Chapter 12 – Land Use and Transport

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12 Land Use and Transport

12.1 Introduction

The NT EPA's objective for the Community and economy factor is to:

> *Enhance communities and the economy for the welfare, amenity, and benefit of current and future generations of Territorians*.

This chapter assesses the potential impacts to current and future land uses, utilities, traffic, and transport (including air and marine transport) that were not fully addressed in the Draft EIS. The potential impacts in this chapter were identified with reference to the project refinements detailed in Chapter 2, impacts identified in the direction issued by the NT EPA (Appendix 1.1), issues raised by stakeholders (Section 12.10 and Appendix 1.3) and professional judgement of the EIS team (Appendix 1.5). Potential impacts were assessed using the EIA methods described in Chapter 3 Impact assessment of the Draft EIS, and as summarised in Chapter 1 of this SEIS. This chapter presents the findings of the EIA process undertaken for the Land Use and Transport factors.

12.2 Information Sources

Since the Draft EIS was lodged, the following reports have been prepared that consider project infrastructure locations and the potential impacts on land use and transport:

- Constraints Planning and Field Development Procedure (Appendix 4.1)
- SIMP (Appendix 3.2)
- Environmental Design Criteria and Standards (Appendix 2.1)
- Land Based Electrode Technical Report (Appendix 12.1).

12.3 Project Refinements Since Draft EIS

Since the Draft EIS has been lodged, the following project refinements (see Chapter 2) with additional footprint or impacts, have been made which require assessment in this chapter:

- Electrode locations were selected (see Appendix 12.1 for selection process)
- Preferred OHTL Corridor
- AI located outside the solar precinct footprint.

In addition, several proposed land uses have been identified that were not assessed in the Draft EIS and are detailed in Section 12.4.1.

DIPL notes that discussion on marine transportation is not evident in Chapter 13 - Community and Economy of the Draft EIS (refer Section 12.10.2.9). The Proponent acknowledges that marine transportation was not explicitly discussed in Chapter 13 – Community and Economy of the Draft EIS. However, marine transportation was discussed and assessed in other parts of the Draft EIS, namely:

- Chapter 2 – Project Description of the Draft EIS
- Appendix K – Traffic Impact Assessment of the Draft EIS.

As discussed in Chapter 2 – Project Refinement, no significant modifications to the Subsea Cable System route, construction or operation phases are proposed. Therefore, the assessment undertaken for these components in the Draft EIS is considered sufficient. The information presented in this chapter regarding marine transportation is solely for the purpose of addressing the DIPL submission and providing a summary of the information presented in the Draft EIS.

12.4 Existing Environment and Values

12.4.1 Existing land uses

The following project refinements have included additional footprint which require consideration in this chapter:

- Powell Creek Electrode
- DCS Electrode
- Preferred OHTL Corridor
- Powell Creek AI (see Figure 2-1).

The Powell Creek Electrode and AI are within the same pastoral station as the Solar Precinct. This land is unzoned and predominantly used for pastoral purposes. The proposed DCS Electrode and the HVDC Electrode Line Corridor is on land identified as Zone A (Agriculture) pursuant to the NT Planning Scheme 2020.

The DCS and Cable Transition Facilities are on land currently identified as Zone FD (Future Development). This is an interim zone intended to facilitate implementation of potential future land uses identified in the Litchfield Sub-Regional Land Use Plan. The DCS and Cable Transition Facilities are identified as having potential to develop for future urban/peri-urban land uses.

Future land use plans associated with this footprint are included in Table 12-1.

12.4.2 Future land uses

Table 12-1 details known future developments occurring along the Project's footprint These future developments were identified by reviewing the NT Major Projects website on 8 November 2022 and identified by stakeholders during consultation. Impacts on existing land uses (such as pastoral activities at the Solar Precinct) are detailed in Chapter 3 of the Draft EIS.

Table 12-1: Future land uses and potential interactions with the Project

Known Development or Proposed Land Use	Project Aspect	Potential Interactions
Mining and Extractive Industries (including oil and gas).	All	Competition for land access and water resources. Vibration from mining impacting on project infrastructure. Potential for sterilisation of resources to maintain appropriate buffers for electrical safety or vibration standards. Cumulative vegetation clearance. Cumulative traffic and transport impacts. Cumulative air quality and GHG impacts.
Barkly Regional Deal and associated developments (including weather radar, youth justice facility, new housing, aerodrome strip upgrades, student boarding facility and smaller infrastructure projects).	OHTL	Competition for workers (Chapter 3 – Stakeholder and Community Engagement). Potentially negligible or minor positive interaction as the Barkly Regional Deal could assist potential future workers on the Project to relocate to the region or encourage them to remain in the region.
Litchfield Sub-Regional Land Use Plan (Gunn Point mapping the future project).	OHTL, DCS, Cable Transition Facilities and Electrode.	Interface issues between DCS, Cable Transition Facility, Electrode and surrounding land uses (predominantly the township of Murrumujuk and the proposed deep sea port at Glyde Point). Potential interactions between proposed future ferry terminal and the Subsea Cable System during operational maintenance.
NTG utilities corridor.	OHTL	Visual amenity impacts on future residential development from the OHTL. Details of visual amenity impacts are addressed in Chapter 10 Amenity. Noise and vibration impacts on future residential development. Details of noise and vibration impacts are addressed in Chapter 10 Amenity. Construction of additional infrastructure within the corridor may require additional safety precautions due to proximity of HVDC line.
Ghan Railway Corridor/line	OHTL	Potential visual amenity impacts of the OHTL for passengers of the Ghan railway. Details of visual amenity impacts are addressed in Chapter 10 Amenity.

12.4.3 Transport

12.4.3.1 DCS Electrode

The DCS Electrode will be located approximately 10 km north-east of the DCS and Cable Transition Facilities. Materials and equipment during the construction phase will need to be transported from East Arm via Howard Springs Road and Gunn Point Road. Howard Springs Road and Gunn Point Road are bituminised and designated road train and oversize load routes. Leaders Creek Boat Ramp Access Road and Saltwater Arm Boat Ramp Road are both unsealed.

The HVDC Electrode Line Corridor connecting the DCS to the Electrode will cross Gunn Point Road and continue along distribution structures parallel to the Leaders Creek Boat Ramp Access Road. The HVDC Electrode Line corridor will then follow a turn off 2 km before Leaders Creek ramp, which provides access to the Saltwater Arm Boat Ramp (refer Figure 2-12 in Chapter 2 - Project Refinement). Detailed design for the Project will consider the best pathway here, including the potential to make use of n corridor directly adjacent to the existing Access Road. Following this alignment provides access to assist with the construction effort and simultaneously reduce the environmental impacts by limiting vegetation clearing associated with the construction effort.

Leaders Creek is north-east of the DCS and Cable Transition Facilities and is a popular tourism and recreational fishing location. As discussed in Appendix I – SIA of the Draft EIS, the Leaders Creek Boat Ramp provides access to the major recreational fishing locations of the Vernon Islands and the Adelaide River delta. The Saltwater Arm Boat Ramp is another popular boat ramp for recreational fishing and access to the mouth of the Adelaide River and is located approximately 4 km south-east for the DCS Electrode site.

Public access along all aforementioned roads will be maintained during both the construction and operational phases of the Project. The Proponent commits to discussing appropriate traffic management measures with the relevant road authority when construction timing and methodology are more refined.

12.4.3.2 Powell Creek AI and Electrode

As discussed in Chapter 2 – Project Refinement, the AI is now located outside the Powell Creek Solar Precinct. Existing transport environment values at the Powell Creek Electrode and AI will remain the same as Powell Creek in that:

- The Stuart Highway will facilitate vehicle turning movements to the Powell Creek Solar Precinct, Electrode and AI
- Two rail sidings are proposed to be constructed at Powell Creek to maximise the use of rail for freight
- During the civil works phase, it is envisaged that the existing Elliott Airstrip will be utilised, up until the establishment of the new Aerodrome.

The preliminary assessment of traffic and transport aspects in the Draft EIS are therefore considered sufficient in assessing the potential impacts for these project refinements. Section 3 – Appendix K of the Draft EIS details the existing conditions of the proposed routes for the Project as per the following breakdown:

- East Arm to Howard Springs
- Howard Springs to Elliott
- Elliott to Powell Creek
- Alice Springs to Elliott
- Existing traffic volumes along the Stuart Highway.

12.4.3.3 Preferred OHTL Corridor

The Draft EIS proposed approximately 788 km of OHTL from Powell Creek to Murrumujuk within the existing railway corridor. Three primary areas of constraint were identified in the Railway corridor at Katherine, Pine Creek and Adelaide River.

A preferred OHTL Corridor approximately 783 km in length has now been identified, subject to further detailed design and ongoing route refinement. An overview of the OHTL Corridor is shown in Figure 2-2 in Chapter 2 - Project Refinement, as well as in Appendix 2.2: OHTL Project Mapping.

Katherine

The preferred OHTL Corridor at Katherine (refer Figure 2-7 in Chapter 2 - Project Refinement) is generally adjacent to the existing railway corridor. The deviation begins at approximately KP 450 to facilitate crossing the Victoria Highway before navigating through several parcels of land and crossing the Katherine River. Once on the northern side of the Katherine River, the preferred OHTL Corridor is generally aligned with the railway corridor to minimise the potential for impacts to occur. The OHTL Corridor re-enters the railway corridor at approximately KP 467.

Pine Creek

The preferred route at Pine Creek (refer Figure 2-8 in Chapter 2 - Project Refinement) begins at approximately KP 542 and is generally adjacent to the railway corridor on the eastern side of the Stuart Highway. This alignment extends for approximately 2 km until the OHTL Corridor preferences proximity to the railway corridor, crosses the Kakadu highway and re-enters the railway corridor at approximately KP 546.

Adelaide River

The OHTL preferred route at Adelaide River (refer Figure 2-9 in Chapter 2 - Project Refinement) begins at approximately KP 620 and extends east of the township predominantly through pastoral and rural land. The OHTL re-enters the railway corridor west of Lake Bennett at approximately KP 690. The spatial constraints of the existing Railway Corridor and complexities with re-entering the railway corridor earlier than KP 690, results in this re-alignment being the longest at approximately 65 km.

12.4.3.4 Subsea Cable System

As noted in Section 12.3, the information presented in this chapter regarding marine transportation (and by extension the Subsea Cable System) is solely for the purpose of addressing the DIPL submission (12.10.2.9) and providing a summary of the information presented in the Draft EIS.

As discussed in Chapter 2 of the Draft EIS, the Subsea Cable System Corridor commences from the Cable Transition Facilities at Gunn Point Beach in Murrumujuk, 31 km north-east of the Port of Darwin. The Subsea Cable System continues through Indonesia to Singapore, with approximately 748 km of the cable length located within the AEEZ and overall CWTH Marine Area. The cable corridor partially enters the NAXA, which is utilised by the Australian Department of Defence. Due to its length spanning to the edge of the CWTH Marine Area and proximity to Port of Darwin, the Subsea Cable System intersects many current and planned shipping channels used by other marine transport, including:

- Recreational transport (such as recreational fishing vessels)
- Commercial shipping vessels and public transport (such as ferries)
- Department of Defence vessels.

The Subsea Cable System for the Project will initially comprise three cables spaced 50 – 200 m apart depending on marine benthic environment features. Provision for up to six cables has been incorporated to allow for potential increases in transmission capacity, subject to statutory requirements.

12.5 Potential Impacts

The potential impacts to land use and transport have been assessed using the EIA methodology described in Chapter 3 of the Draft EIS and are summarised in Chapter 1 of this SEIS. The following impacts were identified and assessed as possibly occurring during construction and/or operations and were not addressed in the Draft EIS to the satisfaction of all stakeholders:

- Potential impacts of the project on future land uses
- Impacts from Electrodes on existing and proposed infrastructure
- Interference with aviation/flight paths and shipping channels (current and planned)
- Reduced amenity from congestion on the roads and delays with project traffic.

12.5.1 Areas of Potential Impact (Direct and Indirect)

The area of direct disturbance is shown on maps and described in Chapter 2 Project Refinement. This includes transport networks that are intersected by the Project.

The area of indirect disturbance for the Electrode extends to a 10 km radius for potential to cause electrical interference and increased corrosion from electrical current. Potential impacts of the Electrode on soils and human health have been described in Chapter 4 TEQ and Chapter 14 Human Health.

Indirect disturbance related to transport construction and operation aspects includes transport networks in surrounding areas that may experience a temporary impact on amenity from construction related traffic on public roads.

No additional impacts to marine transport and shipping channels have been identified and the assessment undertaken for these aspects in the Draft EIS is considered sufficient. Therefore, no further assessment has been undertaken in this SEIS.

The main impact on aviation would be potential safety issues with the OHTL interactions, which is discussed in Chapter 14 - Human Health.

12.5.2 Future Land Use

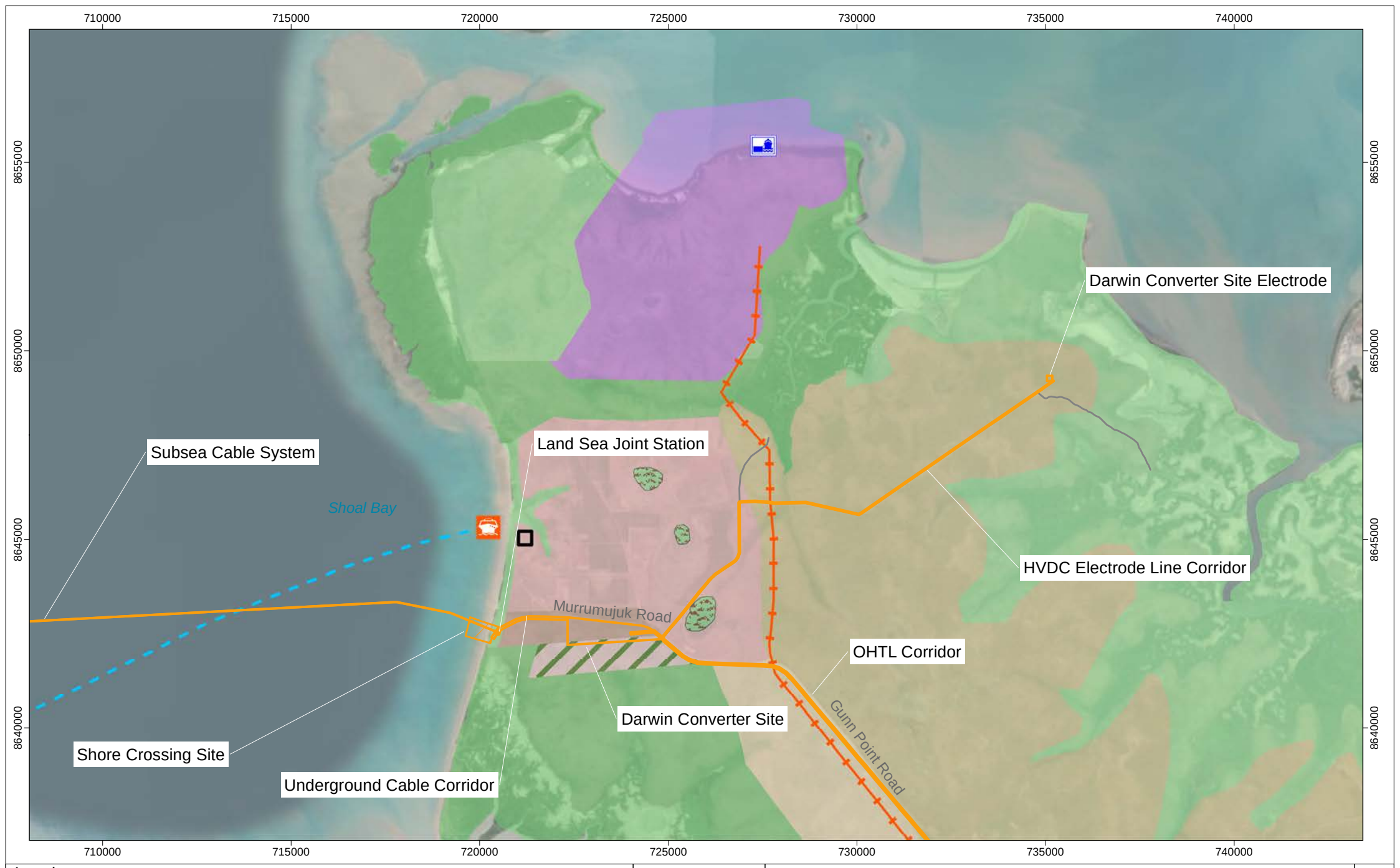
The Draft EIS stated there would be no anticipated impacts of the Project on adjacent land uses (current and future). To address the comments from NT EPA, the following assessment of land use surrounding the precinct is included.

Future Development Potential Murrumujuk

The DCS and Cable Transition Facilities are on land currently identified as Zone FD (Future Development). This is an interim zone intended to facilitate implementation of potential future land uses identified in the Litchfield Sub-Regional Land Use Plan 2016 (the Land Use Plan). The DCS and Cable Transition Facilities are identified as having potential to develop for future urban/peri-urban land uses.

In June 2020, NTG released a report on the Development Potential of the Gunn Point Area and updated the Land Use Plan to account for the findings of the report in August 2021. The Land Use Plan guides the strategic land uses for the region but does not provide a guarantee that these land uses will be established or prevent different land uses from being proposed.

The Land Use Plan identifies Murrumujuk as a potential township development to supply workers to the industrial hub and deep sea port proposed to be built at Glyde Point. A utilities corridor (including a new rail line) is proposed to link the two areas along with a ferry link from Murrumujuk to Darwin. Project infrastructure and its relationship with the Land Use Plan is shown in Figure 12-1.



Legend

- AAPowerLink Infrastructure

Litchfield Sub-regional land uses

- Planned Town Centre
- Potential Ferry Terminal
- Potential Sea Port
- Planned Ferry Route
- Planned Railway
- Grazing / Agriculture
- Mangrove / Conservation
- Open Space / Natural Area
- Rural Area
- Strategic Industry
- Urban / Peri-Urban
- Paperbark Swamps
- Potential Future Development (Aquaculture)
- Potential Rural Residential in response to biting insects

Source: NTG data - Cadastre and roads. Imagery: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

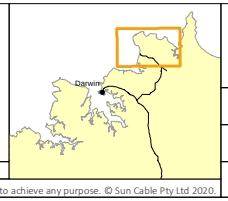


Figure 12-1: Litchfield Sub-Regional Land Use Plan and Project Infrastructure

Project: Australia-Asia PowerLink	Reference #: AAPL_GNR_CTA_GEN_MAP_0320	Figure: 1 of 1	Revision: A
Coordinate System: MGA 52	Datum: GDA2020	Date: 08/11/2022	
0 1 2 3 4 5 Kilometres		Scale: 1:125,000	A4

N

SUN CABLE AUSTRALIA-ASIA PowerLink

Potential interactions between project infrastructure and the Land Use Plan include:

- DCS providing a source of employment adjacent to the proposed Murrumujuk township
- Potential impacts from operational noise to the proposed Murrumujuk residential area will be within acceptable levels. Minor noise impacts are anticipated during construction works, also taking into account the uncertainty around timing of any development in accordance with the Land Use Plan for the area
- Potential impacts of the Electrode on proposed infrastructure (including deep seaport at Glyde Point) are easily mitigated using cathodic protection (see Appendix 12.1).

These interface issues can be easily addressed by the project design and implementation of appropriate management plans during construction and operations. The Project is broadly consistent with the objectives of the Land Use Plan and will not undermine the strategic land uses identified for the locality.

NTG Utilities Corridor

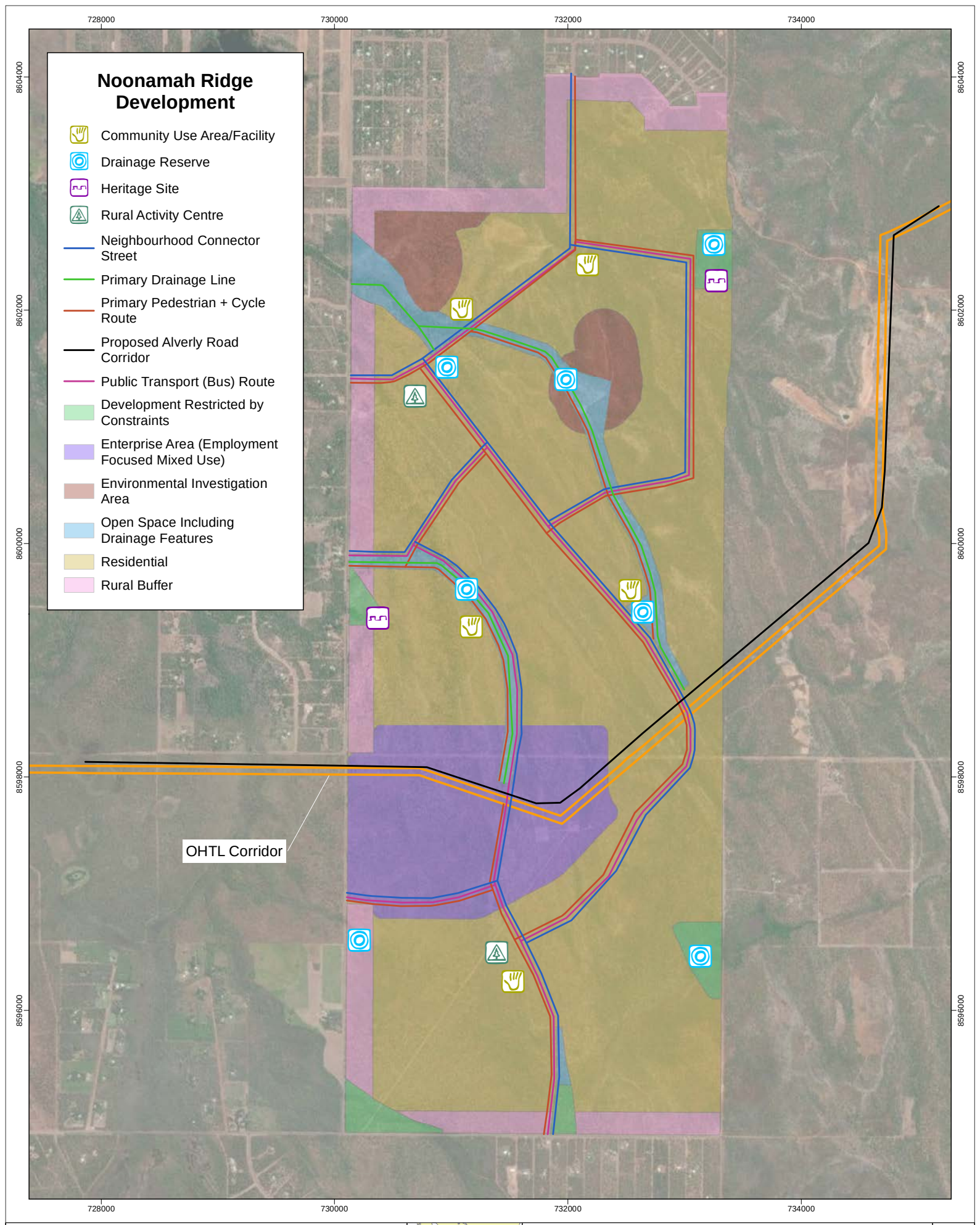
The OHTL is proposed within the NTG utilities corridor from Livingstone to the DCS at Murrumujuk. This NTG corridor is identified in the Land Use Plan for strategic utility scale infrastructure. The proposed OHTL is therefore consistent with the objectives of the Land Use Plan. Transmission structures (poles or towers) will be spaced approximately every 200-400 m and be approximately 60 m in height. The OHTL Corridor width required for construction purposes is approximately 60 m wide. The Project is not seeking sole occupation of the NTG utilities corridor and anticipates that other infrastructure will be located within the corridor.

Noonamah Ridge Development/Lloyd Creek Rural Village

The proposed OHTL Corridor in the NTG utilities corridor extends through the proposed residential development currently forecasted to contain approximately 4,200 homes, two rural activity centres and social infrastructure including provision of services. The EIS for this development was approved in 2017 subject to several conditions and it is proposed to be constructed over a 30-year period. The location of the proposed development in relation to the OHTL Corridor is shown in

Figure 12-2. It is noted that when he Noonamah Ridge EIS was being assessed, the NTG Utilities and Transport Corridor was shown in the Land Use Plan.

Some interface impacts such as noise and dust could occur during the construction phase of the Project if the eastern extent is developed in accordance with the timeframes slated in the EIS. However, the forecast construction timing indicates that the first residential area developed adjacent to the OHTL Corridor is not proposed until year 19 of the development, by which time OHTL construction will have been completed. During the operational stage of the Project, the key main potential impact is considered to be visual amenity (refer to Chapter 10 Amenity).



Legend

OHTL Corridor

Figure 12-2: Noonamah Ridge Development and Project Infrastructure

Project: Australia-Asia PowerLink

N

0 400 800 1,200 1,600 Meters

Reference #: AAPL_GNR_CTA_GEN_MAP_0321

Date: 15/11/2022 | Figure: 1 of 1 | Revision: A

Scale: 1:40,000 | Datum: GDA2020

Coordinate System: MGA Zone 52 | A4

Source: NTG data - Parks and reserves. Australian Government data - Railway, roads, coastal waters and marine parks

SUN CABLE AUSTRALIA-ASIA PowerLink

12.5.3 Construction

12.5.3.1 Potential Impacts of the Project on Future Land Uses

Future land uses identified in the NTG's strategic planning policies and proposed developments along the Project's footprint will be continuously evaluated to ensure potential land use conflicts during construction and operations are identified and manage appropriately.

12.5.3.2 Impacts from Electrodes on Existing and Proposed Infrastructure

Potential impacts from the Electrodes on infrastructure are resulting from the operation of the Electrode and thus will not occur during the construction period (see Appendix 12.1).

12.5.3.3 Interference with Aviation/flight Paths and Shipping channels (current and planned)

AI, Powell Creek Electrode and OHTL Corridor

As discussed in Chapter 2 - Project Refinement, the AI is now located outside the Powell Creek Solar Precinct. However, access and transport logistics to the Powell Creek Electrode and AI will remain the same as the Powell Creek Solar Precinct whereby:

- Temporary Construction Accommodation will be established to accommodate the construction workforce required for the Solar Precinct early works including the construction of the Aerodrome
- The new Aerodrome will enable a Fly-in-Fly-out (FIFO) workforce to be mobilised for the construction phase and during the operational phase
- A large portion of initial workforce will fly-in for their roster predominantly from Darwin during the civil and earthworks preparation of the Powell Creek Solar Precinct. It is envisaged that the Elliott Airstrip will be utilised until the Powell Creek Solar Precinct's Aerodrome is operational.

As discussed in Appendix I – SIA of the Draft EIS, the main impact on aviation would be increased safety risks from proposed project charter flights interacting with helicopters and light planes operating on pastoral properties around the Solar Precinct. Potential safety impacts to aircraft due to the OHTL are assessed in Chapter 14 – Human Health.

Project Logistics at sea

As noted in Section 12.3, the information presented in this chapter regarding marine transportation is solely for the purpose of addressing the DIPL submission (12.10.2.9) and providing a summary of the information presented in the Draft EIS.

As discussed in Section 2.4.3.1 of the Draft EIS, it is estimated that up to 5,000 containers per month will be imported through Darwin Port throughout the construction phase. It is intended to use dedicated shipping charter vessels for freight. Containers and project cargo will be cleared from the Port via road transport to the pre-assembly and distribution centre, which is co-located with the logistics facility at East Arm, or direct to the works areas via rail or road transport. Port capacity modelling of Port of Darwin is being undertaken and a Port Working Group has been established with representatives from Darwin Port, the stevedores and the NTG. The Working Group will address and act on the recommendations arising from the port capacity modelling, including the measures to increase the capacity and productivity at the Port of Darwin in preparation for the Project's commencement.

Subsea Cable System

As noted in Section 12.3, the information presented in this chapter regarding marine transportation (and by extension the Subsea Cable System) is solely for the purpose of addressing the DIPL submission (12.10.2.9) and providing a summary of the information presented in the Draft EIS.

As discussed in Chapter 2 – Proposal Description of the Draft EIS, construction of the Subsea Cable System would be facilitated by the following marine transportation:

- Specialist CLV
- Guard vessels
- Survey vessels
- Anchored or jack-up barge.

Specialised marine vessels would be utilised to undertake geophysical and marine environment surveys prior to construction and to undertake a post-lay survey of the Subsea Cable System to demonstrate burial and depth of cables.

The laying of the subsea cables would be undertaken by a specialist CLV or CLB. CLVs are typically used in water depths of 10 m or more. For shallower waters, a CLB is used, which has the same cable lay equipment as a CLV (i.e., carousels, tensioners, winches) but is not equipped with engines or thrusters. Photo examples of a CLV and CLB are shown in Figure 2-50 and Figure 2-51 of the Draft EIS. Guard vessels may be involved with the operation.

Cable laying can progress at speeds of typically 400 to 500 m/hour (up to 600 m/hour) and will be performed on a 24-hour basis to ensure minimal navigational impact on other users and to maximise efficient use of applicable weather conditions and vessel and equipment time. At this rate, laying of the Subsea Cable System within the CWTH Marine Area is anticipated to take about two months per cable/cable bundle, excluding any time for loading, unloading and offshore jointing.

The TOR requires a description of the potential impacts to shipping channels (current and planned). The Subsea Cable System will comprise up to six cables installed over approximately 748 km, spaced 50-200 m apart. Cable installation will disturb a 12 m wide area of seabed around each cable. The Subsea Cable System would form a narrow linear corridor in the context of the surrounding marine environment. Construction activities would therefore be localised at any one point in time and occur in a largely linear fashion, meaning that other vessels have greater capacity to manoeuvre around cable laying activities.

The nature of the construction, maintenance and repair processes means that cable laying vessel speeds will be low. Collisions with other boating traffic as cables are laid on the sea floor will be minimised through consultation with harbour users and relevant project stakeholders such as Harbour Master's Notices to Mariners and safety cable plans for cable-laying vessels. The risk of impacts to shipping channels decreases the further away from shorelines along the Subsea Cable System alignment.

Impacts to marine fauna such as collisions are discussed in Chapter 9 – Marine Ecosystems.

12.5.3.4 Reduced Amenity from Congestion on the Roads and Delays with Project Traffic

DCS Electrode

Materials and equipment for the DCS Electrode will need to be transported from East Arm via Howard Springs to Murrumujuk. Howard Springs Road and Gunn Point Road are designated road train and oversize load routes.

The HVDC Electrode Line Corridor will cross Gunn Point Road and continue along distribution poles within the HVDC Electrode Line running parallel to the Leaders Creek Boat Ramp Access Road. The HVDC Electrode Line Corridor will then follow a turn off 2 km before Leaders Creek ramp, which provides access to the Saltwater Arm Boat Ramp (refer Figure 2-12 in Chapter 2 – Project Refinement). The Leaders Creek Boat Ramp and Saltwater Arm Boat Ramp are popular boat ramps used by recreational fishing. Leaders Creek is also a tourist location.

The movement of construction personnel between Darwin and the Electrode Site will include bussing or shared vehicle transport each day.

The ground Electrode will be comprised of a metallic grid or rods (or other conductive material), that are buried in the ground at a prescribed depth and connected externally to the grounding system by ground wire (usually copper wire). The HVDC Electrode Line Corridor will be designed in accordance with AS7000: 2016 Overhead line design and is comparable in scale, height and appearance to conventional overhead distribution lines and poles. The height of these poles is approximately 12 m. The quantities of additional materials required for the DCS Electrode are considered substantially smaller than those required for the construction of the OHTL and would largely involve similar construction materials and methodologies.

The additional traffic generation from logistics of freighting construction materials and equipment to the DCS Electrode site is not considered to be material to the estimated traffic volumes assessed in the Draft EIS. Therefore, the assessment of projected traffic and transport impacts undertaken as part of Appendix K – Traffic Impact Assessment of the Draft EIS is considered sufficient in capturing this refinement.

The proposed location for the DCS Electrode is a greenfield site and will be developed to provide adequate areas for laydown and contractor parking. The use of buses for personnel transport will reduce the requirement for light vehicle parking areas.

During the construction phase of the DCS Electrode, several oversize and overmass loads may be required to move from the Port to the DCS Electrode near Murrumujuk. Oversize and overmass movements are discussed in Appendix K of the Draft EIS, including requirements under the *Motor Vehicles Act 1949* (NT) as well as safety considerations.

The nature of the oversize and overmass loads will impact general traffic movements along the designated routes. The project logistics team will work closely with all service authorities to develop specific movement plans to limit and mitigate traffic impacts as much as possible. The Proponent anticipates conducting a route assessment in future phases of the design prior to commencement of construction to confirm the structural capacity of existing infrastructure and any mitigation measures required for overmass loads.

Construction of the HVDC Electrode Line Corridor would be confined as much as possible to within the HVDC Electrode Line Corridor to minimise impacts to existing access roads.

The Proponent is committed to continuing engagement with DIPL and Litchfield Council where it is the relevant road authority, to ensure that requirements such as those identified in Section 12.10.2.3 are incorporated into future traffic assessments and traffic management plans. Proposed future traffic assessments will include:

- Road Transport Route Survey and Engineering Assessment of all road transport routes to each of the project sites. This will identify the transport envelope for all heavy lift transport, confirm any infrastructure limitations and provide an engineering assessment of bridges.
- Traffic Impact Assessment and Dilapidation Report of the impact of the increased heavy vehicle transport on the roads used by the Project and recommendations on the need to undertake maintenance and improvements.

Powell Creek Electrode and AI

As discussed in Chapter 2 – Project Refinement, the AI is now located outside the Powell Creek Solar Precinct. However, access and transport logistics to the Powell Creek Electrode and AI will remain the same as Powell Creek whereby:

- Road vehicle movements will occur via the Stuart Highway, which will require a new, major intersection to be constructed to facilitate vehicle turning movements to the Solar Precinct, Powell Creek Electrode and AI
- Two rail sidings are proposed to be constructed at Powell Creek to maximise the use of rail for freight
- A new Aerodrome is proposed to be constructed to facilitate predominantly FIFO workforce, which will enable personnel to be bused between the camp and the Aerodrome
- The workforce will fly-in for their roster predominantly from Darwin to Elliott Airstrip during the civil and earthworks preparation of the Powell Creek Solar Precinct, where it will be more efficient and safer for them to do so due to time and distance.

The assessment of transport aspects for the Powell Creek Solar Precinct in the Draft EIS are therefore considered sufficient and capture the potential transport impacts for these project refinements. As discussed in the previous section, the quantities of additional materials required for the Powell Creek Electrode construction are considered substantially smaller than those required for the construction of the OHTL and would largely involve similar construction materials and methodologies. Additional traffic generated due to movement of materials to facilitate Electrode construction is not considered material to the estimates assessed in the Draft EIS.

A summary of transport aspects for Powell Creek Solar Precinct and therefore by extension the Powell Creek Electrode and AI, is provided below:

- The establishment phase is expected to take in the order of 20 months. A limited number of project personnel will be bused from the Temporary Construction Accommodation at the Solar Precinct to the existing Elliott Airstrip for FIFO transport. Peak trips per day along the Stuart Highway between the Solar Precinct and Elliott are expected to coincide with personnel shift swings as shown in Table 4.1 – Appendix K of the Draft EIS.
- During construction, the majority of project personnel will be housed at the Temporary Construction Accommodation Village and bused to the site. A new Aerodrome constructed specifically for the project to facilitate a predominantly FIFO workforce will enable personnel to be bused between the village and the Aerodrome. This will minimise vehicle movements along the Stuart Highway. It is also proposed to construct two rail sidings at Powell Creek and maximise the use of rail for freight.

- Being within a greenfield site, the AI will provide adequate areas for contractor parking. The use of aircraft and buses for personnel transport will reduce the requirement for light vehicle parking areas.
- It is estimated that approximately 16 light aircraft flights per week may be required into, and out of, the existing Elliott Airstrip during the first 20 months of the construction phase, while civil and earthworks are undertaken at the Solar Precinct.

Further details such as estimated traffic volumes and total/daily trips for the Powell Creek Solar Precinct are detailed in Section 4.2 – Appendix K of the Draft EIS.

Preferred OHTL Corridor

The OHTL Corridor through Katherine, Pine Creek and Adelaide River has been refined from the areas of interest depicted in the Draft EIS (see Chapter 2 – Project Refinement for a more detailed description). It is acknowledged that the Project will have to work closely with NTG and other stakeholders to ensure the OHTL and the proposed Katherine Heavy Vehicle Bypass and the Stuart Highway alignment in Pine Creek is not adversely impacted by OHTL structures.

The construction of the OHTL will be facilitated by the establishment of temporary mobile accommodation along the OHTL. While locations for the Temporary Construction Accommodation alongside the OHTL alignment has not been refined, any traffic impacts from this infrastructure will be temporary and with limited to the construction period.

12.5.4 Operations

12.5.4.1 Potential Impacts of the Project on Future Land Uses

Potential impacts of the Project on future land uses in operations are discussed in Section 12.5.2, above for each land use.

12.5.4.2 Impacts from Electrodes on Existing and Proposed Infrastructure

Electrodes have the potential to cause disruption in telecommunication equipment or corrosion of infrastructure (Appendix 12:1 Land Based Electrode Technical Report) within a 10 km radius in certain conditions. The impacts are highly unlikely and only have the potential to occur when the Electrode is functioning (up to 500 hours per year at a maximum of 48 hours at a time). However, simple mitigation measures can be used to prevent impacts including cathodic protection or plastic shielding for telecommunications equipment and sectionalising infrastructure, creating electrical isolation gaps in railway tracks and passive or active cathodic protection. In some cases, design standards for this infrastructure also includes a requirement for cathodic protection.

12.5.4.3 Interference with Aviation/Flight Paths and Shipping Channels (current and planned)

Powell Creek Electrode, DCS Electrode and OHTL Corridor

The Electrodes and OHTL are static infrastructure. The main impact on aviation would be potential safety issues with the OHTL interactions, which are assessed in Chapter 14 – Human Health.

Subsea Cable System

As noted in Section 12.3, the information presented in this chapter regarding marine transportation (and by extension the Subsea Cable System) is solely for the purpose of addressing the DIPL submission (Section 12.10.2.9) and providing a summary of the information presented in the Draft EIS.

As discussed in Chapter 2 – Proposal Description of the Draft EIS, operation (i.e., maintenance and repair) of the Subsea Cable System would be facilitated by the following marine transportation:

- Specialist CLV
- Guard vessels
- Survey vessels
- Anchored or jack-up barge.

During operations, access for maintenance and repair would be required in the event of faults in the Subsea Cable System. Where a cable fault is detected, the relevant section of the cable will be located and retrieved to the surface for inspection and replacement. A repair will typically be carried out by a single vessel. A shallow water repair, in less than 10 m of water, will typically be made using an anchored or jack-up barge. In deeper water, a cable vessel will be used. Further discussion on the repair of the Subsea Cable System is discussed in Section 2.8.4.2 and Section 2.11.3.2 of the Draft EIS.

Potential for direct fauna mortality from collisions with vessels is discussed in Chapter 9 – Marine Ecosystems.

12.5.4.4 Reduced Amenity from Congestion on the Roads and Delays with Project Traffic

DCS Electrode

During operations, periodic or ad-hoc monitoring and maintenance of the DCS Electrode will be required. Vehicle movements (including heavy vehicles) may be required for transporting materials to the DCS and HVDC OHTL Corridor including:

- Ongoing monitoring of the Electrode and HVDC OHTL structures
- Deliveries of operational materials for repair or maintenance:
  - Electrode OHTL materials
  - Repair of Electrode or HVDC OHTL infrastructure
- Exportation of waste from maintenance and repair activities.

Traffic generated from the above operational activities is not envisaged to be significant and would comprise substantially lower volumes of traffic compared to the construction phase activities. Oversize and overmass movements may be required if significant infrastructure (such as transmission poles) require replacement.

Powell Creek Electrode and AI

The following AI will be associated with the operational life of the Project as seen as permanent (70 years) and located outside the main Powell Creek Solar Precinct footprint:

- Landfill/Waste Management Area
- Water Bores and storage.

During operations, periodic or ad-hoc monitoring and maintenance of AI and Powell Creek Electrode will be required. Vehicle movements (including heavy vehicles) may be required for transporting materials to the AI and Powell Creek Electrode:

- Ongoing monitoring of the AI, Powell Creek Electrode and HVDC Electrode Line infrastructure
- Transportation of waste to the Landfill/Waste Management Area

- Deliveries of operational materials for storage, repair or maintenance including:
  - Replacement Solar Panels, HVDC Electrode Line Corridor materials
  - Waste management materials (e.g., landfill geotextile)
  - Repair of Powell Creek Electrode or HVDC Electrode Line infrastructure.
- Exportation of recyclable and re-usable materials.

Traffic generated from the above operational activities is not envisaged to be significant and would comprise substantially lower volumes of traffic compared to the construction phase activities. Oversize and overmass movements may be required if significant infrastructure (such as transmission poles) require replacement.

Preferred OHTL Corridor

The OHTL is comprised of largely static infrastructure. Operational activities will largely be comprised of ongoing maintenance such as vegetation trimming, and repair works in the event of a fault or damage to project infrastructure. Traffic generated by operational activities is not envisaged to be significant and will comprise substantially lower volumes of traffic compared to the construction phase activities. Oversize and overmass movements may be required if significant infrastructure (such as transmission poles) requires replacement. No additional impacts have been identified resulting from the preferred OHTL Corridor, including at the areas of constraint (i.e., Katherine, Pine Creek, and Adelaide River).

12.6 Avoidance, Mitigation, and Monitoring

Impact mitigation was undertaken in accordance with the environmental decision-making hierarchy consistent with section 26 of the *EP Act*. The decision-making hierarchy sets the following priorities when addressing impacts which have been considered in developing Table 12-2:

1. Avoid – ensure that actions are designed to avoid adverse impacts on the environment
2. Mitigate – identify management options to mitigate adverse impacts on the environment to the greatest extent practicable
3. Offset – if appropriate, provide for environmental offsets for residual adverse impacts on the environment that cannot be avoided or mitigated.

Table 12-2: Land Use and Transport – Commitments

Impact	Avoidance	Mitigation	Monitoring
Potential impacts of the project on future land uses (excluding electrodes – assessed below).	Subsea Cable System will be vertically separated from ferry route and approximately 1 km from ferry terminal is not expected to require dredging which could impact cable.	Consultation with stakeholders on timing of activities.	Noise and air emissions monitoring will be conducted, following complaints, to verify appropriate limits are being achieved.
Impacts from Electrodes on existing and proposed infrastructure.	Where possible including buffers to existing activities (e.g., 10 km buffer between electrodes and existing land uses).	Consult with NTG to identify potential impacts to new developments within the 10 km buffer zone of electrodes. Cathodic protection to be considered for future electrical infrastructure within the buffer zone as per AS/NZS.	Internal records of electrode operations in line with CIGRE guidelines.
Interference with aviation/flight paths and shipping channels (current and planned).	Aviation: • Aviation or flight movements should be timed to avoid periods of known flight path activity where practicable.	Aviation: • Communication with pastoralists on timing of flights at the new Aerodrome. Marine Transportation: • Communication with AFANT and the fishing community, as well as Harbour Master's Notices • As per Safety Plans for cable-laying vessels, including visibility at night.	Aviation: • As per developed Traffic Management Plans. Marine Transportation: • As per developed Traffic Management Plans and Environmental Emergency and Spill Response Plans.

Impact	Avoidance	Mitigation	Monitoring
Reduced amenity from congestion on the roads and delays with project traffic.	Use of air and rail for personnel and freight transport where possible.	As per developed Traffic Management Plans. Prepare Traffic Management Plans in consultation with the DIPL. Obtain permits for all overweight or over-mass vehicle movements required under the *Motor Vehicles Act 1949* (NT) in accordance with NT requirements. Use buses for movements between personnel accommodation and work sites. Traffic movements to be timed to avoid peak hour traffic in built-up areas where practicable.	As per developed Construction Plans and Traffic Management Plans. Ongoing engagement with DIPL.

12.7 Residual Risk

As stated at the start of this chapter, the NT EPA's objective for the Community and Economy factor is to:

> *Enhance communities and the economy for the welfare, amenity, and benefit of current and future generations of Territorians.*

The residual impact assessment of the Project is included in Table 12-3 and assuming the adoption of impact avoidance, mitigation and monitoring measures described in Table 12-2.

Each impact to land use and transport was assigned a residual impact rating taking into consideration the scale, magnitude and duration of the impacts, the presence/absence of environmental values and/or sensitive receptors and the level of certainty with respect to the intensity of the impact and the effectiveness of the mitigation measures. The residual impact ratings adopted in the assessment are provided in Chapter 3 of the Draft EIS. The combined residual impact to land use and transport from the Project's construction and operations, is summarised in Table 12-3 and Table 12-4.

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Table 12-3: Summary of EIA results – Land use and Transport – Construction

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact Numbering
Potential impacts of the Project on future land uses (excluding Electrodes – assessed below)	Solar Precinct.	**Unlikely** No receptors identified during construction.	**N/A – no impacts identified during construction.**					
	OHTL.	**Unlikely** No additional receptors identified during construction, existing receptor impacts covered in Chapter 10 Amenity and Chapter 14 Human Health	**N/A – no impacts identified during construction.**					
	DCS and Cable Transition Facilities.	**Unlikely** No receptors identified during construction.	**N/A – no impacts identified during construction.**					
Impacts from Electrodes on existing and proposed infrastructure	DCS Electrode.	**Unlikely** No receptors identified. during construction.	**N/A – no impacts identified during construction.**					
	Powell Creek Electrode.	**Unlikely** No receptors identified during construction.	**N/A – no impacts identified during construction.**					

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact Numbering
Interference with aviation/flight paths and shipping channels (current and planned)	AI (Aerodrome).	**Possible** Pastoralists in the region utilise aircraft such as light planes and helicopters, which may potentially interact with proposed project charter flights.	**Regional** There are several pastoral properties around the AI.	**Long Term** Charter flights will utilise the Aerodrome during the commencement of the main construction activities subject to a FIFO roster. The Aerodrome will remain functional at a lower capacity during operations.	**Minor** Impact to pastoralist scheduling of flying activities will be mitigated through good communication with pastoralists.	**Medium** While there are likely to be sensitive receptors (i.e., pastoralists) in the area, they will be adapted to watching for addressing this specific risk through implementation of good communication and awareness.	**High** This is a known risk raised during consultation with pastoralists.	**Minor**
	Subsea Cable System.	**Possible** Recreational, commercial and Department of Defence traffic utilise the waters however, impacted area of the Subsea Cable System is a narrow linear corridor.	**Limited** Narrow linear corridor/s. Interference with shipping channels will affect areas where the cable laying activity would be taking place.	**Short Term** One to three cable laying vessels and associated support ships at a time.	**Minor** Interference with sea traffic may occur however, impacted sea traffic will likely be able to manoeuvre around cable laying activities.	**Medium** Sensitive receptors present however, impacts will be short term.	**High** High confidence in Subsea Cable System construction methodology and potential interaction with shipping channels.	**Minor**
	AI.	**N/A – Draft EIS Assessment considered sufficient for this refinement**						

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact Numbering
Reduced amenity from congestion and traffic delays with project traffic	Powell Creek Electrode.							
	DCS Electrode.	**Likely** Construction will utilise the Leaders Creek Saltwater Arm Boat Ramp Access Roads and impact road users.	**Localised** Construction activities may affect limited areas of Access Roads during construction vehicle movements. Construction will largely be confined to within the Electrode and HVDC OHTL Corridor to minimise impacts to road users.	**Short Term** Impacts will occur during the construction phase. Each construction section will only be under construction for a short period of time.	**Minor** Traffic generated during construction activities not considered to be significant and will largely be confined to within the Electrode and HVDC OHTL Corridor to minimise impacts to road users.	**Medium** Impacted Access Roads connect to popular recreational locations. Construction will largely be confined to within the Electrode and HVDC OHTL Corridor to minimise impacts to road users.	**High** Traffic Impact Assessment undertaken for the Draft EIS for wider region. Risk is considered lower for this refinement and is considered well understood, as are control strategies.	**Minor**

Table 12-4: Summary of EIA results – Land use and Transport – Operations

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
Potential impacts of the Project on future land uses (excluding Electrodes – assessed below)	Solar Precinct	**Unlikely** No receptors identified.	**N/A – no impacts identified**					
	OHTL	**Possible** OHTL crosses through a few existing land uses and areas with land use plans. Potential impacts associated with amenity have been included in Chapter 10 Amenity.	**Limited** Impacts (not including amenity or electrodes) will be limited to site specific competition for land and additional safety precautions when constructing adjacent infrastructure.	**Medium Term** Impacts (not including amenity) are limited to construction of infrastructure, due to the alignment of OHTL in rail and utilities corridors. Competition with extractive industries for access to land is considered to be minimal.	**Minor** Slight impacts are possible but easily managed with mitigation measures.	**Low** OHTL does not contain unique land use values.	**High** Although there is inherently a lot of uncertainty in assessing potential future land uses, the interactions and mitigation measures are well understood.	**Minor**
	DCS Cable Transition Facility	**Possible** The operational noise and air emissions have been modelled to be below the regulatory limits for the proposed land uses in the Land Use Plan. Impacts will only	**Limited** Potential impacts from noise and air emissions will only spread a limited distance from the Project following an incident.	**Short Term** Impacts could occur on hot and windy days and will be easily reduced with additional controls as required.	**Minor** Slight increases in daily noise or air quality limits for a short period will not be expected to have a lasting impact on the adjacent community.	**Medium** Although no receptors present currently, there is potential for residences immediately adjacent to Project, some	**High** Although there is inherently a lot of uncertainty in assessing potential future land uses, the interactions and mitigation measures are well understood.	**Minor**

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
		occur from incidents.				resilience to change.		
	Subsea Cable System	**Possible** The Subsea Cable System overlaps with a proposed ferry route from the future Murrumujuk township to Darwin.	**Limited** The overlap occurs at a single point.	**Short Term** Impacts will only occur during construction of one route over the other.	**Negligible** Cross over from proposed route is ~1 km from shore and no dredging is expected to occur at this position. Vertical separation of the cable and the ferry will mitigate this impact.	**Low** There are no sensitive land uses present in this case.	**High** Although there is inherently a lot of uncertainty in assessing potential future land uses, the interactions and mitigation measures are well understood.	**Minor**
Impacts from Electrodes on existing and proposed infrastructure	DCS Electrode	**Possible** Impacts are only predicted during operation of Electrode which will only occur in response to faults or incidents.	**Regional** Impacts can occur up to 10 km from Electrode.	**Short Term** Impact will occur for a maximum of 48 hours (maximum expected time of energised electrode) and will recover immediately.	**Minor** Impacts limited to short term disruption of telecommunications or increased rate or corrosion.	**Medium** No receptors currently present and those proposed have some resilience to deal with impact.	**High** Potential impacts of Electrodes on infrastructure have been studied over a long time and mitigation measures are well known and effective.	**Minor/Moderate**
	Powell Creek Electrode	**Unlikely** Proposed location has a 10 km buffer to all known infrastructure. No known plans to develop further	**N/A – no receptors identified.**					

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
		infrastructure in this area.						
Interference with aviation/ flight paths and shipping channels (current and planned)	AI (Aerodrome)	**Possible** Pastoralists in the region utilise aircraft such as light planes and helicopters, which may potentially interact with proposed project charter flights.	**Regional** There are several pastoral properties around the AI.	**Long Term** The Aerodrome would remain functional at a lower capacity (compared to construction phase) during operations.	**Minor** Impact to pastoralist scheduling of flying activities will be mitigated through good communication with pastoralists.	**Medium** While there are likely to be sensitive receptors (i.e., pastoralists) in the area, they will be adapted to watching for addressing this specific risk through implementation of good communication and awareness.	**High** This is a known risk for pastoralists who raised this risk during consultation.	**Minor**
	Subsea Cable System	**Possible** Recreational, commercial and Department of Defence traffic utilise the waters however, impacted area of the Subsea Cable System is a narrow linear corridor. Impacts are only predicted during operation of Electrode which will only occur in	**Limited** Narrow linear corridor/s. Interference with shipping channels will affect areas where the cable maintenance and repair activity will be taking place.	**Short Term** One to three Cable Laying Vessels and associated support ships at a time.	**Minor** Interference with sea traffic may occur however, impacted sea traffic will likely be able to manoeuvre around cable repair and maintenance activities.	**Medium** Sensitive receptors present however, impacts will be short term.	**High** High confidence in understanding of Subsea Cable System operations and potential interaction with shipping channels.	**Minor**

Impact	Location	Likelihood	Scale	Duration	Magnitude	Value rating	Certainty	Residual Impact
		response to faults or incidents.						
Reduced amenity from congestion and traffic delays with project traffic	AI Powell Creek Electrode	**N/A – Draft EIS Assessment considered sufficient for this refinement**						
	DCS Electrode	**Possible** Impacts are only predicted during operation of Electrode, which would only occur in response to faults or incidents.	**Localised** Maintenance and repair activities may affect limited areas of Access Roads during vehicle movements. Activities will largely be confined to within the Electrode and HVDC OHTL Corridor to minimise impacts to road users.	**Short Term** Impacts will occur in response to faults or incidents. Each section requiring maintenance or repair will only be under construction for a short period of time.	**Minor** Traffic generated during operational activities not considered to be significant and will occur in response to faults or incidents.	**Medium** Impacted Access Roads connect to popular recreational locations. Impacts are only predicted during operation of Electrode which will only occur in response to faults or incidents.	**High** Traffic Impact Assessment undertaken for the Draft EIS for wider region. Risk is considered lower for this refinement and is considered well understood, as are control strategies.	**Minor**

12.8 Cumulative Impact Assessment

As cumulative impact assesses the impacts of joint projects on the environment (including social environment), it does not apply to the assessment of the Project on future land uses. The residual risk of the DCS Electrode on other infrastructure is low and no other infrastructure is proposed in the area with similar impacts which could create a cumulative effect.

Due to the low level of residual impact to transport and traffic aspects associated with the project refinements, there is limited potential for additional cumulative transport impacts to occur.

The DCS Electrode is unlikely to impact concurrent projects identified in the Draft EIS. Potential cumulative impacts to Project Sea Dragon have been assessed in the Draft EIS. As discussed in this chapter, additional traffic generation from the DCS Electrode construction and operation is not considered a material increase to volumes assessed in the Draft EIS.

As discussed in the chapter, the AI and Powell Creek Electrode site will utilise the same access points as the Powell Creek Solar Precinct, which were assessed in the Draft EIS. Additional traffic generation from the Powell Creek Electrode and AI construction and operation is not considered material to volumes assessed in the Draft EIS.

The Proponent will liaise with relevant proponents/operators and authorities, regarding timing and location of works to minimise the risk of cumulative impacts on the environment. This includes ongoing engagement with DIPL regarding traffic and transport aspects of the Project.

12.9 Conclusion

A review of the project refinements identified in Chapter 2 – Project Refinement and submissions received during the public submission period (Section 12.10) has not identified any new significant impacts. All residual impacts have a rating of ‘unlikely’ or ‘minor’ and thus the Project can achieve the objective of enhancing communities and the economy for the welfare, amenity, and benefit of current and future generations of Territorians.

12.10 Submissions Response

During the Draft EIS Public Submissions period, the following government comments were received regarding land use and transport matters:

- DEPWS
- DIPL
- NT Land Corporation
- Department of the Chief Minister and Cabinet
- Department of Industry, Tourism and Trade.

Several community submitters, including anonymous submitters, also provided comments.

These comments relate to the key themes of recreation, future land use and transport. Impacts on property value are addressed in Chapter 3 Stakeholder and Community Engagement and impacts on air quality, noise, and visual amenity impacts to surrounding residences are addressed in Chapter 10 Amenity.

The Proponent’s responses to the submissions received are provided in Sections 12.10.1 to 12.10.6.

12.10.1 DEPWS Submission

The high recreational value for hunters in Shoal Bay needs to be observed.

12.10.1.1 Response

This has been addressed in Chapter 3 Stakeholder and Community Engagement.

12.10.2 DIPL Submission

12.10.2.1 Future Land Use

Section 15.3.3. DCS and Cable Transition Facilities and Table 15-3 Populated Places, Areas of Interest and Public Infrastructure Proximate to DCS and Cable Transition Facilities, considers existing sensitive environments. In addition to existing environments, a new urban area (Murrumujuk Township) will eventually be located to the north of the Converter Site as set out in the land use framework (LSLUP 2016) for this area. When a future application for approval under the Planning Act 1999 is lodged for the DCS and Cable Transition Facilities, the application should address the compatibility of the Facilities with the nearby future urban area.

12.10.2.2 Response

This has been assessed in Section 12.5.2. No impacts are expected due to air quality or noise impacts. While there is a potential for the Electrode to cause electrical interference or increased corrosion during operations, this is limited to 500 hours per year and simple measures of cathodic protection will prevent this from occurring. As requested by DIPL, the Project will address the compatibility of infrastructure and the proposed Murrumujuk township in the relevant statutory process under the *Planning Act 1999* (NT).

12.10.2.3 Transport Commitments

Commitments to include:

- *Intersections within the NT Government controlled road corridor to be built to DIPL standard and proposed borrow pit on Stuart Highway in vicinity of Powell Creek to be discussed with DIPL*
- *Obtaining permits for all overweight or over-mass vehicle movements in accordance with DIPL's Transport and Civil Services Division (TCSD) permit process*
- *Provide a transport management plan or traffic management plan outlining the access from the NT Government controlled roads, routes, duration, types of activities and anticipated impact on the NT Government controlled road reserves for TCSD review and approval prior to commencement of works. Specific areas, types of work and their impact is required to understand the risks. Transportation of materials is to be included. Depending on TCSD review of the transport and traffic management plan, TCSD may ask the developer to undertake intersection performance analysis or traffic impact assessment to understand impacts on the certain areas of road network*
- *Provide intersection design where the HVDC Over Head Transmission Line crosses the NT Government controlled road reserve for review and approval*
- *Inform the Harbour Master and Australian Hydrographic Office about the route of the pipeline once project is complete*
- *Inform the Harbour Master about the work as the work progresses to allow for notification to mariners.*

12.10.2.4 Response

The Proponent is committed to continued engagement with DIPL to ensure that commitments outlined in this submission are incorporated into the development of the Project's design, future traffic assessments and traffic management plans.

The Proponent is progressing route surveys, stakeholder engagement and technical assessments, to inform the design and construction staging of the OHTL, including:

- Road Transport Route Survey and Engineering Assessment of all road transport routes to each of the project sites. This will identify the transport envelope for all heavy lift transport, confirm any infrastructure limitations and provide an engineering assessment of bridges.
- Traffic Impact Assessment and Dilapidation Report of the impact of the increased heavy vehicle transport on the roads used by the Project and recommendations on the need to undertake maintenance and improvements.
- The Draft EIS recognises that permits under the *Motor Vehicles Act 1949* (NT) will be required for oversize and/or mass movements. The Proponent will ensure permits are obtained for all overweight or over-mass movements in accordance with DIPL's TCSD permit process.
- The Proponent's commitments have been amended and outlined in Table 12-2 to capture the commitments identified in this submission.

12.10.2.5 Preferred OHTL Corridor

DIPL seek an opportunity to review and comment on any deviations through Katherine, Pine Creek and Adelaide River from the existing railway corridor. Any proposal to access or develop Crown land should be discussed with Crown Land Estate of DIPL.

12.10.2.6 Response

The Proponent acknowledges DIPL's request for review and comment and is committed to continued engagement with DIPL, including the Crown land Estate of DIPL, regarding instances where the Project proposes to develop on Crown Land. The OHTL Corridor through Katherine, Pine Creek and Adelaide River is outlined in Chapter 2 – Project Refinement.

12.10.2.7 Road Network Impacts

The road corridor at Chinball Road/Stuart Highway intersection (12-30 approx. KP713.5) has a 265 m span. The average pole placement is 300 - 450 m. Provide further information to enable assessment of significance of impact to road users by outlining:

- *Potential conflict for future road upgrades and proximity to HVDC*
- *Anticipated downtime to road network during stringing of cables and how impacts to traffic will be minimi*sed.

Include an outline of the emergency management procedures for cable breaks in the vicinity of roads in high wind areas (i.e. cyclone areas) detailing risk to motorists.

12.10.2.8 Response

As discussed in Section 12.10.2.4, the Proponent is progressing development of the design, including the following technical assessments to inform the design, construction staging of the OHTL and development of Traffic Management Plans:

- Road Transport Route Survey and Engineering Assessment
- Traffic impact Assessment and Dilapidation Report.

Findings and information from the technical assessments will be provided in future modifications.

Traffic Management Plans will outline mitigations to minimise impacts of road network downtime during stringing of cables. This will include timing of works to occur outside of peak hour periods to minimise impacts.

Emergency management procedures are discussed in Chapter 14 – Human Health. The OHTL HVDC system is design to detect conductor faults extremely quickly. The first response of the OHTL HVDC system will be to determine if this is a temporary fault (lightning strike) or a permeant fault (broken conductor). This will be resolved by de-energizing the line within 100 milliseconds and re-starting. If the fault is still present, the OHTL HVDC system will shut down. Conductor faults are considered rare. Conductor faults are considered more likely to occur in the form of collapsed transmission towers rather than breakage of the conductor itself. Transmission towers are generally designed to fail with a single point of failure.

The OHTL will be managed similarly to many other transmission lines around Australia.

12.10.2.9 Marine Transportation

Discussion on marine transportation is not evident in the Community and Economy Factor.

12.10.2.10 Response

Discussion on marine transportation, including a summary of the information provided in the Draft EIS is provided above in Section 12.4.3 and Section 12.5.4.

12.10.3 NT Land Corporation Submission

12.10.3.1 Future Usability of Portion 2626

The Corporation holds NT Portion 2626 for the purpose of ensuring the long term strategic benefits of the land are maintained. The Corporation currently views the EIS as inadequate because it does not examine if the project will impact on the future usability of NT Portion 2626.

The LSLUP, contained within the NT Planning Scheme 2020, outlines opportunities for the future use of NT Portion 2626. This includes urban development at Murrumujuk, strategic industry uses at Glyde Point, and grazing and agriculture uses to the east of NT Portion 2626.

Of particular concern to the Corporation is:

- *The impact that an Electrode may have on the future usability of land surrounding it (the Corporation understands that an Electrode is proposed for the eastern part of NT Portion 2626)*
- *Noise and amenity impacts from the DCS – Figure 15-4 within Chapter 15 indicates that there will be offsite noise impacts; which may reduce the future useability of land within the noise contours.*

- *Amenity impacts on the foreshore at Murrumujuk as a result of the Land Sea Joint Station – the infrastructure set within the 1.5 ha site may impact on the visual amenity of the foreshore and beach.*

Therefore, the Corporation seeks that the proponent examine if the project will impact on the future useability of NT Portion 2626, as envisaged by the LSLUP. Until this matter is given consideration by the proponent, the Corporation will view this Statement as not satisfactory.

12.10.3.2 Response

This has been assessed in Section 12.5.2. No impacts are expected due to air quality or noise impacts. While there is a potential for the Electrode to cause electrical interference or increased corrosion during operations, this is limited to approximately 500 hours per year and use of simple measures such as cathodic protection will prevent this from occurring (See Appendix 12.1 – Land Based Electrode Technical Report).

12.10.4 Department of Chief Minister and Cabinet Submission

Where the Department of Infrastructure Planning and Logistics has indicated that traffic management plans are required, it is recommended that these be considered as part of the EIS process.

12.10.4.1 Response

DIPL has indicated that a transport management plan or traffic management plan is to be provided as part of the Project's transport commitments. Specific transport commitments raised by DIPL are discussed in Section 12.10.2.4. The Proponent is committed to continuing to work with DIPL in the development of traffic management plans.

12.10.5 Department of Industry, Tourism, and Trade Submission

12.10.5.1 Commercial Fishing

The proponent states that: "The Subsea Cable System is expected to avoid high value fishing areas. Any disruption to recreational fishing is expected to be of a limited scale and duration. Sun Cable is doing further studies to understand whether its activities will impact on commercial fishing operations." (p.14) It is recommended that any further discussions around the impact on fishing include fishing tourism operators. The appropriate representative body is the NT Guided Fishing Association (NTGFA).

12.10.5.2 Response

As discussed in Chapter 3 – Stakeholder and Community Engagement, engagement with AFANT and NTGFA has been included as part of mitigation commitments within the SIMP (Appendix 3.2).

12.10.6 Anonymous Submissions

12.10.6.1 Land Use Planning

Several anonymous community submissions were received regarding future land use planning which are summarised as follows:

- *I request that this project variation to the OHTL route is not deemed feasible by the NT Environmental Protection Agency. I also request that the NT Government re-evaluate the*

LSLUP given the identified risks to significant sites in the reserved NTG Utilities corridor between Livingstone and Murrumujuk. It is apparent that this corridor is not appropriate for any level of infrastructure, and should be removed from any future projects to prevent private companies repeating studies and assessments, time and again

- *Concerns the Project will impact on large rural developments which have the potential to drive significant economic and infrastructure investment across the NT. Impacts of concern include loss of amenity in the living environment and loss of aesthetics in the natural landscape. There were also concerns raised about the lack of consultation with key stakeholders involved in these large rural developments.*

The following anonymous submissions were also received regarding land use planning matters:

- *I also request that the NT Government re-evaluate the LSLUP given the identified risks to significant sites in the reserved NTG Utilities corridor between Livingstone and Murrumujuk. It is apparent that this corridor is not appropriate for any level of infrastructure, and should be removed from any future projects to prevent private companies repeating studies and assessments, time and again*
- *In the OHTL corridor between Livingstone and Murrumujuk alone, there are 34 known archaeological sites, 11 isolated artefacts, 4 culturally significant landscape features, and 33 cultural Heritage Risk Areas. These include a range of sacred sites, WWII sites, and other important evidence of human historic habitation, which links all people with the history of their country and ancestors. The documentation admits that any attempt to divert the OHTL around these sites will likely result in disturbing others. Although not mentioned, I note this would be highly likely to require additional NT Planning permissions for rezoning and/or clearing, and private land owner permission.*

12.10.6.2 Response

An assessment of the potential impacts on cultural heritage sites has been assessed in Chapter 14 Cultural Heritage in the Draft EIS. Should environmental approval be gained for the Project, the Proponent will obtain secondary approvals, including planning permissions, prior to undertaking any work. Concerns about lack of consultation are addressed in Chapter 3 Stakeholder and Community Engagement.

Impacts on known rural developments (including the proposed Lloyd Creek Rural Village (also known as the Noonamah Ridge Development) and the proposed Murrumujuk township) have been assessed in Section 12.5.2 and no impacts are expected due to air quality or noise impacts. Potential impacts due to the visual impact of the OHTL have been assessed in Chapter 10 Amenity.

12.10.6.3 Recreation

Anonymous community submissions were received regarding potential impacts to recreation, which are provided below:

- *Impact on access to recreational fishers and impact on fish populations in affected areas, including the popular Fenton Patches artificial reef area. Have AFANT been engaged for comment? Additionally, at least one stretch of the Alverly Road section of the Utilities corridor may impact land-based recreational fishers*
- *Access/recreational use of Gunn Point Beach/Murrumujuk coastal area may be impacted, especially during construction, for recreational visitors including campers, and also residents of Tree Point Community (currently under consultation).*

12.10.6.4 Response

Details about consultation undertaken by the Proponent are included in Appendix 3.1 Stakeholder Consultation Report. Potential impacts on fish and marine life are included in Chapters 8 Marine Environmental Quality and 9 Marine Ecosystems.

There is no intention to restrict access along the OHTL. Traffic control measures for construction will be detailed in secondary approvals, including development applications under the *Planning Act 1999 (NT)*. Any construction that occurs across roads will require approval from either DIPL or the local council and will require details of an alternative route to be provided for the construction period. Impacts on visual amenity of users (including the Gunn Point Beach and Murrumujuk Coastal Area) have been assessed in Chapter 10 Amenity.

12.11 NT EPA Direction Responses

12.11.1 Traffic Impacts and Management - Comment 36

The draft EIS identifies substantial sea, rail and road transport of infrastructure for the Solar Precinct and OHTL including transport along the full length of the Stuart Highway from the north (Port Darwin) and south (Port Adelaide) of the proposal footprint. The increased road traffic may cause delays, road safety and/or road damage over a four to five year continuous period.

The draft EIS determined that based on current estimates of trip generation, traffic numbers associated with the project are not expected to exceed the previously recorded peak annual average daily traffic, for 2017 along proposed routes. As such, the project is not expected to create any worsening of traffic volumes or levels of service due to capacity issues.

Construction and associated traffic, is proposed 24 hours for some construction activities and standard day shift for most construction works.

Where the OHTL exits the Railway Corridor and enters the Utilities corridor, a construction approach that mitigates the impact to the rural residential areas will be developed accordingly, which may include a staging and laydown area proximate to Gunn Point Road.

The draft EIS does not identify the location and land clearing requirements for this construction approach.

12.11.2 Information required in the Supplement

Provide further information about:

- *Traffic management during construction, particularly for the utilities corridor works in the Litchfield Municipality during weekend and peak work traffic in built up areas (utilities corridor)*
- *Location of staging and laydown areas near Gunn Point Road to minimise traffic impacts and other community impacts.*

12.11.3 Response

The Traffic Impact Assessment (Appendix K of the Draft EIS) identified traffic management measures which were not explicitly stated within the Draft EIS commitments. These measures have now been incorporated into the SEIS commitments (refer Table 12-2).

As discussed in Section 12.10.2.4, the Proponent is progressing route surveys, stakeholder engagement and technical assessments, to inform the design and construction staging of the OHTL, including:

- Road Transport Route Survey and Engineering Assessment
- Traffic Impact Assessment and Dilapidation Report.

An indicative construction staging approach for the OHTL Corridor works, particularly in the Litchfield Municipality, is as follows:

- Construction activity will typically occur between 6.30 am to 5.00 pm Monday to Saturday and 6.30 am to 1.00 pm on Sunday
- Utilities Corridor crews will typically commute from Darwin in shared vehicles and mini-buses
- If there is a concentration of personnel moving from Darwin to a work front along the Utilities Corridor, additional bussing will be considered to further minimise impact to peak traffic flow and congestion in the Litchfield Municipality.

The main staging area for the OHTL will occur in Darwin, with materials delivered on a 'just-in-time' basis from Darwin to the OHTL Corridor. The location of specific staging and laydown areas closer to the Utilities Corridor is yet to be determined and will be assessed for transport and land clearing aspects in future modifications.

12.11.4 Electrode Impacts and Management – Comment 7

- *It is not clear if the electrode AOI forms part of the proposed action: The Executive Summary mentions that the electrode area is under investigation*
- *Section 2.5.3.4 mentions that a ground electrode located more than 8 km from each converter location is an alternative to a dedicated MER*
- *An electrode AOI at Darwin and west of the Solar Precinct is shown on each of Figures 2-27 and 2-28: however, it is not on many of the EIS maps or discussed in many of the environmental factor sections.*

Section 2.5.3.4 indicates each electrode site will be 2 ha; however, in Figures 2-27 and 2-28, the areas of interest appears to be greater than 2000 ha and 20 000 ha respectively. It is not clear why the AOI is much larger than the electrode site.

The depth of ground electrodes is described as shallow in remote areas near or below the water table. Given the future development of Gunn Point area and water depth in arid environments, further information on location, extent and future land use for both electrode and power line connections is required. No detail of ground electrodes has been provided.

Section 2.5.3.4 provides a list of attributes that will be considered during site selection; however, uncertainty remains about potential environmental impacts in the absence of additional information.

12.11.5 Information required in the Supplement

1. *Provide further information relating to the electrodes and the areas of interest: confirm whether the electrode areas of interest are part of the proposed action*
2. *advise/confirm the spatial extent of the electrode area*
3. *advise/confirm the total disturbance footprint within the electrode area including access to the electrode sites*
4. *details of ground electrodes and any potential impacts from construction, installation and operation of ground electrodes including avoidance and mitigation measures.*

12.11.5.1 Response

Information regarding the spatial extent and disturbance footprint of the Electrodes is included in Chapter 2, Project Refinement. Impacts of Electrodes on surrounding infrastructure is included in Section 12.5.3.2 and 12.5.4.2, above and Appendix 12.1: Land Based Electrode Technical Report. Other potential impacts from Electrodes are included in Chapter 4 Terrestrial Environmental Quality and Chapter 14 Human Health.

12.11.5.2 Impacts on Future Land Uses – Comment 33

The DIPL submission notes that cumulative impacts to marine users from the combined impact of the project and the future port development in the Gunn Point Mapping the Futures project have not been included.

The draft EIS identifies potential cumulative impacts on community and economy arising from the:

- *Competition for skilled labour, cumulative pressures on accommodation and community resistance to changed land use in the Barkly*
- *Cumulative impacts with a number of major projects progressing in the Barkly and Katherine/Big Rivers regions on similar timelines*
- *Opposing views of the proposed development at Murrumujuk.*

12.11.5.3 Information required in the Supplement

Provide further information on cumulative impacts as they relate to community and economy and future development along the proposal footprint from the Barkly to Katherine, Gunn Point and offshore.

12.11.5.4 Response

Assessment of the Project's impact on future land uses is included in Section 12.5.2.

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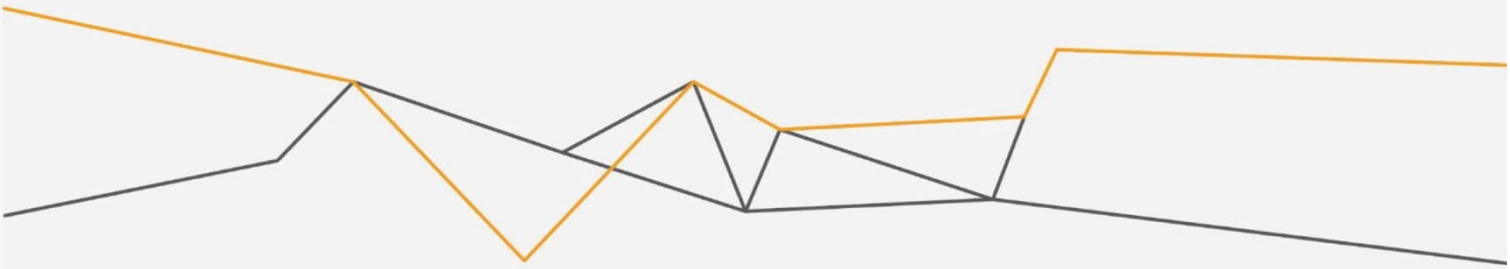

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