Title of Proposal - Project EnergyConnect (South Australia – New South Wales Interconnector): Robertstown to SA/NSW Bdr

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Energy Generation and Supply (renewable)

1.2 Provide a detailed description of the proposed action, including all proposed activities.

Project EnergyConnect is a proposed high voltage electricity interconnector to be constructed between Robertstown in South Australia (SA) and Wagga Wagga in New South Wales (NSW), with an added connection to Red Cliffs in north-western Victoria. The owner and operator of the SA transmission network, ElectraNet, has partnered with TransGrid, the manager and operator of the high voltage electricity transmission network in NSW, to deliver Project EnergyConnect.

Project EnergyConnect will ultimately be built, owned, operated and maintained by the two different parties (ElectraNet and TransGrid). The SA and NSW components are being referred separately.

This referral relates to the construction and operation of Project EnergyConnect (Robertstown to SA/NSW Border), and will include:
• expansion of the existing Robertstown substation
• approximately 10 km of 275kV transmission line supported by steel towers from the existing Robertstown substation to a proposed new substation located towards the western extent of the transmission line at Bundey, near Robertstown
• approximately 180 km of 330 kV transmission line supported by steel towers from the new Bundey substation to the SA/NSW border
• associated telecommunications facilities
• associated access tracks
• associated facilities areas (i.e. temporary laydown and mobile construction camps).

A detailed description of the Project components is provided in Attachment 1.

For the purposes of this report:
• Project Area is defined as a 1 km corridor (500 m buffer on a nominal centreline) for the alignment in South Australia.
• Study Area is defined as a 10 km corridor (5 km buffer on a nominal centreline) along the transmission line alignment and is used to provide broader context for some aspects of the Project.
• Ecological Study Area is the area used for database searches and includes the alignment and a 25 km buffer either side of the alignment.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
Rough Polygon	1	-33.959354841753	139.12021022331
Rough Polygon	2	-33.935146494319	139.10853724968
Rough Polygon	3	-33.919478600927	139.1366897155
Rough Polygon	4	-33.918908805045	139.22973018181
Rough Polygon	5	-33.918481455633	139.30680614006
Rough Polygon	6	-33.919478600927	139.41117625725
Rough Polygon	7	-33.920333287604	139.50902324211
Rough Polygon	8	-33.923182181274	139.58524089348
Rough Polygon	9	-33.944830659537	139.70368724357
Rough Polygon	10	-33.964480431822	139.80977397453
Rough Polygon	11	-33.998073872477	139.98074870598
Rough Polygon	12	-34.034499199809	140.02881389152
Rough Polygon	13	-34.031084989356	140.32235484611
Rough Polygon	14	-34.055266019492	140.41676860344
Rough Polygon	15	-34.05754152613	140.51873546135
Rough Polygon	16	-34.052990451768	140.64473491203
Rough Polygon	17	-34.005758640585	140.68456035148
Rough Polygon	18	-33.973876544783	140.71545939933
Rough Polygon	19	-33.949102735161	140.79682689201
Rough Polygon	20	-33.913780470643	140.85072856437
Rough Polygon	21	-33.868181714245	140.87613444816
Rough Polygon	22	-33.863050328862	140.93518596183
Rough Polygon	23	-33.861909979117	141.00144725334
Rough Polygon	24	-33.862195067981	141.00419383537
Rough Polygon	25	-33.904947615724	141.00282054435
Rough Polygon	26	-33.905517504953	140.91870646965
Rough Polygon	27	-33.938279727137	140.90325694572
Rough Polygon	28	-33.977008351729	140.85931163322
Rough Polygon	29	-33.998073872477	140.79648356926
Rough Polygon	30	-34.018849607015	140.75562816154
Rough Polygon	31	-34.095647179821	140.6903968383
Rough Polygon	32	-34.107302946743	140.68078380119
Rough Polygon	33	-34.107587213684	140.4088721801
Rough Polygon	34	-34.096500095253	140.33471446525
Rough Polygon	35	-34.087686221332	140.31857829582
Rough Polygon	36	-34.080008873783	140.19257884514
Rough Polygon	37	-34.08313676607	140.02435069572
Rough Polygon	38	-34.04559443482	139.95774608146
Rough Polygon	39	-33.976438940865	139.58421092521
Rough Polygon	40	-33.969320983299	139.18973308098
Rough Polygon	41	-33.962202429919	139.12244182121
Rough Polygon	42	-33.959354841753	139.12021022331

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

Project EnergyConnect (Robertstown to SA/NSW Border) will traverse approximately 190 km between Robertstown and the SA-NSW border, mainly within the Murray Darling Depression Interim Biogeographic Regionalisation for Australia (IBRA) Bioregion. The majority of land across the study area is used for grazing, cropping, and primary production and there are also areas managed for conservation.

The line will be sited to parallel and / or utilise existing infrastructure easements, road reserves, existing tracks and disturbed areas, where practicable, to minimise impacts. The estimated total length aligned with pre-disturbed areas is 86%.

The proposed transmission line traverses approximately 100 land parcels held under a combination of tenures including freehold land, pastoral leases, unalienated Crown land and alienated Crown land.

The main population centres in the general vicinity of the Project include Morgan, Waikerie, Barmera, Berri, and Renmark. All population centres are avoided by the proposed transmission line alignment.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

1330 ha

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title. Several - see Attachment 4

1.8 Primary Jurisdiction.

South Australia

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

No

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 07/2020

End date 12/2068

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

Australian energy markets are experiencing a time of significant change, driven by the transition to lower carbon emissions, rapidly evolving technologies and changing customer needs.

South Australia has abundant and high-quality renewable energy resources that exceed its combined minimum demand and export capability. Greater interconnection between South Australia and the rest of the National Electricity Market (NEM) would allow renewable energy from South Australia to assist the nation to meet carbon emission and renewable energy targets at lowest long-run cost.

Greater interconnection would also enable renewable energy resources in New South Wales, Queensland or Victoria to be unlocked, contributing further to the overall market transition.

While new, low carbon emission generation technologies contribute significantly to Australia meeting carbon emission and renewable energy targets, they generally do not provide the same system services as those delivered by traditional coal or gas-fired generators. Consequently, the shift in the generation mix is changing the nature and level of services required to maintain energy supply security.

Security of supply concerns arise in particular in relation to the operation of the South Australian network during ‘separation events’. The loss of the existing Heywood interconnector between South Australia and Victoria has the effect of ‘islanding’ the operation of the electricity network in South Australia from the rest of the NEM.

The Australian Energy Market Operator’s (AEMO) Integrated System Plan (ISP), released in July 2018 following the 2017 Finkel review recommendations, which were agreed to by Council of Australian Governments (COAG) Energy Ministers, supports a new interconnection between South Australia and New South Wales.

The proposal presents a national electricity grid solution which generates a range of benefits for South Australia, New South Wales and Victoria. These benefits include improved electricity affordability, energy and network security and the connection of renewable energy needed to meet Australia’s carbon emissions targets.

Planning, Development and Infrastructure Act 2016 (SA) and the Development Act 1993 (SA)

The existing Development Act 1993 is being replaced over time by the Planning, Development and Infrastructure Act 2016 (PDI Act). The Development Act 1993 (the Act) provides the framework for the State's planning and development system and its statutory procedures and is the key legislation for Project approval for the South Australian component of the Project. Whilst transitioning to the new PDI Act, the Act remains current for development assessment.

The Project will be assessed under one of the pathways described below.

Major Development: under Section 46 of the Act the Minister for Planning may declare the Project a 'major development' if it is considered to be of economic, social or environmental importance to the State. The assessment process under the Major Development provisions is accredited under the bilateral agreement between the State and the Commonwealth. If following the Major Development process, it is anticipated that the Project will be assessed through an Environmental Impact Statement (EIS), in which a public consultation period of at least 30 business days will apply and include at least one public meeting at a suitable location along the corridor. The EIS will be assessed by the Minister for Planning who will prepare an assessment report. The decision to approve or reject the proposal will ultimately be made by the Governor of South Australia.

Crown Development and Public Infrastructure: the Project may otherwise be assessed under the Crown development and public infrastructure provisions of the Act. Under this process, the Project is sponsored by a State agency and assessed under the public infrastructure provisions of Section 49 of the Act. A Development Application for the Project is prepared by the proponent for lodgement with the State Commission Assessment Panel (SCAP). This process includes referral to local Councils and government agencies, and public notification is provided in the form of a public advertisement. Any person may make comment during the notification period within the prescribed timeframe (at least 15 business days) and request to be heard before the SCAP. The SCAP assesses the application, considers any comments made by local Councils and other government agencies and then prepares a report to the Minister who can approve or refuse the application. This assessment process is not accredited under the bilateral agreement.

Native Title Act 1993 (Cth) and ***Native Title Act 1994 (SA)*** provide for the recognition and protection of native title. The proponent is in the process of negotiating agreements with the native title groups on the proposed transmission line alignment and appropriate processes under the Native Title Act will be followed in relation to any agreements and granting of easements over land subject to native title.

Aboriginal Heritage Act 1988 (SA) provides protection for any Aboriginal sites, objects or remains. Cultural heritage surveys with the relevant Aboriginal groups will be completed to ensure that areas to be disturbed have appropriate cultural heritage clearance. The proponent will continue to work with these groups and the Department of Premier and Cabinet (Aboriginal Affairs and Reconciliation) (where relevant) to ensure that Project activities comply with the requirements of the Act.

Heritage Places Act 1993 (SA) provides for the identification and conservation of places and related objects of State heritage significance. The Act provides protection for archaeological artefacts of heritage significance and it is an offence under the Act to damage a Heritage Place.

Environment Protection Act 1993 (SA) provides the regulatory framework for the management of pollution and general environmental protection in SA. The Act establishes a general duty of environmental care, in relation to development activities within the State. It is administered by the SA Environment Protection Authority (EPA). The EIS assessment report prepared under the Development Act would be referred by the Department of Planning, Transport and Infrastructure (DPTI) to the EPA for comment and any necessary approvals.

National Parks and Wildlife Act 1972 (SA) establishes the system of conservation reserves in South Australia and provides protection for native plants and animals.

Native Vegetation Act 1991 (SA) and the ***Native Vegetation Regulations 2017*** apply to the management and clearance of native vegetation on private and public land in South Australia. The process applied will be different, depending on the assessment pathway.

Major Development: consent to clear native vegetation is not required from the Native Vegetation Council (NVC) if:

- the clearing is incidental to building work undertaken by an electricity entity (within the meaning of the *Electricity Act 1996*); or

- the development has been approved by the Governor following an EIS and the EIS had previously been referred to Native Vegetation Council (NVC) for comment and report.

The proponent is required to achieve a ‘significant environmental benefit’ (SEB) under this Act to offset vegetation clearance, either as an on-ground offset or a payment into the Native Vegetation Fund.

Crown Development and Public Infrastructure: the Project would fall under Regulations 12 and 16 of the Native Vegetation Regulations, under the Infrastructure provisions of Schedule 1, Part 6 (clause 34). The Regulations permit clearance for infrastructure if approved under the Development Act 1993 where the Minister has declared that the clearance is in the public interest or is required in connection with the provision of infrastructure to a building or proposed building, or to any place.

The clearance requires written approval from the NVC under Regulation 16, and will be subject to a condition that clearance is undertaken in accordance with an approved management plan that results in a SEB, or payment is made into the Native Vegetation Fund of an amount considered by the Native Vegetation Council as being sufficient to achieve SEB.

In addition, Regulation 8 and Schedule 1, Part 1 (clause 2) cover clearance of vegetation incidental to the repair or maintenance of infrastructure, or the repair or maintenance work of the Crown.

Natural Resources Management Act 2004 (SA) applies to a range of aspects of natural resources management. Of particular relevance to the Project are provisions in the Act addressing activities that affect surface water and groundwater resources, as well as management of pest plants and animals. Permits under this Act will be obtained where required (e.g. for drilling of any new water wells).

Electricity Act 1996 (SA) and the ***Electricity (Principles of Vegetation Clearance) Regulations 2010*** regulate the electricity supply industry, make provisions for safety and technical standards and specify the requirements for vegetation clearance around powerlines.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

Extensive stakeholder and community consultation on environmental, social and economic impacts will be undertaken as part of the impact assessment process after technical studies have been completed.

In the short term, ElectraNet's focus during consultation has been on the route selection process, utilising the methodology and the hierarchy of constraints detailed in Attachment 5a. Consultation has included the targeted participation of a wide range of stakeholders including landholders, Traditional Owners / Native Title Parties community members, Regional Development Australia (Murraylands & Riverland) and local Councils.

In addition to initial discussions with local Councils and the Regional Development Authority, a rigorous in-region engagement program has been undertaken that has included individual landholder discussions, formal Council presentations and workshops, and community drop-in sessions in five towns in the vicinity of the Project.

Meetings with stakeholders to date have included:

- Relevant District Councils and the Regional Development Authority in regions within the proposed route corridor footprint, seeking feedback on high-level constraints and opportunities, how they would like to be engaged / involved moving forward and providing a high-level Project brief.

- A representative from the Australian Landscape Trust (Managers of the Calperum / Taylorville pastoral leases) regarding the Project potentially traversing a portion of both stations.

- Department for Environment and Water (DEW) to discuss the traversing of Calperum, Taylorville, Hawks Nest pastoral leases and Chowilla Regional Reserve and Game Reserve.

- Hawks Nest station to discuss potential traversing of the property.

- First Peoples of the River Murray & Mallee Region (SCD2011/002) (holders of native title over specific areas).

- Ngadjuri Nation #2 (SC2011/002) (native title claimants).Landholders in the Project Area.

- Department of Planning, Transport and Infrastructure (DPTI) planning staff to discuss the Project, route alignment and confirm approvals processes and requirements.

- Department of the Environment and Energy (DoEE) in Canberra regarding the EPBC referral process

- Hon Tim Whetstone MP, Member for Chaffey and Minister for Regional Development and Primary Industries.

- Regular updates to the Project Steering Committee (comprising representatives from DPTI, EPA, Department for Energy and Mining (Energy and Technical Regulation), DEW, NSW Government, ElectraNet, TransGrid, consultants and occasional representatives from DoEE).

An interactive Project website (incorporating a feedback capture mechanism, high-level animation, communications materials including Q&As and Fact Sheets) was launched on 13 February 2019 (www.projectenergyconnect.com.au).

Consultation with the above organisations and individuals will continue during 2019 along with targeted consultation with key stakeholders (e.g. native title parties / traditional owners, landholders, Councils) to refine (narrow) the corridor width.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

As discussed above, the proposed action requires approval under the Development Act 1993 (SA), including assessment under either Section 46 or 49 of the Act.

The Agreement between the Commonwealth of Australia and the State of South Australia Relating to Environmental Assessment (the Bilateral Agreement) dated 25 September 2014 accredits the assessment approach under Section 46 of the Development Act. Consequently, if the proposed action requires EPBC Act approval, it is expected that it will be assessed by the SA Government under the bilateral agreement using this process.

The Crown Development and Public infrastructure provisions in Section 49 of the Development Act are not accredited in the bilateral agreement.

1.15 Is this action part of a staged development (or a component of a larger project)?

Yes

1.15.1 Provide information about the larger action and details of any interdependency between the stages/components and the larger action.

The Project will be constructed and operated by ElectraNet in SA and by TransGrid in NSW. This referral, on behalf of ElectraNet as the proponent, only covers the SA section of Project EnergyConnect as ElectraNet is unable to undertake the action or implement any EPBC approval conditions (if required) in NSW. This responsibility resides with TransGrid, who will separately consider their obligations under the EPBC Act and submit a referral, if necessary.

1.16 Is the proposed action related to other actions or proposals in the region?

No

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

Yes

2.3.1 Impact table

Wetlands	Impact
Riverland Ramsar site	The Riverland Ramsar site extends 80 km along the Murray River, from the town of Renmark in South Australia to the Victorian and New South Wales border and is approximately 30,600 ha in size. The site incorporates a series of creeks, channels, lagoons, billabongs, swamps and lakes, bordered by extensive stands of River Red Gums. Nationally

Wetlands	Impact
	threatened species include the Regent Parrot, Murray Cod, Murray Tortoise and Southern Bell Frog. The site also contains 11 of the 12 vegetation communities found within the Riverina biogeographical region, such as Black Box woodland. The Ramsar wetland is an important habitat for a large number of migratory and waterbirds. The site provides habitat that regularly supports large populations of Freckled Duck, Red-necked Avocet and Red-kneed Dotterel. Numbers of these species recorded at Lake Merreti have, at times, been greater than 1% of the estimated global population. The Project EnergyConnect alignment passes north of the Ramsar site boundary for approximately 36 km and intersects a marginal area of upper floodplain, with a one in 100-year flood frequency, for 2 km. The proposed alignment runs along higher ground on the northern side of the Old Wentworth Road / Renmark-Wentworth Road, and only discrete sections (a total of approximately 16.8 km) of the alignment run within 1 km of lakes and swamps subject to inundation with a reasonable frequency (i.e. every 3-5 years). There will be no direct impacts on the Ramsar site. The potential for indirect impacts on the Ramsar site, and therefore its ecological character, arises through erosion and sedimentation, potential for spread of weeds and pathogens, the risk of oil and fuel spills and the risk of waterbirds colliding with the conductors on the transmission line. In line with the criteria set out in the Significant Impact Guidelines 1.1 (DOTE 2013), the Project will not: • destroy or substantially modify any areas of the wetland • change the hydrological regime or water quality • seriously affect the habitat or lifecycle of native species dependent upon the wetland • result in an invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland. These criteria are discussed in more detail below. Disturbance and water quality There will be limited soil disturbance in the vicinity of the Ramsar site as

Wetlands	Impact
	the Old Wentworth Road can be used as the primary access to tower locations. Where practicable, cleared areas will be used as laydown sites. Based on the (worst-case) average tower spacing interval of 450 m, there may be up to 80 towers within this section of the alignment (36 km) requiring a disturbance footprint of 0.25 ha per tower (total of 20 ha). Three to four towers will be required to span the short 2 km section located within the marginal area of floodplain identified above. All construction works will be subject to an Environmental Management Plan (EMP) which will set out erosion control measures where soil disturbance occurs, and measures to prevent any spills or leaks or to manage them if they did occur. These are all standard requirements on construction sites and can be effectively applied on the relatively small construction footprints for each tower. There will be no discharge of turbid water into the Ramsar site. It should be noted that due to the low rainfall in the area (260 mm average annual rainfall in Renmark), the occasions when runoff could actually occur are limited. However, as intense rain events may still occur, appropriate sediment controls and soil stabilisation measures will be used and incorporated in the Project EMP. Following construction, all disturbed areas will be revegetated via access from Old Wentworth Road. Ongoing vegetation clearance for maintenance should not be required due to the low height of the vegetation along this section of the alignment. Consequently, construction of the transmission line will not destroy or substantially modify any areas of the Ramsar site. The Project will also have no measurable impact on the hydrological regime of the wetland, water quality or on habitat for species of conservation significance. Invasive species The EMP will also address hygiene requirements (e.g. vehicle washing) to prevent spread or introduction of weeds and pathogens. These measures will ensure that Project does not result in the establishment or spread of an invasive species due to Project activities that could be harmful to the ecological character of

Wetlands	Impact
	the wetland. It should also be noted that as the proposed alignment follows an existing road which already receives a high volume of public traffic, construction and maintenance activities related to the Project will result in minimal change to the existing threat of the introduction or spread of weeds and pathogens. Native bird species Bird strikes can occur with transmission lines. While the highest mortality rates occur where transmission lines pass directly through wetlands, lower rates may still occur when transmission lines pass near wetlands (Faanes 1987 cited in Carpenter 2002). This could potentially affect the lifecycle of native species that are dependent on the wetland. Particular attention has therefore been given in the route selection process to avoiding river and wetland crossings wherever possible. Within the Riverland Ramsar site there are number of areas that are subject to regular managed inundation via an environmental regulator built across Chowilla Creek, downstream of Monoman Island. These include Lake Woolpolool, Lake Merreti, Lake Clover, Lake Werta Wert, Coombool Swamp and Lake Limbra. The regulator allows water levels in Chowilla Creek to be raised depending on the nature of environmental flooding required in the wetlands and floodplain. High level operation will generate broad scale inundation of wetlands and the floodplain. Medium level operations raise water levels to a height where water flows out into wetlands and starts to spill out onto the broader floodplain. The alignment is within 500 m of areas which are subject to regular inundation (once every 3-5 years) for less than 2.5 km, and is within 1 km of these areas for approximately 16.8 km (Attachment 6). As the lakes extend south from the northern boundary of the Ramsar site, most of the waterbird habitat on these lakes is more than 1 kilometre from the alignment. Consequently, the proposed transmission line is sufficiently remote from most waterbird habitat within the Ramsar site for the worst-case incidence of bird strike to significantly affect the lifecycle of these waterbirds. In addition, bird strike can only

Wetlands	Impact
	occur when waterbirds are using the area, i.e. when lakes are holding water. Wetland areas near the alignment will be dry in most years with the most regular inundation expected to be every 3-5 years, with flooding of the broader floodplain occurring less frequently. Carpenter (2002) notes that mortality rates for bird collision with powerlines (as a function of overall population size) for similar species to those that occur in the above wetlands (derived from Australian and International studies) are generally low compared with other causes. Most studies have also shown a reduction in collisions and/or an increase in behavioural avoidance at marked lines when compared to unmarked lines. This can vary with location, type of line marking device, and bird species (APLIC 2012). Many studies of transmission lines with high collision rates indicate that collision risk can be lowered by 50% to 80% when these lines are marked, although some studies report much lower levels of reduction, particularly for species which move after dusk. Newer bird deflector devices however are visible to birds during both night and day. In summary, while it is possible that the transmission line may cause the death of some birds, the losses are not expected to be significant compared with total population numbers locally and globally (Carpenter 2002). Consequently, the Project is not considered to significantly affect the habitat or lifecycle of native birds dependent on the wetland. The transmission line is not considered likely to significantly reduce a population of migratory birds given the large extent of riverine floodplain areas (i.e. 34,000 ha of the Riverland Ramsar site) that occurs to the south of the proposed alignment, as well as additional riverine, floodplain and wetland habitat along the length of the Murray both upstream and downstream. Given the above, the proposed action is unlikely to have a significant impact on the ecological character of the wetland.
Banrock Station Wetland Complex	The wetland is approximately 12 km south of the proposed alignment and will not be directly impacted. Banrock Station wetland complex

Wetlands	Impact
	supports two nationally listed species, the Regent Parrot (Vulnerable) and the Southern Bell Frog (Vulnerable). The Regent Parrot colony found on site is one of the largest regional breeding colonies, with 100 nesting birds being recorded at the time of listing in 2002. The complex provides non-breeding habitat for 10 migratory waterbirds. Given the distance to the wetland and the limited clearing and earthworks required for tower construction and other activities, the proposed action will not result in changes to the hydrological regime of the Banrock Station wetland complex While transmission lines can result in bird deaths, the risk to birds feeding or nesting at the wetland will be minimal due to the distance between the two. APLIC (2012) cite studies that showed collision rates at distances of more than two kilometres from water dropped off dramatically. Any interaction with transmission lines 12 km away would be minimal to negligible. Given the distance between this wetland and the proposed alignment, there is no credible pathway for the proposed action to significantly impact the ecological values of the Banrock Station wetland complex.

2.3.2 Do you consider this impact to be significant?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

2.4.1 Impact table

Species	Impact
Ecological Community - Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions Endangered	This community is unlikely to occur in the Project Area with the closest recorded occurrence over 100 km south of the ecological study area. Consequently, impacts to this community are not anticipated. In the highly

Species	Impact
	unlikely event that the community is encountered, micro-siting of towers will enable avoidance and there will be no significant impact.
Ecological Community - Iron-grass (Lomandra spp.) Natural Temperate Grassland Critically Endangered	The mapped eastern extent of this community coincides with the western boundary of the ecological study area. All mapped areas are west of the proposed route alignment. The closest mapped area of this community is 200 m from the western end of the proposed transmission line, but aerial imagery shows this area has been cropped and hence has been mapped incorrectly. The next closest mapped area to the proposed alignment is 300 m away. From aerial imagery interpretation, this is an unploughed area of rolling hills, and is therefore a habitat where Lomandra grasslands is considered likely. Aerial imagery suggests that a limited extent of unploughed land may intersect the transmission line at its most western end. As it is possible the community may occur on the very western end of the alignment, a survey will be undertaken around proposed towers and other disturbance sites. Towers will be repositioned if necessary to avoid impacts and ensure an adequate buffer around any communities. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that may cause a substantial reduction in the quality or integrity of the ecological community. Given implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this community
Ecological Community - Peppermint Box (Eucalyptus. odorata) Grassy Woodland Critically Endangered	This community is unlikely to occur in the area with the closest recorded population over 3.7 km south of the ecological study area (high confidence). In the unlikely event this community is identified in the survey of tower sites, tower locations will be repositioned to avoid impacts. Given the distance to the closest recorded community and small footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this community

Species	Impact
Plant - Acacia glandulicarpa (Hairy-pod Wattle) Vulnerable	This species has been recorded 15 km north-west of the proposed western alignment. Whilst it is unlikely that suitable habitat occurs near the far western end of the alignment, a survey will be undertaken around proposed towers and other disturbance sites. Towers will be repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that may cause species decline. Given the distance of the known species to the ecological study area, implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this species.
Plant - Acacia menzelii (Menzel’s Wattle) Vulnerable	This species is unlikely to occur in the area with the closest recorded population over 100 km south of the ecological study area. Given the distance from the species records, the proposed works are not likely to have a significant impact.
Plant - Acacia spilleriana (Spiller’s Wattle) Endangered	This species has been recorded 5 – 20 km north-west of the proposed western alignment and the ecological study area contains suitable habitat for the species. Roadside populations are generally reported as sparse or comprising 1-2 plants. Larger populations occur in the Burra Gorge/Hallelujah Hills west of the alignment where it is described as common. As it is possible the species may occur on the western end of the alignment, a survey will be undertaken around proposed towers and other disturbance sites. If any populations are identified, they are likely to be small and easily avoided. Towers will be repositioned if necessary to avoid impact and ensure an adequate buffer around any populations. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that may cause species decline. Given the distance of the known populations to the ecological study area, implementation of proposed mitigation measures, and the small

Species	Impact
	footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this species.
Plant - Acanthocladium dockeri (Spiny Daisy) Critically Endangered	This species is unlikely to occur in the area with the closest recorded population over 60 km west of the western end of the alignment. The species was thought extinct after extensive searches in the 1990's revealed no populations present (DEH 2005). Although a small number of records have been located 60 km west of the western end of the proposed alignment, the proposed works are not likely to have a significant impact on this species.
Plant - Atriplex infrequens Vulnerable	This species is unlikely to occur in the area with the closest recorded population over 25 km east of the western-most boundary. Given the distance to the known populations, the proposed works are not likely to have a significant impact on this species.
Plant - Caladenia tensa (Greencomb Spider-orchid) Endangered	This species is unlikely to occur in the area based on current taxonomic assessments and with species found only in the South-east of South Australia. Given the distance to the known populations, the proposed works are not likely to have a significant impact on this species.
Plant - Caladenia xantholeuca (Flinders Ranges White Caladenia) Endangered	This species is unlikely to occur in the area with the closest recorded population over 150 km north-west of the ecological study area. Given the distance of the known populations to the proposed alignment and that this species is confined to these areas, the proposed works are not likely to have a significant impact on this species.
Plant - Codonocarpus pyramidalis (Slender Bell-fruit) Endangered	This species is unlikely to occur in the area with the closest recorded population being over 10 km north-west of the western end of the transmission line. Further, the ecological study area lacks the species' favoured habitat (shaley hills and slopes) and therefore the proposed works are not likely to have a significant impact on this species.
Plant - Dodonaea procumbens (Trailing Hop-bush) Vulnerable	This species has been recorded within the western end of the ecological study area although it is unlikely to occur within the proposed alignment due to unsuitable habitat.

Species	Impact
	As it is possible the species occurs on the western end of the ecological study area, a survey will be undertaken around proposed towers and other disturbance sites and towers repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that may cause species decline. Given the implementation of proposed mitigation measures and the small footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this species.
Plant - Dodonaea subglandulifera (Peep Hill Hop-bush) Endangered	There are four recent records of this species totalling over 5,000 individuals within 2 km of the western end ecological study area. There are 45 sites identified over its broader distribution, comprising 11 subpopulations and over 45 700 individual plants. The species mainly occurs south of the alignment. As it is likely the species occurs on the western end of the alignment, a survey will be undertaken around proposed towers and other disturbance sites with towers repositioned if necessary to avoid impact and ensure an adequate buffer around any populations of the species. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that may cause species decline. Given implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this species.
Plant - Lachnagrostis limitanea (Spalding Blown Grass) Endangered	This species is unlikely to occur in the area with the closest sub-populations recorded between 15 and 60 km north-west and south-west of the western end of the proposed alignment. Given the distance to known populations the proposed works are not likely to have a significant impact on this species.
Plant - Lepidium monoplocoides (Winged Pepper-cress) Endangered	This species is unlikely to occur in the area with only one historical record (1915) in South Australia located 20 km south of the proposed alignment. The species is presumed to be

Species	Impact
	extinct in South Australia therefore the proposed works are not likely to have a significant impact on this species.
Plant - Olearia pannosa subsp. Pannosa (Silver Daisy-bush) Vulnerable	There are nine records of this species, all west of the ecological study area. Given the wide range of landforms and soil types in which this species occurs, it is possible that the species may occur within the far western end of the ecological study area. A survey will be undertaken around proposed towers and other disturbance sites and towers repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that may cause species decline. Given the implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this species.
Plant - Prasophyllum pallidum (Pale Leek-orchid) Vulnerable	This species is unlikely to occur in the ecological study area with the closest records to the proposed alignment approximately 50 kms. Given the distance to species records, an absence of records in the ecological study area, and a lack of suitable habitat, the proposed works are not likely to have a significant impact on this species
Plant - Senecio megaglossus (Superb Groundsel) Vulnerable	This species is unlikely to occur in the ecological study area with one historical record (1892) 5 km and 30 recent records 100 km from the proposed alignment. Given the distance to the species recent records, absence of records in the ecological study area and lack of suitable habitat, the proposed works are not likely to have a significant impact on this species.
Plant - Solanum karsense (Menindee Nightshade) Vulnerable	This species is unlikely to occur with a single record in South Australia located 100 km north of the ecological study area. Given the distance to the species records, absence of records in the ecological study area and lack of suitable habitat, the proposed works are not likely to have a significant impact on this species.
Plant - Swainsona murrayana (Slender Darling-pea) Vulnerable	This species is unlikely to occur in the area with the closest record 200 km north of the proposed

Species	Impact
	alignment. Given the distance to the species records, absence of records in the ecological study area and lack of suitable habitat, the proposed works are not likely to have a significant impact on this species.
Plant - Swainsona pyrophila (Yellow Swainson-pea) Vulnerable	This species has five historic records within the ecological study area which contains suitable habitat for the species. The species is typically short-living with reliance upon soil-stored seed and, depending on the year, there may be no above-ground populations. The species is widely distributed from the northern Eyre Peninsula, South Australia, east to north-western Victoria and western New South Wales. As it is possible the species occurs within the ecological study area a survey will be undertaken around proposed towers and other disturbance sites and towers repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that may cause species decline. Given the wide distribution of this species, the implementation of proposed mitigation measures, the species survival largely on soil-stored seed and the small footprint (tower foundations and access roads, where needed) the proposed works are not likely to have a significant impact on this species.
Reptile - Aprasia pseudopulchella (Flinders Ranges Worm-lizard) Vulnerable	This species habitat has been recorded at eight locations 10 – 25 km from the western end of the proposed alignment. Only the far western end of the ecological study area may contain suitable habitat. As it is possible the species occurs on the western end of the alignment, a survey will be undertaken around proposed towers and other disturbance sites with towers repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations or species habitats. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that adversely affect the habitat critical to the survival of the species. Given the implementation of proposed mitigation

Species	Impact
	measures, and the small footprint (tower foundations and access roads, where needed), the proposed works are not likely to have a significant impact on this species.
Reptile - Tiliqua adelaidensis (Pygmy Blue-tongue) Endangered	This species habitat has not been recorded within the ecological study area and all known records are to the west of the proposed alignment. The western end of the ecological study area may contain suitable habitat. As it is possible the species occurs on the western end of the alignment, a survey will be undertaken around proposed towers and other disturbance sites with towers repositioned if necessary to avoid impact and ensure an adequate buffer around any populations or species habitats. Weed hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that adversely affect the habitat critical to the survival of the species. Given the species has not been recorded in the ecological study are, the implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed), the proposed works are not likely to have a significant impact on this species.
Frog - Litoria raniformis (Southern Bell Frog) Vulnerable	This species occurs along the length of the River Murray corridor, Lower Lakes and the South East region. The nearest records to the proposed alignment occur south of the Wentworth-Renmark Road, between Chowilla homestead and the SA-NSW border. Up to six records are approximately 1 km from the proposed alignment. There are 303 recent records in the ecological study area with most occurring along the River Murray corridor and occasional records from nearby evaporation ponds. It is possible the species occurs on the alignment in the eastern section where it is near the River Murray corridor. A survey will be undertaken around proposed towers and other disturbance sites with towers repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations or species habitats. In the area where the species occurs near the alignment, no additional access roads will be required (Wentworth-Renmark Road can be used) which

Species	Impact
	will prevent creation of any new barriers for the species. Weed and vehicle hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that adversely affect the survival of the species. Given the implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed), the proposed works are not likely to have a significant impact on this species.
Mammal - Nyctophilus corbeni (Corben's Long-eared Bat, South-eastern Long-eared bat) Vulnerable	This species has been recorded 25 km from the proposed alignment with species habitat likely to occur. Records are primarily north of the proposed alignment within intact mallee. The species is found within a wide range of inland woodland vegetation types. The Long-eared Bat prefers to fly low and close to vegetation to hunt for its prey. Given the transmission lines are expected to be in excess of 50 m from the ground, the risk of collision is low. The potential for impact on the species from the proposed transmission lines relates to the clearance of mallee habitat. As it is possible the species habitat could occur on the alignment, a survey will be undertaken around proposed towers and other disturbance sites with towers repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations or species habitats. Weed and vehicle hygiene procedures and programs will be used to prevent spread of weeds or introduction of disease that adversely affect the survival of the species. Given the wide distribution of the species, the implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed), the proposed works are not likely to have a significant impact on this species.
Bird - Botaurus poiciloptilus (Australasian Bittern) Endangered	This species is widespread but uncommon over south-eastern Australia. The ecological study area is likely to contain suitable habitat for the species although its preferred habitat (river corridor) does not traverse the proposed alignment. As it is possible this species occurs on the proposed alignment, markers will be placed on transmission lines at appropriate

Species	Impact
	places as a mitigation measure to avoid significant impact to populations. Given the wide distribution of this species and the mitigation measures, the proposed works are not likely to have a significant impact on this species.
Bird - Calidris ferruginea (Curlew Sandpiper) Critically Endangered, Migratory Wader	This species core habitat does not occur within the ecological study area, but the species may be an occasional visitor to inland water habitats. The ecological study area is likely to contain suitable habitat for the species although its preferred habitat (river corridor) does not traverse the proposed alignment. As it is possible the species occurs on the alignment, markers will be placed on transmission lines as a mitigation measure to avoid significant impact to populations. Given the species is only an occasional visitor to the area and the mitigation measures to be used, the proposed works are not likely to have a significant impact on this species.
Bird - Grantiella picta (Painted Honeyeater) Vulnerable	This species is unlikely to occur in the area with five records 30 km north of the proposed alignment (from 2000) with no records in the ecological study area. Given the lack of records and its status as a vagrant in South Australia, the proposed works are not likely to have a significant impact on this species
Bird - Leipoa ocellate (Malleefowl) Vulnerable	This species has been recorded over 800 times within the ecological study area and often within 2 km of the proposed alignment. The species is a terrestrial ground-dwelling species which makes large conspicuous nesting mounds As it is likely the species occurs within the ecological study area, a survey will be undertaken around proposed towers and other disturbance sites and towers repositioned if necessary to avoid impact and ensure an adequate buffer around any important populations and mounds. Where possible existing vehicle tracks will be used with operators made aware of the species to avoid collision. Given implementation of proposed mitigation measures, and the small footprint (tower foundations and access roads, where needed), the proposed works are not likely to have a significant impact on this species.
Bird - Manorina melanotis (Black-eared Miner)	There are 82 records of this species within the

Species	Impact
Endangered (within South Australia, the taxon is considered to be Manorina flavigula melanotis)	ecological study area mainly to the north of the proposed alignment. Endemic to the Murray Mallee region of Victoria, South Australia and New South Wales where the majority of records are from the Riverland Biosphere Reserve, South Australia and the Murray-Sunset National Park, Victoria. Birds are restricted to large tracts of mature, unfragmented mallee. The alignment traverses though the southern portion of Calperum station and along the southern boundary of Taylorville Station. Both stations, along with the Gluepot Reserve, have been listed under the EPBC Act as critical habitat for the Black-eared Miner. The designated critical habitat area is 383,920 ha and occurs primarily to the north of the proposed alignment. The alignment intersects a southern extension of the critical habitat area for approximately 10-12 km along an existing cleared track, with part being a cleared firebreak north of Cooltong Conservation Park. Assuming 1 ha of clearance per km of alignment (based on a 5 m wide access track and two 50 x 50 m tower footings per km), 12 km of clearance for the alignment would represent approximately 0.003% of the defined critical habitat area (12 ha out of 384,000 ha). This assumes construction of a new access track, however, it is intended to use an existing cleared track in this area that follows a seismic survey line (see Attachment 5 for description of this route). This will halve the clearance required reducing it to 0.0015% of the critical habitat. The species has also been recorded to the north of Calperum on the Danggali Conservation Park so the overall loss of habitat will be considerably less. Given the height of vegetation in this area, there will be minimal need for ongoing maintenance trimming or removal of vegetation. In addition, intact, long unburnt mallee habitat is necessary to maintain genetic diversity and long-term evolutionary development. Black-eared miners occur mainly in old-growth habitats that have not been burnt for at least 50 years. As shown in Attachment 8, the area of Calperum through which the alignment passes was extensively burnt in a 2014 fire. Habitat on Taylorville

Species	Impact
	Station was also burnt in a 2006 fire. Since the 2006 fire, there have been no records of Black-eared Miner within 10 km of the proposed alignment. In contrast, there have been a large number of sightings within unburnt areas in and around Gluepot Reserve. Some of these sightings appear to occur within unburnt patches within the 2006 fire area but the closest of these is approximately 15 km from the proposed alignment. Consequently, construction of the proposed Project is unlikely to affect any populations of Black-eared Miner. If the Project area remains unburnt for the next 20 years, it is possible that the species may begin to return. As noted above, the loss of critical habitat, and overall habitat, is insignificant. Given the preference of Black-eared Miner for unburnt mallee, bushfires represent a significant threat to the species. Electricity lines are a common cause of bushfire, but these originate almost entirely from the lower voltage distribution network where there is much greater potential for contact with vegetation. The Victorian Bushfire Royal Commission identified Single Wire Earth Return (SWER) lines as a particular concern but made no mention of transmission lines. Given the low height of vegetation along the alignment, there is a very low possibility of the transmission line causing a bushfire. ElectraNet undertakes a range of risk reduction measures in the design, maintenance and operation of its transmission network. These measures include: • transmission lines are designed to Australian and International Standards with particular attention to minimising the risk of fire start, including protection systems and increased conductor spacing to eliminate risk of ‘conductor clashing’. • vegetation management (ElectraNet Vegetation Management Manual); • asset inspection and maintenance via routine maintenance tasks; • operation of the transmission system to lower the fire start risk; and • monitoring network performance and investigating fault events to determine root cause. In landscapes such as the Riverland where dry thunderstorms are

Species	Impact
	common, a transmission line may assist in reducing lightning fire start risks. Being the tallest structures in the landscape, transmission towers can attract and dissipate lightning strikes thereby reducing fire start potential. Transmission lines are designed with high levels of lightning protection with earthwires located above the conductors offering shielding from lightning strike and every transmission structure is earthed. It is recognised that the Bookmark Mallee in particular is “an extremely difficult environment in which to combat fire. The size of the area, lack of access and water, steep sandy terrain and often-rapid rate of fire-spread all contribute to a volatile fire environment” (Department for Environment and Heritage Bookmark Mallee Fire Management Plan 2009-2019). Powerline easements can assist in regional fire management by duplicating as physical, maintained fire breaks and assist in providing alternative access for emergency vehicles. The proposed transmission line route, following mostly the southern edge of Taylorville and Calperum Stations on existing access tracks, presents a balance between property protection, energy security and conservation management objectives. A major cause of decline of this species is hybridisation by the conspecific Yellow-throated Miner (Manorina flavigula) and it is therefore necessary to maintain the genetic integrity and diversity of the Black-eared Miner. Intact mallee inhibits this genetic introgression but clearing or fragmentation of habitat may result in genetic swamping by Yellow-throated Miners. It is recognised that “improving access for fire response can potentially impact on habitat for the Black Eared Miner by allowing invasion and genetic introgression Yellow Throated Miner, which prefers a disturbed environment and access to water” (Department for Environment and Heritage Bookmark Mallee Fire Management Plan 2009-2019). The majority of the proposed transmission line route alignment specifically utilises existing access tracks rather than creating new linear access. It should be noted however, that within the

Species	Impact
	ecological study area, including the proposed alignment, there is a high concentration of Yellow-throated Miner x Black-eared Miner hybrids and Yellow-throated Miner (Manorina flavigula) records, indicating that hybridisation is already well advanced. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect the survival of the species. Given the limited areas of potential habitat to be removed, compared with the extensive areas of similar suitable habitat present, the recent fire history and hybridisation with the Yellow-throated Miner, the population is unlikely to be significantly impacted.
Bird - Numenius madagascariensis (Eastern Curlew) Critically Endangered (also Migratory Wader)	This species is unlikely to occur within the ecological study area with the nearest record being 50 km away. Given the species is distributed primarily along the coast with very few inland records, the proposed works are not likely to have a significant impact on this species
Bird - Pachycephala rufogularis (Red-lored Whistler) Vulnerable	This species has been recorded 29 times (recent) and 11 (historical) in the ecological study area. In South Australia the species occurs in the upper South East, lower Murray Mallee and they are widespread in and around the Riverland Biosphere Reserve. The Biosphere Reserve has an estimated population of 1000 birds. As it is likely the species occurs on the proposed alignment, a survey will be undertaken around proposed towers and other disturbance sites. Towers will be repositioned to avoid habitat or important populations. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect the survival of the species. Given the species' very low population densities and the extensive area of suitable habitat present within the region, implementation of proposed mitigation measures, small footprint and re-location of infrastructure (tower foundations and access roads, where needed), the proposed works are not likely to have a significant impact on this species.

Species	Impact
Bird - Pedionomus torquatus (Plains-wanderer) Critically Endangered	This species is unlikely to occur within proposed alignment with all six records historical and located south of the proposed alignment. Given the lack of records and distance to populations, the proposed works are not likely to have a significant impact on this species.
Bird - Pezoporus occidentalis (Night Parrot) Endangered	This species is a nocturnal / elusive ground-dwelling bird listed as extinct in South Australia. Given there are no records within the ecological study area, the proposed works are not likely to have a significant impact on this species.
Bird - Polytelis anthopeplus monarchoides (Regent Parrot) Vulnerable	This species has been recorded 350 times in the ecological study area with important populations along the River Murray corridor. Breeding habitat includes large hollow bearing trees which generally occur to the south of the proposed alignment. As it is likely the species occurs on the proposed alignment, a survey will be undertaken around proposed towers and other disturbance sites with towers repositioned if necessary to occur on existing vehicle tracks to minimise vegetation clearance of important population habitats. The alignment traverses foraging habitat, rather than breeding habitat with the extent of possible foraging habitat that may be affected extremely limited. Given the area of potential foraging habitat available, implementation of proposed mitigation measures, small footprint and re-location of infrastructure (tower foundations and access roads, where needed), the proposed works are not likely to have a significant impact on this species.
Bird - Rostratula australis (Australian Painted Snipe) Endangered	This species has recently (from 2001) been recorded three times along the River Murray with the ecological study area likely to contain suitable habitat for the species. It has been recorded at wetlands in all states of Australia. It is most common in eastern Australia, where it has been recorded at scattered locations throughout much of Queensland, NSW, Victoria and south-eastern South Australia. It has been recorded less frequently at a smaller number of more scattered locations farther west in South Australia, the Northern Territory and Western Australia. The alignment is generally several

Species	Impact
	kilometres from the River and does not intercept existing wetlands. The species may be at risk of collision with the proposed transmission lines. Given the small numbers in the floodplain wetlands, the risk of collision with transmission lines is likely to be low. However, markers will be placed on transmission lines as a mitigation measure to avoid significant impact to populations. Given the small population within the ecological study area and the mitigation measures, the proposed works are not likely to have a significant impact on this species.

2.4.2 Do you consider this impact to be significant?

No

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

Yes

2.5.1 Impact table

Species	Impact
Bird - Apus pacificus (Fork-tailed Swift) Migratory Marine	This species is highly mobile and almost entirely aerial. It is seldom recorded on the ground. The species occurs over a wide range of habitats, which vary from rainforests to treeless plains. It is unlikely to utilise terrestrial habitat within the ecological study area, but may occur as an overfly visitor. Consequently, it is unlikely to be significantly impacted by the proposed action.
Bird - Motacilla cinereal (Grey Wagtail) Migratory Terrestrial	This species is unlikely to be found within the ecological study area being recorded four times in South Australia with the closest record 100 km from the ecological study area. Nearly all records are coastal, with a few widely scattered inland records. Given no records within the ecological study area, distance to known populations and distance to species preferred habitat, the proposed works are not likely to

Species	Impact
	have a significant impact on this species.
Bird - Motacilla flava (Yellow Wagtail) Migratory Terrestrial	This species has been recorded 100 km south-west of the ecological study area with most records occurring in northern Australia (preferred breeding habitat). The species is unlikely to be found within the ecological study area. Given no records within the ecological study area, distance to known populations and distance to species preferred habitat, the proposed works are not likely to have a significant impact on this species.
Bird - Myiagra cyanoleuca (Satin Flycatcher) Migratory Terrestrial	This species has been recorded three times historically and twice recently (1998) within the ecological study area with the closest recorded 5 km south of the proposed alignment. Although considered unlikely to be present within the ecological study area, the species is an occasional visitor to South Australia. Given the few records within the ecological study area, the proposed works are not likely to have a significant impact on this species.
Bird - Actitis hypoleucos (Common Sandpiper) Migratory Wetland	This species has been recorded five times recently within the ecological study area with the closest recorded 12 km from the proposed alignment. The ecological study area contains suitable habitat for the species. It uses a wide range of coastal wetlands and some inland wetlands. Records of migratory birds in the ecological study area, however, are low compared to other sites in South Australia. As it is possible the species occurs on the proposed alignment, markers will be placed on transmission lines near wetlands as a mitigation measure to prevent injury or mortality from collisions. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect habitat. Given implementation of the proposed mitigation measures, the small footprint and the limited occurrence of this species in the area, the proposed works are not likely to have a significant impact on this species.
Bird - Calidris acuminate (Sharp-tailed Sandpiper) Migratory Wetland	This species has been recorded 17 times recently within the ecological study area from the River Murray and adjoining wetlands. The ecological study area contains suitable habitat

Species	Impact
	for the species. The species has been recorded from wetlands throughout Australia. Records of migratory birds in the ecological study area, however, are low compared to other sites in South Australia. As it is likely this species occurs on the proposed alignment, markers will be placed on transmission lines as a mitigation measure to prevent injury or mortality from collisions. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect habitat. Given implementation of the proposed mitigation measures, the small footprint and the wide distribution of this species, the proposed works are not likely to have a significant impact on this species.
Bird - Calidris melanotos (Pectoral Sandpiper) Migratory Wetland	This species breeds in northern North America and Siberia, and migrates to South America and to a lesser extent Australasia. Winters in wet meadows, mudflats, flooded fields, and shores of ponds and pools. There is no core habitat within the ecological study area or recent records of the species. There are three historical records (1981 and 1987) from Lake Meretti, south of the Wentworth Road. Given the limited occurrence of the species in the ecological study area, significant impacts are not considered likely.
Bird - Calidris ruficollis (Red-necked Stint) Migratory Wetland	This species has been recorded 30 times recently within the ecological study area from the River and adjoining wetlands. The ecological study area contains suitable habitat for the species. The species is widespread throughout Australia. Records of migratory birds in the ecological study area, however, are low compared to other sites in South Australia. As it is likely the species occurs on the alignment, markers will be placed on transmission lines as a mitigation measure to prevent injury or mortality from collisions. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect habitat. Given the wide distribution of this species, the small project footprint and with the implementation of proposed mitigation measures, the proposed works are not likely to have a significant impact.

Species	Impact
Bird - Charadrius bicinctus (Double-banded Plover) Migratory Wetland	This species has no recent records within the ecological study area with records in South Australia largely coastal. Therefore, this species is unlikely to occur in the ecological study area. Consequently, the proposed works are not likely to have a significant impact on this species.
Bird - Gallinago hardwickii (Latham's Snipe) Migratory Wetland	This species has been recorded three times recently within the ecological study area from the River and adjoining wetlands. The ecological study area contains suitable habitat for the species. It is a non-breeding migrant to Australia, primarily along the east coast. Records of migratory birds in the ecological study area, however, are low compared to other sites in South Australia. As it is likely the species occurs on the proposed alignment, markers will be placed on transmission lines as a mitigation measure to prevent injury or mortality from collisions. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect habitat. Given implementation of proposed mitigation measures, the small project footprint and the wide distribution of this species, the proposed works are not likely to have a significant impact.
Bird - Pandion haliaetus (Osprey) Migratory Wetland	This species has not been recorded within or near the ecological study area with all South Australian records coastal or off-shore. This species is unlikely to occur in the ecological study area. Consequently, the proposed works are not likely to have a significant impact on this species.
Bird - Pluvialis fulva (Pacific Golden Plover) Migratory Wetland	This species has been recorded in the ecological study area seven times historically with no recent records. It mainly occurs in coastal areas in SA with only occasional inland records. Consequently, the Project is unlikely to have a significant impact on this species.
Bird - Tringa glareola (Wood Sandpiper) Migratory Wetland	This species has not been recorded nearby or within the ecological study area and is unlikely to occur in the area. Within SA, all records are from the coast off Gulf St Vincent, Spencer Gulf, and the Coorong region. Consequently, the Project is unlikely to have a significant impact on this species

Species	Impact
Bird - Tringa nebularia (Common Greenshank) Migratory Wetland	There are numerous records for this species in the ecological study area and suitable habitat. It is widespread in SA, including coastal and inland. Records of migratory birds in the ecological study area, however, are low compared to other sites in South Australia. As it is likely the species occurs on the proposed alignment, markers will be placed on transmission lines as a mitigation measure to prevent injury or mortality from collisions. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect habitat. Given implementation of proposed mitigation measures, the small project footprint and the wide distribution of this species, the proposed works are not likely to have a significant impact.
Bird - Tringa stagnatilis (Marsh Sandpiper) Migratory Wetland	This species has been recorded recently at three locations within the ecological study area and there is suitable habitat for the species. All records are south of the proposed alignment in riverine habitats. Records of migratory birds in the ecological study area, however, are low compared to other sites in South Australia. As it is possible the species occurs on the proposed alignment, markers will be placed on transmission lines as a mitigation measure to prevent injury or mortality from collisions. Weed and vehicle hygiene procedures/programs will be used to prevent spread of weeds or introduction of disease that adversely affect habitat. Given implementation of proposed mitigation measures, the small project footprint and the wide distribution of this species, the proposed works are not likely to have a significant impact.

2.5.2 Do you consider this impact to be significant?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on any part of the environment in the Commonwealth marine area?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

A desktop review of following sources has been completed:

- An EPBC Act Protected Matters database search covering the proposed transmission line alignment plus a 25 km buffer

- A Biological Database of South Australia (BDBSA) search extract covering the proposed transmission line alignment plus a 25 km buffer

- Vegetation mapping of the study area, prepared by the South Australian Department for Environment (accessed from NatureMaps 2019)

- A review of relevant reports, reference materials and published papers from the Project region, including:

    * Other publications and government documents relating to individual species, or recovery plans for threatened species

    * Review of publicly available imagery

    * Threatened species profiles, reference texts and published material

    * Atlas of Living Australia database records (Atlas of Living Australia 2019).

- A review of publicly available imagery

- Threatened species profiles, reference texts and published material

- Previous studies:

    * Sinclar Knight Merz Pty Ltd (SKM) Environmental Impact Assessment, Proposed South Australia – New South Wales Interconnector (SNI) (July 2002) (Ref: EIS Addendum)

    * Sinclar Knight Merz Pty Ltd (SKM) Environmental Impact Assessment, Proposed South Australia – New South Wales Interconnector (SNI) (July 2002) (Ref: EIS Addendum Volume 2).

Jacobs also completed a field review in Spring 2018 of vegetation on sites along or near the alignment as part of the work to refine the alignment location.

Environmental Setting

The Project is situated within the three following Interim Biogeographic Regionalisation for Australia (IBRA) bioregions:

- The Flinders Lofty Block comprised of a general pattern of mountain ranges, alluvial fans and plains, and some outcropping volcanics, with the semi-arid to arid north supporting Native Cypress, Black Oak (Belah) and Mallee open woodlands, Eremophila and Acacia shrublands, and Bluebush / Saltbush chenopod shrublands on shallow, well-drained loams and moderately-deep, well-drained red duplex soils. The increase in rainfall to the south corresponds with an increase in low open woodlands of Eucalyptus obliqua and E. baxteri on deep lateritic soils, and E. fasciculosa and E. cosmophylla on shallower or sandy soils.

- The Murray Darling Depression comprised of extensive gently undulating sand and clay plain of Tertiary and Quaternary age frequently overlain by aeolian dunes. Vegetation consists of semi-arid woodlands of Black Oak / Belah, Bullock Bush / Rosewood and Acacia spp., Mallee shrublands and heathlands and savanna woodlands. The alignment is primarily within this bioregion.

- The Riverina comprised of an ancient riverine plain and alluvial fans composed of unconsolidated sediments with evidence of former stream channels. The Murray and Murrumbidgee Rivers and their major tributaries, the Lachlan and Goulburn Rivers flow westwards across this plain. Vegetation consists of River Red Gum and Black Box forests, Box woodlands, Saltbush shrublands, extensive grasslands and swamp communities.

<u>Vegetation Description</u>

Jacobs undertook a desktop review of ecological communities along the proposed alignment followed by an in-field characterisation via publicly accessible roads (Attachment 10). The following Bushland Community Vegetation Associations were identified along the SA portion of the alignment:

- MDBSA 3.1 Mallee with very open Sclerophyll / Chenopod shrub understorey.

- MDBSA 2.2 Chenopod open shrublands

- MDBSA 2.1 Open Mallee / low open woodland with Chenopod shrub understorey

- MDBSA 1.1 Open woodland with arid adapted shrubland on limestone

- MDBSA 11.6 Semi-saline shrublands of river cliffs, floodplains, depressions and drainage lines

- MDBSA 4.2 Mallee with understorey dominated by Triodia on moderate / low sand dunes

Detailed vegetation descriptions were prepared at 20 sites on or near the proposed alignment. Full details are provided in Attachment 10 and vegetation associations mapped in Attachment 11.

Conservation Significant Species and Communities

A number of threatened species have the potential to occur in the study area. Key areas of habitat include dense old growth Mallee, large tracts of Mallee, large old trees with hollows and riverine and wetlands habitats in close proximity to the eastern portion of the alignment.

Impacts on threatened species and ecological communities are discussed above in section 2.4. Impacts on migratory species are discussed in section 2.5.

In addition, there were recent (within 20 years) records for 82 SA state listed flora and fauna within the study area.

3.2 Describe the hydrology relevant to the project area (including water flows).

The Project is located within the Lower Murray Catchment which occupies nine per cent of the Murray-Darling Basin. The Basin contains some of the most important agricultural land in Australia, with irrigators and graziers extensively using both surface water and groundwater.

The proposed route alignment is outside the associated Murray floodplain areas (floodplain areas relative to a once in 100-year river level). Local surface rainfall run-off is rare due to the aridity, permeable soils and flat topography.

Topography within the proposed alignment is characterised by gently undulating plains and sand dunes and ridges. These plains contain numerous small creeks and drainage lines that are commonly dry with only a few of the major creeks having permanent waterholes.

Burra Creek is the only major creek traversed by the proposed alignment in South Australia. The surface water found in the waterholes of Burra Creek can be quite saline and are suitable for limited stock use (Eastern Districts Soil Conservation Board, 2002).

The Murray Basin contains significant groundwater contained in a variety of aquifers. Groundwater in the Murray Basin generally flows from the margins of the basin towards the River Murray. Shallow aquifers are quite saline while some deeper aquifers provide good quality stock water.

The western-most section of the proposed alignment rests on the pre-Cambrian fractured rock aquifers of the Burra and Umberatana groups. The aquifers outcrop and receive recharge in the North Mount Lofty Ranges. These aquifers are predominantly comprised of sandstones and quartzites and yield water with salinity ranging from 3000-7000 mg/L. To the east of the Mount Lofty Ranges these pre-Cambrian fractured rock aquifers underlie the Cainozoic sediments of the western margin of the Murray Basin.

Along the proposed alignment, the Quaternary sediments at the surface are not considered to house any significant groundwater resources. These sediments are underlain by the more significant aquifers of the Tertiary Murray Group Limestone. The aquifer is approximately 30-60 m below the surface and is approximately 100 m thick. The aquifer is generally unconfined and water levels are near the surface adjacent to the River Murray and are up to 60 m below the

surface near the Mount Lofty Ranges. Salinity of the groundwater ranges from 1500 mg/L along the western basin margin up to 35 000 mg/L adjacent to the River Murray.

The hydrogeology along the proposed alignment has been, to varying degrees, influenced by human induced changes. The more obvious changes to the groundwater hydrology are due to the existence of groundwater interception schemes, such as those south of the River Murray at Woolpunda and Waikerie. There are no salt disposal basins within the Project Area, although they do occur within the region.

3.3 Describe the soil and vegetation characteristics relevant to the project area.

Vegetation is discussed in section 3.1 above.

The western extent of the Project Area, east of the Mount Lofty Ranges is dominated by a gentle easterly sloping landscape which mainly consists of outwash fans, with some incised creek courses and other ill-defined drainage lines.

Further to the east, the proposed alignment is characterised by an expansive, flat to gently undulating plains formed on Tertiary sediments of the Murray Basin and incised by the modern River Murray valley. Gently undulating calcrete plains with stony rises and shallow depressions dominate the area to the west of Morgan while between Morgan and the SA-NSW border, the calcrete plain tends to have a veneer of aeolian dunefields. Aeolian processes remain locally active within the region, and have in some areas, been enhanced by land clearing since European settlement.

The proposed route alignment would pass mainly through undulating sand hills comprised of calcareous earths and sands. The majority of soils along the alignment are loose, unconsolidated sands that are susceptible to erosion.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

The proposed Project alignment traverses or runs adjacent to a number of areas of conservation significance. Important habitat values and notable features in the study area include:

- Calperum Station and Taylorville Station are pastoral leases near Renmark in South Australia, comprising of 242,800 and 92,600 hectares of predominantly open Mallee bushland and Murray River floodplains. They form part of Riverland Biosphere Reserve. Calperum and Taylorville are important locally, nationally and internationally because of their intact Mallee vegetation, the presence of several threatened bird species, and their wetlands and related species. The proposed alignment passes through the southern part of Calperum and along the southern boundary of Taylorville.

- Old growth Mallee, and intact Mallee habitats, which are largely to the north of the Project Area. These habitats take many years to develop to a point where Mallee trees support hollows

and deep litter cover, and are characterised by a mosaic of fire history. In general, they represent important habitat for native fauna species, including a number of conservation significant species. The proposed alignment largely avoids these areas.

- Critical habitat for the Black-eared Miner (Manorina melanotis), listed on the register of critical habitat under the EPBC Act, is located in the high value Mallee habitats within the Riverland Biosphere region, within Gluepot Reserve, Taylorville Station and Calperum Station, excluding the area of Calperum Station south and east of Old Wentworth Road. This habitat is listed on the register of critical habitat under the EPBC Act. The Black-eared Miner is discussed in Section 2.4.

- The Riverland Ramsar site and Banrock Station Wetland Complex are located within the River Murray floodplain and are listed under the Ramsar Convention. They are discussed in Section 2.3.

3.5 Describe the status of native vegetation relevant to the project area.

The proposed alignment has been selected to follow existing roads, tracks and other disturbed areas. Jacobs noted that vegetation condition along the SA portion of the study area ranged from medium / high (predominantly within areas of conservation reserve, but also within larger areas of intact remnant vegetation outside of reserves) to low value vegetation within cleared agricultural paddocks and heavily grazed areas, predominantly within the western half of the alignment.

The alignment follows the Old Wentworth Road for approximately 40 km. While largely uncleared, vegetation along this section has been subject to some impacts from dust and vehicle activity. It is proposed that wherever possible the transmission line be located within or as close as possible to the road reserve.

Grazing impacts are greatest in the western half of the corridor, which includes chenopod shrublands and small blocks of Mallee. Grazing pressure along the eastern portion of the corridor is generally low due to the density of the Mallee vegetation and the lack of water. Feral goats contribute to grazing pressure along the eastern half of the corridor.

Several introduced species were recorded in native vegetation surveys conducted for the 2002 EIS (SKM 2002) and in 2018 (see Attachment 10) although their incidence was generally low. Most introduced species occur at the margins of cleared land but have the potential to spread along tracks into undisturbed native vegetation (e.g. horehound, African boxthorn).

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

Elevation across the Project Area varies from approximately 360 m in the westernmost portion of the proposed route to 20 – 80 m above sea level across the central and eastern portions of the proposed route.

3.7 Describe the current condition of the environment relevant to the project area.

As noted in section 3.5, the proposed alignment predominantly follows roads, tracks and other disturbed areas. The western third of the alignment is mainly cleared and historically used for cropping but is predominantly used for grazing due to drought conditions over the last 5-10 years. The alignment stays to the north of more intensive agricultural activities along the Murray River.

The alignment is within the Rangelands and the Riverlands districts in the Murray-Darling Basin Natural Resource Management (NRM) region. The NRM Plan for the region notes that, while most of the area is uncleared, 'much of this land is under pastoral lease and has historically and currently been subjected to high levels of grazing pressure' (Murray-Darling Basin NRM Board 2015). It also notes that 'historical grazing and browsing pressure has simplified the age structure of semiarid woodland tree species. This may have implications for both the long-term maintenance of these woodlands and their value as fauna habitat'.

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

There are several places of historical significance within the broad study area. These include one Commonwealth Heritage Place (Murray Mallee - Calperum Station and Taylorville Station), numerous shipwrecks along the river and a number of state heritage places which include old homesteads, a wharf, train station, pumping station, graves and Suicide Bridge.

Commonwealth Heritage Place: Murray Mallee - Calperum Station and Taylorville Station

These properties are on the Commonwealth Heritage list due to their previous status as Commonwealth lease. The land remains owned by South Australian Government. With the recent transfer of the pastoral lease to the Australian Landscape Trust (Ausland Services), it is likely these properties will be removed from the list. As noted above, the alignment has been selected to minimise impacts on the habitat values of these areas.

The Department of Environment and Energy provides this summary of the heritage significance of this area:

'Calperum and Taylorville, together with adjoining parts of the Bookmark Mallee Block, Tarawi/Scotia, Mallee Cliffs National Park, Big Desert/Wyperfeld, Murray Sunset Country, Ngarkat, and Billiatt Conservation Park, are an integral part of the Murray Mallee Region that has outstanding natural and cultural values. The region draws its name from the River Murray and from the distinctive mallee tree with its multiple stems and bulbous lignotuber which once dominated ecosystems in southern Australia from WA to NSW.

The reserves and adjoining bushland areas of the Murray Mallee region provide extensive insights into the geological and environmental processes which formed the region, and the changing relationship between people and the environment over time. These relationships are seen in the large, relatively intact areas of mallee bushland, which contain some of the least disturbed ecosystems in the south-east of the Australian continent. The survival of these areas

illustrates a major shift in thinking, which started in the early 1900s, to recognise that parts of Australia's semi-arid interior were important and worth conserving.

Much of the Murray Mallee Region provides tangible cultural links for Aboriginal people. Aboriginal links, which embody identity and ownership, are grounded in oral history and current Aboriginal use of Mallee country, which has always had economic and cultural significance to Aboriginal people due the high diversity of plant and animal species. The region has been acknowledged in an international context under the Ramsar convention for its wetlands and contains two UNESCO Biosphere Reserves.

The continuing agricultural and pastoral uses of the surrounding areas starkly illustrate the impact of European exploration in the mid-1800s and the subsequent push to extract a living from the Mallee shrublands in the late nineteenth and early twentieth centuries'.

Other heritage sites

A number of sites of potential non-Aboriginal heritage significance were identified along the route alignment. These comprise predominantly house/station ruins and/or buildings and structures associated with the pastoral industry. These heritage sites are isolated items and will generally be avoided by the alignment. If any sites are on the alignment, tower placement will avoid any impacts.

There are several heritage sites along the Murray River but these are well outside the alignment.

3.9 Describe any Indigenous heritage values relevant to the project area.

The preferred alignment is located within the Murray / South East cultural area which is part of the larger Murray/Darling Basin cultural complex and encompasses Aboriginal groups from the River Murray and adjacent mallee, the Coorong and the area east and south of the Mount Lofty Ranges (Nicholson and Wood, 1993). Groups within this broad cultural area exhibited similar socio-cultural characteristics and were distinguished primarily on linguistic grounds.

The First Peoples of the River Murray and Mallee Region are the traditional owners and Native Title Holders of the River Murray area from the Victorian border to Morgan. The western most section of the corridor is subject to the Ngadjuri Nation #2 Native Title Claim (SC2011/02). The Native Title claim includes the towns of Burra and Robertstown.

As part of previous work undertaken for the EIS in 2002, cultural heritage sites within the investigation corridor were identified and their significance assessed. Further cultural heritage survey is scheduled in 2019 to ground-truth and update the existing information.

The most sensitive Aboriginal cultural heritage areas in the study area are the river and floodplains, reflecting the importance of water in human settlement patterns. These areas are avoided by the proposed alignment. There are, however, several sites of Aboriginal archaeological significance and areas of high archaeological sensitivity in the vicinity of the alignment. These areas would be subject to detailed investigation during detailed design. Sites

of significance can generally be avoided through selective tower placement and access track location. Where impacts cannot be avoided, appropriate approvals, under relevant heritage legislation would be obtained prior to commencement of work.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

The majority of land covered by the Robertstown to the SA-NSW border section is used for grazing, cropping, primary production and public conservation areas, with the Project Area traversing both the Pooginook and White Dam Conservation Parks.

Many properties operate under multiple management objectives that encompass a range of uses, primarily aimed at achieving environmentally and economically sustainable use of the land. A range of linear developments such as other transmission lines, telecommunications lines, roads, water pipelines and gas pipelines are also located in the vicinity of the proposed transmission line.

The nominal centreline of the Project Area traverses approximately 100 land parcels held by 35 different parties under a combination of tenures including freehold land, pastoral leases, unalienated Crown land and alienated Crown land. It is proposed that the proposed transmission line will be sited to parallel existing infrastructure easements, road reserves, tracks and disturbed areas in order to minimise impacts.

All townships are avoided by the proposed transmission line alignment.

3.11 Describe any existing or any proposed uses relevant to the project area.

Land use in the region traversed by the Project is predominantly a combination of primary production (grazing, cropping, and irrigated agriculture) and conservation related land uses (including Calperum and Taylorville Stations and portions of Pooginook and White Dam Conservation Parks). Other land uses include airstrips, roads and other linear developments such as transmission and telecommunication lines and infrastructure, roads, water and gas pipelines, and vegetation heritage agreement areas.

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

The current alignment has been selected using an intensive corridor selection process which ranked constraints related to environmental, social, engineering, and economic aspects. Where possible, the transmission line route avoids impacting Matters of National Environmental Significance (MNES), and other vegetation and habitat that is of high conservation value. The route selection process is described in Attachment 5a.

Specific design and management measures to further reduce the potential for impact as a result of project activities are detailed below.

Avoidance or minimisation of impact on habitat for threatened species and ecological communities

The following measures are proposed to avoid or minimise impact to the potential habitat of threatened species and ecological communities:

Targeted surveys will be completed during the detailed design phase to review and refine the proposed tower and track locations and ensure that they are appropriately located to minimise or avoid impacts on listed threatened communities and threatened species and their preferred habitats.Site clearance walkovers as part of the land disturbance permitting process and construction environmental management planning prior to construction activities to identify and ‘flag off’ any important habitat, or conservation significant species or communities. Incorporate existing tracks into the design where possible to avoid construction of new access tracks and reduce clearance footprints.Tower location selection will use existing disturbed or degraded areas where practicable.

Mitigation measures and management controls

To further minimise potential impacts to nationally threatened and migratory species, and the environment more generally, the following measures will be undertaken:

Attach bird diverters to powerline conductors and/or the top-most earth/shield wire at regular intervals to increase visibility of the lines on sections of the alignment adjacent to potential water bird foraging habitat.Development and delivery of environmental induction of all contractors to

ensure understanding of local and regional flora and fauna significance and sensitivities, construction method and work area restrictions including:---*Implement protocols for management of waste during construction to avoid attracting feral pest animals.---Regularly check any open excavations for trapped fauna or provide measures to allow their escape.---Implement weed hygiene practices such as vehicle wash-downs and inspections during construction as well as post-construction weed surveillance and control programs.*Conduct post construction weed survey and control program with particular focus on any weed infestations identified in pre-construction surveys.Implement soil erosion and drainage management practices during construction as part of the Construction Environmental Management Plan, including:---*Installation of berms or drainage controls---Careful placement and management of soil stockpiles out of potential flow paths---Maintenance of sediment/erosion controls---Project infrastructure placement to minimise disturbance to any ephemeral drainage lines within the area.*Store and handle of fuel and chemicals in accordance with relevant standards and guidelines.Rehabilitate disturbed areas following the completion of construction activities.Restrict the disturbance footprint to the minimum necessary to safely carry out the activities.Implement best-practice construction traffic management procedures, including all vehicles remaining on tracks, speed restrictions appropriate to the road or track conditions and effective signage where potential ecological constraints exist to raise awareness and further control speeds in these areas.

Appropriate bushfire management and maintenance of clearance distances between vegetation and transmission lines in accordance with the *Electricity (Principles of Vegetation Clearance) Regulations 2010*.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

ElectraNet will avoid significant impacts to MNES through detailed project planning and implementation of control measures as outlined in this referral.

ElectraNet will develop environment and community commitments and outcomes during the preparation of the EIS and Construction Environmental Management Plan ((CEMP), required as a condition of South Australian Development Act approval) in consultation with regulatory agencies, and with consideration to MNES where relevant. Final environmental commitments and outcomes are expected to include the following:

- There is no loss of abundance and/or diversity of native vegetation as a result of project activities unless a ‘significant environmental benefit’ has been approved in accordance with the relevant legislation.

- There is no introduction of new species of weeds declared or listed under relevant legislation, plant pathogens or pests (including feral animals), nor sustained increase in abundance of existing weed or pest species as a result of project-related activities.

- There is no contamination of land and soils as a result of project-related activities.

- Temporarily disturbed areas are rehabilitated in line with the existing land use or as otherwise

agreed with the landholder and relevant government agencies.

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

Detailed assessments of potential impacts to MNES have been undertaken based on the results of field assessments and desktop review of existing data (see Section 2 and Attachment 7 (Jacobs 2019)). Based on the criteria set out in the Significant Impact Guidelines 1.1 (DOTE 2013), the proposed action will not have a significant impact on MNES.

See Sections 2.3 (Wetlands of International Importance), 2.4 (listed threatened species) and 2.5 (listed migratory species) for discussion on the identified MNES relevant to the Project. Key points are:

- The alignment has been selected to minimise new vegetation disturbance by use of existing tracks and other cleared areas where practicable. Clearing will be restricted to tower construction areas, with limited clearing required in some areas for laydown areas and access tracks.

- Vegetation clearance is conservatively estimated to be approximately 200 ha in total. This is spread along the 190 km alignment. The maximum clearance is expected to be 1 ha per kilometre of alignment. This means that loss of habitat for species /communities at each site is very minor and impacts are geographically dispersed. Route alignment, line design and tower placement will result in minimal ongoing vegetation maintenance pruning. Even without mitigation measures, this level of clearance is very unlikely to result in fragmentation of an existing population, reduce the area of occupancy of the species or interfere with its recovery in any way.

- As noted above, all proposed tower sites with native vegetation will be surveyed prior to identification of final tower locations. The disturbance footprint will be located to avoid any impacts on threatened flora species or ecological communities (if identified) and to minimise impacts on any threatened fauna or migratory species habitat.

- The CEMP will also include measures to prevent the spread of weeds, pathogens and pest animal species. It will also include soil erosion and sedimentation controls to prevent any offsite impacts.

- Due to the location of the alignment on or near existing tracks, disturbance to critical habitat for the Black-eared Miner will be negligible. Based on worst case calculations, clearance would

affect at most 0.003% of the defined critical habitat area, but the likely disturbance would be less than half that amount.

- The area of Black-eared Miner critical habitat affected by the proposed alignment was substantially burnt in a 2014 wildfire (and other areas immediately north of the alignment in Taylorville were also burnt in 2006). Black-eared Miners have not been recorded within 10 km of the proposed alignment since the 2006 fire. The alignment will not impact the more important habitat areas to the north that have remained unburnt for 50 years and which have a substantial number of sightings since 2006 (As seen in Attachment 8 – Figure 1 – Figure 3).

- The alignment does not directly affect the Riverland Ramsar site. Indirect impacts on the ecological character could occur from birdstrike with the transmission line. However, the potential for impact is reduced by the following factors:

* Wetland areas near the alignment do not hold water in most years and, therefore, water birds will not be present.

* Most of the wetland waterbird habitat is more than one kilometre from the alignment. Less than 2.5 km of the alignment is within 500 m of a wetland boundary.

* The potential for bird strike will be reduced by strategically placing markers / deflectors on certain sections of the transmission line near waterbodies. Most studies show this is very successful in reducing bird deaths.

* The Riverland Ramsar site receives a relatively low visitation from migratory shorebirds compared to the more important sites in SA such as the Coorong and Lower Lakes, and the Adelaide International Bird Sanctuary. Consequently, the potential for significant impacts on the population of these species is not credible.

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

Yes. ElectraNet has an environmental management system which is certified to ISO14001. Our environmental policy and framework are discussed below in 6.3.1.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

Not applicable

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework.

The key elements of ElectraNet's Environmental Policy include:

- developing and maintaining our environmental management system at a scale appropriate to our activities

- assessing our assets and activities to identify environmental risks and prevent pollution

- complying with local, state and national environmental requirements

- training our staff in the management of environmental issues facing the energy and infrastructure industries

- participating in initiatives that contribute to understanding and addressing the impacts of climate change.

ElectraNet has developed a detailed range of Environmental Operating Requirements which define our environmental management requirements for staff and contractors. These address key environmental aspects, or themes, during all phases of our activities, and are continuously reviewed and improved where gaps are identified.

They define the minimum requirements we expect in the environmental management plans (EMPs) that our partners and contractors develop when working with us.

To facilitate effective environmental management, ElectraNet requires the development and implementation of EMPs, whether for construction projects or asset maintenance service providers. For example, where risk assessments identify the presence of endangered or vulnerable flora or fauna, or where noxious weeds are likely, fit for purpose EMPs ensure our contractors use sound management practices. Cultural heritage planning and management are integral to this process, so that sensitive locations and habitats are protected.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes

6.4.1 EPBC Act No and/or Name of Proposal.

2009/4948 – ElectraNet Pty Ltd/Energy generation and supply (non-renewable)/Adelaide/SA/Construction of substation and 18km of underground cable

2005/2463 - ElectraNet Pty Ltd/Energy generation and supply/Cherry Gardens/SA/Electrical Infrastructure, Cherry Gardens, SA

2004/1903 - ElectraNet SA/Energy generation and supply/Bungama/SA/upgrade existing Bungama substation & install 7km transmission line

2002/726 - ElectraNet SA/Energy generation and supply/Monash-Robertstown/SA/SA-NSW Electricity Interconnector, Monash-Robertstown Section [proposal withdrawn 18/03/2015]

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
EPBC Act Protected Matters Significant Impact Assessment (Jacobs 2019) (Refer to document for full list of references)	Based on desktop studies and database records (PMST and BDBSA)	Database records reflect survey effort
Vegetation Community Summary (Jacobs Memorandum 2019)	Based on desktop studies supplemented by field inspections at 20 sites	Limited number of field survey sites
South Australia – New South Wales Interconnector (SNI) EIS (SKM 2002)	While much of the information is still relevant, the age of this document decreases its reliability	Extent to which environmental conditions have changed since 2002
South Australia – New South Wales Interconnector (SNI) EIS Addendum (SKM 2002)	While much of the information is still relevant, the age of this document decreases its reliability	Extent to which environmental conditions have changed since 2002
Ecological Character Description: Riverland Ramsar Site (Revised July 2009)	Refer to document. Has not been updated since 2009.	Refer to document
Species Profile and Threats Database	Reliable	Database records reflect survey effort

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.0 Provide a description of the feasible alternative?

Not applicable

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

Land Services Manager

9.2.2 First Name

Scott

9.2.3 Last Name

Haynes

9.2.4 E-mail

haynes.scott@electranet.com.au

9.2.5 Postal Address

52 East Terrace
Adelaide SA 5000
Australia

9.2.6 ABN/ACN

ACN

094482416 - ELECTRANET PTY LIMITED

9.2.7 Organisation Telephone

08 84047966

9.2.8 Organisation E-mail

haynes.scott@electranet.com.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date: .....

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, SCOTT HAYNES, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:..... Date: 30/5/19

I, _____, the person proposing the action, consent to the designation of _____ as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:..... Date: .....

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Land Services Manager

9.5.2 First Name

Scott

9.5.3 Last Name

Haynes

9.5.4 E-mail

haynes.scott@electranet.com.au

9.5.5 Postal Address

52 East Terrace
Adelaide SA 5000
Australia

9.5.6 ABN/ACN

ABN

41094482416 - ELECTRANET PTY LIMITED

9.5.7 Organisation Telephone

1800 243 853

9.5.8 Organisation E-mail

haynes.scott@electranet.com.au

Proposed designated proponent - Declaration

I, SCOTT HAYNES, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature:..... Date: 30/5/19

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Land Servies Manager

9.8.2 First Name

Scott

9.8.3 Last Name

Haynes

9.8.4 E-mail

haynes.scott@electranet.com.au

9.8.5 Postal Address

52 East Terrace
Adelaide SA 5000
Australia

9.8.6 ABN/ACN

ACN

094482416 - ELECTRANET PTY LIMITED

9.8.7 Organisation Telephone

1800 243 853

9.8.8 Organisation E-mail

haynes.scott@electranet.com.au

Referring Party - Declaration

I, SCOTT HAYNES, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature:..... Date: 30/05/2019.....

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. Attachment 1. ElectraNet Project Description_RevB.pdf
2. Attachment 2. Location Maps_RevB.pdf
3. Attachment 3. Project EnergyConnect Nominal Route_RevB.zip
4. Attachment 4. Land titles list_RevB.pdf
5. Attachment 5a. Corridor and Route Selection Summary.pdf
6. Attachment 5b. ElectraNet Stakeholder Engagement and Feedback _RevB.pdf
7. Attachment 6. Proximity to inundated areas - Riverland Ramsar_RevB.pdf
8. Attachment 7. Significant Impact Report_RevB.pdf
9. Attachment 8. Black-eared Miner. Critical Habitat and Fire History_RevB.pdf
10. Attachment 9. PMST_output 6 Feb 2019_RevB.pdf
11. Attachment 10. Vegetation Site Descriptions_Jacobs Memo_RevB.pdf
12. Attachment 11. Vegetation Association Mapping_RevB.pdf
13. Attachment 12. ElectraNet Environmental Management Policy_RevB.pdf