clear of debris) • minimal use of herbicides to control exotic species (to reduce pollutants entering downstream watercourses) • re-establishment of native riparian vegetation endemic to the region and aquatic habitat features within and on the banks of any watercourses directly impacted.	Operation and Decommissioning
Aboriginal cultural heritage	Following development consent, the proponent will develop an Aboriginal Cultural Heritage Management Plan (ACHMP) which is to be agreed to by the RAPs and DPE (with input from Heritage NSW). The ACHMP will include an unanticipated finds protocol, unanticipated skeletal remains protocol, protocols related to heritage inductions for work crews, and long-term management of any Aboriginal sites being impacted.	Prior to construction commencing
	Eight Aboriginal sites within the Development Footprint will be salvaged by a surface collection of visible artefacts. The recommended methodology for the salvage will be set out in the ACHMP and will include the measures outlined in Section 9.2.1 of the ACHAR.	Prior to construction commencing
	Four of the seven trees of community interest will be retained. The three trees of community of community interest located within the Development Footprint will be removed in accordance with a methodology set out in the ACHMP.	Construction
	The ruins of the O'Brien homestead slab hut will be avoided from all ground disturbing impacts by a 20-metre buffer.	Construction

Aspect	Management/Mitigation Measure	Timing
	The two identified sites that lie outside the Project access route/Development Footprint will be retained. Should works need to take place at either location, the site would be included on all applicable construction plans and the location made known to all work crews working in the vicinity of the site to ensure the site is not inadvertently harmed.	Prior to construction commencing
Historic heritage	If impacts to areas of high historical archaeological potential cannot be avoided through design changes, further assessment and investigation would be required prior to the commencement of construction activities. This would include the preparation of an archaeological research design and test excavation methodology to confirm the extent of historical archaeological remains present, and the likely significance level of any historical archaeological remains on the site.	Prior to construction commencing
	All contractors and project team for the Project should be made aware of the archaeological potential and heritage sensitivity of the site, through a heritage-specific induction which outlines their requirements under the NSW *Heritage Act 1977* and the Project Approvals.	Construction, operation and decommissioning
	An unexpected heritage finds protocol should be implemented for the construction works in the unlikely event that historical archaeological remains should be encountered during construction works.	Construction
Land	A CEMP will be prepared by Lightsource bp that identifies erosion and sediment control measures prior to works commencing.	Prior to construction commencing
	An ESCP will be developed as part of the CEMP, in accordance with the Managing Urban Stormwater: Soils and Construction Volume 1 (NSW DPIE, 2004) "The Blue Book". The ESCP will be implemented, and particular consideration of the dispersive soils identified within the Project Area will be considered.	Prior to construction commencing
	Areas outside of the Developmental Footprint but within the Project Area may be established as a Biodiversity Stewardship Site. If determined to be compatible, with cattle grazing will be facilitated throughout this area.	Prior to construction commencing
	If required, an OEMP will incorporate a Sheep Grazing Vegetation Management Plan (SGVMP) that will outline measures for solar grazing in line with the Agrisolar Guide (2021) and other animal and welfare standards and guidelines. This will include measures to manage the stock appropriately, including a requirement to keep the stock in good health, ensuring frequent shearing (to keep wool growth low), ensure mustering is conducted in an agreed safe manner, and that any fatalities are managed by the farmer. As a part of the OEMP a Wild Dog Management Plan will also be prepared for sheep grazing management.	Operations
	The OEMP will be developed in consultation with the host landholders and DPI Agriculture and will be implemented post construction.	Operations

Aspect	Management/Mitigation Measure	Timing
	The Project Area will be rehabilitated to a condition as close as practicable to the condition that existed prior to construction of the Project and in consultation with the landowner. This will be achieved through the implementation of a Rehabilitation Management Plan as part of the OEMP for the Project.	Decommissioning
	The OEMP will detail the management requirements, including: • inspection of all vehicles and machinery entering the Project Area, and cleaning if applicable to remove weeds including seeds • appropriate weed management practices to be adopted, including regular weed spraying • appropriate pest management practices to be adopted • limit vehicle access to the established internal road network.	Operation
Visual	Retention of as much existing vegetation within the Project Area as possible.	Design
	Setback of the construction compound, vehicle parking and equipment storage areas from Wollara Road by a minimum of 50 m and partially screened from view (from Wollara Road) via existing and new vegetation screening.	Design
	Signage (if required) would be of sufficient size to contain only information sufficient for the basic facility and company identification, for safety, navigation, and delivery purposes.	Construction
	Where soil disturbance is required, wind erosion controls would be implemented including the use of water carts, covering of stockpiles and avoiding ground disturbance during windy conditions.	Construction
	Lighting would be installed in accordance with AS4228-1997 – Control of Obtrusive Effects of Outdoor Lighting and designed and installed to best practice principles identified within the Dark Sky Planning Guidelines.	Construction
	Where possible colour treat ancillary components of the Project.	Construction
	Landscaping in accordance with the draft Landscape Plan (prepared as part of the VIA) to screen views of the Project Area. The plan illustrates proposed tree and shrub planting on-site, along the western perimeter of the Project Area to screen views from Wollara Road.	Construction
	Monitor visual impacts, contact nearest residents to determine social issues. If social issues experienced, discuss possible remedies.	Operation

Aspect	Management/Mitigation Measure	Timing
Noise and vibration	All sensitive receivers likely to be affected should be notified at least 7 days prior to commencement of any works associated with the activity that may have an adverse noise or vibration impact. The notification should include: • details of the Project • the construction period and construction hours • contact information for project management staff • complaint and incident reporting • how to obtain further information.	Construction
	All employees, contractors and subcontractors are to receive an environmental induction. The induction must include at a minimum, all applicable mitigation measures; hours of works; any limitations on high noise-generating activities; location of nearest sensitive receivers; designated parking areas; relevant approval conditions and incident procedures.	Construction
	Contractors should keep noise to a minimum, including limiting the use of loud stereos/radios, shouting on site and car door slams.	Construction
	Where practical, no dropping of materials from height or throwing of metal items.	Construction
	The noise levels of plant and equipment should have operating sound power levels consistent with those nominated in the NVIA.	Construction
	Noise emitting plant to be directed away from sensitive receivers and to be throttled down or shut down when not in use.	Construction
	Non-tonal reversing beepers could be fitted and used on construction vehicles and mobile plant used regularly on site and for any out of hours work.	Construction
	Limit the use of engine compression brakes.	Construction

Aspect	Management/Mitigation Measure	Timing
	In the unlikely event that any vibration-generating equipment would be used within the recommended safe working distances nominated in **Table 6.11** of the EIS, the following is recommended: • An independent specific structural assessment is undertaken on the structure to ascertain the structural integrity and its ability to withstand vibration, and establishment of an appropriate vibration criterion. • A dilapidation survey is undertaken on the structure prior to works commencing, and regular inspection of the structure throughout the construction activities. • Site specific vibration minimum working distances are established for the nominated equipment on site. • Where appropriate, continuous vibration monitoring is conducted on the structure for the duration of the period of construction while vibration generating equipment is used. The vibration logger should be equipped with the facility to remotely alert the site to reduce or cease construction activities if vibration levels are approaching the criterion threshold.	Construction
	A Draft Construction Noise and Vibration Management Plan (DCNVMP) has been prepared for the management of potential noise and vibration impacts associated with Ringwood Road upgrade works, which details mitigation/controls where required.	Construction
Traffic and Transport	Prior to the commencement of construction, a Construction Traffic Management Plan (CTMP) would be prepared in accordance with relevant guidelines and in consultation with TfNSW, Upper Hunter Shire Council, National Parks and Wildlife Service and any other relevant stakeholders. The CTMP would outline how construction activities would avoid, mitigate and manage risks involving construction activities, users of the traffic and transport network and residents.	Prior to construction commencing
	The community would be notified in advance of proposed road and transport network changes through appropriate media and other forms of community liaison.	Construction
	Where relevant, Road Occupancy Licences (ROLs) and crane permits would be submitted and approved prior to the closure of any roads.	Construction
	Construction workers would be encouraged to carpool or use the shuttle buses to travel to and from the construction site.	Construction
	Parking requirements for the Project during construction and operation would be provided on-site, and parking would not be provided on public roads adjacent to the Project Area.	Construction and Operation
	Additional warning signs are recommended along sections of Ringwood Road and Wollara Road where the road narrows and near the site access points.	Construction
	Swept paths of the proposed site access points with high resolution surveys/aerials would be developed as the project progresses to determine the most appropriate site access arrangements.	Construction

Aspect	Management/Mitigation Measure	Timing
	A detailed Oversized Over Mass (OSOM) vehicle route assessment would be undertaken by the construction contractor and outlined in the Transport Management Plan. The Plan will detail OSOM route, duration, road closures, traffic closures, traffic detours, notifications and any required Traffic Guidance Schemes.	Prior to construction commencing
	Prior to the commencement of construction, a CTMP would be prepared in consultation with Transport for NSW, Upper Hunter Shire Council, National Parks and Wildlife Service and any other relevant stakeholders, outlining how construction activities would avoid, mitigate and manage risks involving construction activities, users of the traffic and transport network and residents.	Prior to construction commencing
Water Resources	Solar panels will be designed to provide a minimum of 300 mm freeboard for the lowest edge above the maximum 1% AEP flood level.	Design
	Solar panel piles will be designed to withstand the 1% AEP flood velocities expected in the Project Area.	Design
	No sensitive infrastructure (e.g., substation, BESS, etc.) will be placed within 20 m of any Strahler 3 or above order streams.	Design
	All waterway crossings will be designed and constructed in compliance with DPI Water Guidelines.	Design and Construction
	Further flood investigations will be carried out where required during detailed design to confirm the flood immunity objectives and design criteria for the Project are met.	Design
	A Construction Soil and Water Management Plan (CSWMP) will be prepared to outline measures to manage soil and water impacts associated with the construction works.	Prior to construction commencing
	Debris will be cleared from fencing following flood events.	Construction and Operation
	An Operational Environmental Management Plan (OEMP) will be developed for the Project to address potentially adverse impacts on the receiving environment surface water quality during the operational phase. This will include the development and appropriate maintenance of suitable ground cover around solar panels, and grassed table drains near access tracks to minimise the potential for erosion and export of sediment. Additional measures for the treatment of stormwater quality are not considered necessary.	Operation
	Water sources would be confirmed during the detailed design phase and in consultation with suppliers and landholders and be subject to availability.	Design
	Post-construction, disturbed areas will be stabilised by the establishment and maintenance of a vegetated groundcover consisting of low-growing grasses.	Prior to construction commencing

Aspect	Management/Mitigation Measure	Timing
	Road repairs and upgrades to Ringwood Road and culvert upgrades will include: • Appropriate scour protection will be designed for the road repairs and culvert upgrades • Road and culvert upgrades will be designed to maximise afflux at an acceptable level • Culverts will be designed to accommodate a 5% AEP event • Culverts will be constructed at existing invert levels or similar to maintain low flow conveyance in channel.	Prior to construction commencing
Hazard, Risk and Bushfire Threat	Lightsource bp will implement a range of technical and non-technical risk mitigation and management measures including rigorous design standards and maintenance practices. Compliance with HIPAP 4 criteria is conditional on these technical and non-technical risk mitigation and management measures being implemented.	Design
	Electrical transformers to be designed, installed, operated and maintained in accordance with relevant Australian Standards.	Construction and Operation
	A Final Hazard Analysis, Fire Safety Study and Emergency Plan will be developed as the Project design progresses toward completion to ensure the final Project design adheres to the risk management measures outlined in the PHA and that the separation distances to the site boundary/involved dwellings are appropriate for the specific battery cell type (i.e. chemistry and capacity) to be used.	Prior to construction commencing
	Asset protection zones will be implemented and maintained for the life of the Project.	Construction and Operation
	Roads and access points will be maintained throughout the Project life to allow for safe and accessible travel for emergencies (if required).	Construction and Operation
	An appropriate dedicated water supply for bushfire protection will be provided.	Construction and Operation
	All project infrastructure will be designed in accordance with relevant industry standards to manage any EMF risks.	Design
	All relevant procedures in relation to a high voltage installation will be adhered to throughout the life of the Project.	Construction and Operation
	Public access will be restricted throughout the life of the Project.	Construction and Operation

Aspect	Management/Mitigation Measure	Timing
Social Amenity	A Social Impact Management Plan (SIMP) will be prepared and implemented for the Project to manage and enhance social impacts through each stage of the Project.	Prior to construction commencing
	A Community Engagement Strategy will be prepared for the Project to include consistent, transparent and proactive information provision and consultation with stakeholders throughout Project development.	Prior to construction commencing
	A Community Benefit Sharing Strategy will be developed in consultation with local stakeholders to target investment to local needs and priorities and cognisant of activities/efforts of adjacent projects.	Prior to construction commencing
	An Accommodation, Employment and Procurement Strategy (AEPS) will be developed in collaboration with local councils and stakeholders. The AEPS will include targeted and proactive initiatives to maximise local employment and sourcing from local communities such as training, up-skilling and capacity building support, in collaboration and with local stakeholders and training providers.	Prior to construction commencing
Economic	Lightsource bp will prepare an Accommodation, Procurement and Employment Strategy (APAES) for the Project in consultation with relevant stakeholders, including: • measures to ensure there is sufficient accommodation for the workforce associated with the construction phase of the Project • measures to address any specific cumulative impacts arising associated with other State significant development projects in the area • measure to prioritise the employment of local workers and the procurement of local businesses for the construction and operation of the Project • a program to monitor and review the effectiveness of the strategy over the life of the Project.	Prior to construction commencing
	A Community Benefits Sharing Strategy will be developed and implemented for the Project including a Community Fund to be available to the wider community.	Prior to construction commencing

Aspect	Management/Mitigation Measure	Timing
Waste Management	Lightsource bp will prepare a Waste Management Plan, which will include a detailed breakdown of the waste types and quantities in accordance with relevant with relevant legislation and guidelines. Waste will be reused and recycled in accordance with a waste management hierarchy. The waste management plan will include the following: • a summary of the waste types, classification and estimated annual quantities of wastes produced during the construction of the Project • measures to manage waste disposal in accordance with the principles of the waste hierarchy, with emphasis on reducing, reusing and recycling wastes prior to disposal • the procedure for assessing, classifying and storing waste in accordance with EPA guidelines • procedures for storage, transport and disposal of waste • monitoring, record keeping and reporting, including the use of waste tracking data to demonstrate the lawful disposal of contaminated products, waste or residues generated by the Project (if any).	Construction
	Management of wastes generated during the operational phase of the Project will occur through a Waste Management Plan as part of the OEMP.	Operation
	A Decommissioning and Rehabilitation Management Framework has been prepared for the Project to demonstrate a commitment to ensuring appropriate environmental management is undertaken during decommissioning and rehabilitation phase in accordance with legislative requirements, conditions of consent, stakeholder interest and industry best practice. The Framework will be updated throughout the life of the Project as appropriate.	Decommissioning
Air Quality	As part of the CEMP, protocols to minimise air emissions during construction will include: • water suppression on all exposed areas, unsealed rads and stockpile area when required (i.e. if visible dust emissions are observed) • the location and scale of activities which generate dust emissions would be modified and limited during periods of dry and windy weather • engines to switch off when not in use for prolonged periods • development of a complaints procedure to identify and respond to complaints.	Construction
	Areas within the Project Area which have been temporarily disturbed by construction and operational activities will be rehabilitated.	Construction and Operation
	Once construction has been completed, ground cover will be established and maintained in accordance with the OEMP.	Operations