Title of Proposal - Sapphire Solar Farm Project, 28km east of Inverell, NSW

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.

Sapphire Solar Farm Pty Ltd (a subsidiary of CWP Solar Pty Ltd) propose to build and operate a utility-scale photovoltaic solar farm with battery storage at Kings Plains, within the Inverell Shire Local Government Area (LGA) 30 km east of Inverell in northern NSW. The project is called the Sapphire Solar Farm ('SSF'; the ‘Proposed Development’). Fully constructed, the SSF is currently expected to have an electricity generation capacity of approximately 180 megawatts (MW - alternating current(AC)) at the point of connection, producing enough energy (370 GWh) to power the equivalent of 66,000 average NSW households each year. The addition of battery-based storage (c.100 MWh) will allow for the Proposed Development, along with the Sapphire Wind Farm (SWF), to dispatch scheduled and reliable renewable energy generated power to the National Electricity Market (NEM).

The electricity generated and dispatched by the Proposed Development would result in significant carbon savings due to the electricity displaced from the current NSW generation supply, which is heavily reliant on coal powered generation. Based on current NSW emission figures of 0.87 kg of CO2-equivilent per kWh, up to 330,000 tonnes of CO2 would be displaced by the Proposed Development annually.

The Proposed Development would include, but not necessarily be limited to, the following elements:
-Solar arrays: solar panels supported by a mounting system installed on piles driven or screwed into the ground;
-Battery-based storage facilities;
-Power Conversion Units (PCU’s) inclusive of Inverters/Rectifiers, Ring Main Units, LV/MV step-up Transformers located throughout the Proposed Development;
-Collector systems: above and/or below ground onsite cabling and electrical connections between the existing SWF substation (the ‘Substation’) and the respective PCU’s;
-Operation and maintenance (O&M) building including workshop, warehouse, offices, ablutions, and carpark;
-Site access and onsite access tracks;
-Fencing and security system;
-Meteorological stations;
-Vegetation buffers (if required) for visual screening; and
-Firebreaks.

In addition to the key components outlined above, there would be a temporary construction compound required to facilitate the construction and decommissioning phases of the Proposed Development. In order to minimise environmental impacts, the SSF temporary construction compound is proposed to be located within the temporary construction compound currently in use for construction of SWF.

The final scale and capacity of the Proposed Development would be optimised within the Site during post-consent studies based on a combination of the most suitable technology at the time of procurement, along with detailed geotechnical and grid connection studies.

It is anticipated that the Proposed Development would take up to 18 months to construct and would be operational over an initial term for approximately 25 years, however could extend for a further term depending on market and commercial circumstances.

It is expected that upgrading or repowering of the PV modules and ancillary equipment may be required throughout, or to extend, the operational life of the project. This will be a commercial decision made at the time based on the relative economics of solar PV generation and battery-based storage compared to alternatives. Decommissioning and restoration would occur at the end of the operational life of the Proposed Development. As such, planning consent for the Proposed Development is sought for 55 years to cover two full terms of operation and associated construction, upgrading and decommissioning periods.

A detailed description of the infrastructure is attached to this referral ('Description of Solar Farm Key Components").

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
SSF approx bounding area	1	-29.704153294505	151.44578546204
SSF approx bounding area	2	-29.704302398711	151.44578546204
SSF approx bounding area	3	-29.70877542194	151.44321054139
SSF approx bounding area	4	-29.705644326599	151.42913430848
SSF approx bounding area	5	-29.707657184811	151.42698854127
SSF approx bounding area	6	-29.717720870645	151.42922013917
SSF approx bounding area	7	-29.723833135478	151.40999406495

Area	Point	Latitude	Longitude
SSF approx bounding area	8	-29.722715066071	151.39557450928
SSF approx bounding area	9	-29.726814592997	151.38381570496
SSF approx bounding area	10	-29.715931844669	151.38166993775
SSF approx bounding area	11	-29.716677276034	151.40012353577
SSF approx bounding area	12	-29.713024609457	151.3917121283
SSF approx bounding area	13	-29.70653893523	151.38750642457
SSF approx bounding area	14	-29.694311927542	151.39437287964
SSF approx bounding area	15	-29.691404066436	151.41548722901
SSF approx bounding area	16	-29.704153294505	151.44578546204

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).

The Proposed Development is in an agricultural area located approximately 28 km east of Inverell and 35 km west of Glen Innes, in the Northern Tablelands region of NSW.

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

445ha

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title. Multiple - refer attached document.

1.8 Primary Jurisdiction.

New South Wales

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 06/2018

End date 12/2043

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

Under the NSW *State Environmental Planning Policy (State and Regional Development) 2011*, electricity generating works (including solar) that have a capital investment value of more than $30 million are classified as "State Significant Development" (SSD) and require approval under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) through the preparation of an EIS. The Proposed Development has an estimated capital value of c. $280 million.

As such, this EIS has been prepared under Part 4 of the EP&A Act, in accordance with the Secretary's Environmental Assessment Requirements (SEARs), dated 23rd August 2017, and the requirements of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) which have been provided by the NSW Department of Planning and Environment (DP&E) who are the consent authority.

The local council (Inverell Shire Council) have been consulted throughout the process, and provided input into the SEARs however are not a consent authority for SSD.

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

Effective and broad community and stakeholder consultation provides communities and stakeholders with a clear understanding of a development proposal as well as opportunities to provide feedback to identify issues important to them and, as such, it is an essential part of the EIA process. CWP has carried out extensive consultation with the local community, stakeholders from the wider area and relevant Government Agencies in order to understand

and respond to community concerns during the design and assessment process leading to this Development Application (DA). A detailed account of all consultation will be prepared in the EIS however consultation thus far can be summarised as described in the list below.

Indigenous stakeholders have been consulted as part of the heritage assessments for the EIS. Consultation with the Aboriginal community was conducted by NSW Archaeology Pty Ltd in accordance with guidance set out in the DECCW (2010a) document Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. Registered Aboriginal Parties (RAPs) have had the opportunity to provide feedback on the draft Aboriginal Cultural Heritage Assessment (ACHA) prior to its finalisation and submission to OEH (as part of the NSW State planning process). The ACHA identifies ongoing consultation commitments and recommends the development of a Cultural Heritage Management Plan (CHMP) to guide this process.

Summary of Consultation

-March 2016 | SWF host landowners | Concept discussion

-April 2016 | TransGrid | Concept discussion

-August 2016 | SWF CCC | Concept discussion

-February 2017 | Potential host consultations | Land use suitability and interest

-March 2017 | Community | Community meeting and feedback

-June 2017 | Potential host consultations | Land use suitability and interest

-June 2017 | Mining lease/licence holder | Discussion and feedback

-July 2017 | Community | Revised footprint

-July 2017 | All stakeholders| PEA submission

-August 2017 | All stakeholders | Media coverage

-August 2017 | Community | CCC participation

-August 2017 | Community | Community meeting and feedback

-August 2017 | Individual neighbours | One-to-one consultations

-August 2017 | Council | Discussion in relation to transport and waste

-September 2017 | Registered Aboriginal Parties | Participation in onsite surveys

-October 2017 | Mining lease/licence holder | Agreement to the Proposed Development

-October 2017 | SWF CCC | Presentation and feedback

-November 2017 | Host consultations | Refined project footprint

-November 2017 | Community | Updated layout

-November 2017 | Potentially affected residences | Potential mitigation measures

-November 2017 | Waterloo Road residences | Potential impacts and concerns

-December 2017 | DPE | Issue draft EIS

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.

This EIS has been prepared under Part 4 of the EP&A Act, in accordance with the Secretary's Environmental Assessment Requirements (SEARs), dated 23rd August 2017, and the requirements of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation).

The EIS addresses the SEARs including a number of specialist reports including:

-Biodiversity

-Aboriginal cultural heritage

-Historic heritage

-Land resources

-Visual impact

-Noise

-Transport

-Water

-Hazards and risks

-Waste and resource use

-Socio-economic factors

-Cumulative impacts

As the Proposed Development is SSD, the biodiversity impacts must be assessed under the Framework for Biodiversity Assessment (FBA; OEH 2014) and a Biodiversity Assessment Report (BAR) must be prepared. The purpose of this BAR is to assess the impacts to biodiversity, propose mitigating and ameliorating options, as well as calculate offsets for unavoidable residual impacts (detailed in a component report referred to as a Biodiversity Offset Strategy or BOS)

The EIS indicates that the impacts of the Proposed Development are generally low and are suitably mitigated using proven successful mitigation measures.

Once submitted to the NSW DP&E and deemed suitable for public exhibition, the DP&E will place the EIS on public exhibition for a period of 30 days. In that period public and Government agency comments are made, following which Sapphire Solar Pty Ltd will prepare a Respone to Submission report addressing comments and issues raised.

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

No

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?

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
White Box, Yellow Box, Blakely's Red Gum	Degraded throughout the impact area, however

Species	Impact
Woodland and Derived Native Grassland	clearing of 66.55ha (23.69ha woodland in poor condition and 42.86ha derived native grassland).

2.4.2 Do you consider this impact to be significant?

Yes

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?

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 a water resource related to coal/gas/mining?

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.

Biodiversity values within the project area are well understood having been subject to both NSW and Commonwealth assessments as part of the Sapphire Wind Farm project in 2011.

Recent investigations of the project are by Environmental Planning Services Pty Ltd (EPS) and Eco Logical Australia Pty Ltd (ELA) have sought to refine understanding of biodiversity values specific to the Sapphire Solar Farm application.

High-level vegetation characterisation surveys were undertaken in July 2017 by EPS, which was supplemented by ELA conducting detailed flora, fauna and vegetation surveys were undertaken during 27 November – 1 December 2017. Methods used by ELA were consistent with those recommended in the NSW *Framework for Biodiversity Assessment* (FBA; OEH, 2014).

Habitat within the project area is highly modified due to persistent and extensive impacts of agriculture. It is mostly covered by agricultural exotic vegetation. Native vegetation comprises approximately 23% of the project area (refer section 3.5). Woodland patches and scattered trees across the project area are White Box (*Eucalyptus albens*), Blakely's Red Gum (*Eucalyptus blakelyi*), Yellow Box (*Eucalyptus melliodora*), Rough-barked Apple (*Angophora floribunda*) and Manna Gum (*Eucalyptus viminalis*). Native grasses occur within the understorey of woodland patches and areas of native grassland contain Couch (*Cynodon dactylon*), Plains Grass (*Austrostipa aristiglumis*), Red Grass (*Bothriochloa macra*), Wild Sorghum (*Sorghum leiocladum*), Western Rat-tail Grass (*Sporobolus creber*) and Wheatgrass (*Elymus scaber*) at varying cover abundances.

Given the present assemblage of vegetation, portions of the project area are consistent with the EPBC Act listing for the Critically Endangered Ecological Community (CEEC) White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box Gum Woodland).

Likely threatened flora and fauna within the project area included review of previous assessment reports for the SWF NSW and Commonwealth assessment, operation of the BioBanking Credit Calculator, as well as the use of the Protected Matters Search Tool (PMST; operated on 7/12/17). The PMST identified the potential for 17 threatened flora, 29 threatened fauna, and one threatened fish to potentially occur within the project area. An analysis of the likelihood of occurrence of all species identified during the literature review considered the distribution, habitat requirements, local occurrence, and proposed impacts to each species and their habitats. Based on this review the following species or habitats have potential to occur

within the project area and require consideration:

Flora species*: Dichanthium setosum* (Bluegrass)*, Picris evae* (Hawkweed) and *Thesium australe* (Austral Toadflax).

Fauna Species: *Anthochaera Phrygia* (Regent Honeyeater)*, Grantiella picta* (Painted Honeyeater), *Lathamus discolour* (Swift Parrot), *Motacilla flava* (Yellow Wagtail) and *Pteropus poliocephalus* (Grey-headed Flying Fox).

Field surveys were conducted from 2008 to 2011 as part of the SWF approvals process. Subsequent field studies have been undertaken in November and December 2017 by ELA to target threatened woodland birds, Koala, and threatened flora with potential to occur within the marginal quality habitat present.

No threatened fauna were identified during field surveys.

T. australe was identified outside the project area. Subsequent surveys are planned for late December 2017 to determine the extent (if any) of this species, as well as *D. setosum* within the project area.

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

The Proposed Development is located within the upper tributaries of the Macintyre River, part of the Border Rivers Catchment. This catchment occupies 49,500 km2, and comprises 24,500 km2 in northern NSW and 25,000 km2 in southern Queensland (NSW Office of Water Border Rivers website). In NSW, the catchment's major urban centres are Glen Innes, Inverell, and Tenterfield, all located within the upper catchment. Goondiwindi, on the northern bank of the Macintyre River in Queensland is the major town in the middle of the catchment, along with the smaller town of Boggabilla in NSW. The town of Mungindi lies on the Barwon River at the lower end of the catchment. The Barwon becomes the Darling River, which joins the Murray in South Western NSW before flowing to the Southern Ocean.

The Proposed Development occurs in the area covered by the *Water Sharing Plan for the NSW Border Rivers Unregulated and Alluvial Water Sources* which commenced on 1 June 2012 (NSW Office of Water, 2012). The majority of the site is located within the Kings Plains Surface Water Source, with a small southern portion falling within the Inverell Surface Water Source.

The Development Footprint has intentionally been designed to avoid higher order drainage lines and generally contains First and Second Order drainage lines (Strahler 1952) which are ephemeral.

The Proposed Development is located in the upper reaches of the Macintyre catchment and comprises the following sub-catchment areas (all Uncontrolled Streams):

- 849 ha in the upper reaches of Kings Plains Creek catchment;

- 1,150 ha in the upper reaches of Frazers Creek catchment; and

- 424 ha in the upper Swan Brook catchment.

Kings Plains Creek drains the eastern portion of the Proposed Development site. The source of Kings Plains Creek is located upstream of the Proposed Development and passes through the solar array located to the north of Waterloo Road as a Third Order stream (Strahler 1952). Downstream of the Proposed Development, Kings Plains Creek flows in a northerly direction for approximately 20 km, passing through Kings Plains National Park, before turning west to joint Weean Creek, which is part of the Frazers Creek Catchment.

The Frazers Creek Catchment area drains the western portion of the Proposed Development, and includes Weean Creek, Frazers Creek, Horse Gully and Mary Anne Creek. Frazers Creek converges with the regulated Severn River just north of Ashford, approximately 55 km North West of the Proposed Development site. The Severn River converges with the Macintyre River within Kwiambal National Park, 80 km North West of the Proposed Development site.

The southernmost portion of the Proposed Development site drains via Apple Tree Gully into Swan Brook. Swan Brook flows into the Macintyre River North of Inverell, approximately 20 km west of the Proposed Development site.

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

Vegetation is described in section 3.5. The soils of the Site are described from the *Reconnaissance Soil Landscape Mapping for the Border Rivers Gwydir Catchments* 1:100,000 mapsheet (CWP, 2012) as:

- Vertosols and Ferrosols (most common across the Development Footprint) on the undulating plains, rise and footslopes;

- Vertosols in the alluvial landscapes restricted to drainage depressions;

- Dermosols and Ferrosols on ridges and upper slopes; and

- Rudosols and Tenosols (erosional soil areas) restricted to small areas on the footslopes.

The majority of the site has moderate to moderate-severe limitations (Class 3 and Class 4) for more intensive use other than grazing and cultivation, but remains suitable for a variety of land uses if careful management to prevent long-term degradation is implemented (according to an eight class system where Class 1 designates the most suitable soil for intensive and constant cultivation and Class 8 is land not suitable for agriculture (OEH 2012)).

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

No outstanding natural features occur in the area impacted by the Proposed Development.

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

In such an agricultural landscape, native vegetation comprises patches of treed woodlands (usually on the rockier, elevated country) and grasslands which occur mostly on fallow agricultural paddocks. The lower or flatter (non-rocky) country in the Development footprint is generally in a multi-year cycle of cultivation. The vegetation surveys conducted as part of the EIS estimate that of the 445 ha Development Footprint, 104 ha is covered by native vegetation (~23%) which is mostly native trees with an understorey of degraded native species quality and grasslands of native grass species tolerant of disturbance.

The native vegetation types are described as ‘Plant Community Types’ (PCTs) (the standard NSW process for vegetation description) which are categorised according to different dominant species. Those PCTs are further described in broad condition types describing native species assemblage and structural integrity, e.g. ‘woodland’ or a ‘derived native grassland’. The vegetation zones and areas of the Development Footprint occupied are:

Vegetation Zone # | PCT | Condition | Area (ha)

- 1 | BR240: White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion | Woodland (Poor)* | 3.89

- 2 | BR240: White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion | Derived Native Grassland (DNG)* | 41.2

- 3 | BR272: Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion | Woodland (Poor)* | 10.58

- 4 | BR272: Blakely's Red Gum - Yellow Box grassy woodland of the New England Tableland Bioregion | DNG | 19.75

- 5 | BR153: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tableland Bioregion and NSW North Coast Bioregion | Woodland (Poor)* | 15.83

- 6 | BR153: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tableland Bioregion and NSW North Coast Bioregion | DNG* | 12.85

All meet the criteria for the NSW *Biodiversity Conservation Act* 2016 (BC Act) listed Endangered Ecological Community (EEC): White Box Yellow Box Blakely’s Red Gum Woodland.

Some parts of the vegetation zones designated by * above meet the criteria for the Commonwealth EPBC Act-listed Critically Endangered Ecological Community (CEEC): White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

These vegetation zones are of relatively low quality as measured using quantitative methods designated in the NSW assessment requirements (the FBA as designated in the SEARs). Their landscape occurrence and general characteristics are described below.

PCT510 (BR272) occurs within the north-east of the development site on chocolate soils that are relatively fertile. This PCT exists as scattered trees within cultivated paddocks. The dominant canopy species within this PCT is *Eucalyptus blakelyi* (Blakely's Red Gum). The mid-storey is absent and native groundcover is largely absent due to extensive agricultural practices. There are areas of native grassland adjacent to remnant trees that have been mapped within the development site as the Derived Native Grassland (DNG) of this PCT. Native grasses growing within the DNG component of this community have persisted following agricultural impacts. Portions of the woodland component of this PCT are consistent with the Endangered Ecological Community (EEC) listing for White Box Yellow Box Blakely's Red Gum Woodland under the NSW *Biodiversity Conservation Act 2016* (BC Act) and with the guidance material for the Critically Endangered Ecological Community (CEEC) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act), also known as 'Box Gum Woodland'. Grassland areas of this PCT are heavily degraded but have been included in the BC Act TEC listing for Box Gum Woodland. The DNG component of this PCT does not meet the EPBC Act TEC.

PCT921: (BR153) occurs on hilltops and slopes throughout the development site, and also exists as scattered trees within cultivated paddocks. The dominant canopy species within this PCT are *Eucalyptus viminalis* (Manna Gum), *Eucalyptus melliodora* (Yellow Box), and *E. blakelyi*. The mid-storey is absent and native groundcover is largely absent due to extensive agricultural practices. Portions of the woodland component of this PCT are consistent with the NSW and EPBC Act listing for Box Gum Woodland. Grassland areas of this PCT are heavily degraded but meet the requirements for the BC Act and EPBC Act TEC listing for Box Gum Woodland.

PCT1383 (BR240) occurs within the south of the development site in lower altitudes and exists as scattered trees within cultivated paddocks. The only present canopy species is *Eucalyptus albens* (White Box). The mid-storey is absent and native groundcover is largely absent due to extensive agricultural practices. Portions of the woodland component of this PCT are consistent with the NSW and EPBC Act listing for Box Gum Woodland. Grassland areas of this PCT are heavily degraded but have been included in the BC Act TEC listing for Box Gum Woodland. Portions of the DNG component of this PCT meet the EPBC Act TEC.

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

Solar farms are typically built on flat country of low relief. Whilst the surrounding wind farm occurs on hilly, ridgeline country, the Proposed Development layout is in relatively flatter areas in and around the wind farm ridges. The Site is generally an undulating landscape, where elevation ranges between 810 m AHD at its lowest point in the south west of the Development Footprint to 1000 m AHD in the northern part of the Development Footprint.

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

The Site is an agricultural landscape. It has been historically cleared and grazed for sheep and cattle production and is typical of farmland in the region. As described in section 3.5, it is estimated that only ~23% of the Development Footprint is covered by native vegetation (~23%) which is mostly native trees with an understorey of degraded native species quality and grasslands of native grass species tolerant of disturbance. A number of stock dams have been developed across the Site. A considerable portion of the Site has been cultivated for improved pasture and other fodder crops. Surrounding land uses include: Agriculture, Sapphire exploration and mining, and Wind farm operation.

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

A heritage assessment is being undertake as part of the EIS process to satisfy the SEARs which includes analysis of heritage values of the site. The historic heritage assessment was undertaken in accordance with the *NSW Heritage Manual* (NSW Heritage Office & NSW Department of Urban Affairs and Planning, 1996), specifically the guidelines *Assessing Significance for Historical Archaeological Sites and 'Relics'* (Heritage Branch Department of Planning, 2009), and with reference to the Burra Charter (the Australian ICOMOS Charter for Places of Cultural Significance) (ICOMOS (Australia), 2013).

Searches of relevant databases for the Inverell Local Government Area (LGA) area identified no listed heritage items in the Development footprint. Items identified on the relevant databases were few, and all greater than 5 km away from the Development Footprint. The analysis undertaken as part of the EIs concluded that no impacts would occur to these items from the Proposed Development.

The on-ground historic heritage survey identified one item of potential heritage significance near the Development Footprint: an old telephone pole located adjacent to Waterloo Road. The pole is still standing between the tall current electricity pole to the right, and the stand of eucalypts in the paddock. It is formed from an undressed tree trunk and has two glass insulators affixed to its upper section. The pole is well outside areas of the Proposed Development and does not satisfy any criteria for heritage listing.

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

A heritage assessment is being undertake as part of the EIS process to satisfy the SEARs which includes analysis of heritage values of the site (including Indigenous heritage: referred to as an Aboriginal Cultural Heritage Assessment (ACHA). Consultation has been undertaken with the Indigenous groups in accordance with the NSW OEH's Aboriginal cultural heritage consultation requirements for proponents (DECCW 2010b).

The ACHA has been guided by the specifications set out in the following documents:

- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales (OEH, 2011); and

- Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW, 2010b).

The study has sought to identify and record Aboriginal cultural areas, objects or places, assess the archaeological potential of the proposal area and formulate management recommendations based on the results of the community consultation, background research, field survey and a significance assessment.

A search of the NSW OEH Aboriginal Heritage Management Information System (AHIMS) has been conducted for this project on 8 September 2017 (AHIMS Reference: #300555). The search area measured 432 km² and encompassed the area between eastings 339000 – 363000, and northings 6703000 – 6721000. Twenty seven Aboriginal object sites are listed for the search area (although three are duplicate recordings). None of those AHIMS records occur in the Development Footprint.

The results of a field survey conducted 6-9 November 2017 identified 15 Aboriginal object sites including (but not limited to) stone artefacts and an unconfirmed scarred tree. Most were assigned a significance of low (n=9), with some low/moderate (n=-5) and one potentially moderate. Many of those (including the latter) will be outside of the Development Footprint.

The ACHA concluded with recommendation including:

- No further archaeological investigations are required in respect of the proposal. No areas were identified that could be characterised as places with a high probability of possessing subsurface Aboriginal objects with high potential conservation value. Accordingly, archaeological test excavation has not been undertaken in respect of the proposal as it could not be justified (DECCW 2010a).

- Management and mitigation strategies are set out in Section 7 of the ACHA. These should be used to formulate appropriate Statement of Commitments to condition Development Approval.

- It is recommended that additional archaeological assessment is conducted in any areas which are proposed for impacts that have not been surveyed during the current assessment. It is predicted that significant Aboriginal objects can occur anywhere in the landscape and, accordingly, they need to be identified and impact mitigation strategies implemented prior to impacts. The assessment may be conducted by predictive modelling, if appropriate.

- The proponent should develop a Cultural Heritage Management Plan for the appropriate management and mitigation of development impacts during any further planning and project construction. The development of an appropriate Cultural Heritage Management Plan should be undertaken in consultation with the project archaeologist, the registered Aboriginal parties and the NSW OEH.

- The Cultural Heritage Management Plan would be prepared to guide the process for

management and mitigation of impacts to Aboriginal cultural heritage and to set out procedures relating to the conduct of additional archaeological assessment, if required, and the management of any further Aboriginal cultural heritage values which may be identified.

- Personnel involved in the construction and management phases of the project should be trained in procedures to implement recommendations relating to cultural heritage, as necessary.

- Cultural heritage should be included within any environmental audit of impacts proposed to be undertaken during the construction phase of the development.

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

All land is freehold.

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

The Proposed Development is agricultural land. In the absence of the Proposed Development, the likely future landuses would be primarily agricultural. Some areas of the Development Footprint are within Mining Lease (ML) and Exploration Licence (EL) areas (four in total: two of each). ML1687, ML1374 and EL8536 are held by Eastern Feeder Holdings Pty Ltd, and EL8230 by Bond Resources Pty Ltd. Consultation with Eastern Feeder Holdings Pty Ltd has resulted in agreement for SSF to progress with the proposal within ML1687, ML1374 and EL8536. To facilitate ongoing activities in the area by Eastern Feeder Holdings Pty Ltd, Coordination Deeds between the parties are in the process of being drafted. Consultation with Bond Resources Pty Ltd has confirmed their acceptance of SSF insofar as it impacts upon EL8230.

Should the Proposed Development occur, it will not be preclusive of some agricultural use. The future landuse can remain as agricultural because sheep grazing can occur in the solar PV panel areas with sheep able to freely pass underneath the panels.

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 Development Footprint has evolved through an iterative process involving refining the Proposed Development from an initial broader area based on the goal to avoid environmental impacts. Specifically relating to biodiversity, the following avoidance measures have been considered in designing the Development Footprint:

- The Proposed Development has been selected to integrate with the approved SWF development, sharing infrastructure and facilities in order to minimise the area required for the Development Footprint.

- The broader study area has been subject to multiple previous NSW and Commonwealth assessments as part of the SWF approvals process. Biodiversity values were first identified within the Site by ELA from 2011, identifying areas of key biodiversity significance within the SWF boundary. Previous assessments were reviewed when planning the SSF Development Footprint. The footprint has undergone several iterations including a significant reduction since preparation of the PEA, with the final footprint avoiding as much CEEC as practicable.

- As part of the current assessment, desktop and field assessments were conducted within the Site in 2017 by Environmental Property Services Pty Ltd (EPS) to determine the areas of native vegetation cover, EECs or CEECs, and potential habitat for threatened species. This preliminary assessment informed the areas to avoid in order to minimise the environmental impact of the footprint. The current development footprint reflects the retention, where possible, of existing biodiversity within the Site.

- Given the nature of the Proposed Development, the Site is predominantly situated within existing cleared agricultural land. The constraints identification and iterative design process has led to the current Development Footprint. This Development Footprint is the alternative to earlier designs with substantial ecological impact avoidance applied.

Residual impacts will be managed and mitigated in management plans which are a standard conditional approval requirement of the NSW SSD approvals process. These will be prepared in liaison with relevant NSW Government agencies. With regard to biodiversity MNES,

management measures to minimise the construction and operational impacts will likely include:

- Installation of sediment barriers, sediment ponds, stormwater management systems, delineation of works zones;

- Weed and pathogen hygiene and management measures;

- Construction works to occur during daylight hours only;

- Use of temporary fencing to demark boundaries and protect retained vegetation;

- Clearing processes for fauna habitats (e.g. hollow-bearing trees);

- Delineation of clearing and access limits;

- Consideration of compensatory ‘artificial’ habitat;

- Management of waste and refuse generation, storage and disposal;

- Management of lightspill and out of hours noise generation;

- Contractor environmental induction.

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.

As identified in Section 2, the only MNES likely to be impacted by the Proposed Development is the CEEC White Box Yellow Box Blakely’s Red Gum Woodland and Derived Native Grassland.

Up to 66.55 ha (of which 42.86 ha is low quality grassland) of Box Gum Woodland may be impacted by the proposed action. The footprint acknowledges the extent of the community within the locality, and will retain much larger tranches of the CEEC onsite.

As a result of the removal of the CEEC, formal offsets will be proposed under the FBA, which will involve sourcing of credits from land secured in perpetuity under a BioBanking Agreement. The extent, location, and condition of proposed offsets will be publicly exhibited via the NSW EIS process.

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

Listed threatened species and communities - Yes

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.

Not applicable.

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, the proponent has a satisfactory record of responsible environmental management.

The Proposed Development is being undertaken by Sapphire Solar Farm Pty Ltd, who's related entity CWP Renewables, is a well-established Australian renewable energy company currently responsibly managing other operations in Australia.

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.

Sapphire Solar Farm Pty Ltd will be able to leverage from the experience of its related entity, CWP Renewables, which has significant experience developing, constructing and operating renewable energy projects in Australia. CWP Renewables has construction and operational management systems that are both legislatively compliant, but also best practice.

Construction contractor selection will focus scrutiny on past environmental performance, and

proposed environmental management measures.

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.

Whilst Sapphire Solar Farm Pty Ltd has not previously referred a project to the Minister under the EPBC Act, its related entity, CWP Renewables, has developed (and is in the process of developing) several projects previously referred:

2013/7026 - Uungula Wind Farm

2013/6810 - Bango Wind Farm

2011/6206 - Crudine Ridge Wind Farm

2011/5854 - Sapphire Wind Farm

2009/4905 - Boco Rock Wind Farm

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
Australian ICOMOS Charter for Places of Cultural Significance (ICOMOS Australia). (2013). The Burra Charter.	High. Australian Government guidance.	Nil
CWP Solar Pty Ltd. (2017). Sapphire Solar Farm Preliminary Environmental Assessment. CWP Renewables	High. Recent ecological assessment	Updated by ELA 2017
Department of Environment, Climate Change and Water NSW (2010). National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Department of Environment, Climate Change and Water NSW, Sydney. Available from: http://www.environment.gov.au/biodiversity/threatened/publications/recovery/white-and-yellow-box.html.	High. Australian Government reference material. In effect under the EPBC Act from 22-Mar-2013	Nil
Eco Logical Australia Pty Ltd (ELA). (2011). Sapphire Wind Farm part 3A Ecological Assessment. Prepared for Wind Prospect CWP.	High. Recent ecological assessment.	Nil
Eco Logical Australia Pty Ltd (ELA). (2017). Sapphire Solar Farm Environmental Impact Statement. Prepared for CWP Solar.	High. Recent ecological assessment.	Nil
Environmental Property Services Pty Ltd (EPS) 2017. Sapphire Solar Farm –	High. Recent ecological assessment.	Preliminary mapping updated by ELA 2017

Reference Source	Reliability	Uncertainties
Preliminary Ecological Constraints Assessment. Prepared for CWP Renewables		
Fairfull, S. & Witheridge, G. (2003). Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings. NSW Department of Primary Industries.	High. Published reference material.	Nil
Heritage Branch of the Department of Planning. (2009). Assessing Significance for Historical Archaeological Sites and 'Relics'. Heritage Branch of the Department of Planning, Sydney.	High. Australian Government guidance.	Nil
NSW Department of Environment, Climate Change & Water (DECCW). (2010b). Due Diligence Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales.	High. NSW Government guidance. NSW OEH's Aboriginal cultural heritage consultation requirements for proponents	Nil
NSW Department of Environment, Climate Change & Water (DECCW). (2010a). Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. Department of Environment, Climate Change & Water, Sydney.	High. NSW Government guidance.	Nil
NSW Department of Planning & Environment (DP&E). (2016). NSW Planning Portal. Retrieved from: https://www.planningportal.nsw.gov.au/	High. NSW Government guidance.	Nil
NSW Department of Primary Industries (NSW DPI). (2004). Policy and Guidelines for Fish Friendly Waterway Crossings. NSW Department of Primary Industries, Sydney.	High. NSW Government guidance.	Nil
NSW Heritage Office & NSW Department of Urban Affairs and Planning. (1996). NSW Heritage Manual. NSW	High. NSW Government reference material.	Nil

Reference Source	Reliability	Uncertainties
Heritage Office & NSW Department of Urban Affairs and Planning, Sydney.		
NSW Office of Environment & Heritage (OEH). (2011). Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW. NSW Office of Environment and Heritage, Sydney.	High. NSW Government guidance.	Nil
NSW Office of Environment & Heritage (OEH). (2012). The land and soil capability assessment scheme – second approximation. NSW Office of Environment and Heritage, Sydney. The eight class soil classification system (OEH, 2012)	High. NSW Government guidance.	Nil
NSW Office of Environment & Heritage (OEH). (2017). Aboriginal Heritage Management Information System (AHIMS) search on 8 September 2017 (AHIMS Reference: #300555)	High. NSW Government guidance.	Nil
NSW Office of Water (NOW). (2012). Water Sharing Plan for the NSW Border Rivers Unregulated and Alluvial Water Sources commenced on 1 June 2012	High. NSW Government guidance.	Nil
NSW Rural Fire Service (RFS). (2006). Planning for Bushfire Protection: A guide for Councils. Planners, Fire Authorities and Developers. NSW Rural Fire Service.	High. NSW Government guidance.	Nil
Office of Environment and Heritage (OEH) (2016). BioBanking Credit Calculator version 4.0	High. NSW Government guidance.	Nil
SMA Solar Technology. (2017). PV Power Plants. Retrieved from http://www.sma-australia.com.au/industrial-systems/pv-	High	Nil

Reference Source	Reliability	Uncertainties
power-plants.html		
Wind Prospect CWP Pty Ltd (CWP). (2012). Proposed Development Sapphire Wind Farm Northern New South Wales: Preferred Project Report and Responses to Submissions. Prepared for Sapphire Wind Farm Pty Ltd.	High. Reconnaissance Soil Landscape Mapping for the Border Rivers Gwydir Catchments 1: 100 000 mapsheet	Nil
Strahler (1952), Hypsometric (area-altitude) analysis of erosional topology, Geological Society of America Bulletin 63 (11): 1117–1142	High. Published reference material.	Nil
Threatened Species Scientific Committee (2006). Commonwealth Listing Advice on White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/box-gum.html. In effect under the EPBC Act from 18-May-2006	High: NSW TSSC advice.	Nil

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?

This is a unique circumstance where the consideration of alternative locations is marginalised by the opportunity to co-locate a solar and battery project with a wind farm and connection asset, already consented and under construction, to establish the New England / Sapphire Renewable Energy Hub. Decisions around alternatives will be made during detailed design with a view to minimising environmental and social impacts while maintaining the investment viability, however these will occur at the micro scale rather than macro, site selection, level. There are no feasible alternatives proposed.

Avoidance measures which have been undertaken (refer section 4) were part of the evolution of the Proposed Development as alternatives to the original design to reduce ongound impacts, although the original designs have not been retained and were built in to the design.

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

Director

9.2.2 First Name

Ed

9.2.3 Last Name

Mounsey

9.2.4 E-mail

ed.mounsey@cwpr.com.au

9.2.5 Postal Address

PO Box 1708
Newcastle NSW 2300
Australia

9.2.6 ABN/ACN

ACN

620649069 - Sapphire Solar Farm Pty Ltd

9.2.7 Organisation Telephone

+61240134640

9.2.8 Organisation E-mail

admin@cwprenewables.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, Edward Mounsey, 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: 15/12/17

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

Signature:..... Date: 15/12/17

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Director

9.5.2 First Name

Ed

9.5.3 Last Name

Mounsey

9.5.4 E-mail

ed.mounsey@cwpr.com.au

9.5.5 Postal Address

PO Box 1708
Newcastle NSW 2300
Australia

9.5.6 ABN/ACN

ACN

620649069 - Sapphire Solar Farm Pty Ltd

9.5.7 Organisation Telephone

+61240134640

9.5.8 Organisation E-mail

admin@cwprenewables.com.au

Proposed designated proponent - Declaration

I, Edward Mounsey, 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: 15/12/17

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Head of Development

9.8.2 First Name

Ed

9.8.3 Last Name

Mounsey

9.8.4 E-mail

ed.mounsey@cwpr.com.au

9.8.5 Postal Address

PO Box 1708
Newcastle NSW 2300
Australia

9.8.6 ABN/ACN

ABN

57127205645 - CWP RENEWABLES PTY LTD

9.8.7 Organisation Telephone

+61240134640

9.8.8 Organisation E-mail

admin@cwprenewables.com.au

Referring Party - Declaration

I, Edwards Mounsey, 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: 15/12/17

Appendix A - Attachments

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

1. 171212_ssf_proposed_layout_context_lowres.pdf
2. 171215_footprint_bggw_data.zip
3. 171215_ssf_cwpr_s1.2.pdf
4. 171215_ssf_cwpr_s1.7.2.pdf
5. fig6_tec_map_bar_v2.jpg