



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 26/02/18 14:39:03

[Summary](#)

[Details](#)

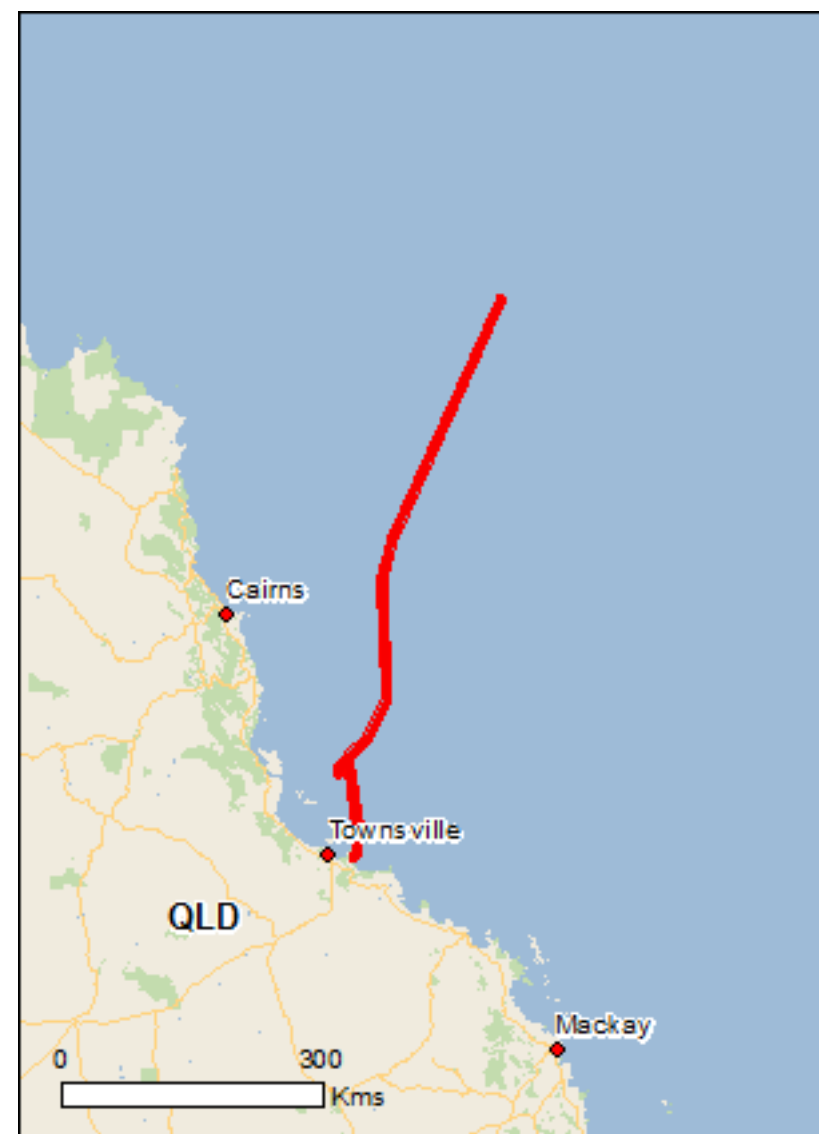
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

[Buffer: 5.0Km](#)



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	1
National Heritage Places:	1
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	13
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	1
Listed Threatened Species:	40
Listed Migratory Species:	58

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	111
Whales and Other Cetaceans:	29
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	2

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	23
Nationally Important Wetlands:	3
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

World Heritage Properties [\[Resource Information \]](#)

Name	State	Status
Great Barrier Reef	QLD	Declared property

National Heritage Properties [\[Resource Information \]](#)

Name	State	Status
Natural		
Great Barrier Reef	QLD	Listed place

Wetlands of International Importance (Ramsar) [\[Resource Information \]](#)

Name	Proximity
Bowling green bay	Within Ramsar site

Great Barrier Reef Marine Park [\[Resource Information \]](#)

Type	Zone	IUCN
Buffer	B-17-3011	IV
Conservation Park	CP-18-4052	IV
Conservation Park	CP-19-4059	IV
Conservation Park	CP-18-4048	IV
Conservation Park	CP-19-4060	IV
General Use	GU-16-6004	VI
Habitat Protection	HP-18-5145	VI
Habitat Protection	HP-16-5133	VI
Habitat Protection	HP-19-5166	VI
Habitat Protection	HP-18-5147	VI
Marine National Park	MNP-17-1072	II
Marine National Park	MNP-17-1068	II
Scientific Research (closed to public access)	SR-19-2008	IA

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name
EEZ and Territorial Sea

Marine Regions [\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name
Coral Sea

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Calidris canutus		
Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
<small>LEX10474</small> Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Neochmia ruficauda ruficauda Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat likely to occur within area
Pterodroma heraldica Herald Petrel [66973]	Critically Endangered	Species or species habitat likely to occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Tyto novaehollandiae kimberli Masked Owl (northern) [26048]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<small>LEX10474</small> Megaptera novaeangliae Humpback Whale [38]	<small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small> Vulnerable	Species or species habitat known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
Pteropus conspicillatus Spectacled Flying-fox [185]	Vulnerable	Species or species habitat likely to occur within area
Saccolaimus saccolaimus nudicluniatus Bare-rumped Sheath-tailed Bat, Bare-rumped Sheath-tail Bat [66889]	Vulnerable	Species or species habitat likely to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat may occur within area
Plants		
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat may occur within area
Myrmecodia beccarii Ant Plant [11852]	Vulnerable	Species or species habitat likely to occur within area
Omphalea celata [64586]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis pristis Freshwater Sawfish, Largetooth Sawfish, River	Vulnerable	Species or species

Name	Status	Type of Presence
LEX10474 Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756] Pristis zijsron	RELEASSED BY DFAT UNDER THE FOI ACT 1982	habitat known to occur within area
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442] Rhincodon typus	Vulnerable	Species or species habitat known to occur within area
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
------	------------	------------------

Migratory Marine Birds

Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
--	--	--

Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
---	--	--

Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
--	--	--

Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
---	--	--

Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
--	--	--

Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
---	--	--

Migratory Marine Species

Anoxypristis cuspidata Narrow Sawfish, Knifetooth Sawfish [68448]		Species or species habitat likely to occur within area
--	--	--

Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
---	------------	--

Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
--	--	--

Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
--	------------	--

Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
---	------------	--

Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
--	------------	--

Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area
---	------------	--------------------------------------

Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
---	------------	-------------------------------------

Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species
--	--	--------------------

Name <small>LEX10474</small>	Threatened <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
Dermochelys coriacea		habitat likely to occur within area
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon		
Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata		
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Isurus oxyrinchus		
Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus		
Longfin Mako [82947]		Species or species habitat likely to occur within area
Lamna nasus		
Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea		
Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Manta alfredi		
Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris		
Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae		
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus		
Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella brevirostris		
Irrawaddy Dolphin [45]		Species or species habitat known to occur within area
Orcinus orca		
Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus		
Sperm Whale [59]		Species or species habitat may occur within area
Pristis pristis		
Freshwater Sawfish, Largetooth Sawfish, River Sawfish, Leichhardt's Sawfish, Northern Sawfish [60756]	Vulnerable	Species or species habitat known to occur within area
Pristis zijsron		
Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus		
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis		
Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Migratory Terrestrial Species		
Cuculus optatus		
Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species 7

Name <small>LEX10474</small>	Threatened <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
Hirundapus caudacutus White-throated Needletail [682]		habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat likely to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species

Name <small>LEX10474</small>	Threatened <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
Numenius minutus Little Curlew, Little Whimbrel [848]		habitat known to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Roosting known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Foraging, feeding or related behaviour known to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
LEX10474 Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat known to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Foraging, feeding or related behaviour known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species ¹⁰

Name <small>LEX10474</small>	Threatened <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
Numenius madagascariensis		habitat known to occur within area
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus		
Little Curlew, Little Whimbrel [848]		Roosting known to occur within area
Numenius phaeopus		
Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus		
Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons		
Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna albifrons		
Little Tern [813]		Species or species habitat may occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Fish		
Acentronura tentaculata		
Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Bulbonaricus davaoensis		
Davao Pughead Pipefish [66190]		Species or species habitat may occur within area
Campichthys tryoni		
Tryon's Pipefish [66193]		Species or species habitat may occur within area
Choeroichthys brachysoma		
Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys sculptus		
Sculptured Pipefish [66197]		Species or species habitat may occur within area
Choeroichthys suillus		
Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Corythoichthys amplexus		
Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys flavofasciatus		
Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Corythoichthys intestinalis		
Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area
Corythoichthys ocellatus		
Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Corythoichthys paxtoni Paxton's Pipefish [66204]	LEX10474 RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Corythoichthys schultzi Schultz's Pipefish [66205]		Species or species habitat may occur within area
Cosmocampus darrosanus D'Arros Pipefish [66207]		Species or species habitat may occur within area
Cosmocampus maxweberi Maxweber's Pipefish [66209]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Festucalex gibbsi Gibbs' Pipefish [66215]		Species or species habitat may occur within area
Halicampus brocki Brock's Pipefish [66219]		Species or species habitat may occur within area
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus macrorhynchus Whiskered Pipefish, Ornate Pipefish [66222]		Species or species habitat may occur within area
Halicampus nitidus Glittering Pipefish [66224]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Haliichthys taeniophorus Ribboned Pipehorse, Ribboned Seadragon [66226]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
LEX10474 Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]	RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippichthys spicifer Belly-barred Pipefish, Banded Freshwater Pipefish [66232]		Species or species habitat may occur within area
Hippocampus bargibanti Pygmy Seahorse [66721]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area
Hippocampus spinosissimus Hedgehog Seahorse [66239]		Species or species habitat may occur within area
Hippocampus zebra Zebra Seahorse [66241]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorn-tail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis brachyurus Short-tail Pipefish, Short-tailed River Pipefish [66257]		Species or species habitat may occur within area
Nannocampus pictus Painted Pipefish, Reef Pipefish [66263]		Species or species habitat may occur within area
Phoxocampus diacanthus Pale-blotched Pipefish, Spined Pipefish [66266]		Species or species habitat may occur within area
Siokunichthys breviceps Softcoral Pipefish, Soft-coral Pipefish [66270]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<p>LEX10474 Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]</p>	<p>RELEASED BY DFAT UNDER THE FOI ACT 1982</p>	<p>Species or species habitat may occur within area</p>
<p>Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]</p>		<p>Species or species habitat may occur within area</p>
<p>Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]</p>		<p>Species or species habitat may occur within area</p>
<p>Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]</p>		<p>Species or species habitat may occur within area</p>
Mammals		
<p>Dugong dugon Dugong [28]</p>		<p>Species or species habitat known to occur within area</p>
Reptiles		
<p>Acalyptophis peronii Horned Seasnake [1114]</p>		<p>Species or species habitat may occur within area</p>
<p>Aipysurus duboisii Dubois' Seasnake [1116]</p>		<p>Species or species habitat may occur within area</p>
<p>Aipysurus eydouxii Spine-tailed Seasnake [1117]</p>		<p>Species or species habitat may occur within area</p>
<p>Aipysurus laevis Olive Seasnake [1120]</p>		<p>Species or species habitat may occur within area</p>
<p>Astrotia stokesii Stokes' Seasnake [1122]</p>		<p>Species or species habitat may occur within area</p>
<p>Caretta caretta Loggerhead Turtle [1763]</p>	<p>Endangered</p>	<p>Breeding likely to occur within area</p>
<p>Chelonia mydas Green Turtle [1765]</p>	<p>Vulnerable</p>	<p>Breeding known to occur within area</p>
<p>Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]</p>	<p>Endangered</p>	<p>Breeding likely to occur within area</p>
<p>Disteira kingii Spectacled Seasnake [1123]</p>		<p>Species or species habitat may occur within area</p>
<p>Disteira major Olive-headed Seasnake [1124]</p>		<p>Species or species habitat may occur within area</p>
<p>Enhydrina schistosa Beaked Seasnake [1126]</p>		<p>Species or species habitat may occur within area</p>
<p>Eretmochelys imbricata Hawksbill Turtle [1766]</p>	<p>Vulnerable</p>	<p>Foraging, feeding or related behaviour known to occur within area</p>
<p>Hydrophis elegans Elegant Seasnake [1104]</p>		<p>Species or species ¹⁴</p>

Name	Threatened	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	habitat may occur within area
Hydrophis mcdowelli null [25926]		Species or species habitat may occur within area
Hydrophis ornatus Spotted Seasnake, Ornate Reef Seasnake [1111]		Species or species habitat may occur within area
Lapemis hardwickii Spine-bellied Seasnake [1113]		Species or species habitat may occur within area
Laticauda colubrina a sea krait [1092]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Breeding likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Species or species habitat likely to occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area

Name	Status	Type of Presence
<small>LEX10474</small> Indopacetus pacificus Longman's Beaked Whale [72]	<small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia simus Dwarf Sperm Whale [58]		Species or species habitat may occur within area
Lagenodelphis hosei Fraser's Dolphin, Sarawak Dolphin [41]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens Ginkgo-toothed Beaked Whale, Ginkgo-toothed Whale, Ginkgo Beaked Whale [59564]		Species or species habitat may occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
Stenella longirostris Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species

Name	Status	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	habitat may occur within area
Ziphius cavirostris		Species or species habitat may occur within area
Cuvier's Beaked Whale, Goose-beaked Whale [56]		

Commonwealth Reserves Marine [Resource Information]

Name	Label
Coral Sea	Habitat Protection Zone (Coral Sea)
Coral Sea	Marine National Park Zone (IUCN II)

Extra Information

State and Territory Reserves [Resource Information]

Name	State
Bowling Green Bay	QLD

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
------	--------	------------------

Birds

Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area

Frogs

Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
--------------------------------------	--	--

Mammals

Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Oryctolagus cuniculus Rabbit, European Rabbit [128]	LEX10474 RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area

Plants

Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Jatropha gossypifolia Cotton-leaved Physic-Nut, Bellyache Bush, Cotton-leaf Physic Nut, Cotton-leaf Jatropha, Black Physic Nut [7507]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Vachellia nilotica Prickly Acacia, Blackthorn, Prickly Mimosa, Black Piquant, Babul [84351]		Species or species habitat likely to occur within area

Nationally Important Wetlands [[Resource Information](#)]

Name	State
Bowling Green Bay	QLD
Burdekin - Townsville Coastal Aggregation	QLD
Great Barrier Reef Marine Park	QLD

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-19.272 147.058,-19.262 147.082,-19.252 147.087,-19.123 147.105,-19.001 147.11,-18.3 147.004,-18.456 146.908,-18.408 146.915,-18.36 146.946,-18.107 147.206,-17.748 147.4,-16.547 147.357,-16.176 147.444,-13.779 148.574

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

© Commonwealth of Australia
Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 26/02/18 14:49:48

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	81
Listed Migratory Species:	74

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	132
Whales and Other Cetaceans:	33
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	3

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	3
Regional Forest Agreements:	None
Invasive Species:	31
Nationally Important Wetlands:	2
Key Ecological Features (Marine)	2

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name

EEZ and Territorial Sea

Marine Regions

[\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name

[Coral Sea](#)

[Temperate East](#)

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur

Name LEX10474	Status RELEASED BY DFAT UNDER THE FOI ACT 1982	Type of Presence
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	within area Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Poephila cincta cincta Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area
Pterodroma heraldica Herald Petrel [66973]	Critically Endangered	Species or species habitat likely to occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat may occur within area
Frogs		
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat known to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat may occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<small>LEX10474</small> Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area
Plants		
Acacia attenuata [10690]	Vulnerable	Species or species habitat known to occur within area
Allocasuarina emuina Emu Mountain Sheoak, Mt Emu She-oak [21926]	Endangered	Species or species habitat likely to occur within area
Allocasuarina thalassoscopica [21927]	Endangered	Species or species habitat may occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Baloghia marmorata Marbled Baloghia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat may occur within area
Bosistoia transversa Three-leaved Bosistoia, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Eucalyptus conglomerata Swamp Stringybark [3160]	Endangered	Species or species habitat likely to occur within area
Graptophyllum reticulatum Veiny Graptophyllum [55459]	Endangered	Species or species habitat known to occur within area

Name	Status	Type of Presence
<small>LEX10474</small> Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat known to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Prasophyllum wallum Wallum Leek-orchid [55148]	Vulnerable	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Triunia robusta Glossy Spice Bush [14747]	Endangered	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Furina dunmali Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Saiphos reticulatus Three-toed Snake-tooth Skink [88328]	Vulnerable	Species or species habitat may occur within area
Sharks		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species ²⁷

Name	Status	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	habitat known to occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Foraging, feeding or related behaviour known to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Ardenna pacifica Wedge-tailed Shearwater [84292]		Breeding known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species

Name <small>LEX10474</small>	Threatened <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		habitat likely to occur within area Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat may occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
LEX10474 Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Orcaella brevirostris Irrawaddy Dolphin [45]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Breeding may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area

Name	Threatened	Type of Presence
LEX10474 Calidris melanotos Pectoral Sandpiper [858]	RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area
Tringa incana Wandering Tattler [831]		Roosting known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area

Other Matters Protected by the EPBC Act

LEXN0174

RELEASED BY DEAT UNDER THE FOI ACT 1982

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Foraging, feeding or related behaviour known to occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Roosting known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur

Name LEX10474	Threatened RELEASED BY DFAT UNDER THE FOI ACT 1982	Type of Presence
Charadrius leschenaultii		within area
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Roosting known to occur within area
Charadrius mongolus		
Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area
Charadrius ruficapillus		
Red-capped Plover [881]		Roosting known to occur within area
Cuculus saturatus		
Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat known to occur within area
Diomedea antipodensis		
Antipodean Albatross [64458]	Vulnerable	Species or species habitat may occur within area
Diomedea exulans		
Wandering Albatross [89223]	Vulnerable	Species or species habitat may occur within area
Diomedea gibsoni		
Gibson's Albatross [64466]	Vulnerable*	Species or species habitat may occur within area
Fregata ariel		
Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area
Fregata minor		
Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Gallinago hardwickii		
Latham's Snipe, Japanese Snipe [863]		Roosting may occur within area
Gallinago megala		
Swinhoe's Snipe [864]		Roosting likely to occur within area
Gallinago stenura		
Pin-tailed Snipe [841]		Roosting likely to occur within area
Haliaeetus leucogaster		
White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes		
Grey-tailed Tattler [59311]		Roosting known to occur within area
Heteroscelus incanus		
Wandering Tattler [59547]		Roosting known to occur within area
Himantopus himantopus		
Black-winged Stilt [870]		Roosting known to occur within area
Hirundapus caudacutus		
White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor		
Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limicola falcinellus		
Broad-billed Sandpiper [842]		Roosting known to occur within area
Limosa lapponica		
Bar-tailed Godwit [844]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Puffinus pacificus Wedge-tailed Shearwater [1027]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<small>LEX10474</small> Thalassarche cauta Tasmanian Shy Albatross [89224]	<small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small> Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Bulbonaricus davaoensis Davao Pughead Pipefish [66190]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys sculptus Sculptured Pipefish [66197]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		Species or species habitat may occur within area
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Corythoichthys schultzi Schultz's Pipefish [66205]	LEX10474 RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Cosmocampus maxweberi Maxweber's Pipefish [66209]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus macrorhynchus Whiskered Pipefish, Ornate Pipefish [66222]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
LEX10474 Hippocampus planifrons Flat-face Seahorse [66238]	RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
Hippocampus zebra Zebra Seahorse [66241]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorn-tail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
Phoxocampus diacanthus Pale-blotched Pipefish, Spined Pipefish [66266]		Species or species habitat may occur within area
Siokunichthys breviceps Softcoral Pipefish, Soft-coral Pipefish [66270]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<small>LEX10474</small> Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]	<small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat known to occur within area
Reptiles		
Acalyptophis peronii Horned Seasnake [1114]		Species or species habitat may occur within area
Aipysurus laevis Olive Seasnake [1120]		Species or species habitat may occur within area
Astrotia stokesii Stokes' Seasnake [1122]		Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Breeding known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Disteira kingii Spectacled Seasnake [1123]		Species or species habitat may occur within area
Disteira major Olive-headed Seasnake [1124]		Species or species habitat may occur within area
Emydocephalus annulatus Turtle-headed Seasnake [1125]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Laticauda laticaudata a sea krait [1093]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
------	--------	------------------

Mammals

Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Indopacetus pacificus Longman's Beaked Whale [72]		Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia simus Dwarf Sperm Whale [58]		Species or species habitat may occur within area
Lagenodelphis hosei Fraser's Dolphin, Sarawak Dolphin [41]		Species or species ³⁹

Name LEX10474	Status RELEASED BY DFAT UNDER THE FOI ACT 1982	Type of Presence
Megaptera novaeangliae		habitat may occur within area
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Mesoplodon densirostris		
Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon ginkgodens		
Ginkgo-toothed Beaked Whale, Ginkgo-toothed Whale, Ginkgo Beaked Whale [59564]		Species or species habitat may occur within area
Mesoplodon grayi		
Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon layardii		
Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Orcaella brevirostris		
Irrawaddy Dolphin [45]		Species or species habitat may occur within area
Orcinus orca		
Killer Whale, Orca [46]		Species or species habitat may occur within area
Peponocephala electra		
Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus		
Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens		
False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa chinensis		
Indo-Pacific Humpback Dolphin [50]		Breeding known to occur within area
Stenella attenuata		
Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba		
Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area
Stenella longirostris		
Long-snouted Spinner Dolphin [29]		Species or species habitat may occur within area
Steno bredanensis		
Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tursiops aduncus		
Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str.		
Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris		
Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Name	Label
Coral Sea	Habitat Protection Zone (Seamounts)
Coral Sea	Marine National Park Zone (IUCN II)
Coral Sea	Multiple Use Zone (IUCN VI)

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Name	State
Ex-HMAS Brisbane	QLD
Maroochy River	QLD
Mountain Creek Conservation Area	QLD

Invasive Species [\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
<div style="display: flex; justify-content: space-between; align-items: center;"> LEX10474 RELEASED BY DFAT UNDER THE FOI ACT 1982 </div>		
Mammals		
<p>Bos taurus Domestic Cattle [16]</p>		Species or species habitat likely to occur within area
<p>Canis lupus familiaris Domestic Dog [82654]</p>		Species or species habitat likely to occur within area
<p>Felis catus Cat, House Cat, Domestic Cat [19]</p>		Species or species habitat likely to occur within area
<p>Lepus capensis Brown Hare [127]</p>		Species or species habitat likely to occur within area
<p>Mus musculus House Mouse [120]</p>		Species or species habitat likely to occur within area
<p>Rattus norvegicus Brown Rat, Norway Rat [83]</p>		Species or species habitat likely to occur within area
<p>Rattus rattus Black Rat, Ship Rat [84]</p>		Species or species habitat likely to occur within area
<p>Sus scrofa Pig [6]</p>		Species or species habitat likely to occur within area
<p>Vulpes vulpes Red Fox, Fox [18]</p>		Species or species habitat likely to occur within area
Plants		
<p>Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]</p>		Species or species habitat likely to occur within area
<p>Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]</p>		Species or species habitat likely to occur within area
<p>Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]</p>		Species or species habitat likely to occur within area
<p>Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]</p>		Species or species habitat likely to occur within area
<p>Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]</p>		Species or species habitat may occur within area
<p>Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]</p>		Species or species habitat likely to occur within area
<p>Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]</p>		Species or species habitat likely to occur within area
<p>Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]</p>		Species or species habitat likely to occur within area
<p>Opuntia spp. Prickly Pears [82753]</p>		Species or species

Name	Status	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	habitat likely to occur within area
Protasparagus densiflorus Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Reptiles

Hemidactylus frenatus Asian House Gecko [1708]	Species or species habitat likely to occur within area
---	--

Nationally Important Wetlands

[[Resource Information](#)]

Name	State
Coolum Creek and Lower Maroochy River	QLD
Lower Mooloolah River	QLD

Key Ecological Features (Marine)

[[Resource Information](#)]

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Tasmantid seamount chain	Coral Sea
Upwelling off Fraser Island	Temperate east

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-26.659 153.104,-26.657 153.115,-26.644 153.132,-26.61 153.16,-26.597 153.195,-26.647 154.013,-26.546 154.264,-26.364 154.353,-26.145 154.38,-26.045 154.45,-25.867 154.73,-25.591 154.844,-25.344 155.27,-23.559 156.091,-21.534 155.988,-21.07 156.009,-19.01 154.788,-17.529 154.144,-15.048 153.492

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

© Commonwealth of Australia
Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 26/02/18 15:04:48

[Summary](#)

[Details](#)

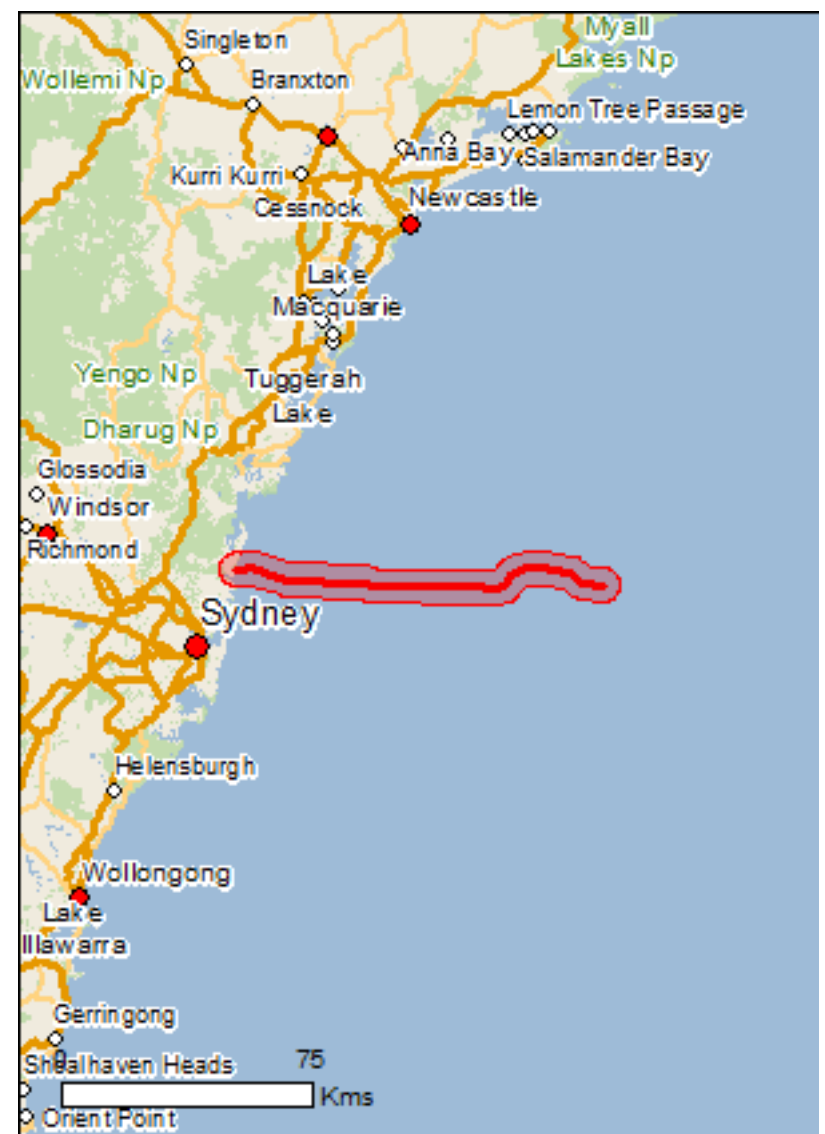
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

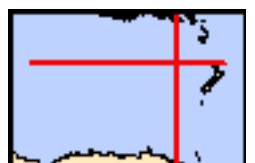
[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	1
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	83
Listed Migratory Species:	56

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	6
Commonwealth Heritage Places:	None
Listed Marine Species:	80
Whales and Other Cetaceans:	35
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	2
Regional Forest Agreements:	None
Invasive Species:	49
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	1

Details

Matters of National Environmental Significance

National Heritage Properties [\[Resource Information \]](#)

Name	State	Status
Natural		
Ku-ring-gai Chase National Park, Lion, Long and Spectacle Island Nature Reserves	NSW	Listed place

Commonwealth Marine Area [\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name

EEZ and Territorial Sea

Marine Regions [\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name

[Temperate East](#)

Listed Threatened Ecological Communities [\[Resource Information \]](#)

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community likely to occur within area
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion	Endangered	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<small>LEX10474</small> Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma heraldica Herald Petrel [66973]	Critically Endangered	Species or species habitat likely to occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area

Name	Status	Type of Presence
LEX10474 Rostratula australis	RELEASED BY DFAT UNDER THE FOI ACT 1982	
Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Sternula nereis nereis		
Australian Fairy Tern [82950]	Vulnerable	Breeding likely to occur within area
Thalassarche bulleri		
Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei		
Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta		
Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi		
White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Fish		
Epinephelus daemeli		
Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Macquaria australasica		
Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena		
Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Heleioporus australiacus		
Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat known to occur within area
Litoria aurea		
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area
Litoria littlejohni		
Littlejohn's Tree Frog, Heath Frog [64733]	Vulnerable	Species or species habitat may occur within area
Mixophyes balbus		
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely

Name <small>LEX10474</small>	Status <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
		to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat known to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat may occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area
Acacia terminalis subsp. terminalis MS Sunshine Wattle (Sydney region) [88882]	Endangered	Species or species habitat likely to occur within area
Asterolasia elegans [56780]	Endangered	Species or species habitat likely to occur within area
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
<small>LEX10474</small> Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat likely to occur within area
Genoplesium baueri Yellow Gnat-orchid [7528]	Endangered	Species or species habitat known to occur within area
Grevillea caleyi Caley's Grevillea [9683]	Endangered	Species or species habitat known to occur within area
Haloragodendron lucasii Hal [6480]	Endangered	Species or species habitat likely to occur within area
Kunzea rupestris [8798]	Vulnerable	Species or species habitat likely to occur within area
Leptospermum deanei Deane's Tea-tree [21777]	Vulnerable	Species or species habitat may occur within area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat may occur within area
Microtis angusii Angus's Onion Orchid [64530]	Endangered	Species or species habitat likely to occur within area
Pelargonium sp. Striatellum (G.W.Carr 10345) Omeo Stork's-bill [84065]	Endangered	Species or species habitat may occur within area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat likely to occur within area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat known to occur within area
Prostanthera marifolia Seaforth Mintbush [7555]	Critically Endangered	Species or species habitat may occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area

Name	Status	Type of Presence
^{LEX10474} Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area

Sharks

Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat known to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species

[[Resource Information](#)]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within

Name <small>LEX10474</small>	Threatened <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
Sternula albifrons Little Tern [82849]		area Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur

Name LEX10474	Threatened RELEASED BY DFAT UNDER THE FOI ACT 1982	Type of Presence
Lagenorhynchus obscurus Dusky Dolphin [43]		within area Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species ⁵⁵

Name	Threatened	Type of Presence
LEX10474 Calidris acuminata Sharp-tailed Sandpiper [874]		habitat known to occur within area Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name

Commonwealth Land -
Commonwealth Land - Australian Postal Commission
Commonwealth Land - Australian Postal Corporation
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Defence Housing Authority
Commonwealth Land - Director of War Service Homes

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
------	------------	------------------

Birds

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
--	--	---

Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
--	--	--

Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur
---	--	--

Name LEX10474	Threatened RELEASED BY DFAT UNDER THE FOI ACT 1982	Type of Presence
Ardea alba Great Egret, White Egret [59541]		within area Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
<small>LEX10474</small> Hirundapus caudacutus White-throated Needletail [682]	RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<small>LEX10474</small> Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	<small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small> Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
<p><small>LEX10474</small> Maroubra perserrata Sawtooth Pipefish [66252]</p>	<p>RELEASSED BY DFAT UNDER THE FOI ACT 1982</p>	<p>Species or species habitat may occur within area</p>
<p>Notiocampus ruber Red Pipefish [66265]</p>		<p>Species or species habitat may occur within area</p>
<p>Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]</p>		<p>Species or species habitat may occur within area</p>
<p>Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]</p>		<p>Species or species habitat may occur within area</p>
<p>Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]</p>		<p>Species or species habitat may occur within area</p>
<p>Solenostomus paegnius Rough-snout Ghost Pipefish [68425]</p>		<p>Species or species habitat may occur within area</p>
<p>Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]</p>		<p>Species or species habitat may occur within area</p>
<p>Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]</p>		<p>Species or species habitat may occur within area</p>
<p>Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]</p>		<p>Species or species habitat may occur within area</p>
<p>Stigmatopora olivacea a pipefish [74966]</p>		<p>Species or species habitat may occur within area</p>
<p>Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]</p>		<p>Species or species habitat may occur within area</p>
<p>Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]</p>		<p>Species or species habitat may occur within area</p>
<p>Urocampus carinirostris Hairy Pipefish [66282]</p>		<p>Species or species habitat may occur within area</p>
<p>Vanacampus margaritifer Mother-of-pearl Pipefish [66283]</p>		<p>Species or species habitat may occur within area</p>
Mammals		
<p>Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]</p>		<p>Species or species habitat may occur within area</p>
<p>Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]</p>		<p>Species or species habitat may occur within area</p>
<p>Dugong dugon Dugong [28]</p>		<p>Species or species habitat may occur within area</p>
Reptiles		
<p>Caretta caretta Loggerhead Turtle [1763]</p>	<p>Endangered</p>	<p>Species or species habitat known to occur</p>

Name	Threatened	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Foraging, feeding or related behaviour known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area

Name	Status	Type of Presence
LEX10474 Grampus griseus Risso's Dolphin, Grampus [64]	RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Kogia breviceps Pygmy Sperm Whale [57]		Species or species habitat may occur within area
Kogia simus Dwarf Sperm Whale [58]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat likely to occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]		Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]		Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]		Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]		Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]		Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Peponocephala electra Melon-headed Whale [47]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]		Species or species habitat likely to occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]		Species or species habitat may occur within area

Name	Status	Type of Presence
Stenella longirostris Long-snouted Spinner Dolphin [29]	LEX10474 RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Steno bredanensis Rough-toothed Dolphin [30]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Name	State
Garigal	NSW
Ku-ring-gai Chase	NSW

Invasive Species [\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
------	--------	------------------

Birds

<i>Acridotheres tristis</i> Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
<i>Alauda arvensis</i> Skylark [656]		Species or species habitat likely to occur within area
<i>Anas platyrhynchos</i> Mallard [974]		Species or species habitat likely to occur within area
<i>Carduelis carduelis</i> European Goldfinch [403]		Species or species habitat likely to occur within area
<i>Carduelis chloris</i> European Greenfinch [404]		Species or species habitat likely to occur within area
<i>Columba livia</i> Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
<i>Lonchura punctulata</i> Nutmeg Mannikin [399]		Species or species habitat likely to occur

Name	Status	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
<p>LEX10474 Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]</p>	<p>RELEASED BY DFAT UNDER THE FOI ACT 1982</p>	<p>Species or species habitat likely to occur within area</p>
<p>Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax, Florist's Smilax, Smilax Asparagus [22473]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Asparagus plumosus Climbing Asparagus-fern [48993]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Asparagus scandens Asparagus Fern, Climbing Asparagus Fern [23255]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]</p>		<p>Species or species habitat may occur within area</p>
<p>Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Genista sp. X Genista monspessulana Broom [67538]</p>		<p>Species or species habitat may occur within area</p>
<p>Lantana camara Lantana, Common Lantana, Kamara Lantana, Large- leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Lycium ferocissimum African Boxthorn, Boxthorn [19235]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Opuntia spp. Prickly Pears [82753]</p>		<p>Species or species habitat likely to occur within area</p>
<p>Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]</p>		<p>Species or species habitat may occur within area</p>

Name	Status	Type of Presence
<small>LEX10474</small> Protasparagus densiflorus Asparagus Fern, Plume Asparagus [5015]	<small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Species or species habitat likely to occur within area
Protasparagus plumosus Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Key Ecological Features (Marine) [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Canyons on the eastern continental slope	Temperate east

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-33.697 151.307,-33.7 151.319,-33.694 151.346,-33.72 151.439,-33.726 151.651,-33.727 151.657,-33.729 151.662,-33.733 151.665,-33.734 151.665,-33.737 151.943,-33.74 152.007,-33.736 152.023,-33.71 152.042,-33.7 152.071,-33.695 152.092,-33.696 152.129,-33.704 152.2,-33.726 152.235,-33.732 152.288

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

© Commonwealth of Australia
Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 26/02/18 15:22:19

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

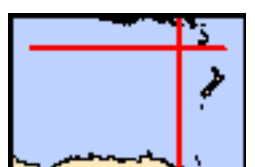
[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	37
Listed Migratory Species:	41

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	73
Whales and Other Cetaceans:	36
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	5

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	None
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	4

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[\[Resource Information \]](#)

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside the Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area. Generally the Commonwealth Marine Area stretches from three nautical miles to two hundred nautical miles from the coast.

Name

EEZ and Territorial Sea

Marine Regions

[\[Resource Information \]](#)

If you are planning to undertake action in an area in or close to the Commonwealth Marine Area, and a marine bioregional plan has been prepared for the Commonwealth Marine Area in that area, the marine bioregional plan may inform your decision as to whether to refer your proposed action under the EPBC Act.

Name

[Coral Sea](#)

[Temperate East](#)

Listed Threatened Species

[\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel	Endangered	Species or species

Name	Status	Type of Presence
[1060]		habitat may occur within area
Macronectes halli		
Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis		
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur subantarctica		
Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat may occur within area
Phoebetria fusca		
Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma heraldica		
Herald Petrel [66973]	Critically Endangered	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera		
Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta		
Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Thalassarche bulleri		
Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei		
Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta		
Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche cauta steadi		
White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita		
Chatham Albatross [64457]	Endangered	Species or species habitat likely to occur within area
Thalassarche impavida		
Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris		
Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini		
Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Balaenoptera borealis		
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera musculus		
Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus		
Fin Whale [37]	Vulnerable	Foraging, feeding or

Name	Status	Type of Presence
LEX10474	RELEASED BY DFAT UNDER THE FOI ACT 1982	related behaviour likely to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Sharks		
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Foraging, feeding or related behaviour known to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
<small>LEX10474</small> Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat likely to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
LEX10474 Isurus oxyrinchus Shortfin Mako, Mako Shark [79073]		Species or species habitat likely to occur within area
Isurus paucus Longfin Mako [82947]		Species or species habitat likely to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat likely to occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994]		Species or species habitat likely to occur within area
Manta birostris Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995]		Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

LEX10174

RELEASED BY DEAT UNDER THE FOI ACT 1982

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anous stolidus Common Noddy [825]		Foraging, feeding or related behaviour known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Species or species habitat likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Species or species habitat likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Species or species habitat likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Species or species habitat likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within

Name <small>LEX10474</small>	Threatened <small>RELEASED BY DFAT UNDER THE FOI ACT 1982</small>	Type of Presence
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	area Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat may occur within area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat likely to occur within area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Species or species habitat likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Fish		
Bulbonaricus davaoensis Davao Pughead Pipefish [66190]		Species or species habitat may occur within area
Choeroichthys brachysoma Pacific Short-bodied Pipefish, Short-bodied Pipefish [66194]		Species or species habitat may occur within area
Choeroichthys sculptus Sculptured Pipefish [66197]		Species or species habitat may occur within area
Choeroichthys suillus Pig-snouted Pipefish [66198]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within

Name LEX10474	Threatened RELEASED BY DFAT UNDER THE FOI ACT 1982	Type of Presence
Corythoichthys flavofasciatus Reticulate Pipefish, Yellow-banded Pipefish, Network Pipefish [66200]		area Species or species habitat may occur within area
Corythoichthys intestinalis Australian Messmate Pipefish, Banded Pipefish [66202]		Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Corythoichthys schultzi Schultz's Pipefish [66205]		Species or species habitat may occur within area
Cosmocampus maxweberi Maxweber's Pipefish [66209]		Species or species habitat may occur within area
Doryrhamphus dactyliophorus Banded Pipefish, Ringed Pipefish [66210]		Species or species habitat may occur within area
Doryrhamphus excisus Bluestripe Pipefish, Indian Blue-stripe Pipefish, Pacific Blue-stripe Pipefish [66211]		Species or species habitat may occur within area
Doryrhamphus janssi Cleaner Pipefish, Janss' Pipefish [66212]		Species or species habitat may occur within area
Doryrhamphus negrosensis Flagtail Pipefish, Masthead Island Pipefish [66213]		Species or species habitat may occur within area
Halicampus dunckeri Red-hair Pipefish, Duncker's Pipefish [66220]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Halicampus macrorhynchus Whiskered Pipefish, Ornate Pipefish [66222]		Species or species habitat may occur within area
Halicampus spinirostris Spiny-snout Pipefish [66225]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus histrix Spiny Seahorse, Thorny Seahorse [66236]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
LEX10474 Hippocampus planifrons Flat-face Seahorse [66238]	RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Hippocampus zebra Zebra Seahorse [66241]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thornail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Phoxocampus diacanthus Pale-blotched Pipefish, Spined Pipefish [66266]		Species or species habitat may occur within area
Siokunichthys breviceps Softcoral Pipefish, Soft-coral Pipefish [66270]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Trachyrhamphus longirostris Straightstick Pipefish, Long-nosed Pipefish, Straight Stick Pipefish [66281]		Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat likely to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat likely to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
^{LEX10474} Eretmochelys imbricata Hawksbill Turtle [1766]	Released by DFAT under the FOI Act 1982 Vulnerable	Species or species habitat likely to occur within area
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle [1767]	Endangered	Species or species habitat likely to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Species or species habitat known to occur within area

Whales and other Cetaceans [Resource Information]

Name	Status	Type of Presence
Mammals		

Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera bonaerensis Antarctic Minke Whale, Dark-shoulder Minke Whale [67812]		Species or species habitat likely to occur within area
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat likely to occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat may occur within area
Feresa attenuata Pygmy Killer Whale [61]		Species or species habitat may occur within area
Globicephala macrorhynchus Short-finned Pilot Whale [62]		Species or species habitat may occur within area
Globicephala melas Long-finned Pilot Whale [59282]		Species or species habitat may occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Hyperoodon planifrons Southern Bottlenose Whale [71]		Species or species habitat may occur within area
Indopacetus pacificus Longman's Beaked Whale [72]		Species or species habitat may occur within area

Name	Status	Type of Presence
Kogia breviceps Pygmy Sperm Whale [57]	Vulnerable	Species or species habitat may occur within area
Kogia simus Dwarf Sperm Whale [58]	Vulnerable	Species or species habitat may occur within area
Lagenodelphis hosei Fraser's Dolphin, Sarawak Dolphin [41]	Vulnerable	Species or species habitat may occur within area
Lissodelphis peronii Southern Right Whale Dolphin [44]	Vulnerable	Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat likely to occur within area
Mesoplodon bowdoini Andrew's Beaked Whale [73]	Vulnerable	Species or species habitat may occur within area
Mesoplodon densirostris Blainville's Beaked Whale, Dense-beaked Whale [74]	Vulnerable	Species or species habitat may occur within area
Mesoplodon ginkgodens Ginkgo-toothed Beaked Whale, Ginkgo-toothed Whale, Ginkgo Beaked Whale [59564]	Vulnerable	Species or species habitat may occur within area
Mesoplodon grayi Gray's Beaked Whale, Scamperdown Whale [75]	Vulnerable	Species or species habitat may occur within area
Mesoplodon layardii Strap-toothed Beaked Whale, Strap-toothed Whale, Layard's Beaked Whale [25556]	Vulnerable	Species or species habitat may occur within area
Mesoplodon mirus True's Beaked Whale [54]	Vulnerable	Species or species habitat may occur within area
Orcinus orca Killer Whale, Orca [46]	Vulnerable	Species or species habitat may occur within area
Peponocephala electra Melon-headed Whale [47]	Vulnerable	Species or species habitat may occur within area
Physeter macrocephalus Sperm Whale [59]	Vulnerable	Species or species habitat may occur within area
Pseudorca crassidens False Killer Whale [48]	Vulnerable	Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]	Vulnerable	Species or species habitat may occur within area
Stenella coeruleoalba Striped Dolphin, Euphrosyne Dolphin [52]	Vulnerable	Species or species habitat may occur within area
Stenella longirostris Long-snouted Spinner Dolphin [29]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Steno bredanensis Rough-toothed Dolphin [30]	LEX10474 RELEASED BY DFAT UNDER THE FOI ACT 1982	Species or species habitat may occur within area
Tasmacetus shepherdi Shepherd's Beaked Whale, Tasman Beaked Whale [55]		Species or species habitat may occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area
Ziphius cavirostris Cuvier's Beaked Whale, Goose-beaked Whale [56]		Species or species habitat may occur within area

Commonwealth Reserves Marine [\[Resource Information \]](#)

Name	Label
Central Eastern	Habitat Protection Zone (IUCN IV)
Central Eastern	Multiple Use Zone (IUCN VI)
Coral Sea	Habitat Protection Zone (Seamounts)
Coral Sea	Marine National Park Zone (IUCN II)
Coral Sea	Multiple Use Zone (IUCN VI)

Extra Information

Key Ecological Features (Marine) [\[Resource Information \]](#)

Key Ecological Features are the parts of the marine ecosystem that are considered to be important for the biodiversity or ecosystem functioning and integrity of the Commonwealth Marine Area.

Name	Region
Tasmantid seamount chain	Coral Sea
Canyons on the eastern continental slope	Temperate east
Tasman Front and eddy field	Temperate east
Tasmantid seamount chain	Temperate east

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-33.696 152.129,-33.704 152.2,-33.72 152.235,-33.732 152.288,-33.704 152.59,-33.675 152.758,-33.623 152.894,-33.596 152.946,-33.578 152.997,-33.583 153.042,-33.58 153.08,-33.491 153.306,-33.376 153.425,-30.796 155.017,-30.609 155.08,-30.553 155.07,-30.48 155.017,-30.428 155.026,-29.844 155.332,-29.299 155.38,-29.043 155.447,-28.943 155.525,-28.852 155.802,-28.613 156.004,-24.717 155.932,-24.074 156.118,-21.534 155.988,-21.07 156.009,-19.01 154.788,-17.529 154.145,-15.048 153.492

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

© Commonwealth of Australia
Department of the Environment
GPO Box 787
Canberra ACT 2601 Australia
+61 2 6274 1111



Australian Government

Department of Foreign Affairs and Trade

11 April 2018

Ref: D18/541239

Mr James Barker
Assistant Secretary
Assessments and Policy Implementation Branch
Environment Standards Division
Department of the Environment and Energy
GPO Box 787
CANBERRA ACT 2601

Dear Mr Barker

Referral under s 161 of the *Environment Protection and Biodiversity Conservation Act 1999*: Undersea Cables Project (UCP)

Please find at Attachment A a referral for advice of a proposal for the Department of Foreign Affairs and Trade to enter into a contract under the foreign aid program to construct an undersea telecommunications cable from Australia to Papua New Guinea and Solomon Islands.

I also attach supporting information which describes the UCP, environmental values potentially affected by the proposal, the nature and extent of likely impacts, and measures to avoid or reduce impacts (Attachment B).

The referral for advice and supporting information describe routes to three potential Australian landing sites. The cable will be constructed following a decision by the Government on the preferred landing site.

Entering into the contract for the proposal before 1 May 2018 will enable the timelines for the implementation of the UCP to be met.

The Prime Ministers of Australia, Papua New Guinea and Solomon Islands have all publicly announced their commitment to the UCP, with work to be substantially underway by mid-2018. The cables will enable improved internet access and connectivity to Papua New Guinea and Solomon Islands which has the potential to positively impact on business engagement and bring significant development benefits.

If you have any questions about the UCP or this referral for advice, please call me on s 22(1)(a)(ii) or s 22(1)(a)(ii)

Yours sincerely

s 22(1)(a)(ii)

Pablo Kang
Head
Undersea Cables Task Force
Pacific Division

ATTACHMENT A**Referral for advice under the *Environment Protection and Biodiversity Conservation Act 1999* (s 161)****Proposal to enter into a contract to survey and construct an undersea telecommunications cable from Australia to Papua New Guinea and Solomon Islands****a) Referral contacts****i) Commonwealth agency making the referral**

Department of Foreign Affairs and Trade
RG Casey Building
John McEwen Crescent
Barton ACT 0221
Telephone number: 6261 1111

ii) The person proposing to take the action

Commonwealth of Australia, represented by the Department of Foreign Affairs and Trade

iii) The person nominated by the Department of Foreign Affairs and Trade as the designated proponent

Pablo Kang
Head
Undersea Cables Task Force
Pacific Division
Telephone number: s 22(1)(a)(ii)

b) The kind of authorisation of the action that the Department of Foreign Affairs and Trade proposes to give

The Department of Foreign Affairs and Trade (DFAT) proposes to enter into a contract with an Australian telecommunications company under Australia's foreign aid program to:

- i. undertake a geophysical survey of a route connecting Australia with Papua New Guinea and Solomon Islands for the construction of an undersea telecommunications cable; and
- ii. construct an undersea telecommunications cable along the route identified in the geophysical survey, including landing infrastructure in Australia, Papua New Guinea and Solomon Islands.

Attachment B describes the proposal, its environmental impacts and measures to manage those impacts.



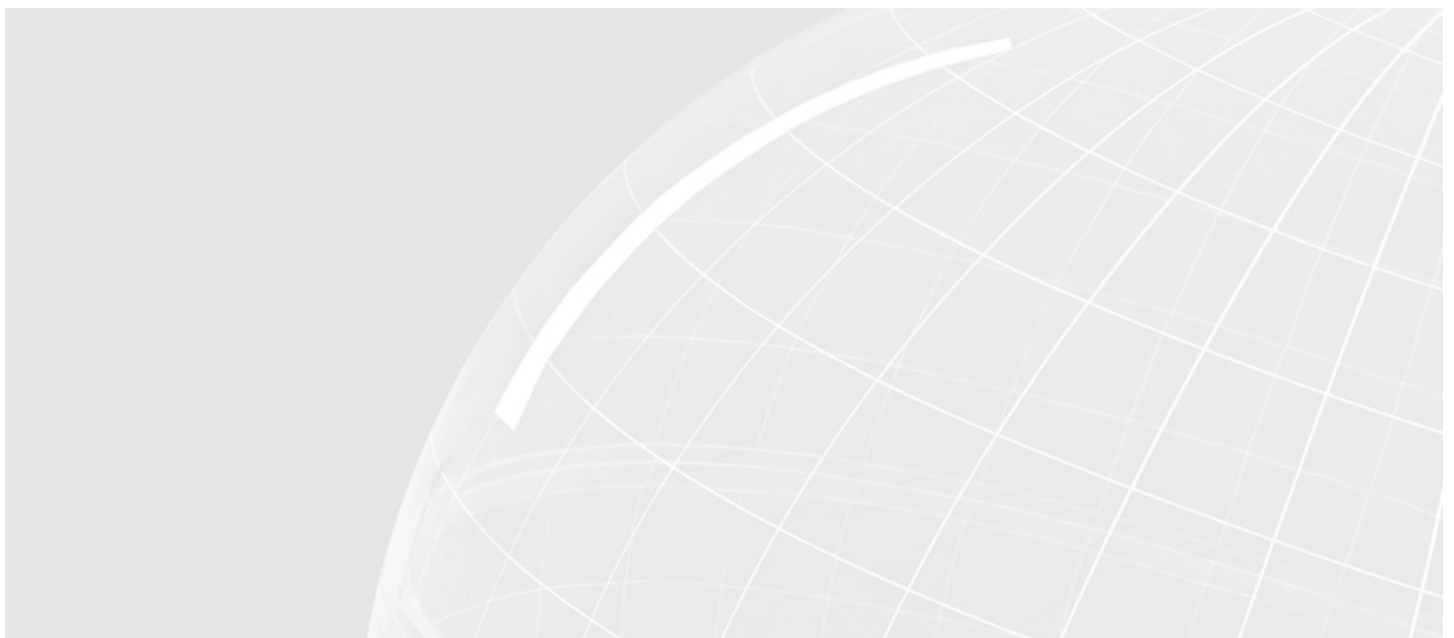
Coral Sea Cable Installation

Vocus Group

Environment Protection and Biodiversity Conservation Act - Section 160
Supporting Information Document

IW175400-0000-NP-RPT-001 | F

6 April 2018



Coral Sea Cable Installation

Project No: IW175400
 Document Title: Environment Protection and Biodiversity Conservation Act - Section 160 Supporting Information Document
 Document No.: IW175400-0000-NP-RPT-001
 Revision: F
 Date: 6 April 2018
 Client Name: Vocus Group
 Project Manager: s 47F(1)
 Author: s 47F(1)
 File Name: J:\IE\Projects\06_Central West\IW175400\21 Deliverables\2. Section 160 'Referral'\Coral Sea Cable System_ S160 Supporting Information _Rev F_Final.docx

Jacobs Australia Pty Limited

11th Floor, Durack Centre
 263 Adelaide Terrace
 PO Box H615
 Perth WA 6001 Australia
 T +61 8 9469 4400
 F +61 8 9469 4488
 www.jacobs.com

© Copyright 2018 Jacobs Australia Pty Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Document history and status

Revision	Date	Description	By	Review	Approved
A	02/3/18	Draft for Client review	s 47F(1)		
B	03/3/2018	Draft for Issue to DFAT	s 47F(1)		
C	06/3/2018	Final Draft following DFAT comments	s 47F(1)		
D	13/03/2018	Draft for Client Review	s 47F(1)		
E	27/03/2018	Client Comments Incorporated	s 47F(1)		
F	04/04/2018	Final following DFAT comments	s 47F(1)		

Contents

Executive Summary.....1

1. Introduction.....3

1.1 Proposal Overview.....3

1.2 Scope and Purpose of this Document.....5

1.3 Additional Regulatory Requirements.....5

1.3.1 Great Barrier Reef Marine Park Act 19755

1.3.2 Australian Marine Park Requirements5

1.3.3 Environment Protection (Sea Dumping) Act 1981 (Cwth).....6

2. Description of the Proposal.....7

2.1 Overview.....7

2.2 Project Justification7

2.3 Route Options.....7

2.4 Route Selection Process9

2.5 Infrastructure Details.....9

2.5.1 Submarine Cable9

2.5.2 Beach Manholes12

2.5.3 Landing Station/Equipment Shelter12

2.6 Construction Method.....13

2.6.1 Stage 1 – Geophysical Survey13

2.6.2 Stage 2 – Cable Installation.....14

2.6.3 Schedule.....18

2.7 Connection to Customers.....18

2.8 Maintenance18

2.9 Decommissioning.....19

3. Impact Assessment Approach20

4. Existing Environment: Australia21

4.1 Regional Overview.....21

4.1.1 Commonwealth Marine Areas21

4.1.2 Australian Marine Parks24

4.2 Physical Environment.....31

4.3 Key Ecological Features.....31

4.4 Biological Environment.....32

4.4.1 Matters of National Environmental Significance32

4.4.2 Biologically Important Areas42

4.4.3 Habitats and Communities49

4.5 Social Environment.....52

5. Existing Environment: Solomon Islands.....53

5.1 Regional Overview.....53

5.2 Physical Environment.....53

5.2.1 Honiara.....53

5.2.2	Noro.....	57
5.2.3	Auki	58
5.2.4	Taro	60
5.3	Biological Environment.....	64
5.3.1	Coral Reefs.....	64
5.3.2	Seagrass Meadows.....	65
5.3.3	Mangroves.....	66
5.3.4	Lagoons and Estuaries.....	66
5.3.5	Protected Areas and Species	66
5.4	Social Environment	67
6.	Existing Environment: Papua New Guinea	69
6.1	Regional Overview.....	69
6.2	Physical Environment.....	69
6.3	Biological Environment.....	69
6.3.1	Coral Reefs.....	69
6.3.2	Deep Water Coastal Lagoon	69
6.3.3	Barrier Reef	69
6.3.4	Marine Fauna.....	70
6.3.5	Kila Police Barracks	70
6.4	Social Environment	72
7.	Stakeholder Consultation	73
8.	Impact Assessment.....	74
8.1	Australia and Surrounding Waters	75
8.2	Solomon Islands	82
8.3	Papua New Guinea	85
9.	References	88

Appendix A. PMST Results

Appendix B. Survey Equipment

Appendix C. Radiated Power Vs Source Level for Underwater Noise

Appendix D. Example Specifications for cable articulated pipe system

Appendix E. Giringun Traditional Use Marine Resource Agreement Region

Executive Summary

Overview

The Commonwealth Government, supported by the Department of Foreign Affairs and Trade (DFAT), is proposing to construct an offshore submarine fibre optic cable network between Australia, Papua New Guinea and Solomon Islands (the Proposal) as a foreign aid project. This document has been prepared to provide supporting information to assist DFAT seek the advice of the Commonwealth Minister for the Environment and Energy (the Minister) on the potential environmental impacts of the Proposal in accordance with Section 160 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth).

The purpose of this document is to provide a description of the proposed activities and to undertake an environmental impact assessment of the Proposal to facilitate obtaining advice from the Minister under Section 160 of the EPBC Act. Should a referral or assessment under Part 7 of the EPBC Act be required as a result of that advice, it is proposed that this document will support those statutory processes.

The Proposal

The proposal is to install a fibre optic cable from Australia (three potential landing locations are discussed and assessed) to Papua New Guinea (Port Moresby) and Solomon Islands (Honiara). The proposal also includes the installation of a domestic fibre optic network within Solomon Islands with four landing points (Honiara, Taro, Auki and Noro).

Currently three options exist for the route that the cable may take. The three options are described in Route Options 2.3 and all three options have been assessed in this document.

The project will be executed in two stages:

- Stage 1: Geophysical survey to obtain a detailed understanding of the seabed within the proposed alignment
- Stage 2: Installation of the cable.

Activities related to the Proposal that may impact on the environment include:

- Geophysical survey (Stage 1)
- Construction of onshore landing stations in Australia, Papua New Guinea and the Solomon Islands (Stage 2)
- Cable beach crossings in Australia, Papua New Guinea and Solomon Islands (Stage 2)
- Cable lay and burial (Stage 2).

The geophysical survey will identify a development corridor within which the final route will be located. The proposed development corridor is approximately 10 km wide (5 km either side of the cable), and becomes narrower as it enters shallower water and approaches the cable landing point at each beach crossing. The development corridor approach allows for flexibility in the final route selection and in turn, selection of the most appropriate route from an engineering, construction and environmental perspective.

Assessment of Impacts to the Environment

Section 8 of this report assesses the impacts of the Proposal on the environment in Australia, international waters, Solomon Islands and Papua New Guinea. The conclusion of this assessment is that the Proposal is not likely to have any significant impacts on Matters of National Environmental Significance (including Great Barrier Reef Marine Park and World Heritage Area values), Australian Marine Park values and other environmental and social factors.

Important note about your report

The sole purpose of this report and the associated services performed by Jacobs is to undertake and document an environmental impact assessment in accordance with the scope of services instructions to Jacobs from Vocus. That scope of services, as described in this report, was developed by Vocus in consultation with the Department of Foreign Affairs and Trade (DFAT).

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by Vocus and/or DFAT and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs have derived the conclusions of this report from information sourced from Vocus and/or DFAT and/or available in the public domain at the time or times outlined in this report. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report.

Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above; however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of Vocus, and is subject to, and issued in accordance with, instructions to Jacobs from Vocus.

Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

1. Introduction

1.1 Proposal Overview

The Commonwealth Government represented by the Department of Foreign Affairs and Trade (DFAT), in partnership with the Papua New Guinea Government and Solomon Islands Government, is proposing to construct and operate an offshore submarine fibre optic cable between Australia, Papua New Guinea and Solomon Island, and a domestic network within the Solomon Island. There are current three route options, as shown in Figure 1-1 all of which have been assessed and described in this document. The cable will form an important telecommunication link for Papua New Guinea ultimately replacing the current aging Australia Papua New Guinea (APNG) cable and for Solomon Islands be their first fibre connection to the rest of the world. This fibre optic cable is essential for the digital economy of both countries, it is expected to assist both consumer and business engagement in the world economy. The cable will also provide national development benefits, particularly in relation to health care and education.

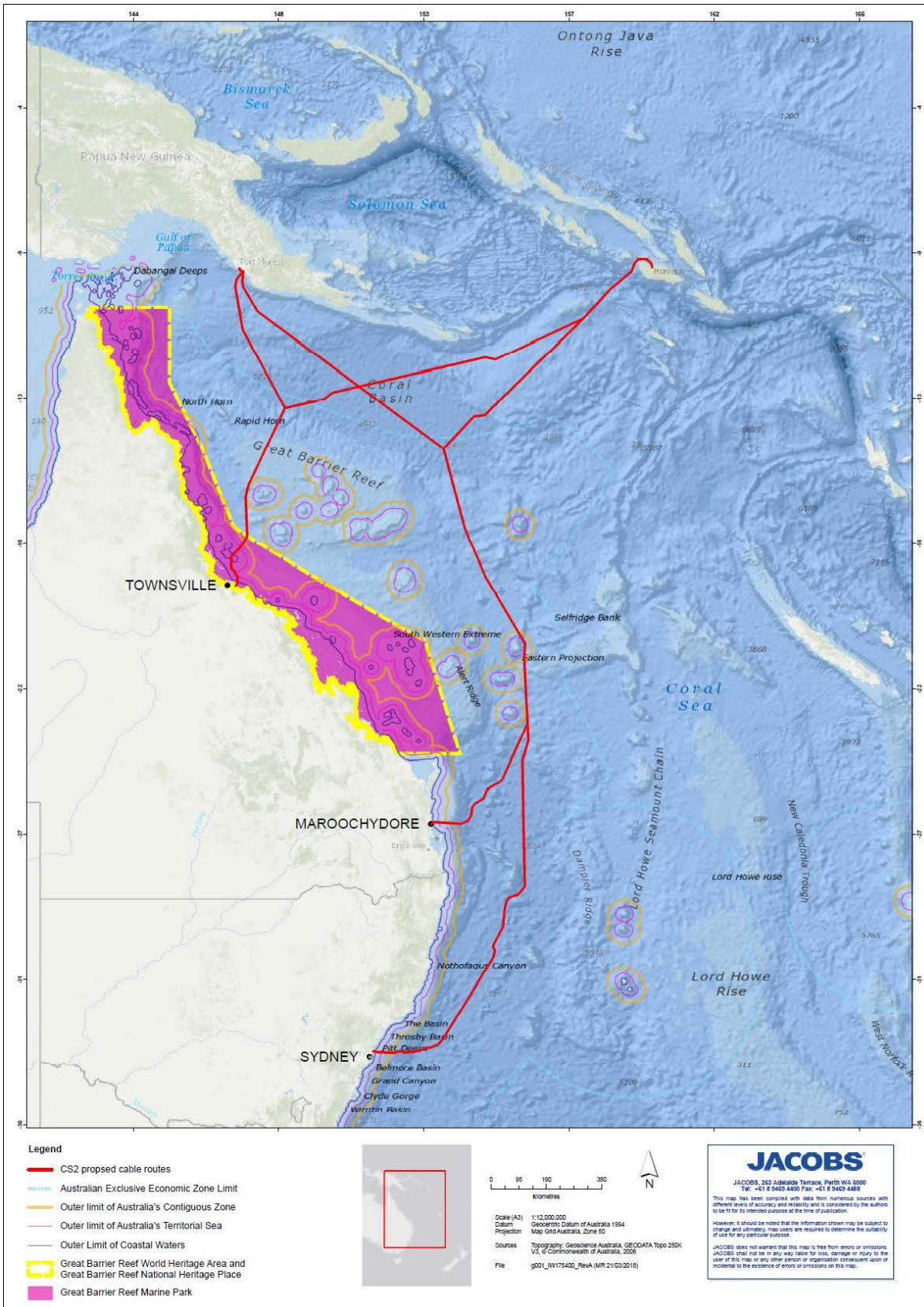


Figure 1-1 Cable Route Options

1.2 Scope and Purpose of this Document

This document provides supporting information to assist DFAT in seeking the advice of the Minister in accordance with Section 160 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth). Section 160(1) of the EPBC Act states:

“Before a Commonwealth agency or employee of the Commonwealth gives an authorisation (however described) of an action described in subsection (2), the agency or employee must obtain and consider advice from the Minister in accordance with this Subdivision.”

And Section 160(2)(a) of the EPBC Act states:

*“Subsection (1) applies in relation to:
(a) the entry by the Commonwealth, under Australia’s foreign aid program, into a contract, agreement or arrangements for the implementation of a project that has, will have or is likely to have a significant impact on the environment anywhere in the world”*

Therefore, this document provides an assessment of the impacts that the proposal is likely to have on the environment anywhere in the world. The scope of this document is limited to the construction and operation of the cable, including the undertaking of the geophysical survey.

1.3 Additional Regulatory Requirements

Whilst this document has been prepared to help satisfy the requirements of Section 160 of the EPBC Act, other Commonwealth legislation may be applicable to the installation of the proposed cable (depending on the final route selection). It should be noted that state and international environmental approvals requirements are not addressed as part of this document.

1.3.1 Great Barrier Reef Marine Park Act 1975

The Great Barrier Reef Marine Park Act 1975 (GBRMP Act) establishes the framework for protecting and managing activities and the use of the Great Barrier Reef Marine Park. Part V of the GBRMP Act establishes the requirement for the GBRMP to be managed in accordance with specific zoning plans. The GBRMP is divided into a number of zones and various activities are restricted or permitted in accordance with each of those zones. Undertaking activities that are not permitted under the relevant zoning plan requires permission from the GBRMP Authority in accordance with the GBRMP Act.

Ordinarily, permission from the GBRMP Authority would be processed alongside a Part 7 EPBC Act referral in accordance with a memorandum of understanding between GBRMP Authority and Department of Environment and Energy. However, this combined approvals process does not necessarily apply to applications made under Section 160 of the EPBC Act. If required, a separate approval (permission) will be submitted to the GBRMP Authority for the proposed activities that traverse or otherwise affect the GBRMP.

1.3.2 Australian Marine Park Requirements

Commonwealth reserves, including Australian Marine Parks, are established under the EPBC Act, and the EPBC Act and EPBC Regulations 2000 provide the legal basis for management of Australian Marine Parks.

Australian Marine Park management has recently been restructured with the Marine Park Management Plans relevant to this section 160 application (the Coral Sea Marine Park and the Central Eastern Marine Park, within the Temperate East Marine Parks Network) recently approved by the Minister for Environment and Energy. [The management plans come into effect on 1 July 2018 for a period of ten years.](#) Under the proposed arrangements, an authorisation will be required from the Director of National Parks for the proposed activities.

Once draft management plans are approved, they will come into effect from a specified date for a period of 10 years. When new management plans come into effect, requirements in those plans take effect immediately. Parks Australia will liaise with DFAT in relation to authorization requirements for this activity.

1.3.3 Environment Protection (Sea Dumping) Act 1981 (Cwth)

While the Environment Protection (Sea Dumping) Act 1981 (Cwth) does not apply to the construction and operation of the project, a Sea Dumping Permit (under the Sea Dumping Act) may need to be acquired at the end of the life of the cable, if proposed to be left *in situ*.

2. Description of the Proposal

2.1 Overview

The proposal involves the installation of between 2400 km – 4400 km of fibre optic cable from the east coast of Australia to Papua New Guinea and Solomon Islands (depending on the final route). For one of the proposed routes (Option 1) approximately 200 km of the cable passes through the Great Barrier Reef Marine Park. Installation of the cable also includes installation of a domestic network within Solomon Islands with four beach landing points, Honiara, Noro, Auki and Taro.

There are currently three options for the route that the cable may take, differentiated by the location where they leave Australia. All three of these options have been assessed in this document and are described in Section 2.3.

The Proposal will be executed in two stages:

- Stage 1: Geophysical survey to obtain a detailed understanding of the seabed
- Stage 2: Installation of the cable.

Activities related to the Proposal that may impact on the environment include:

- Geophysical survey (Stage 1)
- Construction of onshore landing stations in Australia, Papua New Guinea and the Solomon Islands (Stage 2)
- Cable beach crossings in Australia, Papua New Guinea and Solomon Islands (Stage 2)
- Cable lay and burial (Stage 2).

2.2 Project Justification

The Proposal will provide enhanced telecommunication connectivity to Papua New Guinea and Solomon Islands. This will significantly improve connectivity reliability and accessibility and will encourage positive developments in business engagement and in a broad range of government services including in education and healthcare in Papua New Guinea and Solomon Islands.

2.3 Route Options

The Proposal includes three optional landing locations within Australia; however, only one of these options will be surveyed and installed. Furthermore, a final route alignment will not be developed until after the geophysical survey is completed on the determined route alignment. Therefore, for the purposes of this assessment all three route options, with a 10 km wide buffer (5 km each side of the indicative alignment) are described and assessed.

Table 2-1 describes the proposed route options using coordinates of the indicative alignment. All route options are shown in Figure 1-1.

Table 2-1: Proposed Route Options

Route	Approximate location (Lat/Lon; WGS 84)		Description
Route 1 (Townsville Option)	Australian Landing Station	Latitude: -19.267 Longitude: 147.057	Route begins in Townsville at Cape Cleveland and traverses approximately 200 km of the GBRMP, 200 km of the Great Barrier Reef World Heritage Area and 200 km of the Great Barrier Reef National Heritage Place. The cable also traverses the Coral Sea Marine Park and then branches out, within Australia's Economic Exclusive Zone, to Port Moresby and Honiara. The Port Moresby Branch lands at the Kila Police Barracks, near Gabutu. The Honiara Branch will land in Lengakiki, with additional domestic landing locations at Taro, Auki and Noro.
	Branching Unit Location	Latitude: -13.779 Longitude: 148.574	
	Papua New Guinea Landing Station (Port Moresby)	Latitude: -9.494 Longitude: 147.182	
	Solomon Island Landing Station (Honiara)	Latitude: -9.429 Longitude: 159.955	
Route 2 (Maroochydore Option)	Australian Landing Station	Latitude: -26.659 Longitude: 153.104	Route begins at Maroochydore Beach (south of the Paynter river), heading northeast, outside of Australian territorial waters, through the Coral Sea Marine Park before branching out within Australia's Economic Exclusive Zone (EEZ), to Port Moresby and Honiara. The Port Moresby Branch lands on at the Kila Police Barracks, near Gabutu. The Honiara Branch will land in Lengakiki, with additional domestic landing locations at Taro, Auki and Noro.
	Branching Unit Location	Latitude: -15.048 Longitude: 153.492	
	Papua New Guinea Landing Station (Port Moresby)	Latitude: -9.494 Longitude: 147.182	
	Solomon Island Landing Station (Honiara)	Latitude: -9.429 Longitude: 159.955	
Route 3 (Sydney Option)	Australian Landing Station	Latitude: -33.697 Longitude: 151.307	Route begins in North Narrabeen within the northern Sydney Submarine ACMA Cable Protection Zone. The route then heads northeast, outside of Australian territorial waters, through the Central Eastern Marine Park and Coral Sea Marine Park before branching out, within Australia's EEZ, to Port
	Branching Unit Location	Latitude: -15.048 Longitude: 153.492	
	Papua New Guinea Landing Station (Port Moresby)	Latitude: -9.494 Longitude: 147.182	
	Solomon Island Landing Station (Honiara)	Latitude: -9.429 Longitude: 159.955	

Route	Approximate location (Lat/Lon; WGS 84)	Description
		Moresby and Honiara. The commencement point may be varied to the southern Sydney Submarine ACMA Cable Protection Zone subject to further commercial and technical analysis (near Tamarama). The Port Moresby Branch lands at the Kila Police Barracks, near Gabutu. The Honiara Branch will land in Lengakiki, with additional domestic landing locations at Taro, Auki and Noro.

2.4 Route Selection Process

The proposal currently consists of three route options as described in Section 2.3. Once the preferred route has been identified a geophysical survey of the proposed route will be undertaken to confirm the exact route alignment and floor reports including coastal inundation assessment will be done at beach landing sites.

The preferred route option and final route alignment will be selected based on considerations including:

- Route length – shortest distance possible is favourable in order to reduce installation costs and maintain project commercial viability
- Route cost – minimised costs of operation, civil works, construction, installations (power and lightning protection), cable trenching or horizontal directional drill works
- Engineering feasibility – providing for practicable engineering solutions to constructability and operations
- Environmental impact minimisation – avoiding key ecological features where practicable and avoid areas of high ecological value (for example canyons, seamounts and rocky reefs)
- Minimisation of impacts effecting reliability, speed and capacity to the service of the cable during operations. This includes consideration of 100 year flood levels and coastal inundation.
- Risks and opportunities at each landing site (potential risks and opportunities may consider environmental, economic, security, construction and operational aspects).

2.5 Infrastructure Details

2.5.1 Submarine Cable

The proposed cable types will vary along the route, whereby the cable width is determined by the level of armouring that is applied, which in turn is determined by the depth of water, risks to cable and seabed type where the cable section is being laid. The cable includes insulation to protect the fibre optic strands, as well as external areas, from external damage including from electromagnetic emissions from power sources. Table 2-2 outlines which cable type, subject to seabed features are likely to be used at the various depth ranges along the cable route and

Table 2-3 shows the likely installation method. In water depths up to 1000 m below sea level, the cable will be buried to provide extra protection and stabilisation. Beyond these depths the cable will be laid directly on the seabed. Figure 2-1 shows an example of the various cable types.

Route 3 is likely to cross into the East Australian Exercise Area, therefore to avoid risk of unexploded ordinance in Department of Defence range areas a policy of avoidance is employed. Survey activities will not sample the

seafloor in Department of Defence range areas and construction activities will be in areas that avoid any metal contact identified in magnetometer data. Post survey, data will be shared with Department of Defence to help determine appropriate construction and risk management plans. Furthermore, consistent with other submarine cable projects crossing Department of Defence range areas, a deed will be settled with Department of Defence acknowledging, amongst other things, that the proponent has surveyed the area and satisfied itself that the risk of unexploded ordinance has been mitigated and there is no unreasonable risk to the health and safety of persons.

Table 2-2. Range of cable types, applications, features and methods of installation

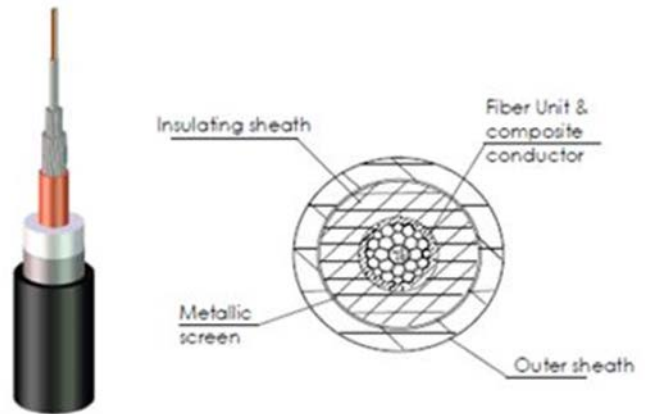
Cable Type	Application	Features
Lightweight	<ul style="list-style-type: none"> Benign, sandy bottom Depths to 8000 m 	<ul style="list-style-type: none"> Core cable Light protection Outside diameter approximately 17 mm
Lightweight Protected	<ul style="list-style-type: none"> Partially rocky bottom Risk of moderate abrasion and/or damage by marine life Depths up to 7000 m 	<ul style="list-style-type: none"> Metallic tape and polyethylene outer jacket applied over core Additional abrasion protection Hydrogen sulphide protection Outside diameter approximately 19.6 mm
Single Armoured Light	<ul style="list-style-type: none"> Rocking terrain Moderate risk of trawler damage Depth to 2000 m Normally used for burial 	<ul style="list-style-type: none"> Light armour wire layer applied to core cable Outside diameter approximately 26 mm
Single Armoured	<ul style="list-style-type: none"> Very rocky terrain High risk of trawler damage Depth to 1200 m 	<ul style="list-style-type: none"> Heavy armour wire layer applied to core cable Outside diameter approximately 26 mm
Double Armoured	<ul style="list-style-type: none"> Rocky terrain high risk of trawler damage Moderate abrasion risk Depth to 500 m 	<ul style="list-style-type: none"> Two armour wire layers applied to core cable Outside diameter approximately 35 mm

Table 2-3. Proposed cable types and methods of installation

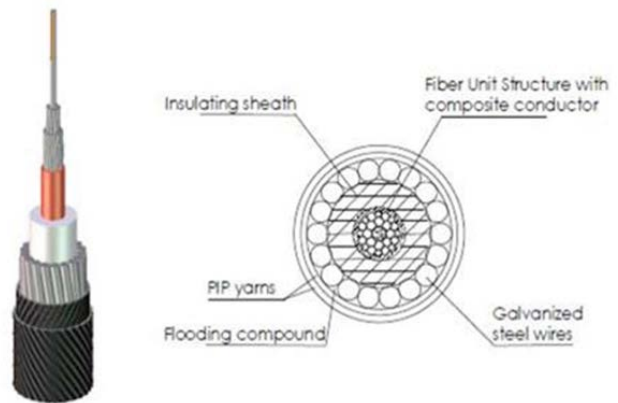
Application	Cable Type	Features
Mean Low Water Mark to 15-20	Single Armour	Installed via Horizontal Directional Drilled (HDD) Conduit or trench. In areas where the cable cannot be buried or there is the risk of unexploded ordinance, the cable may be laid within an articulated steel pipe fixed to the seabed (see Appendix D for example specifications).
15-20 to 35	Double or Single Armour	Plough or Jet Burial
35 to 1000	Double or Single Armour	Plough Burial
1000 to 2000	Single Armour	Surface Lay

Application	Cable Type	Features
2000 to 3500	Light Weight Protected	Surface Lay
3500 to 5000	Light Weight Protected	Surface Lay

The cross section to the right shows a lightweight protected cable that will be used in water depths greater than 1000 m for surface lay activities. The lightweight cable includes a metallic screen and polyethylene outer jacket applied over the core cable for basic protection from moderate abrasion and/or attack by marine life (Alcatel Lucent, 2013a). This method of protection is applied when there are no known risks to the cable from human factors. The insulating sheath consists of Ethylene-Propylene Rubber (EPR) dielectric and protects the cable from electromagnetic emissions (ICPC, 2011).



The cross section to the right shows a **single armour cable** that will be used in the HDD drilling process and in water depths between 500 m to 1000 m. The single armour cable includes a light to heavy armour wire layer (galvanised steel) applied to the core cable, with additional abrasion protection consisting of a hydrogen sulphide protection (PIP yarns) (Alcatel Lucent, 2013a). This level of protection also includes a 'flooding compound' that consists of a bituminous based material blended with synthetic polymers for bonding and corrosion protection between the armouring wires and plastic sheath (ICPC, 2011 and H&R ChemPharm Ltd, 2006). This type of protection is applied in areas with a moderate to high risk of trawler damage.



The cross section to the right shows a **double armour cable** that will be used during shallow water lay operations (less than 1000 m deep). It consists of the same protective measures applied to the cable core as the previous cable cross section however; it also includes a second armour wire layer. This type of protection is required in areas with a high risk from trawler damage as it substantially reduces the potential for a cable being snagged (Alcatel Lucent, 2013a). It also protects the cable in areas exposed to harsh wave conditions as with the coastline.

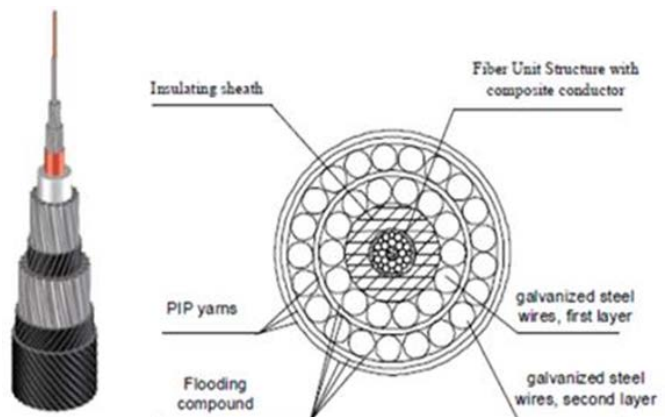


Figure 2-1 Examples of cables that may be used

2.5.2 Beach Manholes

The proposed cable will traverse the coastline and potential dunes, emerging via a beach manhole. The beach manhole is required to facilitate the initial shore end landing, cable haul and cable. The beach manhole is proposed to be a typical manhole size approximating 2m x 2m x 2m, which will be used to 'anchor' the cable. After installation each manhole will be buried and the surrounding areas rehabilitated.

The Route 1 beach landing site is on land used by the Australian Institute of Marine Science (AIMS) which has water intake pipes from the ocean into the AIMS facility. To avoid impacting water quality at the AIMS intake pipe the preferred process is to drive a rodding system from the shore side and connecting different size mandrels to haul/clean the conduits. If the preferred process is not successful, water pumping/jetting processes are used to assist providing conduits. Both of these options avoid impacts to water quality at the AIMS intake pipe.

2.5.3 Landing Station/Equipment Shelter

A permanent cable landing station (CLS) will be required onshore nearby each of the beach landing locations. The cable landing station connects marine and terrestrial networks. The marine cable passes through the above beach manhole and is delivered to the landing station via underground conduit. The CLS will be constructed on a minimum lot size approximating 10m x 10m and will be fully fenced. The CLS will contain the required electronic equipment to maintain the operation of the cable and will also contain a back-up power generator. The CLS will be unmanned during normal operation. Figure 2-2 shows an indicative landing station design.



Figure 2-2. Indicative cable landing station design

Subject to the availability of existing terrestrial fibre transmission networks nearby landing locations, it may be possible to design minimum footprint CLS (significantly less than the above size) to house power equipment only, with fibre transmission equipment co-located at nearby point of presence (POP) locations. Options exist at each of the proposed landing locations to site these facilities on cleared land, in developed areas or via re-purposing existing building structures. Fibre connections to nearby POP locations are unlikely to raise environmental issues as any new works will be confined to existing road corridors or infrastructure alignments where collocation options are possible. Further assessment of these terrestrial network design issues is outside the scope of this document – engagement of relevant environmental authorities will occur, as necessary, at a later date.

2.6 Construction Method

2.6.1 Stage 1 – Geophysical Survey

A geophysical survey will be undertaken along the proposed cable route and will incorporate survey methods and procedures similar to other hydrographic and geophysical surveys conducted in Australian waters. No unique or unusual survey equipment or operations are proposed.

The objective of the survey is to acquire detailed bathymetry together with an understanding of the seabed type and sediment layer thickness, in order to inform the final route selection and installation methods. In waters greater than 1000 m in depth, sediment layer thickness is not required as the cable will be laid directly on to the seabed.

While the particular vessel that will be used for the survey has not yet been confirmed, it is likely that this vessel will come from international waters. All relevant State, Commonwealth and international biosecurity requirements will be complied with to prevent the introduction or spread of Invasive Marine Species (IMS).

In deep waters, information is likely to be acquired via a single pass; however, within shallower waters, multiple passes may be required to achieve the required ‘swathe’ coverage. The vessel will operate at between 4 – 7 knots depending on water depth.

In very shallow waters (typically <20 m), it may not be safe to operate the main survey vessel (due to draft restrictions). In this case, a small local survey vessel with vessel charter (non-tourist) operation permit, registered to operate within the area, will be mobilized to complete the survey.

The survey equipment that will be used to obtain the required data will include a Multi-beam Echo sounder (MBES), a Side Scan Sonar (SSS) and a Sub-bottom Profiler (SBP). A summary of the survey equipment proposed for the geophysical survey is described in the following subsections and Table 2-4 contains information on typical survey lines.

Table 2-4 Typical Survey Lines

Depth Range (m)	Survey Corridor (m)	Survey Line Spacing (m)	No. of Survey Lines	Equipment
± 3 to 20	500	50	21- 11	Multi beam echo sounder, sub-bottom profiler, side-scan sonar, magnetometer (as required), bottom samples (as required)
20 to 50	500	75	7	Multi beam echo sounder, sub-bottom profiler, side-scan sonar, magnetometer (as required), bottom samples (as required)
50 to 500	500	150	3	Multi beam echo sounder, sub-bottom profiler, side-scan sonar, magnetometer (as required), bottom samples (as required)
500 to 1000	1000	150	5	Multi beam echo sounder, sub bottom profiler, side-scan sonar, magnetometer (as required), bottom samples (as required)
>1000m	3 x WD (up to 10km)	NA	1-3	Multi beam echo sounder

Multi-beam Echo Sounder (MBES)

The MBES will be used to measure the depth of the water. It will operate at 12 kHz in deep water and 300 kHz in shallow water (Alcatel Lucent, 2013b). The MBES works by measuring the time interval between emissions and return of a broad acoustic fan shaped pulse emitted from a specially designed transducer across the full swath across track (Fugro, 2001).

Side Scan Sonar (SSS)

The SSS will be used to determine the composition of the seafloor in water depths from 0-1000 m. SSS works by ensonifying a strip of seabed and measuring the intensity of the returning sound waves (Fugro, 2001).

Sub-bottom Profile (SBP)

The SBP will be used for determining the structure of the upper few metres of seabed. It operates in the 1-10 kHz range (Alcatel Lucent, 2013b). Two types of seabed sampling equipment are typically available; a conventional Van Veen or Shipek type grab sampler for obtaining surface samples and a 3 m gravity corer. Standard sampling procedure is to deploy the gravity corer and if it fails to obtain a sample >1 m (or as expected following geophysical data review) after a second attempt is required. If no recovery is achieved the grab sampler is then deployed. Sample locations will be selected by on board geophysicists in consultation with customer representatives. The specified requirement for samples is (generally) 10 km intervals.

Other Survey Equipment

A range of other equipment (non-acoustic) will be used for ground truthing the measurements of the acoustic equipment including, grab samplers and gravity corers, magnetometers; and possibly Cone Penetrometer Testing (CPT) (Alcatel Lucent, 2013b). Magnetometers and Cone Penetrometer testing will typically be specified on an 'as need' basis. Magnetometer will be deployed for assessing other infrastructure crossing locations and in DOD range areas. Cone Penetrometer testing will be used on the basis of sub-bottom and coring data, to further concentrate soils testing in areas of variability. Where the along track seabed profile is consistent, the frequency of sampling will be limited.

Beach Landing Sites

A limited low energy geophysical survey and drilling of borehole(s) are expected to be undertaken onshore to confirm the geotechnical conditions around the potential HDD landing sites (if this construction method is proposed).

2.6.2 Stage 2 – Cable Installation

Cable installation will consist of HDD or trenching in the nearshore and various cable lay methods within offshore areas. The various techniques for cable installation are described in detail below (Alcatel Lucent, 2013b).

Initial planning for shore crossings is as follows-

- HDD required at Cape Cleveland, possible re-use of under-shore conduits previously used for water pumping purposes. Fall back option is landing via jetting/trenching;
- HDD required at Maroochydore due to risk of extreme weather impacting beach profile and sand dunes
- HDD required at Narrabeen due to presence of cliffs and possible need to under bore nearby reef systems and shoreline aquatic reserve – positive identification of these constraints via survey will assist final HDD plan. Options to avoid under boring the aquatic reserve will be given priority.

Cable Beach Crossing via Horizontal Directional Drilling (HDD)

The beach crossings may be drilled via HDD; the process involves drilling a horizontal hole (pilot hole) at the onshore entry point. The drill bit will then be steered over a predetermined pathway underneath the shoreline to

the exit point offshore, where divers will recover the drilling assembly once all equipment has been removed from the seabed. Typically, drilling fluids are released to the seabed once the drill bit is removed. The main component of the drilling fluid will be Bentonite or equivalent. Bentonite is a naturally occurring clay of low ecotoxicity. As a drilling fluid, prehydrated bentonite consists of up to 98 per cent water, the remainder being additives that are either completely inert in the marine environment, or naturally occurring benign materials. In addition to having inherent low toxicity, Bentonite is biodegradable and is highly dispersive within the marine environment. Analysis was undertaken to quantify the volume of drilling fluids that may potentially be released to the surrounding environment and are estimated to be between: 20 – 30 m³. To combat this, the positioning of the drill head will be monitored constantly and additional water will be added if fluids are anticipated to be lost. The addition of water will alleviate the loss of bentonite and polymers to the water column (Read, 2004).

Drilling muds will be used to stabilize the hole and remove cuttings out of the borehole back to the surface. Prior to drilling operations commencing, mud mixing will take place. After consultation and viewing the geotechnical investigation, a drilling fluid will be prepared specific to the local conditions to be encountered. Using a fresh water supply, a rapid yielding high solids Bentonite will be prepared in the makeup tank of the Solids Control Unit. The fluid will be prepared with the assistance of a qualified Mud Technician. Additives may be necessary depending on the water quality and the varying cross section of materials encountered during the drilling process. The final fluid selection will depend on various factors such as the ability to form filter cake within the more porous material, most likely on the subsea exit approach. In addition to these important factors, the drilling fluid also helps to suspend solids and carry them to the surface with the assistance of constant fluid velocity. The drilling fluid also helps lubricate the drill pipe and maintain hole stability. All materials to be used on site will have approvals and copies of their Safety Data Sheets (SDSs) readily available (Coe Drilling Pty Ltd, 2013).

Cable Beach Trenching

If feasible, the beach crossings may be undertaken through the temporary construction of a trench. Trenching is a method commonly undertaken for the inner shore marine end of cable lay operations and beach landing in order to protect the cable in high energy coastal environments. Depending on the extent of trenching required and sediment type to be trenched, there several options available, including use of a backhoe or excavator with a rock saw or rock breaker. This equipment could be utilised to the low water mark. In the event that trenching is required beyond the low water mark, a marine rock trencher could be used.

Pre-cable Lay Activities

In areas that are safe to do so, before the cable is laid offshore, a clearance process will be undertaken to specifically remove debris along the route. A Pre-Lay Grapnel Run (PLGR), which involves towing a grapnel device along the seafloor, will also be undertaken immediately prior to cable installation to remove common marine debris from within the area. The PLGR will not be undertaken in any areas that are likely to contain hard substrate, known shipwrecks or sensitive benthic habitats, as noted from the initial geophysical survey. In addition, the PLGR will not be used in any planned surface lay areas (or where there is risk of UXO) and will only be conducted within areas planned for burial (Alcatel Lucent, 2013b). This method involves towing a grapnel array through the area and is therefore, not designed for deep penetration into the seabed. If deeper penetration is required, a spear point type grapnel can be included in the array, or a de-trenching grapnel can be used (Alcatel Lucent, 2013b).

The method will be to launch the grapnel and pay out a towing line scope appropriate to the depth of water. The towing line is passed over a sensitive dynamometer which is monitored continuously. Changes in recorded tension may indicate that debris has been encountered. The grapnel is recovered and any debris cleared and retained on board. The grapnel array is then redeployed. Even if no tension increases are noted, the grapnel is recovered to the surface at regular intervals, to allow visual checking of the condition of the grapnel. Each time the grapnel is re-deployed, the launch position is adjusted so there is an overlap between each grapnel drive. Towing speeds will be approximately 1.5 km/hr (Alcatel Lucent, 2013b).

Cable Lay and Burial

When landing the cable to shore, the maximum length that can be handled is about 3 km. The main cable lay vessel is typically limited to water depths of 15 m or more. Cable payout from the main cable ship will be by a

Linear Cable Engine (LCE). During shallow water lay operations (usually with Double Armour cable, typically in water depths less than 100 m depth), the cable payout will be in bottom tension mode, where the LCE speed is automatically varied to maintain outboard cable tension at a set value (usually between 2 – 5 knots).

In water depths <1000 m, the cable will be buried. Burial will primarily be achieved via a combination of the following, depending on seabed conditions:

- Plough burial
- Trenching
- Post lay burial via jetting.

Plough burial can be undertaken simultaneously for laying of the cable and will be used where sufficient suitable sediment exists in waters up to 1000 m water depth. As the plough (Figure 2-3) is lowered to the seafloor and pulled along by the cable ship, the cable is simultaneously threaded through the plough. The plough creates a narrow trench approximately 200 mm wide into which it places the cable before burying it. The machine proposed to be used for ploughing will be a Soil Machine Dynamics Ltd long-beam type plough (or similar) with a maximum penetration into the seafloor in ideal conditions of 2.4 m. Target cable depth for deployment by plough for this project is 1 m. Skid width of the plough sled is approximately 6m.



Figure 2-3. Example image of a cable plough on a cable ship.

Where sufficient suitable sediment does not exist, alternate means of burial will be required. One such method involves trenching through soft rocky areas to create a narrow trench to a target depth of 0.5 m below the

seabed. The cable is then laid in the trench and covered by natural sedimentation. Divers may be used to complete the backfill, if required. No material is proposed to be brought to the site for use as backfill.

In other areas where ploughing is not suitable a Remotely Operated Submersible Vehicle (ROV) using jetting techniques may be used as an alternative method to bury the cable. Track width of the ROV is approximately 4m and trench width approximately 400mm. At crossing points in waters less than 30 m deep, jetting may be undertaken by diver hand-held apparatus.



Figure 2-4. Example image of a Remotely Operated Vehicle being deployed from a cable ship.

Surface lay of the cable will be used where it is not feasible to bury the cable, or where there is no threat to the cable if it is laid on the surface.

In areas where cable protection is necessary, but burial via the above methods is not feasible, a number of alternate methods exist for cable laying in situations where the seafloor material is too hard for cable burial by jetting and ploughing techniques, e.g. existence of rock or stiff clay. The methods include:

- Placement of a rock berm over the cable
- Draping of a prefabricated flexible concrete mattress over the cable
- Use of articulated pipe and stapling, involving the fitting of a split cast iron piping around the cable which is then stapled or clamped to the seafloor – this technique is limited to less than 30 m due to the diver bottom line.

Crossing Existing Cables

All of the proposed cable route options will cross a number of existing telecommunications cables including:

- Australia - Papua New Guinea 2
- PacRimWest
- Southern Cross Cable Network
- Gondwana
- PPC_1

- Tasman Global Access (TGA) Cable
- Australia Japan Cable
- Endeavour (Note: this is only applicable to cable route option 3).

In locations where crossing existing cables is necessary, arrangements are negotiated between the parties. Ploughing is typically not used within 500 m either side of a cable crossing. Cable crossings are usually completed by laying the new cable over the existing cable, with protective materials attached to the new cable to prevent impact on the existing cable. Where seabed conditions are suitable, a remote operation vehicle with jetting tool may be used to achieve coverage of the crossing cable either side of the crossed cable.

2.6.3 Schedule

The Proposal will be undertaken in following distinct phases as shown in Table 2-5. Nominal dates for activities are below, these will be revised as the overall works program is developed with DFAT

Table 2-5. Proposed Schedule

Activity	Expected Commencements	Duration
Geophysical survey	Q3 2018	Approximately 1 month in Australia waters
Horizontal direction drilling	Q3 – Q4 2018	Approximately 4-5 weeks consisting of: <ul style="list-style-type: none"> • Mobilisation and drilling set up (1 week) • Drilling (conduits) (3 weeks) • Clean-up and demobilization (1 week)
Cable installation	Q2 2019	Approximately 1-2 months
Landing station	Q4 2018	Approximately 3-4 months
Commissioning	Q4 2019	Approximately 1-2 months

2.7 Connection to Customers

Regulatory requirements with respect to future customer connection will be managed separately on land, in existing exchanges and data centres, by interconnecting network operators at each nearby POP. It is likely that works required on the domestic networks to facilitate access to the cable will not have significant environmental impacts due to the urbanised nature of the proposed connection locations; however, such works will be formally assessed as part of local environmental regulatory requirements within Solomon Islands and Papua New Guinea

Operation of the cable will be managed remotely via a contracted operations centre manager. Maintenance and corrective actions will be undertaken at the cable landing station on an as needs basis. It is not envisaged that maintenance activities will be undertaken on the cable unless unforeseen corrective action is required.

2.8 Maintenance

Once installed, it is not expected that the cable network will require any routine maintenance activity. In the unlikely event of damage or failure of the cable, relevant authorities and stakeholders will be consulted. In this case, the procedure for remedying a cable fault is to deploy a grapnel or lift the cable to the deck of a maintenance vessel. The location of the fault can be determined by on-cable sensors, thus there is precision in undertaking the grapnel procedure nearby the fault location. Typically, a new section of cable will be spliced into the network and the repaired cable will be lowered to the seafloor. Sufficient slack will be included in the cable to allow for this eventuality. Such unplanned maintenance activities involve a minor and temporary disturbance to the seafloor and as such is not deemed to be a significant environmental impact.

Despite the lack of need for regular maintenance, surveys may be undertaken of the cable (e.g. where it is exposed or if damage is thought to have occurred to an area) over its operational lifetime in order to determine its integrity. Cable landing station maintenance activities are confined to the inside of the building and the stand-alone external power generator, which will be within the compound of the cable landing station.

2.9 Decommissioning

The life of the cable is a minimum of 25 years and removal of the decommissioned cable is not considered to be the best environmental outcome following the end of the cable life for the following reasons:

- The potential environmental impacts of the retrieval and disposal of buried cable are likely to significantly outweigh the impacts of leaving an inert cable in place. The commercial costs of retrieval and disposal of buried cable are likely to significantly affect the commercial viability of the Proposal
- Developing technology may extend the life of the cable, or may lead to recommissioning of the cable for viable future use.

While it is proposed that the marine cable is left *in situ* following decommissioning, the onshore cable landing station and ancillary equipment may be decommissioned and demolished, assuming no other related uses for the buildings is found. Decommissioning (leaving cable *in situ*) has been considered as part of the impact assessment within Table 8-1.

It should be noted that the Commonwealth will retain long term management interests in the cable and DFAT is negotiating a Landing Party Agreement that provides that following the expiry or termination of the Agreement, the Commonwealth will remove the land Cable and the Terminating Equipment from the Landing Party Infrastructure at its own cost.

3. Impact Assessment Approach

Section 160 of the EPBC Act requires that before the Commonwealth enters into an aid program, contract agreement or arrangement for the implementation of a project that has, will have or is likely to have a significant impact on the environment anywhere in the world, advice from the Minister must be obtained.

Therefore, this document assesses the environment in Australia, Papua New Guinea and Solomon Islands including their Exclusive Economic Zones (EEZs). No area traversed by the cable is outside the EEZ of these three countries. The impact assessment considers all relevant aspects of the environment and assesses the likely impact that construction and operation of the proposed cable may have on the environment.

Given the broad scale nature of 'impact to the environment anywhere in the world', we have undertaken the following approach to assessing the potential impacts of the Proposal:

- 1) Identify planned or unplanned activities that may have direct or indirect impacts on the environment. For the Proposal the following activities have been identified:
 - Planned beach disturbance
 - Planned seabed disturbance
 - Planned noise emissions
 - Planned discharges from vessels and drilling activities
 - Displacement of local users from planned activities
 - Unplanned beach disturbance
 - Unplanned seabed disturbance
 - Unplanned discharges to the environment
 - Displacement of users from unplanned activities
- 2) Identify sensitive receptors that may be impacted by the Proposal. MNES will be used as a starting point for determining sensitive receptors in Australia and additional receptors have been identified as relevant to the proposed activities based on an understanding of the baseline environment along the proposed cable routes and in consideration of criteria provided in DoEE guidance documentation (e.g. *Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies – Significant Impact Guidelines 1.2*)
- 3) Describe potential impacts that planned and unplanned activities may have on sensitive receptors
- 4) Describe proposed management measures
- 5) Provide indication of the scale of impact that may occur as a result of the planned or unplanned activities.

4. Existing Environment: Australia

This section describes the existing environment that the proposed cable traverses in Australian waters and International Waters within the Australian EEZ (Figure 4-1).

4.1 Regional Overview

This section describes the existing environment from a regional perspective with particular emphasis on the marine bio regions and marine parks that all three cable route options traverse. Section 4.2 and Section 4.4 describe the specific features of the existing environment drawing upon specific characteristics of each bio region and Marine Park that the proposed route options traverse.

4.1.1 Commonwealth Marine Areas

Most of the cable for the three route options lie within Commonwealth marine areas, from three to 200 nautical miles from the coastline (including within the GBRMP). Australia's Commonwealth Marine Area is divided into six marine bioregions; South-west, North-west, North, Coral Sea, Temperate East and South-east, all of which contain a number of marine Parks (DoEE, 2018b). Table 4-1 details the marine bioregions relevant to the proposal.

Table 4-1. Relevant Marine Bioregions

Marine Area	Description	Relevance to Proposal
Temperate East	The Temperate East Region covers subtropical and tropical environments including southernmost coral reefs, 3 seamount chains, the canyons of the eastern continental slope, shelf rocky reefs, offshore reefs and abyssal plains (SEWPaC 2012).	Cable route from Sydney is within the Temperate East Region.
Coral Sea	The Coral Sea Marine Region covers tropical to subtropical environments and includes atoll reefs, reef complexes, coral cays, offshore islands, terraces, deepwater valleys and troughs, offshore plateaus, abyssal plains and seamounts (DoEE, 2018a). Biological communities are not well known in this area but are thought to reflect the high diversity of habitats and geomorphic features. There is also a number of migratory species (DoEE, 2018a).	All three cable routes traverse the Coral Sea Region.
Great Barrier Reef Marine Park and World Heritage Area	The Great Barrier Reef World Heritage Area contains the largest continuous coral reef system in the world as well as one of the world's most ecologically diverse ecosystems. The Great Barrier Reef Marine Park constitutes 99 percent of the Great Barrier Reef World Heritage Area. There are 70 bioregions (30 reef and 40 non reef) identified within the GBRMP. The bioregions reflect the diversity of habitats and communities within the Marine Park and	Cable route from Townsville traverses the GBRMP and WHA.

Marine Area	Description	Relevance to Proposal
	the variation between reef and non-reef areas, north and south, and inshore and offshore.	

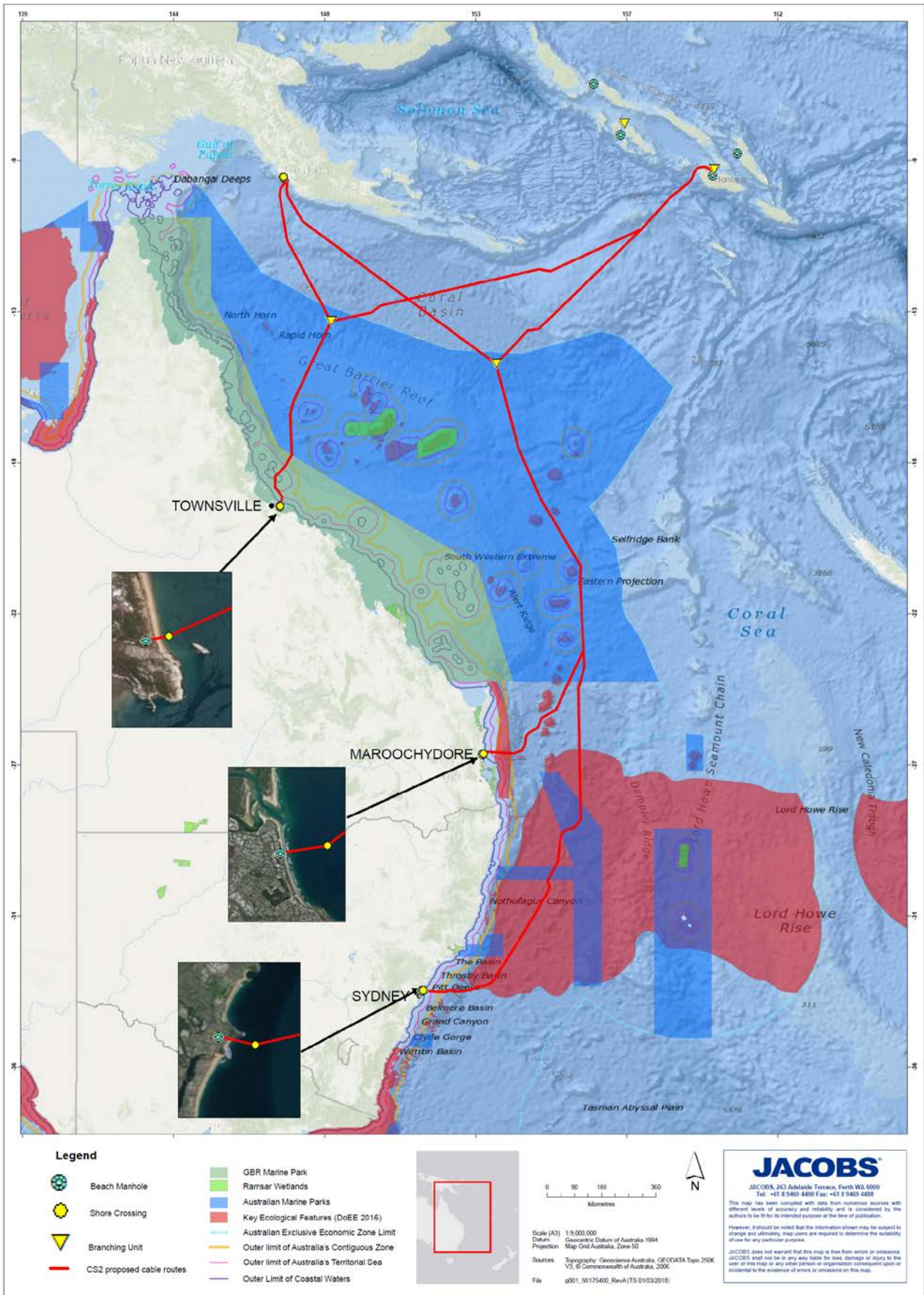


Figure 4-1. Proposed cable routes and landing locations with key environmental sensitivities outlined.

4.1.2 Australian Marine Parks

Marine parks are created to protect and manage unique biodiversity, while also allowing for the sustainable use of natural resources in certain areas. Marine parks in Commonwealth waters have been selected in accordance with the National Representative System of Marine Protected Areas. This system ensures that a comprehensive, adequate and representative system of marine protected areas to contribute to the long-term viability of the marine environment and protect biodiversity. Australian Marine Parks have been carefully located to include representative examples of Australia's marine habitats and features.

Understanding the representative values of each marine park that the proposed cable routes traverses is important to be able to identify those characteristics of the existing environment that may be most sensitive to the Proposal. In general, the values of each Marine Park are broadly defined as:

- Natural values—habitats, species and ecological communities within marine parks, and the processes that support their connectivity, productivity and function.
- Cultural values—living and cultural heritage recognising Indigenous beliefs, practices and obligations for country, places of cultural significance and cultural heritage sites.
- Heritage values—non-Indigenous heritage that has aesthetic, historic, scientific or social significance.
- Socio-economic values—the benefit of marine parks for people, businesses and the economy.

Table 4-2 outlines the specific listed values within Management Plans for the two Australian Marine Parks which overlap the proposed cable routes, including the Central Eastern Marine Park (overlaps proposed Route 3; Figure 4-2) and the Coral Sea Marine Park (overlaps all three cable routes; Figure 4-3) (Director of National Parks, 2017a, 2017b). For values identified as overlapping the proposed cable routes an impact assessment was undertaken and is presented in **Table 8-3**.

Table 4-2. Relevant Australian Marine Park and values as listed within Draft Management Plans (Director of National Parks, 2017a and 2017b)

Marine Park	Value	Description of value as presented within Marine Park Management Plans (Director of National Parks, 2017a, 2017b)	Values overlapping the Proposed Routes
Coral Sea Marine Park	Natural values	<p>The Marine Park includes examples of ecosystems representative of:</p> <ul style="list-style-type: none"> • Cape Province—a deep-water valley and ridge feature in the north of the Marine Park, with water depths of between 1000 and 4000 m. • Northeast Transition—a deep-water feature consisting of troughs, plateau, reefs and carbonate mud in the north of the Marine Park, in waters deeper than 1000 m. • Northeast Province—a large area of reefs, trenches, troughs, terraces and aprons in the central part of the Marine Park. It contains cays, atolls, islets and associated reef communities. • Central Eastern Transition—an area in the south of the Marine Park featuring slope, canyon, and terrace, in waters between 3000 and 4000 m deep. • Kenn Province—an area in the south-west of the Marine Park featuring seamounts and plateaux, in waters between 1000 and 3000 m deep. • Kenn Transition—an area in the south-west of the Marine Park featuring seamounts. 	<p>The proposed cable routes traverse the following Provincial Bioregions:</p> <ul style="list-style-type: none"> • Northeast Transition • Northeast Province • Kenn Province • Kenn Transition
	Key Ecological Features (KEFs)	<p>KEFs of the Marine Park are:</p> <ul style="list-style-type: none"> • Reefs, cays and herbivorous fish of the Queensland Plateau—this is the largest marginal plateau in Australia. Ancient reefs have formed broad limestone platforms that extend over about half of the plateau forming 21 reefs and cays, the largest of which are Tregrosse and Lihou Reefs. Other significant reefs include Coringa–Herald, Moore, Flinders, Holmes, Shark and Osprey Reefs. Osprey Reef differs from the other platform reefs of the plateau in that it is an isolated pinnacle more similar to the seamount reefs found further south. • Reefs, cays and herbivorous fish of the Marion Plateau—this area contains three major reef systems: Marion Reef, Saumarez Reef and Frederick Reefs. Marion and Saumarez reefs are built on carbonate platforms that make up half the surface area of the plateau. Both reefs are ancient, dating back to the Pliocene drowning of the platforms. Frederick Reefs rise up to sea level from the Cato Basin at 3000 m depth off the eastern edge of the plateau. 	<p>The proposed cable routes do not traverse any KEF within the Coral Sea Marine Park.</p>

Marine Park	Value	Description of value as presented within Marine Park Management Plans (Director of National Parks, 2017a, 2017b)	Values overlapping the Proposed Routes
		<ul style="list-style-type: none"> The Tasmantid Seamount Chain—these seamounts provide shallow reef and deep-water habitats that differ from the more southerly seamounts in that they are older and they break the sea surface forming Kenn, Cato, Wreck and Mellish Reefs. 	
	Protected Species / Biologically Important Areas (BIAs)	The Marine Park supports a range of species including species listed as threatened, migratory, marine or cetacean under the EPBC Act. BIAs within the Marine Park include breeding and or foraging habitat for seabirds, internesting habitat for marine turtles, and a migratory pathway for humpback whales	The proposed cable routes traverse a number of BIAs for birds, cetaceans and marine turtles. Refer to Table 4-4 for a complete list of BIAs overlapping each of the proposed routes.
	Coringa-Herald and Lihou Reefs and Cays Ramsar site	The Coringa-Herald and Lihou Reefs and Cays Ramsar site includes representative examples of coral reef in near-pristine condition. The Ramsar site also includes the forested reef cays, making it an outstanding breeding site for several key waterbird species. It has breeding sites for the nationally threatened green turtle and hawksbill turtle. Species diversity includes at least 390 species of coral reef fish, 29 waterbird species, 128 crustaceans, 140 hard corals, 745 marine molluscs, and various starfish, brittle stars, feather stars, and sea urchins.	The proposed cable routes do not traverse the Coringa-Herald and Lihou Reefs and Cays Ramsar site National Nature Reserve.
Cultural values			
	Indigenous culture	The Meriam People's sea country extends over the Ashmore Reef region of the Coral Sea Marine Park. Under traditional (Malo's) law, Ashmore Reef is a significant cultural area for the Meriam People and they must be consulted by people wanting to access Ashmore Reef. The Mer Gedkem Le Prescribed Body Corporate represents the native title holders of Meriam land and sea country. The Mer Gedkem Le Prescribed Body Corporate is the point of contact for Ashmore Reef. The Torres Strait Regional Authority and the Cape York Land Council are the Native Title Representative Bodies for the Torres Strait and Cape York regions, with native title responsibilities for the Ashmore Reef area.	The proposed cable routes do not traverse any Indigenous Protected Areas established near the Coral Sea Marine Park.
Heritage values			
	Protected places (historic shipwrecks)	The Marine Park contains over 45 known shipwrecks listed under the Historic Shipwrecks Act 1976. The oldest known shipwrecks are the Cato (wrecked in 1803), HMS Porpoise, (wrecked in 1803), and Echo (wrecked in 1820). There are also three United States of America navy ships sunk in 1942 during the Battle of the Coral Sea: the USS Lexington (aircraft carrier), USS Neosho (aviation fuel supplier), and USS Sims (destroyer). There are	The proposed cable routes do not traverse the location of any known shipwreck within the Coral Sea Marine Park.

Marine Park	Value	Description of value as presented within Marine Park Management Plans (Director of National Parks, 2017a, 2017b)	Values overlapping the Proposed Routes
		likely to be hundreds of historic shipwrecks in the Marine Park, the precise locations of which remain unknown.	
	Social and economic values		
	Tourism, commercial fishing, and recreation	Tourism, commercial fishing, and recreation, including fishing, are important activities in the Marine Park. These activities contribute to the wellbeing of regional communities and the prosperity of the nation.	The proposed cable route traverses a number of tourism, commercial fishing and recreation areas. Refer Section 4.5 for further information.
Central Eastern Marine Park (Temperate East Marine Parks Network)	Natural values		
	Representative ecosystems	<p>The Marine Park includes examples of ecosystems representative of:</p> <ul style="list-style-type: none"> • Central Eastern Province—includes canyons along the continental shelf that interact with currents and ocean gyres resulting in upwellings that influence biological productivity. Plankton blooms associated with the upwellings attract aggregations of tuna, whales and albatrosses and support over 50 fish species endemic to the area. • Central Eastern Shelf Transition—upwellings caused by the East Australian Current crossing the continental shelf, and river sediment influence biological productivity in this area. • Tasman Basin Province—interactions between currents, eddies and seamounts and the movements of the deep sub-Antarctic water mass influence biological productivity in this area. The deep-reef coral communities on seamounts are dominated by filter feeders and provide stepping stones for large oceanic species moving between breeding, nesting, calving and foraging sites. 	<p>The proposed cable routes traverse the following Provincial Bioregions:</p> <ul style="list-style-type: none"> • Central Eastern Province • Tasman Basin Province
	KEFs	<p>KEFs of the Marine Park are:</p> <ul style="list-style-type: none"> • Tasmanid Seamount Chain—a series of underwater volcanic mountains comprised of guyots, seamounts, tablemounts, banks, plateaux and terraces that runs in a north-south direction, and extends into the Tasman Basin. The feature rises from approximately 4800 m deep to 125 m from the surface at Taupo Seamount in the south, approximately 280 m from the surface at Derwent-Hunter Seamount in the centre of the Marine Park, and to approximately 350 m from the surface at Queensland Guyot in the 	Route 3 traverses the Tasman Front and eddy field KEF (refer to Section 4.3 for further information). No other KEF overlaps the proposed cable routes.

Marine Park	Value	Description of value as presented within Marine Park Management Plans (Director of National Parks, 2017a, 2017b)	Values overlapping the Proposed Routes
		<p>north of the Marine Park. The seamounts support a diverse range of habitats in temperate and subtropical waters.</p> <ul style="list-style-type: none"> • Canyons on the eastern continental slope—canyons enhance diversity and abundance of species, driven by the combined effects of steep and rugged topography, ocean currents, seafloor types and nutrient availability. Canyons also create localised changes in productivity in the water column above them, providing feeding opportunities for a range of species. • Tasman Front and eddy field—a region that separates the warm, nutrient-poor waters of the Coral Sea from the cold, nutrient-rich waters of the Tasman Sea, providing increased nutrients and plankton aggregations, and enhanced productivity that attracts mobile species such as turtles, cetaceans, tuna and billfish. 	
	Protected Species / Biologically Important Areas (BIAs)	The Marine Park supports a range of species, including species listed as threatened, migratory, marine or cetacean under the EPBC Act. Biologically important areas within the Marine Park include foraging and breeding habitat for seabirds, and a migratory pathway for the humpback whale.	The proposed cable routes traverse a number of BIAs for birds, cetaceans, marine turtles and fish. Refer to Table 4-4 for a complete list of BIAs overlapping each of the proposed routes.
	Cultural values		
	Indigenous culture	At the commencement of this plan, there is limited information about the cultural significance of this Marine Park.	The proposed cable routes do not traverse any known Indigenous Protected Areas within the Central Eastern Marine Park.
	Heritage values		
	Protected places (historic shipwrecks)	The Marine Park contains two known shipwrecks listed under the Historic Shipwrecks Act 1976 – Amelia (wrecked in 1816) and Illagong (wrecked in 1872).	The proposed cable routes do not traverse the location of any known shipwreck within the Central Eastern Marine Park.
	Social and economic values		
	Tourism, commercial fishing, and recreation	Tourism, commercial fishing, and recreation, including fishing, are important activities in the Marine Park. These activities contribute to the wellbeing of regional communities and the prosperity of the nation.	The proposed cable route traverses a number of tourism, commercial fishing and recreation areas. Refer Section 4.5 for further information.

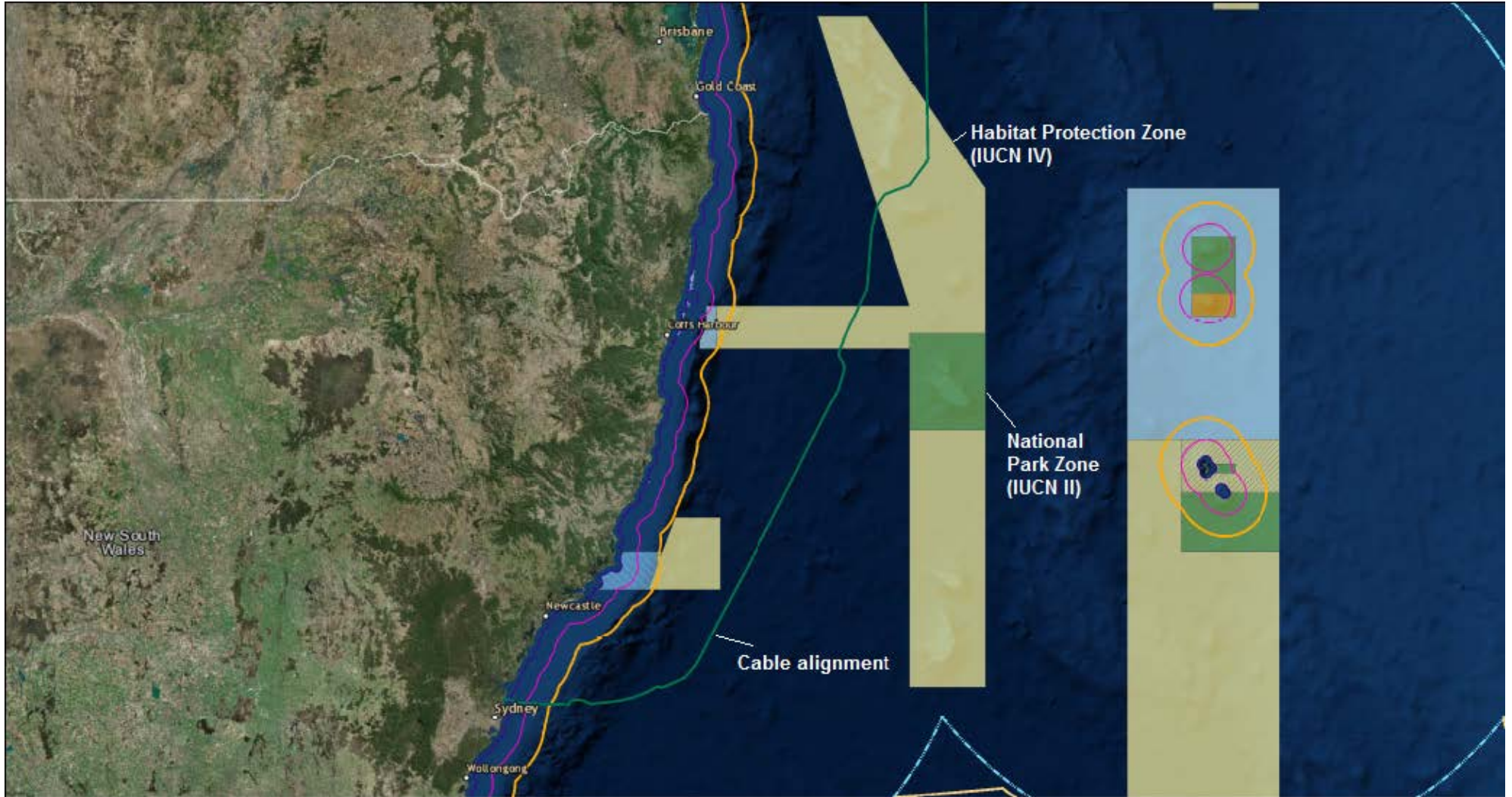


Figure 4-2. Central Eastern Marine Park Zones in relation to the proposed cable route from Sydney.

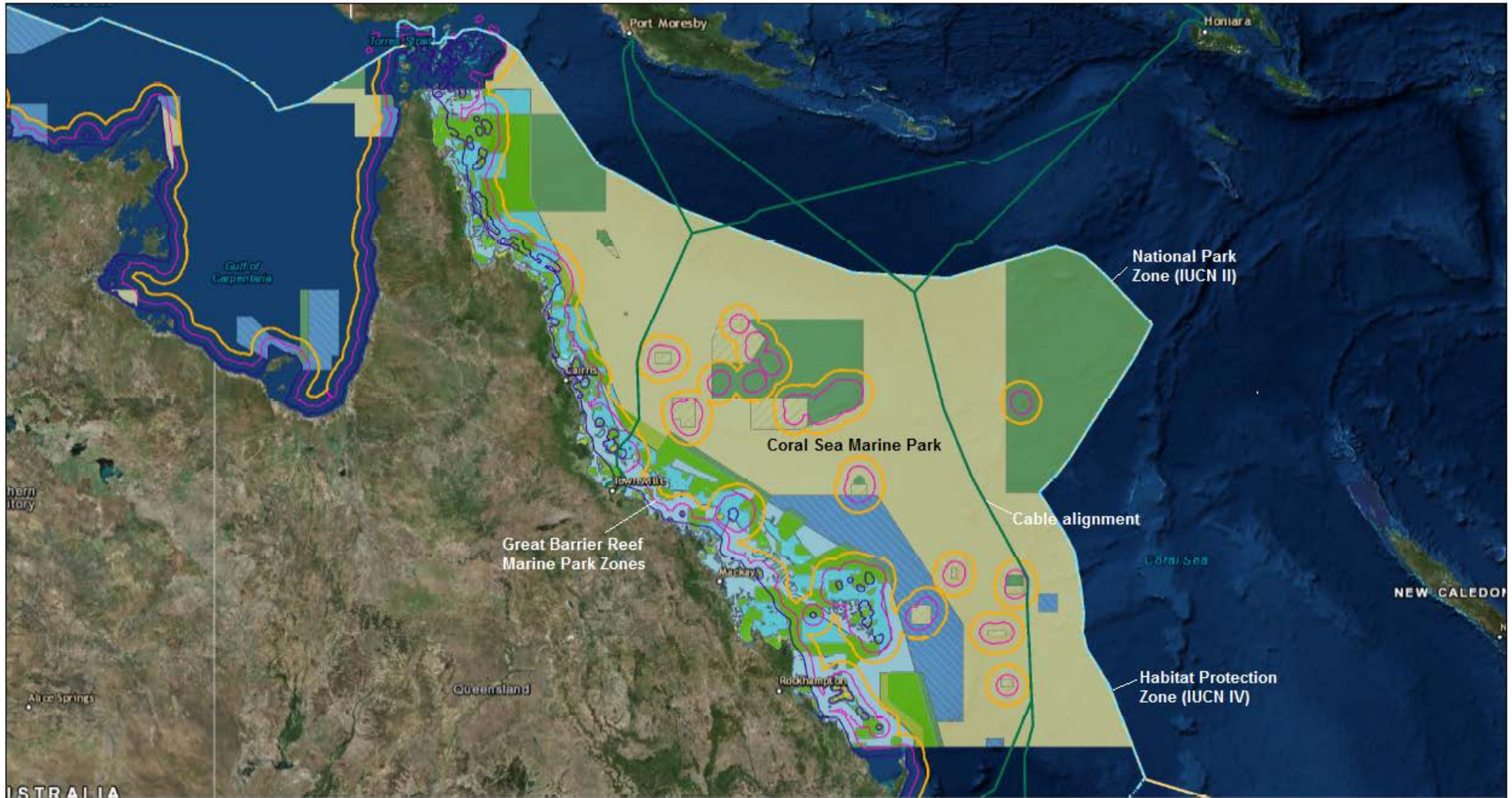


Figure 4-3. Coral Sea Marine Park Zones in relation to the proposed cable routes.

4.2 Physical Environment

All three routes start on sandy beach environments, through the nearshore environment and along the continental shelf, before descending to the abyssal plain to maximum depths of approximately 5 600 m before ascending back up the continental shelf and the nearshore environment within the landing locations in Papua New Guinea and Solomon Islands.

The Temperate East and Coral Sea marine bioregions have varied oceanographic characteristics. The Temperate East area's oceanography is dominated by the East Australian current, which brings warm waters down from the Coral Sea (Director of National Parks, 2017a). Warm waters provide large eddy features that support areas of enhance productivity. The Coral Sea is also characterised by complex currents, of note is the South Equatorial Current which passes through the centre of the Coral Sea bioregion and forms a barrier which reduces the mix of species between the north and south of the Coral Sea marine bioregion (Director of National Parks, 2017a).

All three route options pass through varied bathymetry and traverse alongside a variety of topographical seabed features. The optimal location for the proposed cable from a construction perspective is flat seabed avoiding seabed features. Therefore, the proposed route options have been developed to avoid uneven seabed and high relief features.

4.3 Key Ecological Features

The Department of the Environment and Energy (DoEE) defines Key Ecological Features as elements of the Commonwealth marine environment that are considered to be of regional importance for either a region's biodiversity or its ecosystem function and integrity (DoEE 2018). KEFs that are relevant for this assessment meet the criteria of a unique seafloor feature, with known or presumed ecological properties of regional significance (DoEE 2017).

While, there are a number of Key Ecological Features (KEF) near the Proposal, the chosen alignments were designed to specifically avoid such areas where feasible. Route 1 (Townsville route) is located approximately 30 km (at its nearest point) from the reefs and cays of the Queensland Plateau KEF. This KEF is characterised as a large fragment of Australian continental crust lying more than 1000m below sea level scattered with extensive reef growth (Mutter, 1977). The characteristics and location of the Queensland Plateau make the KEF a hotspot for continent – ocean interaction (Mutter, 1977)

Route 2 and Route 3 are both located approximately 8 km from the Tasmantid seamount chain KEF. This KEF is characterised by underwater volcanoes extending from the Coral Sea and extending to the Tasman Basin (Williams et al. 2012). The Tasmantid seamount chain KEF supports a diverse collection of habitats, from deep sea sponge gardens to tropical coral reef systems (DoEE, 2012). Route 2 traverses the Fraser Island upwelling KEF which is characterised by two areas near Fraser Island where cold upwellings from deep waters mix with surface waters (DoEE, 2012). The upwellings generate blooms of phytoplankton that support flora and fauna of the area through the tides, wind and currents near Fraser Island (DoEE, 2012). Route 3 traverses Tasman front and eddy field KEF which is characterised by a region of productivity that separated the nutrient poor waters of the Coral Sea from the nutrient rich waters of the Tasman Sea (DoEE 2012). The Tasman front and eddy field KEF also demonstrates a complex oceanographic environment where waters mix vertically allowing for patches of increased productivity that attracts assortments of species across all trophic levels (DoEE 2012).

Although the areas where the cable is located have varied physical characteristics, the nature of the cable is such that it is most efficiently installed and operated on flat sandy seabed. Therefore, pre-lay geophysical surveys will confirm a cable alignment that avoids as many seabed features as practicable.

4.4 Biological Environment

4.4.1 Matters of National Environmental Significance

The EPBC Act affords specific protection to a number of environmental aspects identified as Matters of National Environmental Significance (MNES). Although the context of Section 160 of the EPBC Act is broader than impacts to MNES, MNES are still relevant to determine the sensitivities present in the existing environment.

In order to determine which MNES may be present in the vicinity of the Proposal a search of the EPBC Act Protected Matters Search Tool (PMST) Database was conducted for all three routes that comprise the Proposal. Searches included the 10 km development corridor and a 500 m buffer around each cable landing point. Table 4-3 summarises the results from the PMST results, full PMST reports are in **Appendix A**.

Table 4-3. PMST Search Results Summary

Route Option	MNES	Number	Description	Comment
Route 1 (Townsville)	World Heritage Properties	1	The Great Barrier Reef is a declared World Heritage Area (GBRWHA) is classified as a declared place. Route 1 traverses the Great Barrier Reef.	Impacts within the GBRWHA are unlikely to be significant due to the nature, scale and route selection of the proposed cable.
	National Heritage Places	1	The listed national heritage place that has been identified is the Great Barrier Reef. Route 1 traverses the Great Barrier Reef.	Impacts within the GBRMP listed place are unlikely to be significant due to the nature, scale and route selection of the proposed cable.
	Wetlands of International Importance	1	Bowling Green Bay Ramsar Wetland is located approximately 800 m from the Cape Cleveland cable landing zone associated with Route 1.	There are no likely impacts to this Ramsar site due the nature and scale of the available shore landing options at Cape Cleveland in relation to the distance from the wetland, which is anticipated to be over 800m away from the preferred landing location, within the existing AIMS facility. Impacts at this location are anticipated to be short in duration, with minimal environmental sensitivities noted within the existing terrestrial footprint of the facility.
	Great Barrier Reef Marine Park	1	Great Barrier Reef Marine Park	<p>Impacts within the GBRMP are unlikely to be significant due to the nature, scale and route selection of the proposed cable.</p> <p>The proposed cable route traverses 5 designated zones within the GBRMP (Figure 4-2). These zones include:</p> <ul style="list-style-type: none"> Scientific research zone - The Scientific Research Zone allows for research, in areas primarily around scientific research facilities that are relatively undisturbed by extractive activities. For people who are not undertaking research, these areas are essentially the same as Marine National Park (Green) Zones, where only non-extractive activities like swimming, snorkelling and diving are allowed without written permission. General use zone - The general use zone promotes the social part of the Values of the Great Barrier Reef Marine Park; understanding, appreciation, and

Route Option	MNES	Number	Description	Comment
				<p>aesthetics and permits are permitted for research purposes.</p> <ul style="list-style-type: none"> • Marine National Park zone - The marine national park zone is a zone in the marine park where no extractive activities can take place without a permit. • Habitat Protection zone - The habitat protection zone is the zone that allows for greater habitat protection of sensitive habitats in comparison to other zones of the marine park and permits are permitted for specific activities. • Buffer zone - The Buffer Zone provides for the protection and conservation of areas of the Marine Park in their natural state, while allowing the public to appreciate and enjoy the relatively undisturbed nature of the area. Permits are required for specific activities. <p><u>No Conservation Park or Preservation Zones are traversed by the proposed cable route. The route within the GBRMP has been specifically designed to avoid areas of high conservation value and topographical complexity, so as to avoid sensitive benthic habitats as far as practicably possible. It is noted that the cable is designated as a facility within the GBRMP and therefore permission will be required in all zones.</u></p>
	Commonwealth Marine Areas	1	The proposed cable route extends from the Australian shoreline to the edge of the EEZ, through the Coral Sea Marine Park.	<p>Impacts within the Commonwealth Marine Areas are unlikely to be significant due to the nature, scale and route selection of the proposed cable, within the marine park. The proposed cable route traverses the Habitat Protection Zone (IUCN IV); however, avoids the National Park Zone (IUCN II), which has higher conservation value. While the proposed alignment traverses these zones, the route has been specifically designed to avoid areas of high relief or topographical complexity, where sensitive benthic habitats</p>

Route Option	MNES	Number	Description	Comment
				<p>may be present. Therefore, there are no anticipated significant impacts to ecological values within these zones.</p> <p>Habitat Protection Zones (IUCN IV) are protected areas within the marine park designated to protect particular species or habitats and the management of these zones reflect this priority (IUCN 2018a).</p> <p>National Park Zones (IUCN II) typically represent Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area. (IUCN 2018b).</p>
	Listed Threatened Ecological Communities	1	There is one endangered TEC located approximately 2 km from the proposal cable landing station in Townsville. This is the Semi-evergreen vine thickets of the Brigalow Belt (north and South) and Nandewar Bioregions	There are no likely impacts to this TEC due the nature and scale of the available shore landing options in relation to the distance from the communities.
	Listed Threatened Species	40 (Birds – 14, Mammals – 11, Plants – 3, Reptiles – 8, Sharks –4)	<p>There are 40 listed threatened species showing on PMST search results. Of these 23 are shore dwelling and within 500 m of the beach landing or cable route.</p> <p>Of the remaining 16 marine species, 9 are listed as known to be located in the area and 7 are listed as likely to occur in the area.</p> <p>Of those that are known to be located in the area <u>one</u> is critically endangered (Curlew Sandpiper), <u>two</u> are endangered (the Red Knot Knot, and the Lesser Sand Plover) and <u>five</u> are vulnerable (Greater Sand Plover, Large Sand Plover, Green Turtle, Hawksbill Turtle, Flatback Turtle and the Humpback Whale).</p> <p>The Curlew Sandpiper is a listed marine migratory bird that is known to occur in the area traversed by Route 1 but is unlikely to be impacted upon by the proposal.</p>	While, it is noted that there are a number of listed species within the vicinity of the proposed cable route and landing location, it is not anticipated that any significant impacts to these species will occur due the nature of the proposed activity (i.e. small physical footprint and short duration during construction) and the management measures proposed to be implemented (Table 8-1)

Route Option	MNES	Number	Description	Comment
			<p>The Red Knot is a listed migratory marine bird with known habitats occurring within a 500m radius of the Route 1 landing location at Cape Cleveland, and the Lesser Sand Plover has known foraging feeding or related behaviour known to occur within a 500m radius of the landing location.</p> <p>The Greater Sand Plover and the Large Sand Plover have known feeding, foraging or related behaviour within a 500m radius of the proposed landing location, similarly the green turtle and flatback turtle have been known to nest within a 500m radius of the landing locations. In addition, hawksbill turtles and humpback whales are known to occur offshore within a 500m radius of the proposed cable landing location.</p>	
	Listed Migratory Species	58 (Migratory marine birds – 6, Migratory Marine Species – 27, Migratory Terrestrial Species – 7, Migratory Wetland Species - 18)	Of the 58 migratory species, 19 are listed also listed as threatened species and mentioned in the line above. Of the non-threatened species, 15 are listed as known to be located in the area and 16 are listed as likely to occur in the area.	While, it is noted that there are a number of migratory species within the vicinity of the proposed cable route and landing location, it is not anticipated that any significant impacts to these species will occur due the nature of the proposed activity (i.e. small physical footprint and short duration during construction) and the management measures proposed to be implemented (Table 8).
Route 2 (Maroochydoore)	World Heritage Properties	None	Not applicable	

Route Option	MNES	Number	Description	Comment
	National Heritage Places	None	Not applicable	
	Wetlands of International Importance	None	Not applicable	
	Great Barrier Reef Marine Park	None	Not applicable	
	Commonwealth Marine Area	1	The proposed cable route extends from the Australian shoreline to the edge of the EEZ, through the Coral Sea Marine Park, intersecting the Habitat Protection Zone (IUCN IV), while avoiding the National Park Zone (IUCN II).	<p>Impacts within the Commonwealth Marine Area are unlikely to be significant due to the nature, scale and route selection of the proposed cable, within the marine park.</p> <p>The proposed cable route traverses the Habitat Protection Zone (IUCN IV); however, avoids the National Park Zone (IUCN II), which has higher conservation value. While the proposed alignment traverses these zones, the route has been specifically designed to avoid areas of high relief or topographical complexity, where sensitive benthic habitats may be present. Therefore, there are no anticipated significant impacts to ecological values within these zones.</p> <p>Habitat Protection Zones (IUCN IV) are protected areas within the marine park designated to protect particular species or habitats and the management of these zones reflect this priority (IUCN 2018a).</p> <p>National Park Zones (IUCN II) typically represent Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area. (IUCN 2018b).</p>

Route Option	MNES	Number	Description	Comment
	Listed Threatened Ecological Communities	2	<p>There is one critically endangered TEC located approximately 5 km from the proposal cable. This is the Lowland Rainforest of Subtropical Australia.</p> <p>There is one vulnerable TEC located approximately 2 km from the proposed cable. This is the Subtropical and Temperate Coastal Saltmarsh.</p>	There are no likely impacts to this TEC due the nature and scale of the proposed shore landing in relation to the distance from the communities.
	Listed Threatened Species	81 (Birds – 32, Fish – 1, Frogs – 2, Insects – 2, Mammals – 13, Plants – 18, Reptiles – 9, Sharks – 4)	<p>There are 81 listed threatened species showing on PMST search results. Of these 37 are shore dwelling and within 500 m of the beach landing.</p> <p>Of the remaining 31 marine species, 8 are listed as known to be located in the area and 6 are listed as likely to occur in the area.</p> <p>Of those that are known to be located in the area <u>four</u> are critically endangered (Curlew Sandpiper, Green Knot, Swift Parrot and the Far Eastern Curlew), <u>ten</u> are endangered (the Red Knot Knot, the Lesser Sand Plover Mongolian Plover, Southern Giant-Petrel Southern Giant Petrel, Painted Snipe, Chatham Albatross, Loggerhead Turtle, Leatherback Turtle, Oliver Ridley Turtle Pacific Ridley Turtle, Blue Whale and the Southern Right Whale) and <u>fourteen</u> are vulnerable (Antipodean Albatross, Wandering Albatross, Gibson's Albatross, Northern Giant Petrel, Sooty Albatross, Tasmanian Shy Albatross, Campbell Albatross, Black-browed Albatross, Salvin's Albatross, White-capped Albatross, Green Turtle, Hawksbill Turtle, Flatback Turtle, and Humpback Whale).</p>	While, it is noted that there are a number of listed species within the vicinity of the proposed cable route and landing location, it is not anticipated that any significant impacts to these species will occur due the nature of the proposed activity (i.e. small physical footprint and short duration during construction) and the management measures proposed to be implemented (Table 8).
	Listed Migratory Species	74 (Migratory Marine Birds – 14, Migratory Marine	Of the 74 migratory species, 26 are listed also listed as threatened species and mentioned in the line above. Of the non-threatened species, 29 are listed as known to be located in the area and 9 are listed as likely to occur in the area.	There are no an anticipated significant impacts to these migratory species due the nature, scale and duration of the proposed disturbance associated with the installation of the cable and onshore infrastructure.

Route Option	MNES	Number	Description	Comment
		Species – 26, Migratory Terrestrial Species – 6, Migratory Wetlands Species – 28)		
Route 3 (Sydney)	World Heritage Properties	None	Not applicable	
	National Heritage Places	None	Not applicable	
	Wetlands of International Importance	None	Not applicable	
	Great Barrier Reef Marine Park	None	Not applicable	
	Commonwealth Marine Area	1	The proposed cable route extends from the Australian shoreline to the edge of the EEZ, through the Central Eastern Marine Park and the Coral Sea Marine Park.	Impacts within the Commonwealth Marine Area are unlikely to be significant due to the nature, scale and route selection of the proposed cable, within the marine parks. The proposed cable route traverses the Habitat Protection Zones (IUCN IV) within both Marine Parks; however, avoids the National Park Zones (IUCN II). The Multiple Use Zone (off Coffs Harbour) within the Temperate East Marine Park is also traversed. While the proposed alignment traverses these zones, the route has been specifically designed to avoid areas of high relief or topographical complexity, where sensitive benthic habitats may be present. Therefore, there are no anticipated significant impacts to ecological values within these zones.

Route Option	MNES	Number	Description	Comment
				<p>Habitat Protection Zones (IUCN IV) are protected areas within the marine park designated to protect particular species or habitats and the management of these zones reflect this priority (IUCN 2018a).</p> <p>National Park Zones (IUCN II) typically represent Large natural or near natural areas set aside to protect large-scale ecological processes, along with the complement of species and ecosystems characteristic of the area. (IUCN 2018b).</p>
	Listed Threatened Ecological Communities	1	There is one endangered TEC located approximately 1.5 km from the proposal cable. This is the Coastal Upland Swamps in the Sydney Basin Bioregion and the	There are no likely impacts to this TEC due the nature and scale of the proposed shore landing in relation to the distance from the communities.
	Listed Threatened Species	83 (Birds – 33, Fish – 3, Frogs – 4, Mammals – 13, Plants – 21, Reptiles – 6, Sharks – 3)	<p>There are 83 listed threatened species showing on PMST search results. Of these 48 are shore dwelling and within 500 m of the beach landing.</p> <p>Of the remaining 31 marine species, 6 are listed as known to be located in the area and 11 are listed as likely to occur in the area.</p> <p>Of those that are known to be located in the area, <u>three</u> are endangered (the Red Knot Knot, Loggerhead Turtle, and Leatherback Turtle) and <u>four</u> are vulnerable (are vulnerable; Green Turtle, Hawksbill Turtle, Flatback Turtle and the Humpback Whale).</p>	There are no an anticipated significant impacts to these threatened species due the nature, scale and duration of the proposed disturbance associated with the installation of the cable and onshore infrastructure.
	Listed Migratory Species	55 (Migratory Marine Birds – 15, Migratory Marine Species –	Of the 55 migratory species, 24 are listed also listed as threatened species and mentioned in the line above. Of the non-threatened species, 2 are listed as known to be located in the area and 8 are listed as likely to occur in the area.	There are no anticipated significant impacts to these migratory species due the nature, scale and duration of the proposed disturbance associated with the installation of the cable and onshore infrastructure.

Route Option	MNES	Number	Description	Comment
		23, Migratory Terrestrial Species – 7, Migratory Wetlands Species – 10)		

4.4.2 Biologically Important Areas

Biologically important areas (BIAs) are spatially defined areas where aggregations of individuals of a species are known to display biologically important behaviour such as breeding, foraging, resting or migration (DoEE,2016d). Route 3 (Sydney) overlaps 16 BIAs, while Route 1 (Townsville) and 3 (Maroochydore) overlap 15 and 13 BIAs, respectively. All BIAs overlapping the proposed route options are listed in Table 4-4, including the type of BIA, location and any relevant seasonality for the presence of each species.

Table 4-4. Relevant BIAs overlapping the three cable route options.

Species	BIA Type	Location	Seasonal Presence	Route 1 (Townsville)	Route 2 (Maroochydore)	Route 3 (Sydney)
Birds						
Black Noddy	Breeding and/or Foraging	North west Coral Sea and Bunker group islands with 30 km foraging buffer	All year round	Y		
Bridled Tern	Breeding and/or Foraging	Coral Sea, Coringa Herald Group, Lihou Reef, Willis Group	October - April (breeding season)	Y		
Black-naped Tern	Breeding and/or Foraging	Northern offshore islands between Lady Elliot island and Torres Strait	July - Jan	Y		
Brown Booby	Breeding and/or Foraging	Coral Sea, Coringa Herald Group, Lihou Reef, Willis Group with 40 km foraging buffer	All year round; peak presence during Spring and Autumn	Y		
		GBR Rocky Island, Swains Reefs with 40 km foraging buffer	All year round; peak presence during Spring and Autumn	Y		
Common Noddy	Breeding and/or Foraging	Reefs and cays of the Coral Sea with 100 km foraging buffer	Breeding between August – April; foraging between March - December	Y	Y	

Species	BIA Type	Location	Seasonal Presence	Route 1 (Townsville)	Route 2 (Maroochydore)	Route 3 (Sydney)
Crested Tern	Breeding and/or Foraging	Coringa Herald Island group with 20 km buffer	November - April	Y		
Masked Booby	Breeding and/or Foraging	Coral Sea: Coringa group, Lihou group, Herald group, Diamond, Marion with 100 km buffer	All year round	Y		
Sooty Tern	Breeding and/or Foraging	Breeding area buffer around Observatory Cay and South West Islet	August - April	Y		
Wedge-tailed shearwater	Breeding and/or Foraging	Coral Sea Islands with 160 km buffer	August - May	Y		
		160 km Buffer around Hope Cay and Bird Islet			Y	
		Breeding area / sites buffer- Broughton Island (NSW)				Y
Greater Frigatebird	Breeding and/or Foraging	Islands of the Coral Sea (Coringa Herald/Lihou) with 100 km buffer	March - May	Y		

Species	BIA Type	Location	Seasonal Presence	Route 1 (Townsville)	Route 2 (Maroochydore)	Route 3 (Sydney)
Black Petrel	Foraging	From Fraser Island to the southern coast of NSW out to and including the area around Lord Howe Island	All year round		Y	Y
Black Browed Albatross	Foraging	Shelf region NSW coast	May - November, peak presence between May - June		Y	
Flesh-footed Shearwater		Region based on Thalman paper – South-east Queensland and NSW	November - February		Y	Y
Lesser Frigatebird	Breeding and/or Foraging	Coral Sea: Coringa group, Lihou group, Wreck Reef, Diamond Islets, Cato Island, Magdaline Cays with 100 km buffer	March - November		Y	
Red-Footed Booby	Breeding and/or Foraging	Breeding site buffer around islands in the Great Barrier Reef (Cato Island, Wreck Island and Central Diamond Islet)	All year round		Y	
Antipodean Albatross	Foraging	NSW coast	All year round			Y
Campbell Albatross	Foraging	Shelf region NSW coast	June - August			Y
Great-Winged Petrel	Foraging	South-east Queensland and NSW	All year round			Y

Species	BIA Type	Location	Seasonal Presence	Route 1 (Townsville)	Route 2 (Maroochydore)	Route 3 (Sydney)
Indian Yellow-Nosed Albatross	Foraging	Shelf region NSW coast	May - November			Y
Norther Giant Petrel	Foraging	Shelf region NSW coast	June - October			Y
Short-Tailed Shearwater	Foraging	120 km buffer around Sydney	September - March			Y
Southern Giant Petrel	Foraging	Shelf region NSW coast	June - October			Y
Wandering Albatross	Foraging	Shelf region NSW coast	July - November			Y
Wilson's Storm-Petrel	Migration	Shelf region NSW coast	April - June (Northern), September - November (Southern)			Y
Mammals						
Humpback Whale	breeding and calving	Great Barrier Marine Park (from N of Hervey Bay to tip of Cape York)	High number from June to October, additional reports of whales in lower numbers all year round in the Great Barrier Reef marine park	Y		

Species	BIA Type	Location	Seasonal Presence	Route 1 (Townsville)	Route 2 (Maroochydore)	Route 3 (Sydney)
	Migration	Frazer Island to Moreton Bay	June to November (includes N and S migration): the peak of the northbound migration is June - July, the peak of the southbound migration is August - mid October. N and S migration can overlap.		Y	
		From NSW-QLD border to Eden	May to November (includes N and S migration): the peak of the northbound migration is June - July, the peak of the southbound migration is August - mid October. N and S migration can overlap.			Y
Indo-pacific Humpback Dolphin	Breeding, calving and foraging	Coastal waters south of Tully Heads to Mackay/Grasree Beach Region (including Cleveland, Bowling Green, Repulse and Upstart Bays), within the 20m depth contour	All year round	Y		
		Northeastern tip of Cooloola National Park south the the Queensland/New South Wales Border (including Moreton Bay), within the 20m depth contour			Y	
Indo-pacific/Spotted	Breeding and calving	Throughout statewaters of the East Marine Region, within the 20 metre contour; Cleveland Bay	All year round	Y		Y

Species	BIA Type	Location	Seasonal Presence	Route 1 (Townsville)	Route 2 (Maroochydore)	Route 3 (Sydney)
Bottlenose Dolphin		Moreton Bay			Y	
Marine Reptiles						
Flatback Turtle	Nesting	Shoalwater Bay to Townsville	November to late January	Y		
Loggerhead Turtle	Nesting and Internesting	Ballina to Bustard head with 20 km internesting buffer (From Moore Park Beach out to Fraser Island heading south to Evans head)	November - February		Y	
Fish						
Grey-nurse Shark	Breeding	NSW coastline	All year round; breeding between October - November		Y	
		From Fraser Island, south to Corindi Beach				Y
White Shark	Distribution	Between the 60 to 120 m and 120 to 1,000 m depth contoura	Autumn - winter - spring		Y	Y

4.4.3 Habitats and Communities

The proposed cable routes pass adjacent to and (in some instances) through a variety of habitats and benthic communities. This section broadly describes the likely habitats and communities within or adjacent to each of the route options.

Route 1 traverses five zones within the Great Barrier Reef Marine Park (Figure 4-2 and Figure 4-3), which is one of the most sensitive and protected areas in Australian waters. Habitats and communities present in the GBRMP include:

- Seagrass, shoals and sandy or muddy seabed: ~61% of the GBRMP
- Mangroves: ~0.6% of the GBRMP
- Fringing reefs, mid-shelf reefs and outer reefs: ~7% of the GBRMP
- Continental shelf/slop: ~15% of the GBRMP
- Deep water habitats: ~16% of the GBRMP
- Islands: ~1% of the GBRMP.

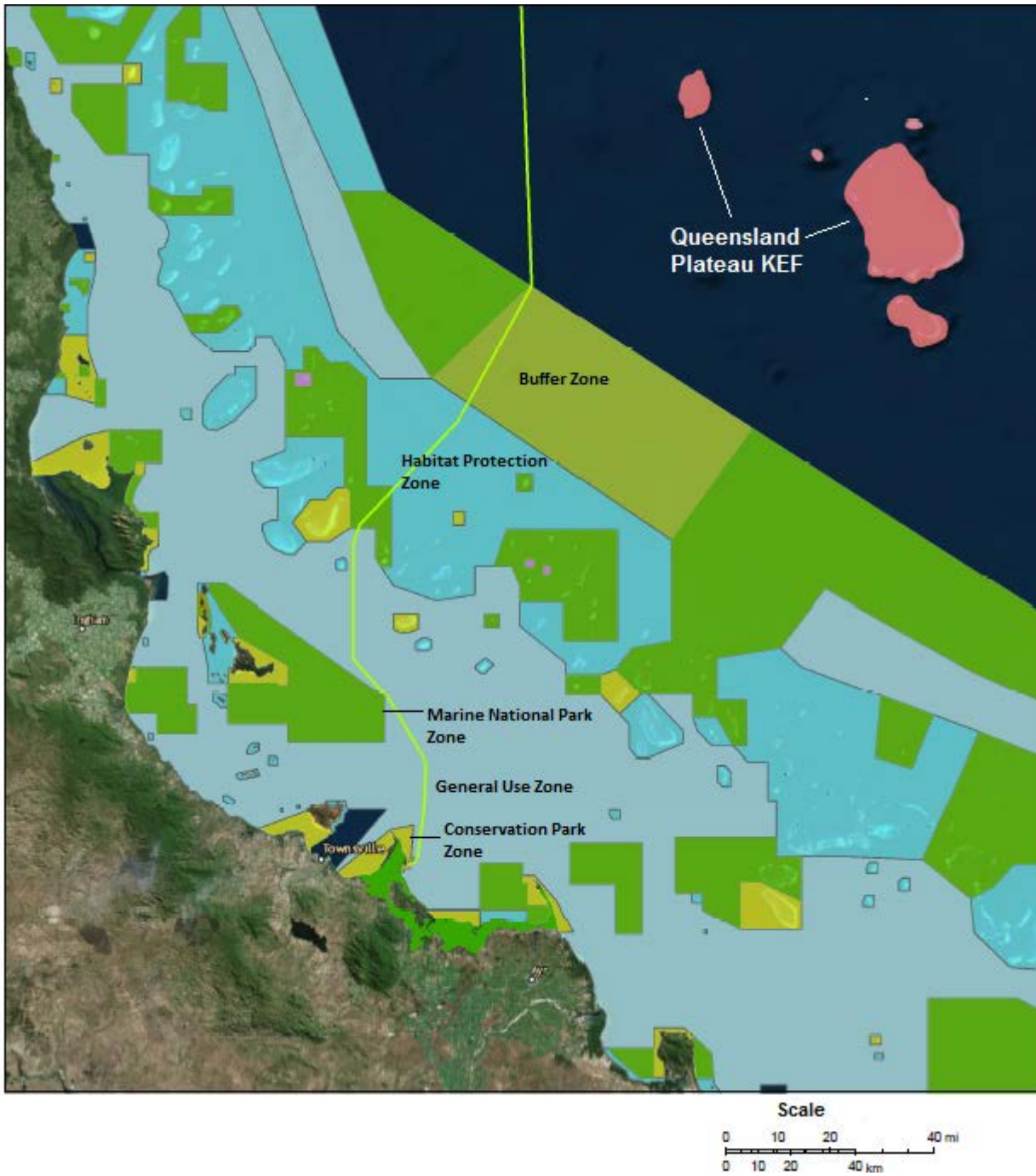


Figure 4-4. Great Barrier Reef Marine Park Zones in relation to the offshore cable route.

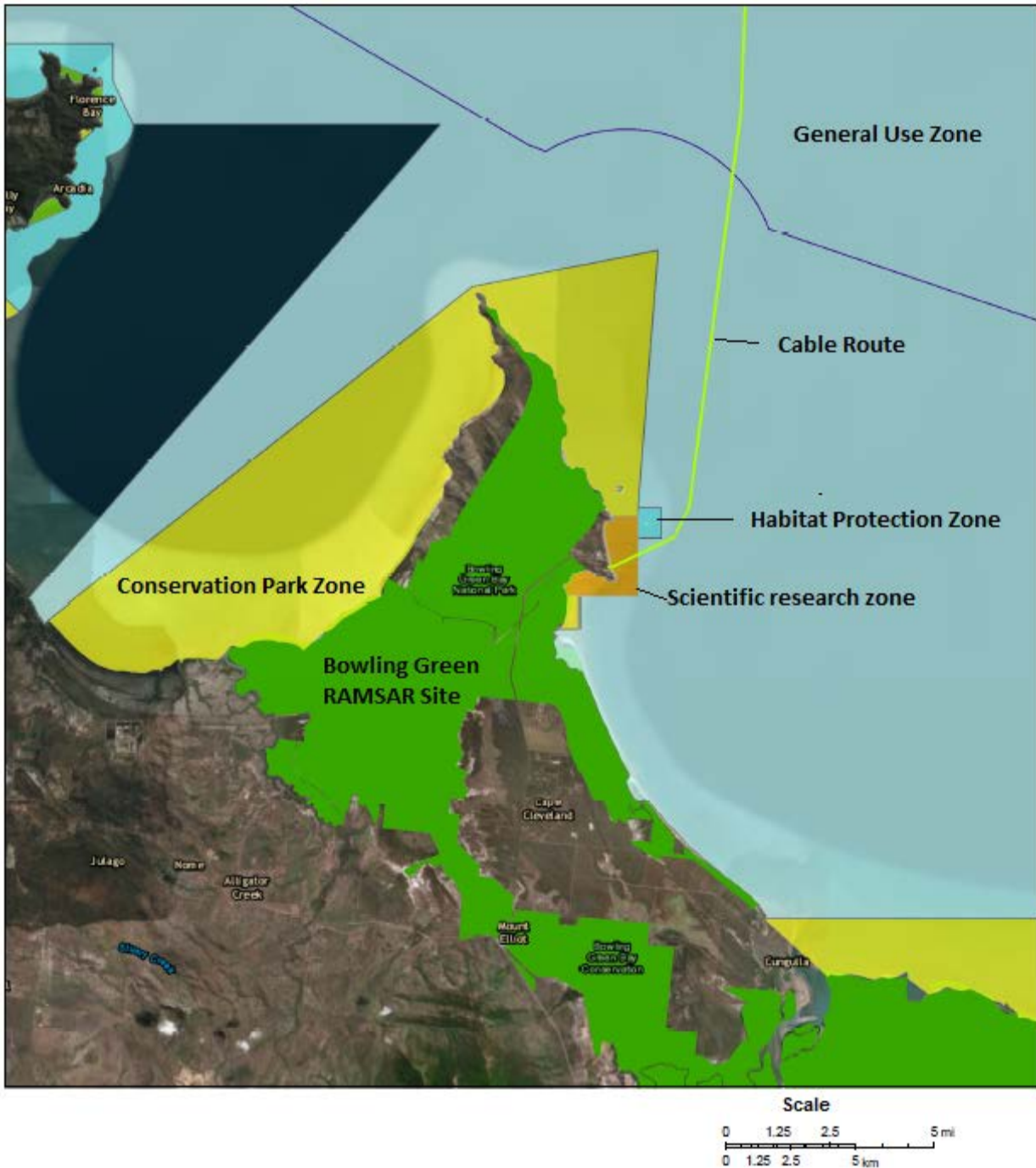


Figure 4-5. Great Barrier Reef Marine Park Zones in relation to the nearshore cable route and landing location.

All three routes traverse the Coral Sea Marine Park and Coral Sea Bioregion which contains habitats and communities of coral reefs, seamounts, deep shelf and abyssal habitats (Ceccarelli *et al.* 2013). These systems support marine benthic flora and fauna, distinct from the Great Barrier Reef (DoEE, 2009).

Route 2 and Route 3 traverse the Temperate East Bioregion which contains a number of habitats and communities such as shelf rocky reefs, canyons, eddy fields and the seamount chains that are identified as KEFs and described in Section 4.2 (DoEE, 2009).

The nearshore benthic environments for the Route 1 are likely to be characterised by soft sediment habitats, bare sandy substrate, rock walls, rocky shores, with little or no epibenthic habitats present (BMT WBM, 2012).

The nearshore benthic environments for the Route 2 are likely to be characterised by soft sediment habitats, consolidated reefs, bare sandy substrate with extremely sparse epibenthic habitats present (Sunshine Coast Council, 2017).

It is noted that the shore landing location of the Route 3 option will be in close proximity (approximately 500 m) to the Narrabeen Head Aquatic Reserve. The reserve covers an area of approximately six hectares of rocky shore between the southern end of Turimetta Beach and the rock baths at Narrabeen Head. The reserve extends 100 m offshore. The primary objectives of the aquatic reserves are to conserve the biodiversity of fish and marine vegetation, protect fish habitat, and facilitate educational activities and scientific research (NSW DPI, 2016).

4.5 Social Environment

The Proposal traverses a number of areas that have notable social uses. This section described those social uses in relation to each route option.

The proposed Route 1 landing site is located on Commonwealth land within the AIMS facility at Cape Cleveland. This facility provides research to governments, industry and the wider community (AIMS, 2018). Cape Cleveland also hosts various recreation activities and provides beach access to the public. Once the cable leaves the beach it traverses the GBRMP which also provides for recreational use and supports a number of commercial and tourism activities. Further offshore the proposed cable traverses a number of state fisheries, specifically C1 and C3 crab fisheries; L8 line fisheries; N1, N2, N4 and N11 net fisheries; pearl fishery; and T1 trawl fishery (Queensland Government 2018). Route 1 also crosses, and runs within a designated shipping lane, except for the short section between the AIMS facility and the tip of Cape Cleveland. Potential impacts associated with the installation of the cable on the seabed are discussed in Table 8-1.

Aboriginal and Torres Strait Islander persons or bodies with registered but unresolved claims over land open to native title claim shall be afforded the same procedural rights as holders of freehold title or registered Native Title. If project activities are proposed on land at AIMS Cape Cleveland or Maroochydore there will be consultation and other procedural rights with Bindal People or Kabi Kabi First Nation respectively, in accordance with the Native Title Act 1993 (Cth).

The proposed Route 2 traverses Maroochydore beach which is frequently used for a variety of general recreational uses. Offshore from Maroochydore beach the proposed cable traverses a number of state fisheries specifically, C1 and C2 crab fisheries, K7 net fishery; L1, L2, L3 and L8 line fisheries; N1 and N11 net fisheries; pearl fishery; and, the T2, T4, T5 trawl fisheries (Queensland Government 2018).

The proposed Route 3 has a cable landing site located in the North Narrabeen Reserve surrounded by urban development. The Narrabeen reserve supports a number of local recreation uses and also provides public access to the beach. Offshore from Narrabeen beach, the proposed route traverses the Region 4 of the NSW Fisheries. Region 4 includes ocean hauling, ocean trap and line, ocean trawling, estuary general, and estuary prawn haul (NSW DPI 2018).

The Tamarama southern route option would use existing under-shore crossing conduits, landing and terrestrial telecommunications infrastructure and the southern Sydney ACMA Cable Protection Zone, so no impacts are considered likely.

5. Existing Environment: Solomon Islands

This section describes the existing environment that the proposed cable, including the domestic network, traverses in Solomon Islands and International Waters within the Solomon Islands EEZ (Figure 5-1).

5.1 Regional Overview

Solomon Islands is made up of approximately 900 islands, atolls and cays with total land area of approximately 28 000 km². There are six major island groups: Choiseul, New Georgia, Santa Isabel, Guadalcanal, Malaita and San Cristobal (Krüger & Sharma, 2008). The Solomon Island EEZ is approximately 600 000 km² (Figure 5-1; Krüger & Sharma, 2008).

5.2 Physical Environment

The proposed cable traverses a variety of bathymetric and seabed features within the maritime boundaries of Solomon Islands. The optimal location for the proposed cable from a construction perspective is flat seabed avoiding seabed features. Therefore, the proposed route options have been developed to avoid uneven seabed and high relief features. The cable enters the Solomon Island EEZ along the abyssal plain at maximum depths of approximately 5 600 m before ascending back up the continental shelf and the nearshore environment to the Honiara beach manhole.

The following subsections describe the physical environment at each of the cable landing points within Solomon Islands, including the domestic network:

5.2.1 Honiara

A single beach landing point is proposed in Honiara, as shown in Figure 5-2. The cable will be landed through a single articulated duct that will be pinned to the fringing reef and connected to a shore based beach manhole. Once on shore, the cable will run along a trench that borders private property, to the main highway and continued underground for approximately 350 m to the Solomon Telecom building, where the landing station will be located. The domestic network will start at Honiara, therefore there will also be an outgoing cable bound for Noro, Auki and Taro. The outgoing cable will follow the same path as the incoming cable and will reuse trenches and the cable duct.

At Honiara Beach the seabed gradually deepens to approximately 40 m (Solomon Oceanic Cable Company, 2014). The bathymetry of the seabed is characterised by volcanic features and tectonic faulting typical in the Solomon Islands (Solomon Oceanic Cable Company, 2014). At approximately 20 km offshore the seabed drops off steeply to a depth of approximately 700 m (Solomon Oceanic Company, 2014). The shoreline at the Honiara beach landing site can be broadly described as a mix of limestone reef and coral rubble/sandy beach as shown in Figure 5-3 and Figure 5-4. The beach is narrow, approximately 3-5 m, with a vertical height of approximately 1.5 m. Beach sediments consist of pebbles and broken coral approximately 1-5 cm in length. The coastal foreshore during inclement weather periods is subjected to high-energy waves resulting in erosion (Solomon Oceanic Cable Company, 2014).

The proposed cable passes near Savo Volcano, approximately 75 km from Honiara and passes through Iron Bottom Sound, where numerous ship wrecks are known to be located (Pacific Wrecks, 2018). Geophysical surveys will identify where ship wrecks are located and the final cable route will be designed to avoid these constraints.

Following Savo Island, the route follows a deep depression reaching a maximum depth of approximately 4500 m. For much of the remainder of the route the depth ranges between approximately 2000 m and 3500 m (Solomon Oceanic Cable Company, 2014).

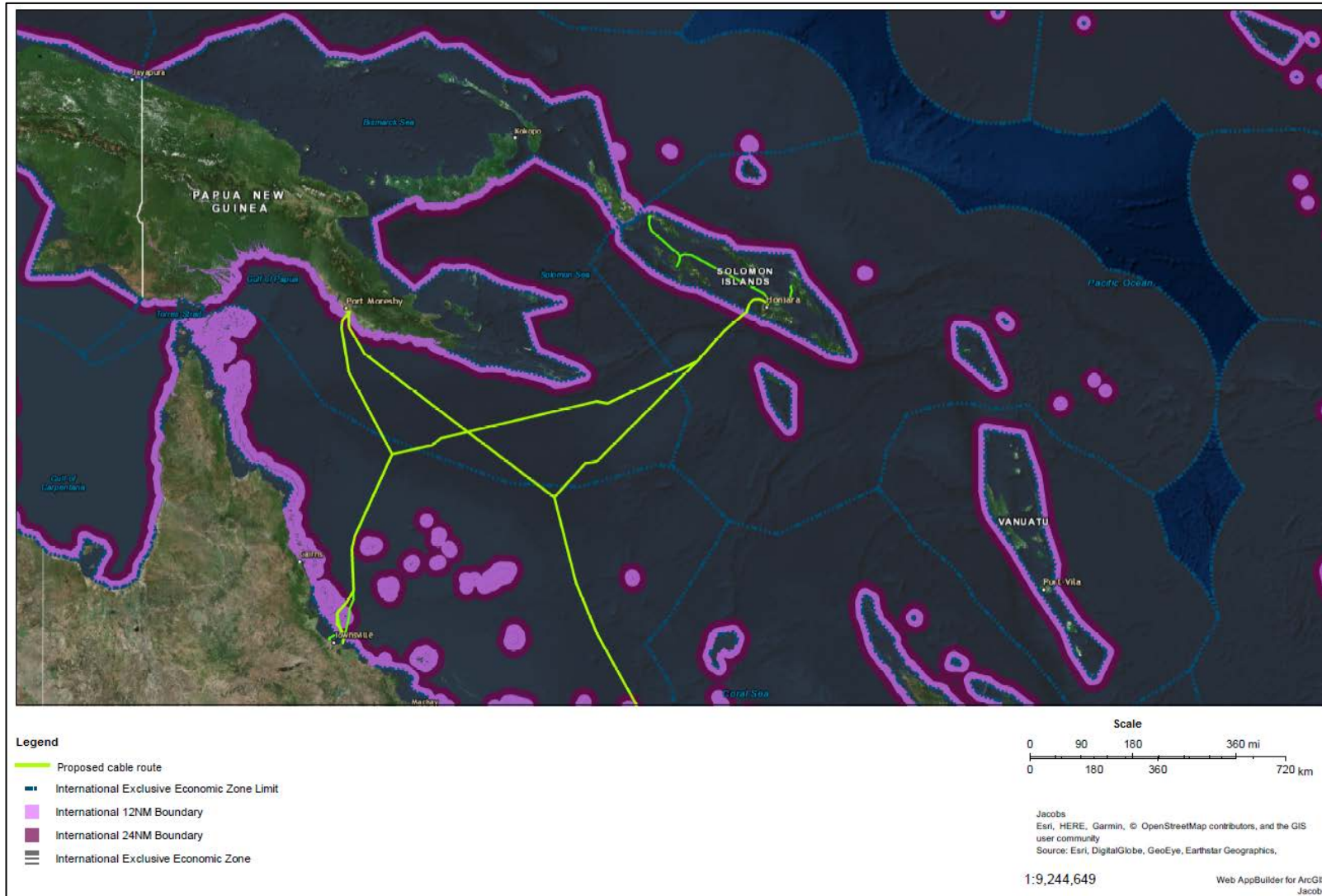


Figure 5-1. Solomon Islands and Papua New Guinea International Maritime Boundaries



Figure 5-2: Honiara Landing location and Cable Alignment to cable landing station.



Figure 5-3: Honiara beach landing site nearshore environment (looking north)



Figure 5-4: Honiara beach landing site nearshore environment (looking south east)

5.2.2 Noro

The first leg of the domestic network is between Honiara and Noro. This cable will pass through deep waters in the Iron Bottom Sound and past Russel Islands before continuing into Noro beach. The cable passes through the Noro channel which is deep and used for commercial port activities. The cable also traverses a nearshore fringing coral reef. The nearshore environment at Noro is characterised by large tidal changes exposing reef at low tide. For this reason, the proposed manhole will be located 10 m above mean sea level (Solomon Oceanic Cable Company, 2014).

The Noro beach is located north-east of the Noro town centre and travels approximately 3 km to the cable landing station. The cable landing station will use an existing telecommunication site that has capacity to house terminal equipment for the cable. Between the beach landing site and the cable landing station the cable follows public roads. Figure 5-5 shows the cable route on shore at Noro.

Noro beach is narrow because of low energy wave action from the calm lagoon waters which are a result of protection from the distant island of Kolombangara and the nearby island of Kohinggo (Solomon Oceanic Cable Company, 2014). The beach is composed predominantly of hard limestone coral substrate interspersed with small amounts of sand and loose coral fragments. Photos of the beach are shown in Figure 5-6.

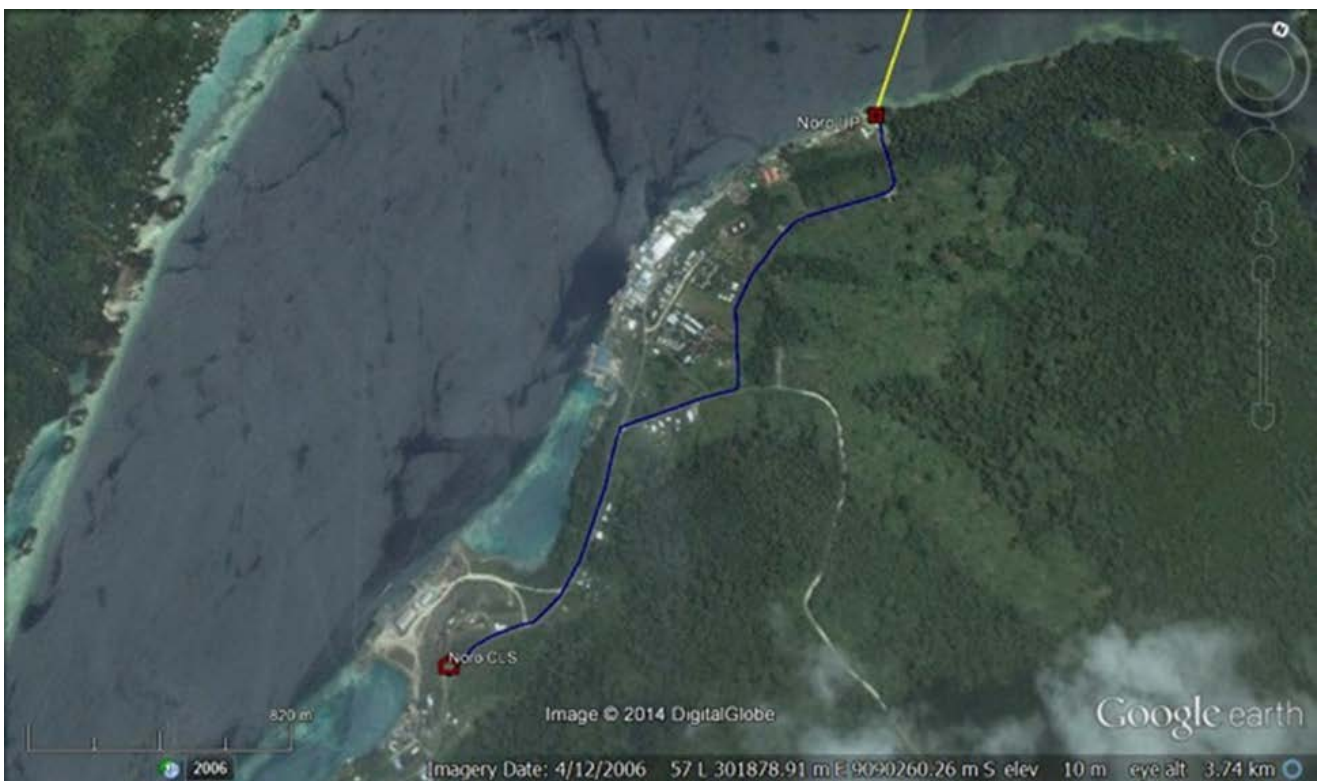


Figure 5-5: Domestic Cable Alignment and Landing location in Noro.



Figure 5-6: Noro beach landing site coastline

5.2.3 Auki

Another branch of the domestic network is between Honiara and Auki. This cable passes through the Sealark Channel where the water depth drops to approximately 1500 m and follows the Indispensable Strait before ascending towards Auki at the south of Alite Reef.

The proposed beach landing point is located north of Auki town centre at Kelakwai Beach, where the cable crosses a well-developed fringing coral reef environment (Figure 5-7). The cable alignment will be laid parallel to existing vehicle and walking tracts for approximately 1 km where it will then follow an unsealed road directly to the cable terminal location. The cable station is located at an existing station, which is approximately 1.6 km from the landing site and is situated in the centre of Auki town. The existing cable station has sufficient space for the proposed cable.

Kelakwai beach is composed predominantly of a mixture of fine sand, coarse sand and medium-large coral pebbles derived from the nearby fringing reef and include shell fragments, coral fragments, remnants of calcareous algae and invertebrate exoskeletons. Photos of the beach are shown in Figure 5-8. The beach is an approximate gradient of 1:7, gently sloping towards the sea and measured around 7-10 m wide, the beach is also bordered by coastal vegetation.

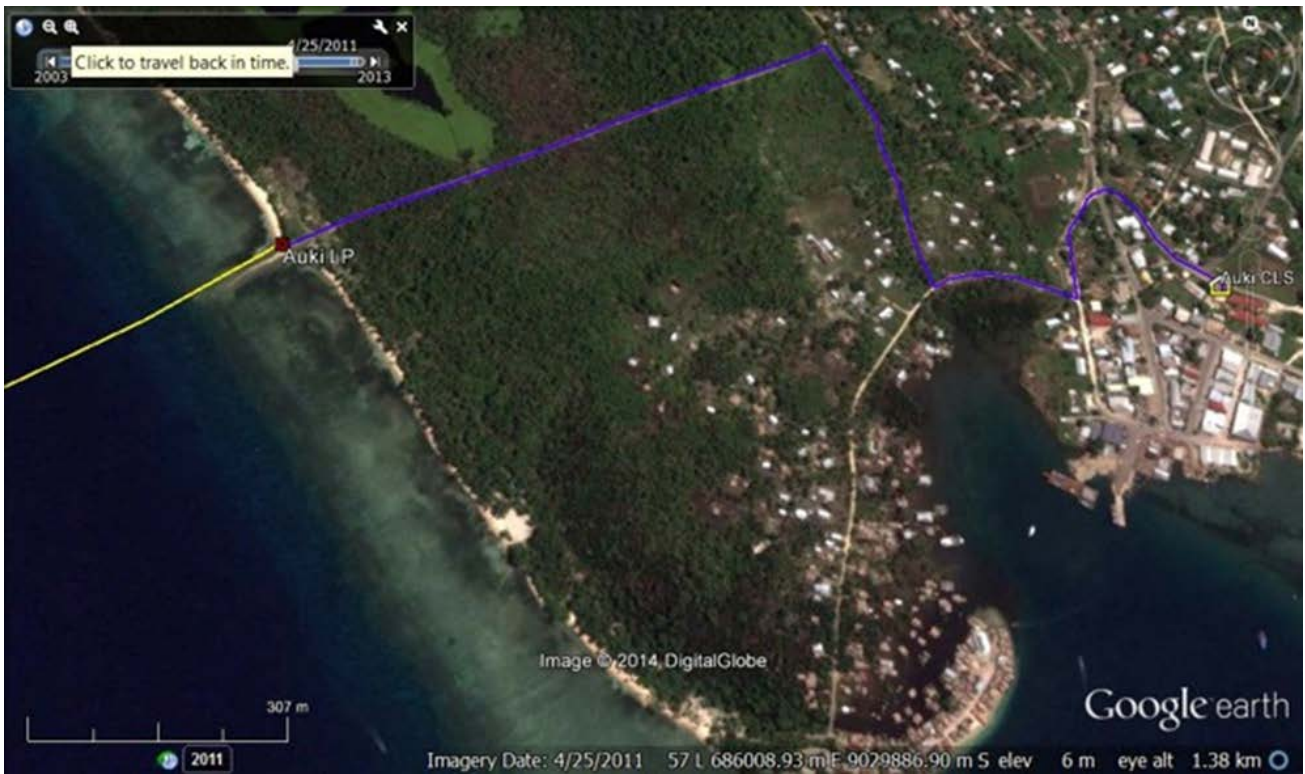


Figure 5-7:Auki Domestic Landing Site and Cable Alignment



Figure 5-8: Auki landing site coastline

5.2.4 Taro

Taro Island is a small island (approximately 0.4km²; 1km x 500m) within Choiseul Province. The majority of Taro Island is low-lying and less than two metres above Mean Sea Level (MSL). The island currently serves as the provisional capital of the province, with government departments and an airstrip key infrastructure (e.g. local hospital) on the island. In addition, the island has a concrete wharf (Figure 16 and Figure 17), with supply vessels docking twice a month to deliver supplies to the island. Taro Island contains approximately 900 permanent inhabitants, with people from nearby islands frequenting the island daily for trade and commerce (food markets and shops). Power on the island is supplied by a World Bank funded solar panel array, providing power 24hrs/day, with diesel back-up generators also present. Mobile telecommunications (VSat satellite system) are serviced by Solomon Telekom, which has an office and telecommunications center on the island (Figure 16). Freshwater is sourced both from rainwater tanks and groundwater wells, with purification undertaken for drinking water. The majority of land on the island is owned in perpetuity by the provisional government, with few customary landholdings present.

At Taro Island, two proposed landing locations have been identified on the eastern side of the island, one adjacent (the southern side) to the existing wharf (Figure 5-9 and Figure 5-10) and another location approximately 200m south of the wharf, directly in line with the existing Solomon Telekom building (Figure 5-11 and Figure 5-12). Given the density of housing within the island both landing locations are adjacent to existing buildings and housing.

The nearshore environment for both landing locations are similar, with small sand beaches present with coral rubble and coastal vegetation inland of the waterline. The nearshore marine environment at both locations is characterised by a shallow sandy fringing reef flat (1-2m deep), interspersed dense and diverse coral reef communities (Section 5.3.1). The reef flat is between 20-60 m long, with the reef sloping sharply to approximately 15-20m within the adjacent channel. Substrates on the reef slopes are largely sand, with live coral colonies observed though less prevalent.



Figure 5-9. Solomon Telekom building immediately landward of one of the proposed landing locations.



Figure 5-10. Example housing within Taro Island.



Figure 5-11. Proposed landing location adjacent to the existing Taro Island wharf. Proposed landing location is left of the wharf in this image, in line with the blue vessel.



Figure 5-12. Proposed landing location adjacent to the existing Taro Island wharf, looking NE towards Choiseul Island.



Figure 5-13. Proposed landing location behind the Solomon Telkom building, looking NE towards Choiseul Island.



Figure 5-14. Proposed landing location beach behind the Solomon Telkom building (red building in background) looking SW inland.

5.3 Biological Environment

The marine environment of the Solomon Islands is highly diverse containing, coral reefs, mangroves, estuaries, seagrass, littoral vegetation and estuary ecosystems (World Wildlife Fund, 2013). The proposed cable route traverses through various aspects of the biological environment within the Solomon Islands. Key habitats and communities are discussed in further detail below.

5.3.1 Coral Reefs

The Solomon Islands has one of the highest levels of coral diversity globally, with 494 species recorded (485 known species and nine unknown species, which may be new species) (Maraghoto Holdings Company Limited, 2009). Similarly, coral reefs in the Solomon Islands have one of the richest concentrations of reef fishes in the world with a total of 1019 fish species identified (Maraghoto Holdings Company Limited, 2009). The Solomon Island coral reefs are mainly fringing and intermittent around islands (Maraghoto Holdings Company Limited, 2009).



Figure 5-15. Soft coral (*Sinularia* sp.) dominated fringing reef community adjacent to the proposed Taro Island Solomon Telkom landing location.

Coral reefs support extraordinary diversity of species by providing food, shelter, nursery and feeding grounds for many fish species and crustaceans (Maraghoto Holdings Company Limited, 2009). The reefs protect coastal areas from storms and erosions by forming natural break waters (Maraghoto Holdings Company Limited, 2009). Furthermore, local residents depend on the coral reefs for fishing. The proposed cable route traverses areas of fringing reef as the cable approaches each respective landing point in the domestic network. The coral

communities within the proposed Taro Island nearshore route are well developed, healthy coral communities, with high biodiversity and seemingly few environmental or anthropogenic stressors (Figure 5-15 and Figure 5-16). In areas where the cable is likely to traverse fringing reef communities, a pre-installation survey will be undertaken in order to determine an appropriate alignment for the cable on the reef(s), avoiding coral or other sensitive benthic habitats.



Figure 5-16. Soft coral (*Sinularia* sp.), hard coral (*Pocillopora damicornis*, *Porites* sp.) colonies and echinoderms (*Diadema setosum*), within the fringing reef flat adjacent to the proposed Taro Island wharf landing location.

5.3.2 Seagrass Meadows

Seagrass meadows are a significant coastal habitat and contain high biodiversity value in Solomon Islands due to their ecological function. The seagrasses are fully submerged and rooted in soft bottom estuarine (Solomon Oceanic Cable Company, 2014). Seagrass meadows can be found in habitats extending from the intertidal zone to sub tidal zone. Specifically, they tend to be located along mangrove coastlines, estuaries, shallow embankments, coral reef, inter reef and offshore islands. In the Solomon Islands there are ten known species of seagrass (Solomon Oceanic Cable Company, 2014).

Specific locations of seagrass meadows in relation to the proposed cable alignment are not known; however, recent investigations at the proposed Taro Island landing locations indicate that seagrass beds are often interspersed within coral communities on the fringing reefs adjacent to the proposed landing locations (Figure 5-17).



Figure 5-17. *Thalassia heamprichii* (long bladed) and *Halophila decipiens* (small oval leafed) seagrass interspersed with coral rubble on the nearshore reef flat adjacent to the proposed Taro Island Solomon Telkom landing location.

5.3.3 Mangroves

Mangroves are a significant coastal habitat and contain high biodiversity value in the Solomon Islands. According to a report by the Nature Conservancy, there are 20 species and two hybrids of mangrove found in the Solomon Islands. There are no known areas of significant mangroves where the cable is proposed within Solomon Islands.

5.3.4 Lagoons and Estuaries

Lagoons, estuaries and other inshore marine waters are particularly productive ecosystems, demonstrating high levels of biological productivity (Solomon Oceanic Cable Company, 2014). Such areas are home to a diverse combination of species and ecosystems. These ecosystems can serve as sinks for terrestrial run-off and sediment and pollutant traps, which can damage the fragile offshore ecosystems (Maraghoto Holdings Company Limited, 2009). The proposed cable traverses a variety of lagoons to land at the proposed domestic cable landing sites.

5.3.5 Protected Areas and Species

There are a total of 22 marine protected areas in the Solomon Islands and one designated marine conservation area (Arnavon Marine Conservation Area) (Solomon Oceanic Cable Company, 2014). A number of marine conservation areas have been established by communities in Marau Sound, Ngella, Marovo Lagoon, Tetepare, Roviana Lagoon and Gizo (Solomon Oceanic Cable Company, 2014). Other marine protected areas are

informally designated and include the customary management areas established in Roviana and Vonavona Lagoons (Solomon Oceanic Cable Company, 2014). None of the 22 marine protected areas are traversed by the proposed cable routes and landing sites.

The International Union for Conservation of Nature and Natural Resources (IUCN) undertakes a global assessment to classify species at varying risk of global extinction. The 2008 IUCN Red List provides the most up-to-date collated information for the Solomon Islands. It identifies and assesses the list of threatened species which includes 245 bird species, 19 amphibians, 75 fishes, 60 plants, 75 mammals, 522 invertebrates and 6 reptiles.

Two species of bird have been declared Extinct in the Solomon Islands – the Thick-billed Ground Dove (*Gallicolumba salomonis*) and the Choiseul Pigeon (*Microgoura meeki*) (Solomon Oceanic Cable Company, 2014). Turtle species found in the Solomon Islands are listed as protected and include; Leatherback Turtle (*Dermochelys coriacea*), Hawksbill Turtle (*Eretmochelys imbricate*), Green Turtle (*Chelonia mydas*), Olive Ridley turtle (*Lepidochelys olivacea*) and Loggerhead Turtle (*Caretta caretta*) (Solomon Oceanic Cable Company, 2014). The eight identified nesting sites for the turtles in Solomon Islands include two islands in Western Province (Rendova and Tetepare), these sites are not located close to the cable landing sites.

5.4 Social Environment

The proposed cable, including the domestic networks, traverses a number of areas that have social significance or uses. The cable between Australia and Honiara, and Honiara and Noro passes through the Iron Bottom Sound. This area contains a number of shipwrecks and airplane wrecks from World War II making this area socially significant (Pacific Wrecks, 2018). Figure 5-18 shows where known wrecks are located.



Figure 5-18: Maps of Shipwrecks near Honiara

The risk of UXO to people and environment is a particular issue for further assessment in Iron Bottom Sound. Where desktop and field survey results demonstrate UXO risks, further investigation will be considered. In shallow water more intense survey passes will be undertaken for identification purposes. Divers will be used for further identification purposes where necessary. In areas where there are magnetic anomalies from surveys and/or UXO risks, only surface lay of cable will be considered.

Recent experience of cable deployment in Darwin Harbour raised similar UXO risks. In some areas there was a density of magnetic anomalies (e.g. UXO risk) that could not be avoided. Surface lay in these areas proceeded without incident. All practical and available UXO identification procedures will be utilised in Iron Bottom Sound to avoid UXO areas in the first instance.

In addition, the cable crosses beaches that are used for recreational and local fishing purposes and in a number of instances the cable will be laid along public roads in urban locations.

It is difficult to obtain robust information on customary land holdings in Solomon Islands, however there is one known site that the proposed cable traverses in Auki (Solomon Oceanic Cable Company, 2014). Also in Auki, the proposed cable traverses land used for crops that provide food to local residents, specifically coconut, swamp taro, sago palm and other vegetables (Solomon Oceanic Cable Company, 2014).

6. Existing Environment: Papua New Guinea

This section describes the existing environment that the proposed cable traverses Papua New Guinea and international waters within the Papua New Guinea EEZ.

6.1 Regional Overview

Papua New Guinea is located in the South-West Pacific Basin north of Australia and has more than 600 atolls and offshore islands (Government of Papua New Guinea, 2015). Papua New Guinea has a land area of approximately 460 000 km². The proposed cable route between Australia and Papua New Guinea will traverse various offshore environments to the proposed landing point at Port Moresby. The cable beach landing at Port Moresby is proposed to be located at the Kila Police Barracks, near Gabutu (Figure 6-2 and Figure 6-3).

6.2 Physical Environment

Port Moresby is located in the south-west of Papua New Guinea. The area has a number of harbours, bays and small islands. The coastal area is characterised by a mixture of rocky shoreline and sandy beaches.

The Papua New Guinea south coast is generally classified in terms of its structural geology whereby the Port Moresby area falls within the South-east Papua Volcanic Province (Mungkaje, 2012). The characteristics of this geology is marine features comprising beaches and fringing reef systems, this area also consists of a barrier reef system, which is separated from the coastline by the Papuan Coastal Lagoon (Mungkaje, 2012).

The circulation of the waters in the Papuan Coastal Lagoon system near Port Moresby flows in a counter clockwise pattern and is largely influenced by tides (Mungkaje 2012). Port Moresby has semi-diurnal tides with two high and low tides daily (Mungkaje 2012). The larger oceanographic drivers of the waters beyond the barrier reef is regarded as an area of convergence of the tropical waters and the waters from the east.

6.3 Biological Environment

Distinct habitat types occur within the Port Moresby Bay, all of which provide important shelter, foraging and nursery sites to marine organisms. These include the shoreline, the intertidal zone, the seagrass beds, the shallow submerged reef, the reef slope, and the basin floor.

6.3.1 Coral Reefs

The coral reef communities near Port Moresby are typically characterised by fringing reefs with corals sparsely distributed (Mungkaje 2012). The intertidal zone is usually exposed at low tide and is generally comprised of limestone boulders, coral rubble, sand substrates (Mungkaje 2012). The lagoon zone is usually the largest zone and supports a significant portion of seagrass, echinoderms and fish species (Mungkaje 2012). Live coral communities are predominately found on the back reef, reef crest and reef slope.

6.3.2 Deep Water Coastal Lagoon

Beyond the reef slope of the fringing reefs, the deeper water of the Papuan coastal lagoon has average depths of 20-30 m. The lagoon system is largely a featureless basin of fine sediments that supports benthic infauna (Mungkaje 2012).

6.3.3 Barrier Reef

The Papuan Barrier Reef structure is similar to the fringing reef structure, the only difference being that the barrier reef occurs offshore and is separated from the coastline by a deep lagoon (Mungkaje 2012). The Papuan Barrier Reef off Port Moresby is illustrated in Figure 6-1. The barrier reef supports diverse coral communities and a variety of fish species.



Figure 6-1: Barrier Reef System off Port Moresby

6.3.4 Marine Fauna

The southern Papua New Guinea coast hosts a diverse range of marine fauna. Marine mammals are common around the coast of Port Moresby and include killer whales, sperm whales, spinner dolphins, bottle-nosed dolphins and dugongs (Mungkaje 2012). Turtles are the most common marine fauna found near Port Moresby. There are three known species of turtle known to occur within the vicinity of the proposed cable route; Hawksbill turtle, Green turtle and the Loggerhead turtle (Mungkaje 2012). Tuna, Mackerels, Barracudas and the Rainbow runner are regularly found pelagic fish species caught by subsistence fisheries and artisanal fisheries (Mungkaje 2012).

6.3.5 Kila Police Barracks

A narrow sandy beach is evident adjacent to the proposed landing location (Figure 6-3), with the fringing reef directly off the beach typical of local fringing coral communities with an intertidal reef flat transitioning to a reef slope with a higher density of live corals and a reef slope descending to the seabed within the lagoon system. It is likely that the coral communities immediately adjacent to the proposed landing location are not dense and dominated by Faviid species. In areas where the cable is likely to traverse fringing reef communities, a pre-installation survey will be undertaken in order to determine an appropriate alignment for the cable on the reef(s), avoiding coral or other sensitive benthic habitats. It is noted that a small proportion of the intertidal reef flat, immediately adjacent (north) to the proposed landing location has been subject to some minor reclamation, with a small wharf facility evident (Figure 6-3). Little natural vegetation is observed within the area, with mature trees (likely planted) located within the Barracks complex and little coastal vegetation present.



Figure 6-2. Port Moresby (Kila Barracks) Landing location and nearshore cable alignment



Figure 6-3. Close up of the proposed landing location at Kila Police Barracks.

6.4 Social Environment

Kila Police Barracks is located between Gabutu and Vabukori, approximately 4 km from the center of Port Moresby. The closest residential area to the proposed landing location is Gabutu, located north west of the proposed cable landing point. Historically the barracks were part of the Kila Kila Airfield, which was used by the Royal Australian Airforce until 1944. Given the historic and more recent use of the location (barracks for the Royal Papua Guinea Constabulary) this area, including the adjacent beach, is not as urbanised as other suburbs of Port Moresby though remains highly disturbed. The design and siting of the proposed land infrastructure within the Kila Police Barracks Site will be to avoid any historic airfield fabric and is not expected to affect any historic values associated with the airfield given the existing disturbance associated with the Police Barracks and the small scale of the proposed infrastructure. Any necessary Papua New Guinea approvals and permits associated with the protection of historic sites or heritage values will be obtained.

7. Stakeholder Consultation

Specific stakeholder consultation in relation to the environmental and social aspects of the proposal have not yet been undertaken at this point. However, initial discussions have been held with the Department of Environment and Energy, The Great Barrier Reef Marine Park Authority, Australian Institute of Marine Science, Sunshine Coast Council, Townsville City Council, the Department of Defence, the Australian Communications and Media Authority and the Queensland State Referral Agency with regards to the likely regulatory approvals pathway for the project. Further stakeholder consultation with State and Commonwealth agencies and regulatory authorities, as well as Traditional Owners, will be undertaken during the cable design process, once a final route option is determined.

8. Impact Assessment

The following section assesses potential impacts from planned and unplanned activities of the Proposal in relation to receptors within Australia, Papua New Guinea, Solomon Islands and International Waters. The approach to this impact assessment is described in Section 3.

In order to determine if the impacts are likely to have 'significant impacts' on sensitive receptors (as per Section 160(2) (a)) the definition for 'significant impact' has been adopted from DoEE *Matters of National Environmental Significance Significant Impacts Guidelines 1.1* (DoEE, 2013).

"A 'significant impact' is an impact which is important, notable, or of consequence having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts"

As stated in Section 3, the activities that are assessed in the impact assessment for the Proposal are:

- Planned beach disturbance
- Planned seabed disturbance
- Planned noise emissions
- Planned discharges from vessels and drilling activities
- Displacement of users from planned activities
- Unplanned beach disturbance
- Unplanned seabed disturbance
- Unplanned discharges to the environment
- Displacement of users from unplanned activities.

8.1 Australia and Surrounding Waters

Table 8-1. Impact Assessment: Australia and Surrounding Waters

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
Planned seabed disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area¹ Marine fauna and flora Commercial and recreational users Benthic habitat (other than GBRMP) Key ecological features Traditional Owner groups 	<ul style="list-style-type: none"> Localised habitat disturbance within the GBRMP (see Table 4-3, Figure 4-2 and Figure 4-3 for a description of the specific zones traversed by the cable within the GBRMP) Physiological and/or behavioural impacts to fauna The burial of the cable in nearshore waters (in water depths of up to 1000 m) will temporarily disturb the sub-tidal habitat. This disruption is expected to be minimal in extent (in the order of a few metres width) and temporary in nature. Existing information and the results of the geophysical survey will be used to avoid ecological features including canyons, rocky reefs and seamounts as far as practically possible. Impacts to threatened marine fauna due to habitat disturbance as a result of cable lay activities. Temporary disturbance of sub-tidal benthic habitat due to the burial of the cable in near shore waters. Impacts on amenity and resources use by Traditional Owner groups within the Great Barrier Reef. 	<ul style="list-style-type: none"> The route within the GBRMP has been specifically designed to avoid areas of high conservation value and topographical complexity, so as to avoid sensitive benthic habitats. Similarly, the route has been designed to avoid any canyons within the Canyons on the Eastern Continental Slope KEF and the seamounts associated with Tasmantid seamount chain KEF. The route selection processes has included a 10 km (max width) development corridor. The final route should be within this corridor and take into account habitat identified by the geophysical survey. The geophysical survey will be of sufficient details to identify features such as rocky reefs, canyons, seamounts and other features which are likely to form habitat. No cable lay activities will occur within close proximity such as to cause disturbance to the rocky reefs offshore of Narrabeen Beach to protect important habitat for Juvenile Black Cod and the Grey Nurse Shark (including BIAs for Grey Nurse Shark). The geophysical survey data will be used to finalise the route and construction method and distance between cable lay activities and the rocky reefs will be kept as large as possible. Seamounts and canyons along the cable route will be avoided for engineering reasons and to avoid impact on potential fauna habitat. Minimal disturbance area (cable is a matter of inches wide) meaning the impact area is negligible The nature of the construction requirements is such that the cable is most efficiently installed on flat, sandy seabed. Cable installation will be short in duration, with efforts made to avoid installation during important behavioural periods for key species. The route within the GBRMP has been specifically designed to avoid existing Traditional Use Marine Resources Agreements (TUMRA) with Traditional Owner Groups. The closest TUMRA is the Giringun Agreement. This applies to sea country between Rollingstone and Mission Beach. The proposed cable route adjacent to Trunk Reef, lies approximately 3-5kms from the boundary of this agreement (Appendix E). 	<ul style="list-style-type: none"> Impacts to sensitive receptors including MNES, are expected to be minor in nature and in short duration, with no impacts anticipated at a population level. As such the predicted impact associated with this activity is not considered to be significant With specific reference to benthic habitats within the Great Barrier Reef Marine Park, it is not anticipated that there will be any significant impacts on benthic habitats, primarily due to the design of the proposed alignment, specifically avoiding areas of environmental sensitivity. While it is noted that some areas of seagrass may be impacted within the nearshore environment off Townsville, this impact is anticipated to be minor in scale and duration, particularly within the context of the available habitat and natural processes evident within the area (i.e. variable natural turbidity).
Planned beach disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Recreation beach users Recreational fisheries Tourism Terrestrial flora and fauna Traditional Owner groups 	<ul style="list-style-type: none"> Recreational users of the beach and fishing areas may temporarily not be able to use the area where the cable is being laid. Potential impacts to terrestrial flora and fauna Tourism users may temporarily not be able to use the area where the cable is being laid. Impacts on amenity and resources use by Traditional Owner groups within the Great Barrier Reef. 	<ul style="list-style-type: none"> Beach disruption will be limited to a small area, safety signposts will be in place and construction periods will be short in duration, with efforts made to avoid construction during important behavioural periods for key species. Options for shore crossing to be undertaken via HDD to minimise the disturbance to the beach, users and marine fauna (i.e. nesting turtles). The location of the HDD 'punch-out' point will be determined following consideration of the nearshores survey data. A location will be selected that avoid sensitive marine habitats. HDD or nearshore cable installation activities will occur over 2-3 days during daylight hours only, minimising any potential impacts on nesting turtles (e.g. flatback and green turtles at Cape Cleveland). Construction of the Cable Landing Station, is likely to take between 2-3 months; however, this infrastructure is located away from the 	<ul style="list-style-type: none"> Impacts will be minor in nature and short in duration. All terrestrial based activities (including drilling and the development of the landing station and beach manhole) will be undertaken on existing cleared sites that are highly unlikely to contain any sensitive environmental receptors and will be short in duration, as such no impact to terrestrial environmental or social receptors is expected to occur.

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
			<p>beach, in land of the BMH and therefore unlikely to have any impacts on nesting turtles.</p> <ul style="list-style-type: none"> Dust will be managed during construction and noise and vibration impacts will be short in duration (HDD and beach man hole construction likely to take approximately 1 week). Recreational fishing associations will be advised in advance of works. All terrestrial based activities (including the HDD and the development of the landing station and beach manhole) will be undertaken on existing cleared or developed sites that are highly unlikely to contain any threatened species or ecological habitats. Expert site surveys for archaeological and environmental protection purposes will be completed during design processes. Consultation with traditional owners on native title and cultural heritage matters as required. The location on the onshore infrastructure has been specifically sited to avoid existing Traditional Use Marine Resources Agreements (TUMRA) with Traditional Owner Groups. 	
<p>Planned noise emissions as a result of geophysical survey, cable lay and burial</p>	<ul style="list-style-type: none"> Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area¹ Marine fauna Residential communities in close proximity to the planned construction 	<ul style="list-style-type: none"> Behavioural responses from terrestrial fauna to planned noise emissions from construction activities. Temporary noise disturbance to residential communities in close proximity to the beach crossing. The geophysical survey (vessel and towed equipment) will produce underwater noise that could potentially lead to behavioural changes of marine fauna transiting the survey area, including masking of sounds vital for cetacean navigation, identification of prey and predator locations etc. 	<ul style="list-style-type: none"> Noise impacts from construction activities will be minor and short in nature. Geophysical and other additional survey equipment (e.g. magnetometer) uses low output power survey equipment (see Appendix B and Appendix C) and is short in duration. The proponent will Implement Part A of the Standard Management Procedures of the EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales (September 2008), to minimise impacts to whales including: <ul style="list-style-type: none"> A 300 shutdown and low power zone, during all Pinger and Boomer Profiler Operations Where required by the policy, Part B of the Standard Management Procedures of the EPBC Act Policy Statement 2.1 Interaction between offshore seismic exploration and whales will be implemented. In addition, the following additional measures will be put in place to manage interactions between vessels and whales from 1 May to 30 November: <ul style="list-style-type: none"> One dedicated Marine Fauna Observer must be on board the inshore survey vessel The inshore survey vessel will only be surveying during daylight hours 2 dedicated marine fauna observers must be on board the offshore survey vessel. Survey vessel in a cautionary zone will operate at a constant speed of less than 6 knots and minimise noise Survey vessels will not approach closer than 50 m for a dolphin and/or 100 m for a whale (with the exception animals bow riding). <p>Exception: It should be noted that in certain circumstances (emergency only) the above requirements do not apply to survey vessels operating under limited/constrained manoeuvrability..</p>	<p>It is considered very unlikely that the geophysical survey will significantly impact marine fauna as:</p> <ul style="list-style-type: none"> The low output power of the survey equipment - the type of survey being utilised for the proposal is a low powered geophysical survey that does not include airguns and is expected to generate noise levels between 110-130 dB, decreasing rapidly with distance from the source. For details on proposed survey equipment, radiated power vs source level for geophysical and seismic surveys, see Appendix B and Appendix C. The short duration of the survey activities The linear nature of the survey activities (i.e. The survey will be undertaken over a very long distance meaning impacts to specific areas will be short and temporary. <p>This risk will be further reduced by the application of proposed mitigation measures.</p>

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
Planned emissions and discharges from vessels and drilling activities	<ul style="list-style-type: none"> Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area¹ Marine flora and fauna Benthic habitats (other than GBRMP) Commercial and recreational fisheries 	<ul style="list-style-type: none"> Physical and/ or behavioural impacts to fauna from the planned vessel discharges Temporary impacts to water quality resulting from planned vessel discharges Temporary disturbance to marine habitats due to changes in water quality Light spill will occur from the beach crossing activities; however, this is expected to be minimal and consistent with the existing light spill associated with the urban/developed areas there are located in. Light emissions will also occur as a result of the survey and cable lay vessels. These emissions which will be similar to that of standard marine construction vessels are unavoidable due to safety and navigational requirements. A small volume (estimated at approximately 20-30 m³) of drilling fluids are expected to be released near-shore, at the HDD exit point (if this option is adopted). Drill cuttings generated at each HDD site will be between 5-10 m³. Marine fauna including turtles and shorebirds, transiting through the area, may temporarily alter their normal behaviour while attracted to the light emissions from the vessel. The impact of this attraction to artificial light sources can increase their vulnerability to predation (DSEWPaC, 2012b) and on seabirds in particular, can cause interruption of their migration path potentially leading to incomplete migration. Introduced Marine Species (IMS) could potentially be introduced via vessel movements, ballast water discharge and bio fouling activities and have the potential to prey on and/or compete with native marine species. 	<ul style="list-style-type: none"> Vessels have appropriate waste management procedures and emergency fuel/oil spill plans in accordance with the MARPOL Convention. Any excess discharges will be taken onshore and disposed of in accordance with relevant regulations The use of Bentonite (or equivalent) as the drilling fluid for the HDD beach crossing, which has a low toxicity, is biodegradable and highly dispersive Addition of water to the drill head as the drill head reaches the exit points to reduce the concentration of drilling fluid lost to the water column Lighting will be maintained at levels that allow safe operation of equipment with no additional lighting required. The short duration of the HDD, geophysical survey and cable lay activities; and the limited extent of light spill, make it highly unlikely than any significant impacts will be caused to marine fauna as a result of light spill. The Proponent will comply with State and Commonwealth and international biosecurity requirements to prevent IMS. If required, a vessel risk assessment (IMS) will be undertaken prior to mobilisation and submitted to the appropriate authorities. These drill cuttings will be taken onshore and disposed of in accordance with relevant regulations. 	<ul style="list-style-type: none"> Impacts to sensitive receptors including MNES, are expected to be minor in nature and in short duration, with no impacts anticipated at a population level. As such the predicted impact associated with this activity is not considered to be significant Given the relatively low volume of drill fluid to be released, its biodegradability, dispersive nature and low toxicity, there is not expected to be any resultant impact on sensitive receptors. The concentration of drilling fluid released will be minimised by the addition of water as the drill head approaches the exit point (thus diluting the drill fluid). The main component of this drilling fluid is Bentonite which has a low toxicity, is biodegradable and is highly dispersive within the marine environment.
Unplanned seabed disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area¹ Marine fauna and flora Commercial and recreational fisheries Benthic habitat (other than GBRMP) Key ecological features Traditional Owner groups 	<ul style="list-style-type: none"> Localised habitat disturbance at the GBRMP Physiological and/or behavioural impacts to fauna Minor, short term and localised elevated turbidity levels Impacts to threatened marine fauna due to habitat disturbance Temporary disturbance of sub-tidal benthic habitat Impacts on amenity and resources use by Traditional Owner groups within the Great Barrier Reef. 	<ul style="list-style-type: none"> Construction management plans will be implemented by the Contractor. These management plans will include specific procedures and processes designed to mitigate for potential impacts on the seabed. Contractors will manage incident management system and incidents will be reported to DoEE as applicable. The route within the GBRMP has been specifically designed to avoid existing Traditional Use Marine Resources Agreements (TUMRA) with Traditional Owner Groups. The closest TUMRA is the Giringun Agreement. This applies to sea country between Rollingstone and Mission Beach. The proposed cable route adjacent to Trunk Reef, lies approximately 3-5kms from the boundary of this agreement (Appendix E). 	Unlikely to occur and not likely to result in a significant impact due to the nature and scale of the proposed construction activities.
Unplanned fauna interactions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Marine fauna 	<ul style="list-style-type: none"> Fauna injury or mortality from direct interaction with construction vessels, towed survey equipment and/or the cable during installation. 	<ul style="list-style-type: none"> Fauna protection distances and other relevant controls from the <i>EPBC Regulations</i> 2000 (Part 8) will be met at all times. Fauna interaction incidents will be reported to DoEE as applicable. 	Not likely to result in any impact due to the controls and management measures in place.

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
			<ul style="list-style-type: none"> Fauna interaction incidents within the GBRMP will also be reported to GBRMP Authority as applicable. 	
Unplanned beach disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Recreation beach users Commercial and recreational fisheries Tourism Terrestrial flora and fauna Traditional Owner groups 	<ul style="list-style-type: none"> Recreational users of the beach and fishing areas may not be able to use certain areas during construction Tourism activities may not be able to use certain areas during construction Impacts on amenity and resources use by Traditional Owner groups within the Great Barrier Reef. 	<ul style="list-style-type: none"> Construction management plans will be implemented by the Contractor Contractors will manage incident management system and incidents will be reported to DoEE as applicable. The location on the onshore infrastructure has been specifically sited to avoid existing Traditional Use Marine Resources Agreements (TUMRA) with Traditional Owner Groups. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned discharges to the environment from vessels	<ul style="list-style-type: none"> Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area¹ Marine flora and fauna Benthic habitats (other than GBRMP) Commercial and recreational fisheries 	<ul style="list-style-type: none"> Waste, hydrocarbon and / or other chemicals accidentally discharged have the potential to be toxic or dangerous to marine fauna that may be present in the area. Spills on terrestrial areas may result in localised, short term impacts. Waste generated during construction activities 	<ul style="list-style-type: none"> The likelihood of an accidental waste, hydrocarbon or chemical discharge from the cable lay vessel is expected to be low, due to the management procedures that will be implemented and the short duration of the cable lay activities. As such, it is considered unlikely that any significant impacts will occur. Construction management plans will be implemented by the Contractor Waste will be contained on site and disposed of in appropriate waste management facilities when required. Contractors will manage incident management system and incidents will be reported to DoEE as applicable. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned vessel interactions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Commercial and recreational vessels 	<ul style="list-style-type: none"> Construction of Route 1 is located within a designated shipping lane. Geophysical surveys will be located within a designated shipping lane. Injury may occur to marine fauna as a result of interaction with either the vessel (vessel strike) or entanglement with the cable during cable lay. Juvenile Black Cod and the Grey Nurse Shark may both use rocky reefs such as those found offshore from Narrabeen Beach. Cable lay activities have the potential to indirectly impact these threatened species if the activities results in damage to the rocky reefs. Mitigation measures proposed for this Proposal, including maximising the distance cable lay activities will occur from of the rocky reefs, will significantly reduce the likelihood of such impacts occurring. Impacts to privacy and safety of users in the Australian Marine Parks. 	<ul style="list-style-type: none"> Much of the proposed cable route within the GBRMP is within an existing shipping lane, though the duration of time traversing the shipping lane is very short (hours). Vessels will have all appropriate navigation equipment. Australian Marine Safety Authority will be consulted as required and notice to mariners issued if appropriate. Given the short duration of the survey and cable lay activities; and the low speed at which the vessels will be travelling (6-7 knots), it is considered highly unlikely that any significant impacts will occur to marine fauna as a result of vessel strike. 	Not likely to result in any impact due to the controls and management measures in place.
Decommissioning – cable left <i>in situ</i>	<ul style="list-style-type: none"> Great Barrier Reef Marine Park and Great Barrier Reef World Heritage Area¹ Marine fauna and flora 	<ul style="list-style-type: none"> Potential corrosion and deterioration of the external cable materials, leading to localised contamination of nearby sediments. Unburial or detachment of the cable 	<ul style="list-style-type: none"> Cable materials have a significantly higher life span than the proposed 25-year life of the cable and are made of inert plastics (polyethylene) and corrosion resistant galvanised steel. Bituminous based material blended with synthetic polymers are used as a flooding compound within the cable. Corrosion and degradation of the cable will occur over decadal timeframes, potentially introducing small amounts of anthropogenic material into seabed sediment along the cable. Such materials are of very low toxicity, with a small potential footprint in the context of the receiving environment. Within waters shallower than 1000m the cable is proposed to be buried up to 1m below the surface. The inherent weight of the cable 	Not likely to result in any impact due to the size, location and inherent nature of the cable and its materials.

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
			should ensure that it cannot 'detach' from the seabed unless, physically removed or snagged.	

1. See Table 8-2 for full assessment against the Great Barrier Reef World Heritage Area Outstanding Universal Values.

Table 8-2. Great Barrier Reef World Heritage Area Outstanding Values Impact Assessment ¹

Outstanding Universal Value	Applicable Attributes/Sensitive Receptors	Potential Impacts	Significance of Impact
<p>Criterion (vii): Contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance</p>	<ul style="list-style-type: none"> • String of reef • Coral assemblages of hard and soft corals • Thousands of species of reef fish • Coral spawning • Migrating whales • Significant spawning aggregations of many fish species • Breeding colonies of marine turtles. • Spectacular white sandy beaches • Vast mangrove forests • Breeding colonies of seabirds • Green turtle breeding • Nesting turtles 	<ul style="list-style-type: none"> • Planned and unplanned seabed disturbance as a result of cable lay and burial • Planned and unplanned beach disturbance as a result of cable lay and burial • Planned noise emissions as a result of geophysical survey, cable lay and burial • Planned and unplanned emissions and discharges from vessels and HDD activities • Unplanned fauna interactions as a result of geophysical survey, cable lay and burial • Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. 	<p>The proposed activities will not significantly impact areas of exceptional and natural beauty and aesthetic importance.</p> <p>The cable footprint will be small and unobtrusive in the marine environment, there will be no severance between coral or reef areas as a result of the proposed infrastructure.</p> <p>During installation controls will be in place to ensure activities avoid fauna interactions. Breeding colonies of seabirds, turtle nesting beaches and mangrove forests will also be avoided. Impacts during installation will be limited to a small footprint. The exact location of the cable will be based on geophysical surveys that will avoid uneven seabed features where possible. Processes will also be in place for managing the risk of unplanned activities occurring and for minimising emissions.</p> <p>On land, the proposed installation will use HDD to minimise impacts to the beach and operations will not have ongoing impacts to the beach.</p>
<p>Criterion (viii): Be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features</p>	<ul style="list-style-type: none"> • Coral cays • New phases of coral growth • Old massive corals • Inshore fringing reefs, mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development • Continental shelf • Flat-topped hills of eroded limestone • Deep oceanic waters • Abyssal plains • Continental islands 	<ul style="list-style-type: none"> • Planned and unplanned seabed disturbance as a result of cable lay and burial • Planned and unplanned beach disturbance as a result of cable lay and burial • Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. • 	<p>The proposed activities will not significantly impact examples of major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.</p> <p>The cable footprint will be small and will not cause major disturbance to areas of coral. Due to the nature of the installation requirements the cable will avoid uneven seabed where possible and therefore features such as cays will be avoided. The cable will pass over the continental shelf, abyssal plains and through deep oceanic waters however the size of the cable will mean that there is no significant change to the characteristics of these features.</p>
<p>Criterion (ix): Be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.</p>	<ul style="list-style-type: none"> • Significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental process. • Cross-shelf, longshore and vertical connectivity. • Coral reefs, sand banks and coral cays. • Beds of Halimeda algae • Evolution of hard corals • 4000 species of molluscs, over 1500 species of fish, plus great diversity of sponges, anemones, marine worms, crustaceans and many others. • Other marine fauna including microfauna. 	<ul style="list-style-type: none"> • Planned and unplanned seabed disturbance as a result of cable lay and burial • Planned and unplanned beach disturbance as a result of cable lay and burial • Planned noise emissions as a result of geophysical survey, cable lay and burial • Planned and unplanned emissions and discharges from vessels and HDD activities • Unplanned fauna interactions as a result of geophysical survey, cable lay and burial • Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. 	<p>The proposed activities will not significantly impact significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals.</p> <p>The cable footprint will be small and unobtrusive in the marine environment, there will be no severance between marine habitats and disturbance to benthic habitat will be minimised.</p> <p>During installation controls will be in place to ensure activities avoid fauna interactions. Impacts during installation will be limited to a small footprint. The exact location of the cable will be based on geophysical surveys that will avoid uneven seabed features where possible. Processes will also be in place for managing the risk of unplanned activities occurring and for minimising emissions.</p> <p>On land, the proposed installation will use HDD to minimise impacts to the beach ecosystems and operations will not have ongoing impacts to the beach.</p>

¹ Avoidance, Mitigation and Management Measures are outlined within Table 8-1.

Outstanding Universal Value	Applicable Attributes/Sensitive Receptors	Potential Impacts	Significance of Impact
<p>Criterion (x): Contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of Outstanding Universal Value from the point of view of science or conservation</p>	<ul style="list-style-type: none"> Diversity supports marine and terrestrial species Coral reefs Coral cays Diversity of mangroves Marine species Dugong Species of whale calving Marine turtles 	<ul style="list-style-type: none"> Planned and unplanned seabed disturbance as a result of cable lay and burial Planned and unplanned beach disturbance as a result of cable lay and burial Planned noise emissions as a result of geophysical survey, cable lay and burial Planned and unplanned emissions and discharges from vessels and HDD activities Unplanned fauna interactions as a result of geophysical survey, cable lay and burial Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. 	<p>The proposed activities will not cause significant impact to natural habitats for <i>in-situ</i> conservation of biological diversity.</p> <p>The cable footprint will be small and unobtrusive in the marine environment, there will be no severance between coral or reef areas as a result of the proposed infrastructure.</p> <p>During installation controls will be in place to ensure activities avoid fauna interactions. Breeding colonise of seabirds, turtle nesting beaches and mangrove forests will also be avoided. Impacts during installation will be limited to a small footprint. The exact location of the cable will be based on geophysical surveys that will avoid uneven seabed features where possible. Processes will also be in place for managing the risk of unplanned activities occurring and for minimising emissions.</p> <p>On land, the proposed installation will use HDD to minimise impacts to the beach and operations will not have ongoing impacts to the beach.</p>
<p>Integrity: Wholeness, intactness and threats</p>	<ul style="list-style-type: none"> Unparalleled size Scale of the Great Barrier Reef ecosystem Integrity of the coral reef ecosystems in all their diversity Property is largely intact and includes the fullest possible representation of marine ecological, physical and chemical processes from the coast to deep abyssal waters, enabling key interdependent attributes to exist in their natural relationships. Key ecological, physical and chemical processes essential for long-term conservation of marine and island ecosystems and their associated biodiversity occur outside property's boundaries. Good state of conservation across the property. 	<p>All activities</p>	<p>The scale and nature of the proposed activities will not have significant impact on the wholeness, intactness or threats to the Great Barrier Reef National Heritage Place.</p> <p>The proposed infrastructure has a small footprint and no ongoing operational impacts.</p> <p>The installation of the cable will have small scale, short term impacts to Great Barrier National Heritage Place. Controls will be in place to ensure the impacts remain small and short term.</p>

Table 8-3. Australia Marine Parks Values Impact Assessment (Director of National Parks, 2017a and 2017b)

Marine Park Values as outlined in Management Plans	Activity	Significance of Impact
Coral Sea Marine Park		
<p>Natural values:</p> <ul style="list-style-type: none"> Representative ecosystems Protected Species / BIAs 	<ul style="list-style-type: none"> Planned and unplanned seabed disturbance as a result of cable lay and burial Planned and unplanned beach disturbance as a result of cable lay and burial Planned noise emissions as a result of geophysical survey, cable lay and burial Planned and unplanned emissions and discharges from vessels and HDD activities Unplanned fauna interactions as a result of geophysical survey, cable lay and burial Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. 	<p>Given the nature and scale of the proposed activities, there will be negligible, highly localised impacts to representative ecosystems and species, including protected species, within the Coral Sea Marine Park. Impacts to marine fauna may occur only during construction and potential maintenance activities, and therefore, are highly unlikely given the short duration of these activities.</p> <p>The cable footprint will be small and unobtrusive in the marine environment, there will be no severance between coral or reef areas as a result of the proposed infrastructure. During installation controls will be in place to ensure activities avoid fauna interactions. Breeding colonise of seabirds, turtle nesting beaches and mangrove forests will also be avoided. Impacts during installation will be limited to a small footprint. The exact location of the cable will be based on geophysical surveys that will avoid uneven seabed features where possible. Processes will also be in place for managing the risk of unplanned activities occurring and for minimising emissions.</p> <p>On land, the proposed installation will use HDD to minimise impacts to the beach and operations will not have ongoing impacts to the beach.</p>

Marine Park Values as outlined in Management Plans	Activity	Significance of Impact
Social and economic values (tourism, commercial fishing, and recreation)	<ul style="list-style-type: none"> Planned noise emissions as a result of geophysical survey, cable lay and burial Planned and unplanned emissions and discharges from vessels and HDD activities Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. 	<p>Given the nature and scale of the proposed activities, there will be negligible, highly localised impacts to tourism, commercial fishing, and recreation within the Coral Sea Marine Park.</p> <p>Within waters shallower than 1000m the cable is proposed to be buried up to 1m below the surface and will be laid within an existing ACMA Cable Protection Zone. The inherent weight of the cable should ensure that it cannot 'detach' from the seabed unless, physically removed or snagged.</p> <p>Much of the proposed cable route within the GBRMP is within an existing shipping lane, though the duration of time traversing the shipping lane is very short (hours). Vessels conducting maintenance or construction activities will have all appropriate navigation equipment. Australian Marine Safety Authority will be consulted as required and notice to mariners issued if appropriate.</p> <p>The route within the GBRMP has been specifically designed to avoid existing Traditional Use Marine Resources Agreements (TUMRA) with Traditional Owner Groups. The closest TUMRA is the Girringun Agreement. This applies to sea country between Rollingstone and Mission Beach. The proposed cable route adjacent to Trunk Reef, lies approximately 3-5kms from the boundary of this agreement (Appendix E).</p>
Central Eastern Marine Park (Temperate East Marine Parks Network)		
<p>Natural values:</p> <ul style="list-style-type: none"> Representative ecosystems Tasman Front and eddy field KEF Protected Species / BIAs 	<ul style="list-style-type: none"> Planned and unplanned seabed disturbance as a result of cable lay and burial Planned and unplanned beach disturbance as a result of cable lay and burial Planned noise emissions as a result of geophysical survey, cable lay and burial Planned and unplanned emissions and discharges from vessels and HDD activities Unplanned fauna interactions as a result of geophysical survey, cable lay and burial Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. 	<p>Given the nature and scale of the proposed activities, there will be negligible, highly localised impacts to representative ecosystems, the Tasman Front and eddy field KEF and species, including protected species, within the Central Eastern Marine Park. Impacts to marine fauna may occur only during construction and potential maintenance activities, and therefore, are highly unlikely given the short duration of these activities.</p> <p>The cable footprint will be small and unobtrusive in the marine environment, there will be no severance between coral or reef areas as a result of the proposed infrastructure. During installation controls will be in place to ensure activities avoid fauna interactions. Breeding colonise of seabirds, turtle nesting beaches and mangrove forests will also be avoided. Impacts during installation will be limited to a small footprint. The exact location of the cable will be based on geophysical surveys that will avoid uneven seabed features where possible. Processes will also be in place for managing the risk of unplanned activities occurring and for minimising emissions.</p> <p>On land, the proposed installation will use HDD to minimise impacts to the beach and operations will not have ongoing impacts to the beach.</p>
Social and economic values (tourism, commercial fishing, and recreation)	<ul style="list-style-type: none"> Planned noise emissions as a result of geophysical survey, cable lay and burial Planned and unplanned emissions and discharges from vessels and HDD activities Unplanned vessel interactions as a result of geophysical survey, cable lay and burial. 	<p>Given the nature and scale of the proposed activities, there will be negligible, highly localised impacts to tourism, commercial fishing, and recreation within the Central Eastern Marine Park.</p> <p>Within waters shallower than 1000m the cable is proposed to be buried up to 1m below the surface and will be laid within an existing ACMA Cable Protection Zone. The inherent weight of the cable should ensure that it cannot 'detach' from the seabed unless, physically removed or snagged.</p> <p>Much of the proposed cable route within the GBRMP is within an existing shipping lane, though the duration of time traversing the shipping lane is very short (hours). Vessels conducting maintenance or construction activities will have all appropriate navigation equipment. Australian Marine Safety Authority will be consulted as required and notice to mariners issued if appropriate.</p> <p>The route within the GBRMP has been specifically designed to avoid existing Traditional Use Marine Resources Agreements (TUMRA) with Traditional Owner Groups. The closest TUMRA is the Girringun Agreement. This applies to sea country between Rollingstone and Mission Beach. The proposed cable route adjacent to Trunk Reef, lies approximately 3-5kms from the boundary of this agreement (Appendix E).</p>

8.2 Solomon Islands

Table 8-4: Impacts Assessment: Solomon Islands

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
Planned seabed disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Marine fauna and flora Commercial and recreational users Benthic habitat 	<ul style="list-style-type: none"> Physiological and/or behavioural impacts to fauna The burial of the cable in nearshore waters (in water depths of up to 1000 m) will temporarily disturb the sub-tidal habitat. This disruption is expected to be minimal in extent (in the order of a few metres width) and temporary in nature. Existing information and the results of the geophysical survey will be used to avoid ecological features including canyons, rocky reefs and seamounts as far as practically possible. Impacts to threatened marine fauna due to habitat disturbance as a result of cable lay activities. Temporary disturbance of sub-tidal benthic habitat due to the burial of the cable in near shore waters. 	<ul style="list-style-type: none"> The route selection processes have included a 10 km (max width) development corridor. The final route should be within this corridor and take into account habitat identified by the geophysical survey. The geophysical survey will be of sufficient detail to identify features such as rocky reefs, canyons, seamounts and other features which are likely to form habitat. There will be minimal disturbance area as the cable is only a matter of inches wide. The nature of the construction requirements is such that the cable is most efficiently installed on flat, sandy seabed and therefore important seabed features and sensitive benthic habitats will be largely avoided. Post survey there will be consultation with relevant authorities in respect of preferred route and construction methodologies to ensure impacts are minimised. Cable installation will be short in duration. 	<ul style="list-style-type: none"> Impacts to sensitive receptors including marine fauna and benthic habitats, are expected to be minor in nature and in short duration, with no impacts anticipated at a population level. As such the predicted impact associated with this activity is not considered to be significant
Planned beach disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Recreation beach users Recreational fisheries Tourism Terrestrial flora and fauna 	<ul style="list-style-type: none"> Recreational users of the beach and fishing areas may temporarily not be able to use the area where the cable is being laid. Potential impacts to terrestrial flora and fauna Tourism users may temporarily not be able to use the area where the cable is being laid. 	<ul style="list-style-type: none"> Beach disruption will be limited to a small area, safety signposts will be in place and construction periods will be short in duration. Options for shore crossing to be undertaken via HDD to minimise the disturbance to the beach and users. Dust will be managed during construction and noise and vibration impacts will be short in duration. Recreational and artisan fishing groups will be advised in advance of works. All terrestrial based activities (including the HDD and the development of the landing station and beach manhole) will be undertaken on existing cleared or developed sites that are highly unlikely to contain any threatened species or ecological habitats. Site surveys for archaeological and environmental purposes will be completed during final design processes. 	<ul style="list-style-type: none"> Impacts will be minor in nature and short in duration. All terrestrial based activities (including drilling and the development of the landing station and beach manhole) will be undertaken on existing cleared sites that are highly unlikely to contain any sensitive environmental receptors and will be short in duration, as such no impact to terrestrial environmental or social receptors is expected to occur.
Planned noise emissions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Marine fauna Residential communities in close proximity to the planned construction 	<ul style="list-style-type: none"> Behavioural responses from terrestrial fauna to planned noise emissions from construction activities. Temporary noise disturbance to residential communities in close proximity to the beach crossing. The geophysical survey will produce underwater noise that could potentially lead to behavioural changes of marine fauna transiting the survey area, including masking of sounds vital for cetacean navigation, identification of prey and predator locations etc. 	<ul style="list-style-type: none"> Noise impacts from construction activities will be minor and short in nature. Geophysical equipment uses low output power survey equipment (see Appendix B and Appendix C) and is short in duration. In addition, the following additional measures will be put in place to manage interactions between vessels and whales: <ul style="list-style-type: none"> One dedicated Marine Fauna Observer must be on board the inshore survey vessel The inshore survey vessel will only be surveying during daylight hours 2 dedicated marine fauna observers must be on board the offshore survey vessel. 	<p>It is considered very unlikely that the geophysical survey will significantly impact marine fauna as:</p> <ul style="list-style-type: none"> The low output power of the survey equipment - the type of survey being utilised for the proposal is a low powered geophysical survey that does not include airguns and is expected to generate noise levels between 110-130 dB, decreasing rapidly with distance from the source. For details on proposed survey equipment, radiated power vs source level for geophysical and seismic surveys, see Appendix B and Appendix C. The short duration of the survey activities The linear nature of the survey activities (i.e. The survey will be undertaken over a very long distance meaning impacts to specific areas will be short and temporary.

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
			<ul style="list-style-type: none"> - Survey vessels will not travel at greater than 6 knots within 300 m of a cetacean (caution zone) and minimise noise - Survey vessels will not approach closer than 50 m for a dolphin and/or 100 m for a whale (with the exception animals bow riding). <p>Exception: Points 3 and 4 above requirement do not apply to survey vessels operating under limited/constrained manoeuvrability including but not limited to vessels towing equipment and actively acquiring data, or in the event of an emergency.</p>	<p>This risk will be further reduced by the application of proposed mitigation measures.</p>
<p>Planned emissions and discharges from vessels and drilling activities</p>	<ul style="list-style-type: none"> • Marine flora and fauna • Benthic habitats • Commercial and recreational fisheries 	<ul style="list-style-type: none"> • Physical and/ or behavioural impacts to fauna from the planned vessel discharges • Temporary impacts to water quality resulting from planned vessel discharges • Temporary disturbance to marine habitats due to changes in water quality • Light spill will occur from the beach crossing activities; however, this is expected to be minimal and consistent with the existing light spill associated with the urban/developed areas there are located in. • Light emissions will also occur as a result of the survey and cable lay vessels. These emissions which will be similar to that of standard marine construction vessels are unavoidable due to safety and navigational requirements. • A small volume (estimated at approximately 20-30 m³) of drilling fluids are expected to be released near-shore, at the HDD exit point (if this option is adopted). • Drill cuttings generated at each HDD site will be between 5-10 m³. • Marine fauna including turtles and shorebirds, transiting through the area, may temporarily alter their normal behaviour while attracted to the light emissions from the vessel. The impact of this attraction to artificial light sources can increase their vulnerability to predation (DSEWPaC, 2012b) and on seabirds in particular, can cause interruption of their migration path potentially leading to incomplete migration. • Introduced Marine Species (IMS) could potentially be introduced via vessel movements, ballast water discharge and bio fouling activities and have the potential to prey on and/or compete with native marine species. 	<ul style="list-style-type: none"> • Vessels have appropriate waste management procedures and emergency fuel/oil spill plans in accordance with the MARPOL Convention. • Any excess discharges will be taken onshore and disposed of in accordance with relevant regulations • The use of Bentonite (or equivalent) as the drilling fluid for the HDD beach crossing, which has a low toxicity, is biodegradable and highly dispersive • Addition of water to the drill head as the drill head reaches the exit points to reduce the concentration of drilling fluid lost to the water column • Lighting will be maintained at levels that allow safe operation of equipment with no additional lighting required. • The short duration of the HDD, geophysical survey and cable lay activities; and the limited extent of light spill, make it highly unlikely than any significant impacts will be caused to marine fauna as a result of light spill. • The Proponent will comply with international biosecurity requirements to prevent IMS. If required, a vessel risk assessment (IMS) will be undertaken prior to mobilisation and submitted to the appropriate authorities. • These drill cuttings will be taken onshore and disposed of in accordance with relevant regulations. 	<ul style="list-style-type: none"> • Impacts to sensitive receptors are expected to be minor in nature and in short duration, with no impacts anticipated at a population level. As such the predicted impact associated with this activity is not considered to be significant • Given the relatively low volume of drill fluid to be released, its biodegradability, dispersive nature and low toxicity, there is not expected to be any resultant impact on sensitive receptors. The concentration of drilling fluid released will be minimised by the addition of water as the drill head approaches the exit point (thus diluting the drill fluid). The main component of this drilling fluid is Bentonite which has a low toxicity, is biodegradable and is highly dispersive within the marine environment.
<p>Unplanned seabed disturbance as a result of cable lay and burial</p>	<ul style="list-style-type: none"> • Marine fauna and flora • Commercial and recreational fisheries • Benthic habitat 	<ul style="list-style-type: none"> • Physiological and/or behavioural impacts to fauna • Minor, short term and localised elevated turbidity levels • Impacts to threatened marine fauna due to habitat disturbance • Temporary disturbance of sub-tidal benthic habitat 	<ul style="list-style-type: none"> • Dropped object management procedures will be in place on the vessel • Construction management plans will be implemented by the Contractor 	<p>Unlikely to occur and not likely to result in a significant impact due to the nature and scale of the proposed construction activities.</p>

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
			<ul style="list-style-type: none"> Contractors will manage incident management system and incidents will be reported to the relevant government as applicable. 	
Unplanned fauna interactions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Marina fauna 	<ul style="list-style-type: none"> Fauna injury or mortality from direct interaction with construction vessels and/or the cable during installation. 	<ul style="list-style-type: none"> Fauna interaction incidents will be reported to the relevant government authority as applicable. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned beach disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Recreation beach users Commercial and recreational fisheries Tourism Terrestrial flora and fauna 	<ul style="list-style-type: none"> Recreational users of the beach and fishing areas may not be able to use certain areas during construction Tourism activities may not be able to use certain areas during construction 	<ul style="list-style-type: none"> Construction management plans will be implemented by the Contractor Contractors will manage incident management system and incidents will be reported to the relevant government authority as applicable. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned discharges to the environment from vessels	<ul style="list-style-type: none"> Marine flora and fauna Benthic habitats Commercial and recreational fisheries 	<ul style="list-style-type: none"> Waste, hydrocarbon and / or other chemicals accidentally discharged have the potential to be toxic to marine fauna that may be present in the area. Spills on terrestrial areas may result in localised, short term impacts. Waste generated during construction activities 	<ul style="list-style-type: none"> The likelihood of an accidental waste, hydrocarbon or chemical discharge from the cable lay vessel is expected to be low, due to the management procedures that will be implemented and the short duration of the cable lay activities. As such, it is considered unlikely that any significant impacts will occur. Construction management plans will be implemented by the Contractor Waste will be contained on site and disposed of in appropriate waste management facilities when required. Contractors will manage incident management system and incidents will be reported to the relevant government authority as applicable. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned vessel interactions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Commercial and recreational vessels 	<ul style="list-style-type: none"> Geophysical surveys will be located within a designated shipping lane. Injury may occur to marine fauna as a result of interaction with either the vessel (vessel strike) or entanglement with the cable during cable lay. 	<ul style="list-style-type: none"> Duration of time in shipping lanes is short. Vessels will have all appropriate navigation equipment. Solomon Islands Maritime Safety Administration will be consulted as required and notice to mariners issued if appropriate. Given the short duration of the survey and cable lay activities; and the low speed at which the vessels will be travelling (6-7 knots), it is considered highly unlikely that any significant impacts will occur to marine fauna as a result of vessel strike. 	Not likely to result in any impact due to the controls and management measures in place.

8.3 Papua New Guinea

Table 8-5: Impact Assessment: Papua New Guinea

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
Planned seabed disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Marine fauna and flora Commercial and recreational users Benthic habitat Papuan Barrier Reef 	<ul style="list-style-type: none"> Physiological and/or behavioural impacts to fauna The burial of the cable in nearshore waters (in water depths of up to 1000 m) will temporarily disturb the sub-tidal habitat. This disruption is expected to be minimal in extent (in the order of a few metres width) and temporary in nature. Existing information and the results of the geophysical survey will be used to avoid ecological features including canyons, rocky reefs and seamounts as far as practically possible. Impacts to threatened marine fauna due to habitat disturbance as a result of cable lay activities. Temporary disturbance of sub-tidal benthic habitat due to the burial of the cable in near shore waters. 	<ul style="list-style-type: none"> The route selection processes have included a 10 km (max width) development corridor. The final route should be within this corridor and take into account habitat identified by the geophysical survey. The geophysical survey will be of sufficient details to identify features such as rocky reefs, canyons, seamounts and other features which are likely to form habitat. No cable lay activities will occur within close proximity such as to cause disturbance to the rocky reefs offshore or diverse areas of fringing reefs and seagrass meadows. The geophysical survey data will be used to finalise the route and construction method and distance between cable lay activities and the rocky reefs will be kept as large as possible. Seamounts and canyons along the cable route will be avoided for engineering reasons and to avoid impact on potential fauna habitat. There will be minimal disturbance area as the cable is only a matter of inches wide. The nature of the construction requirements is such that the cable is most efficiently installed on flat, sandy seabed. Post survey there will be consultation with relevant authorities in respect of preferred route and construction methodologies to ensure impacts are minimised. Cable installation will be short in duration. 	Impacts to sensitive receptors are expected to be minor in nature and in short duration, with no impacts anticipated at a population level. As such the predicted impact associated with this activity is not considered to be significant
Planned beach disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Recreation beach users Recreational fisheries Tourism Terrestrial flora and fauna 	<ul style="list-style-type: none"> Recreational users of the beach and fishing areas may temporarily not be able to use the area where the cable is being laid. Potential impacts to terrestrial flora and fauna Tourism users may temporarily not be able to use the area where the cable is being laid. 	<ul style="list-style-type: none"> Beach disruption will be limited to a small area, safety signposts will be in place and construction periods will be short in duration. Options for shore crossing to be undertaken via HDD to minimise the disturbance to the beach and users. Dust will be managed during construction and noise and vibration impacts will be short in duration. Recreational fishing associations will be advised in advance of works. All terrestrial based activities (including the HDD and the development of the landing station and beach manhole) will be undertaken on existing cleared or developed sites that are highly unlikely to contain any threatened species or ecological habitats. Expert site surveys for archaeological and environmental protection purposes will be completed during design processes. 	<ul style="list-style-type: none"> Impacts will be minor in nature and short in duration. All terrestrial based activities (including drilling and the development of the landing station and beach manhole) will be undertaken on existing cleared sites that are highly unlikely to contain any sensitive environmental receptors and will be short in duration, as such no impact to terrestrial environmental or social receptors is expected to occur.
Planned noise emissions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Marine fauna Residential communities in close proximity to the planned construction 	<ul style="list-style-type: none"> Behavioural responses from terrestrial fauna to planned noise emissions from construction activities. Temporary noise disturbance to residential communities in close proximity to the beach crossing. 	<ul style="list-style-type: none"> Noise impacts from construction activities will be minor and short in nature. Geophysical equipment uses low output power survey equipment (see Appendix B and Appendix C) and is short in duration. 	It is considered very unlikely that the geophysical survey will significantly impact marine fauna as: <ul style="list-style-type: none"> The low output power of the survey equipment - the type of survey being utilised for the proposal is a low powered geophysical survey that does

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
		<ul style="list-style-type: none"> The geophysical survey will produce underwater noise that could potentially lead to behavioural changes of marine fauna transiting the survey area, including masking of sounds vital for cetacean navigation, identification of prey and predator locations etc. 	<ul style="list-style-type: none"> In addition, the following additional measures will be put in place to manage interactions between vessels and whales: <ul style="list-style-type: none"> One dedicated Marine Fauna Observer must be on board the inshore survey vessel The inshore survey vessel will only be surveying during daylight hours 2 dedicated marine fauna observers must be on board the offshore survey vessel. Survey vessels will not travel at greater than 6 knots within 300 m of a cetacean (caution zone) and minimise noise Survey vessels will not approach closer than 50 m for a dolphin and/or 100 m for a whale (with the exception animals bow riding). <p>Exception: Points 3 and 4 above requirement do not apply to survey vessels operating under limited/constrained manoeuvrability including but not limited to vessels towing equipment and actively acquiring data, or in the event of an emergency.</p>	<p>not include airguns and is expected to generate noise levels between 110-130 dB, decreasing rapidly with distance from the source. For details on proposed survey equipment, radiated power vs source level for geophysical and seismic surveys, see Appendix B and Appendix C.</p> <ul style="list-style-type: none"> The short duration of the survey activities The linear nature of the survey activities (i.e. The survey will be undertaken over a very long distance meaning impacts to specific areas will be short and temporary. <p>This risk will be further reduced by the application of proposed mitigation measures.</p>
<p>Planned emissions and discharges from vessels and drilling activities</p>	<ul style="list-style-type: none"> Marine flora and fauna Benthic habitats Commercial and recreational fisheries Papuan Barrier Reef 	<ul style="list-style-type: none"> Physical and/ or behavioural impacts to fauna from the planned vessel discharges Temporary impacts to water quality resulting from planned vessel discharges Temporary disturbance to marine habitats due to changes in water quality Light spill will occur from the beach crossing activities; however, this is expected to be minimal and consistent with the existing light spill associated with the urban/developed areas there are located in. Light emissions will also occur as a result of the survey and cable lay vessels. These emissions which will be similar to that of standard marine construction vessels are unavoidable due to safety and navigational requirements. A small volume (estimated at approximately 20-30 m³) of drilling fluids are expected to be released near-shore, at the HDD exit point (if this option is adopted). Drill cuttings generated at each HDD site will be between 5-10 m³. Marine fauna including turtles and shorebirds, transiting through the area, may temporarily alter their normal behaviour while attracted to the light emissions from the vessel. The impact of this attraction to artificial light sources can increase their vulnerability to predation (DSEWPaC, 2012b) and on seabirds in particular, can cause interruption of their migration path potentially leading to incomplete migration. Introduced Marine Species (IMS) could potentially be introduced via vessel movements, ballast water discharge and bio fouling activities and have the potential to prey on and/or compete with native marine species. 	<ul style="list-style-type: none"> Vessels have appropriate waste management procedures and emergency fuel/oil spill plans in accordance with the MARPOL Convention. Any excess discharges will be taken onshore and disposed of in accordance with relevant regulations The use of Bentonite (or equivalent) as the drilling fluid for the HDD beach crossing, which has a low toxicity, is biodegradable and highly dispersive Addition of water to the drill head as the drill head reaches the exit points to reduce the concentration of drilling fluid lost to the water column Lighting will be maintained at levels that allow safe operation of equipment with no additional lighting required. The short duration of the HDD, geophysical survey and cable lay activities; and the limited extent of light spill, make it highly unlikely than any significant impacts will be caused to marine fauna as a result of light spill. The Proponent will comply with international biosecurity requirements to prevent IMS. If required, a vessel risk assessment (IMS) will be undertaken prior to mobilisation and submitted to the appropriate PNG authorities. These drill cuttings will be taken onshore and disposed of in accordance with relevant regulations. 	<ul style="list-style-type: none"> Impacts to sensitive receptors are expected to be minor in nature and in short duration, with no impacts anticipated at a population level. As such the predicted impact associated with this activity is not considered to be significant Given the relatively low volume of drill fluid to be released, its biodegradability, dispersive nature and low toxicity, there is not expected to be any resultant impact on sensitive receptors. The concentration of drilling fluid released will be minimised by the addition of water as the drill head approaches the exit point (thus diluting the drill fluid). The main component of this drilling fluid is Bentonite which has a low toxicity, is biodegradable and is highly dispersive within the marine environment.

Coral Sea Cable System- EPBC Act s160 Supporting Information Document

Activity	Sensitive Receptors	Potential Impacts	Avoidance, Mitigation and Management Measures	Significance of Impact
Unplanned seabed disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Marine fauna and flora Commercial and recreational fisheries Benthic habitat Papuan Barrier Reef 	<ul style="list-style-type: none"> Physiological and/or behavioural impacts to fauna Minor, short term and localised elevated turbidity levels Impacts to threatened marine fauna due to habitat disturbance Temporary disturbance of sub-tidal benthic habitat 	<ul style="list-style-type: none"> Dropped object management procedures will be in place on the vessel Construction management plans will be implemented by the Contractor Contractors will manage incident management system and incidents will be reported to the relevant government as applicable. 	Unlikely to occur and not likely to result in a significant impact due to the nature and scale of the proposed construction activities.
Unplanned fauna interactions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Marina fauna 	Fauna injury or mortality from direct interaction with construction vessels and/or the cable during installation.	<ul style="list-style-type: none"> Fauna interaction incidents will be reported to the relevant government authority as applicable. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned beach disturbance as a result of cable lay and burial	<ul style="list-style-type: none"> Recreation beach users Commercial and recreational fisheries Tourism Terrestrial flora and fauna 	<ul style="list-style-type: none"> Recreational users of the beach and fishing areas may not be able to use certain areas during construction Tourism activities may not be able to use certain areas during construction 	<ul style="list-style-type: none"> Construction management plans will be implemented by the Contractor Contractors will manage incident management system and incidents will be reported to the relevant government authority as applicable. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned discharges to the environment from vessels	<ul style="list-style-type: none"> Marine flora and fauna Benthic habitats Commercial and recreational fisheries Papuan Barrier Reef 	<ul style="list-style-type: none"> Waste, hydrocarbon and / or other chemicals accidentally discharged have the potential to be toxic to marine fauna that may be present in the area. Spills on terrestrial areas may result in localised, short term impacts. Waste generated during construction activities 	<ul style="list-style-type: none"> The likelihood of an accidental waste, hydrocarbon or chemical discharge from the cable lay vessel is expected to be low, due to the management procedures that will be implemented and the short duration of the cable lay activities. As such, it is considered unlikely that any significant impacts will occur. Construction management plans will be implemented by the Contractor Waste will be contained on site and disposed of in appropriate waste management facilities when required. Contractors will manage incident management system and incidents will be reported to the Papua New Guinea National Maritime Safety Authority as applicable. 	Not likely to result in any impact due to the controls and management measures in place.
Unplanned vessel interactions as a result of geophysical survey, cable lay and burial	<ul style="list-style-type: none"> Commercial and recreational vessels 	<ul style="list-style-type: none"> Geophysical surveys will be located within a designated shipping lane. Injury may occur to marine fauna as a result of interaction with either the vessel (vessel strike) or entanglement with the cable during cable lay. 	<ul style="list-style-type: none"> Duration of time in shipping lane is short. Vessels will have all appropriate navigation equipment. The Papua New Guinean National Maritime Safety Authority will be consulted as required and notice to mariners issued if appropriate. Given the short duration of the survey and cable lay activities; and the low speed at which the vessels will be travelling (6-7 knots), it is considered highly unlikely that any significant impacts will occur to marine fauna as a result of vessel strike. 	Not likely to result in any impact due to the controls and management measures in place.

9. References

- Alcatel Lucent Submarine Networks 2013a, Technical Operational Aspects of SMD HD3 Cable as operated by Alda Marine, Nextgen Group Holdings Pty Ltd
- Alcatel Lucent Submarine Networks Marine Operations Department. 2013b. Nextgen Project Fitzroy Cable System Installation Methodology Overview.
- Australian Institute of Marine Science (AIMS) 2018 <https://www.aims.gov.au/docs/about/visiting/townsville.html> Visiting AIMS headquarters in Townville 28 February 2018.
- BMT WBM, 2012, Port of Townville Port Expansion Project EIS- marine Ecology Baseline Report, <http://eisdocs.dsdip.qld.gov.au/Townsville%20Port%20Expansion/EIS/Appendices/appendix-k2-marine-ecology-baseline-report-rev1.pdf>, 2 March 2018.
- Ceccarelli et al., 2013. The Coral Sea, in: Advances in Marine Biology. Elsevier, pp. 213–290. <https://doi.org/10.1016/B978-0-12-408096-6.00004-3>
- Coe Drilling Pty Ltd. 2013. HDD Works for ASC1-Cable Landings at Port Hedland & Darwin.
- DoE 2013, Matters of National Environmental Significance: Significant Impact Guidelines 1.1, Environmental Protection and Biodiversity Act, Department of Environment and Energy, 27 February 2018.
- Department of Environment and Heritage Protection (DoEaHP) 2017. <https://www.ehp.qld.gov.au/wildlife/threatened-species/> Threatened species 22 February 2018.
- DoEE, 2009 <http://www.environment.gov.au/system/files/resources/c39abe2a-b386-4074-bde0-b5c38b26c2bc/files/bioregional-profile.pdf> East Marine Bioregional Plan Bioregional Profile – A Description of the Ecosystems, Conservation Values and Uses of the East Marine Region. 27 February 2018.
- DoEE 2012 <https://www.environment.gov.au/system/files/pages/1e59b6ec-8b7e-42a8-9619-b5d728f878b2/files/temperate-east-marine-plan.pdf> Temperate East Marine Bioregional Plan, 27 February 2018.
- DoEE, 2017a <http://www.environment.gov.au/heritage/about/world-heritage> Australia's World Heritage. 22 February 2018.
- DoEE, 2017b <http://www.environment.gov.au/heritage/places/national-heritage-list> Australia's National Heritage List. 22 February 2018.
- DoEE, 2017c Coral Sea Commonwealth Marine Reserve – Overview <http://www.environment.gov.au/topics/marine/marine-reserves/coral-sea/overview>. 27 February 2018.
- DoEE, 2018a. Temperate East Commonwealth Marine Reserves Network. <http://www.environment.gov.au/topics/marine/marine-reserves/temperate-east>, 21 February 2018.
- DoEE, 2018b Marine Bioregional Plans, <http://www.environment.gov.au/marine/marine-bioregional-plans>, 20 February 2018.
- DoEE, 2018c Australian Marine Parks, <http://environment.gov.au/topics/marine/marine-reserves>, 28 February 2018
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) 2012. Marine bioregional plan for the Temperate East Marine Region. Prepared under the Environment Protection and Biodiversity Conservation Act 1999. DSEWPaC, Canberra

Coral Sea Cable System- EPBC Act s160 Supporting
Information Document



Director of National Parks, 2017a. Draft Coral Sea Commonwealth Marine Reserve Management Plan 2017. Director of National Parks, Canberra.

Director of National Parks, 2017b. Draft Temperate East Commonwealth Marine Reserves Network Management Plan 2017, Director of National Parks, Canberra.

Fugro N. 2001. Geophysical & Geotechnical Techniques for the Investigation of Near-Seabed Soils & Rocks. A handbook for non-specialists. Accessed at <http://www.fugro.com/downloads/corporate/other/GP-GT-TECHNIQUES-handbook.pdf>.

Government of Papua New Guinea, 2015, National Marine Conservation Assessment of Papua New Guinea, Conservation and Environment Protection Authority.

Great Barrier Reef Marine Park Authority (GBRMPA), 2017 <http://www.gbrmpa.gov.au/zoning-permits-and-plans/zoning/zoning-guide-to-using-the-marine-park/interpreting-zones> Zoning, Permits and Plans. 22 February 2018.

Green, A, Lokani, P, Atu, W, Ramohia, P, Thomas, A & Almany, J 2004, 'Solomon Islands Marine Assessment', The Nature Conservancy, Indo-Pacific Resource Centre, http://www.sprep.org/att/IRC/eCOPIES/Countries/Solomon_Islands/41.pdf 28 February 2018.

GBRMPA 2018 http://www.gbrmpa.gov.au/_data/assets/pdf_file/0020/4358/IntroActiveGuide.pdf Activities Guide

GTRMPA 2018a Facts about the Great Barrier Reef. <http://www.gbrmpa.gov.au/about-the-reef/facts-about-the-great-barrier-reef> , 28 February 2018.

H&R ChemPharm Ltd. 2006. Dussek Campbell Technology Inside Cables. Waterblocking Compounds for the Communication Cable Industry. United Kingdom. http://hur.com/fileadmin/redakteur_hurcom/produkte/kabelfuellmassen/dussek_product_range_telecom_e.pdf

International Cable Protection Committee (ICPC) Ltd. 2011. About Submarine Power Cables. http://www.iscpc.org/publications/About_SubPower_Cables_2011.pdf

IUCN 2018a, <https://www.iucn.org/theme/protected-areas/about/protected-areas-categories/category-iv-habitatspecies-management-area> Category IV: Habitat/Species Management Area.

IUCN, 2018b, <https://www.iucn.org/theme/protected-areas/about/protected-areas-categories/category-ii-national-park> Category II: National Park

Kiele, R, Mageto, A, Numbasa, G & Miria, G 2013, Port Moresby-Papua New Guinea: Climate Change Vulnerability Assessment, Cities and Climate Change Initiative, United Nations Habitat, <https://unhabitat.org/wp-content/uploads/2014/07/Port-Moresby-Papua-New-Guinea-Climate-Change-Vulnerability-Assessments.pdf> 2 March 2018.

Krüger, J, & Sharma, A, 2008, Solomon Islands Technical Report, Pacific Islands Applied Geoscience Commission, Fiji, <http://pacgeo.org/documents/1890/download> 28 February 2018.

Maraghoto Holdings Company Limited 2009, Solomon Islands National Biodiversity Strategic Action Plan, Ministry of Environment Conservation and meteorology, Government of Solomon Islands. Available from: <https://www.cbd.int/doc/world/sb/sb-nbsap-01-en.pdf>

Ministry of Environment Conservation and Meteorology, 2008, http://www.sprep.org/att/IRC/eCOPIES/Countries/Solomon_Islands/49.pdf ,Solomon Islands State of Environment Report. 8 February 2018.

Coral Sea Cable System- EPBC Act s160 Supporting
Information Document



Mungkaje, AJ 2012, The Local marine Biodiversity and Ecology at the Site of a Seismic Survey, Larus Energy Limited, Papua New Guinea.

Mutter, J.C., 1977. The Queensland Plateau, Bulletin 109: Department of National Resources, Bureau of Mineral Resources, Geology and Geophysics. Canberra.

National Oceanic and Atmospheric Administration (NOAA) 2010, Ocean Floor Features, , <http://www.noaa.gov/resource-collections/ocean-floor-features>, Accessed 1 March 2018

NSW DPI 2016 Marine protected areas <http://www.dpi.nsw.gov.au/fishing/marine-protected-areas/aquatic-reserves/narrabeen-head-aquatic-reserve> 27 February 2018

NSW DPI 2018 Commercial Fisheries http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0005/567131/NSW-Commercial-Fisheries-map.pdf 27 February 2018.

Office of Environment and Heritage 2017. <http://www.environment.nsw.gov.au/topics/animals-and-plants/threatened-species/about-threatened-species> About threatened species. 22 February 2018.

Pacific Wrecks 2018, Iron Bottom Sound: Solomon Islands, Available from: https://www.pacificwrecks.com/provinces/solomons_iron_bottom_sound.html

Queensland Government 2018 <https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/licences/fisheries-symbols> Fisheries Symbols 27 February 2018

Read, G. 2004. Sewers: Replacement and New Construction, Chapter 15 Horizontal Directional Drilling. Elsevier Butterworth-Heinemann. Burlington MA. pp: 297-321

SMEC PNG Limited 2007, Volume 2 – Background Information, Port Moresby Town Local Development Plan, National Capital District Commission, Papua New Guinea.

Solomon Oceanic Cable Company 2014, Initial Environmental Examination, SOL Broadband for Development Project, Asian Development Bank, Available from: <https://www.adb.org/sites/default/files/linked-documents/44382-022-sol-ieeab.pdf>

Sunshine Coast Council 2017, Sunshine Coast Expansion Project: Marine Ecology, <http://eisdcs.dsdip.qld.gov.au/Sunshine%20Coast%20Airport%20Expansion/EIS/Volume%20B%20chapters/Chapter%20B10%20-%20Marine%20ecology%2018Sep14.pdf>, 2 March 2018.

United Nations Habitat 2014, Honiara: Solomon Islands – Climate Change Vulnerability Assessment, United Nations Human Settlements Programme, https://reliefweb.int/sites/reliefweb.int/files/resources/3558_alt.pdf, Accessed 1 March 2018.

White, AT, Aliño, PM, Cros, A, Fatan, NA, Green, AL, Teoh, SJ, Laroya, L, Peterson, N, Tan, S, Tighe, S, Venegas-Li, R, Walton, A & Wen, W 2014, 'Marine Protected Areas in the Coral Triangle: progress, Issues, and Opinions, Coastal Management, <http://www.coraltriangleinitiative.org/sites/default/files/resources/Marine%20Protected%20Areas%20in%20the%20Coral%20Triangle%20Progress%20Issues%20and%20Options.pdf> , 28 February 2018.

World Wildlife Fund 2013, Stewarding Biodiversity and Food Security in the Coral Triangle, US Aid, Available from: https://c402277.ssl.cf1.rackcdn.com/publications/659/files/original/CTSP-LessonsLearned_final_MK_edits_PD_review_2014_Jan_15.pdf?1391724667

Williams et al. 2012. The Tasmantid Seamount Chain: geomorphology, benthic biodiversity and fishing history. CSIRO Internal Report; CSIRO Marine and Atmospheric Research, Hobart, Tasmania.

Appendix A. PMST Results

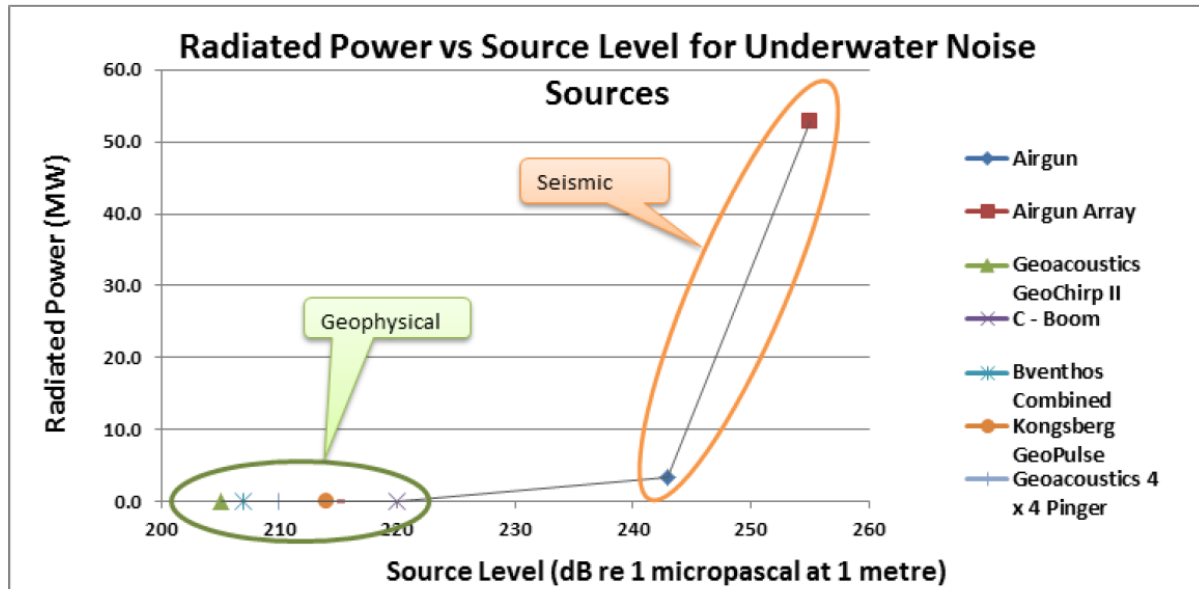
Appendix B. Survey Equipment

Dominant frequency, the source level and the energy level of a typical hydrographic and geophysical survey instruments.

Survey Equipment	Frequency (kHz)	Source Level (dB re 1µPa-m)	Energy (dB re 1µPa ² -s)	Stand-Off Distance (km)	
				Disturbance	Harassment
Single Beam Echosounder					
Kongsberg EA400 Dual Frequency	38 / 200	180	82	0.01	0.001
Multi Beam Echosounder					
0 - 100m Depths: Reson Seabat 8125	455	216	118	0.11	0.03
0 - 250m Depths: Simrad EM 3002	300	207	111	0.1	0.035
0 - 700m Depths: Simrad EM 710	70	210	114	0.4	0.11
500 - 10,000m Depths: Simrad EM 122	12	211	117	6	1.0
Side-Scan Sonar					
GeoAcoustics Sidescan dual frequency	100 / 500	223	127	0.37	0.08
Klein 3000	100 / 500	223	127	0.37	0.08
Benthos Combined	100 / 400	225	129	0.40	0.10
High-Resolution Sub-Bottom Profilers					
Applied Acoustics AA201 & AA301	0.5 – 7	215	122	0.55	0.045
C-Boom	0.5 – 2.5	220	127	1.0	0.08
GeoAcoustics GeoChirp II	0.5 – 13.5	205	112	0.18	0.014
GeoAcoustics 4x4 Pinger	0.5 – 13.5	210	117	0.32	0.025
Kongsberg GeoPulse	2 – 12	214	121	0.5	0.04
Benthos Combined	3	207	114	0.22	0.08
Reflection & Refraction Sparker					
Applied Acoustics Delta Sparker	0.2 – 5	226	136	2.0	0.16
EGS Seabed Refraction Sparker	0.1 – 3	220	130	1.0	0.08
USBL Positioning System					
Sonardyne USBL 8021	19 - 36	202	109	0.1	0.01
Sound Sources Used In Hydrocarbon Exploration					
Airgun	0.05 - 0.25	243	153	14	1.2
Airgun Array	0.05 - 0.25	255	165	56	4.5

Equipment not used in survey

Appendix C. Radiated Power Vs Source Level for Underwater Noise



Source	Acoustic Power (Watts)
Geoacoustics GeoChirp II	528
Bventhos Combined	838
Geoacoustics 4 x 4 Pinger	1671
Kongsberg GeoPulse	4198
Applied Acoustics	5284
C - Boom	16711
Airgun	3334264
Airgun Array	52844525

The **decibel (dB)** is a logarithmic unit used to express the ratio between two values of a physical quantity (usually measured in units of power or intensity).

Appendix D. Example Specifications for cable articulated pipe system

Protectorshell

Protectorshell Articulated Pipe has been developed to provide shallow water abrasion and impact protection for submarine cables.

Protectorshell is unique in that it clips together, avoiding the nuts and bolts of traditional articulated pipe. This clip together feature allows quick real time application during laying and a much simplified diver installation onto pre-laid cables.

The **Protectorshell** system comprises two different cast segments which are identified as uppers and lowers. Each successive pair of segments clips over and retains the end of the preceding pair.

A wide range of adaptors and attachments are available for use with **Protectorshell** Articulated Pipe. These adaptors and attachments allow the reversal of application direction and interfacing with other cable protection measures such as directionally drilled pipes, pipe flanges and concrete abutments.



PS100/500/09

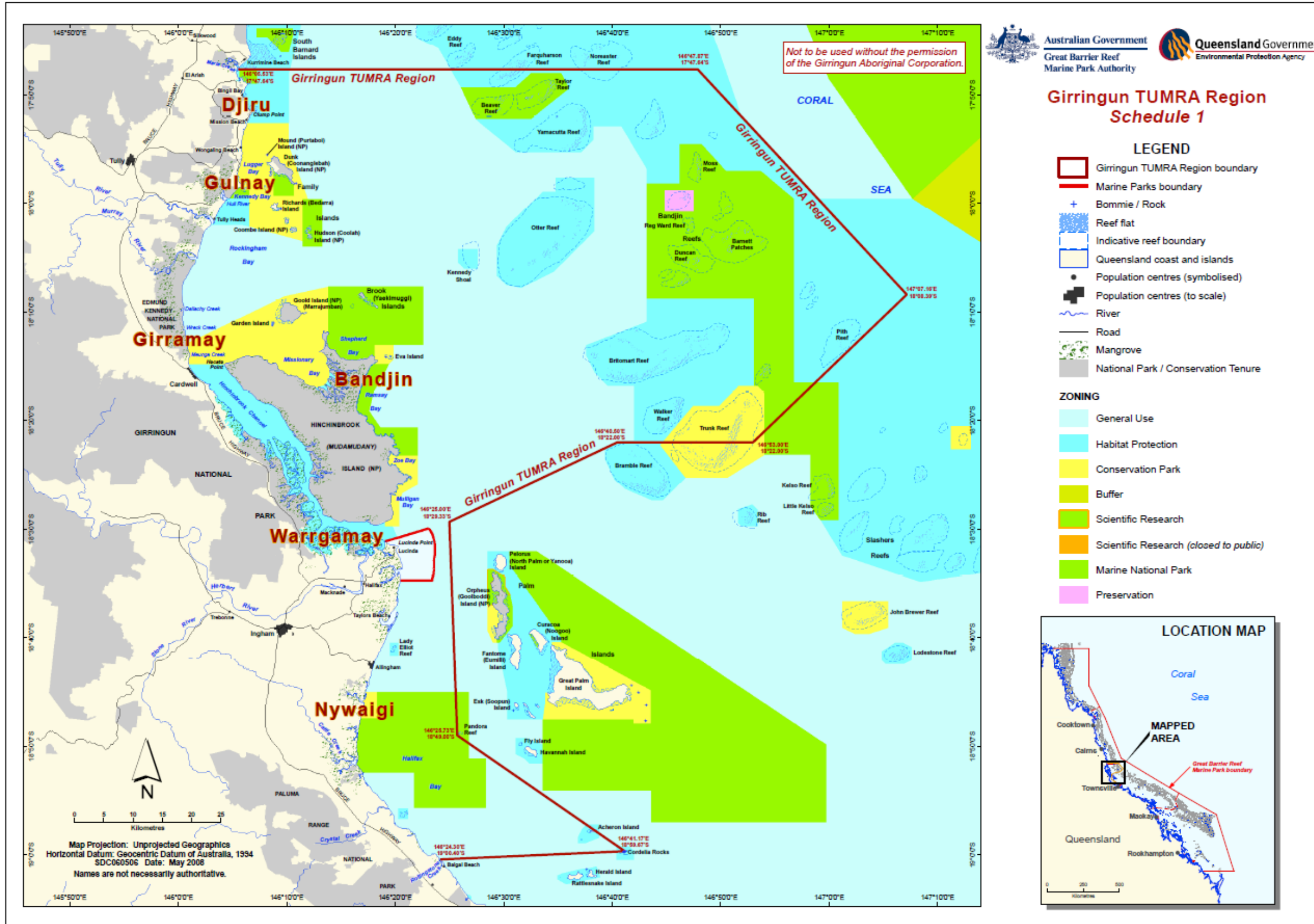
Specifications	
Segment Length - Overall	550mm
Effective Installed Length/segment pair	500mm
Minimum Internal Diameter	100mm - for cables up to 88mm diameter
Maximum External Diameter	214mm
Wall Thickness	9mm
Material	Ductile Iron to ISO 1083
Tensile Strength / Elongation	400MPa / 15% elongation
Impact Resistance	12m Drop test or 26kg
Minimum Bend Diameter	4.0m
Weight per Segment	15.5kg
Weight per installed metre (air)	31.0kg
Weight per installed metre (water)	26.6kg
Fasteners	M12x50 Bolt and M12 Nyloc Nut – Material: Stainless Steel G316/A4 Recommended usage: 1 pair per 10 metres of installed pipe

Protectorshell SL
 C/Regata Cuty Sank No 21 4 12 - 15002 La Coruña, Spain
 T: +34 8 8124 1115 F: +34 8 8192 4978
www.protectorshell.com

MS Diversified Services Pty Limited
 PO Box 150 Maroubra NSW 2035 Australia
 1135 Anzac Parade, Matraville, NSW 2036 Australia
 T: +61 2 9034 1004 F: +61 2 9314 3526



Appendix E. Giringun Traditional Use Marine Resource Agreement Region





**Notification of
REFERRAL DECISION – Minister’s advice not required**

**Coral Sea Cable System – Australia, Papua New Guinea and Solomon Islands
(EPBC 2018/8187)**

This decision is made under Section 161A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed action

name of agency or employee of Commonwealth that referred the action under subsections 160 (1) and 161 (1) of the EPBC Act	Department of Foreign Affairs and Trade
proposed action	To provide funding under Australia’s foreign aid program to support the installation of a submarine telecommunications cable between Australian, Papua New Guinea and the Solomon Islands.
Paragraph of subsection 160 (2) of the EPBC Act that applies to proposed action	(a) the entry by the Commonwealth, under Australia’s foreign aid program, into a contract, agreement or arrangement for the implementation of a project that has, will have or is likely to have a significant impact on the environment anywhere in the world.

Referral decision: Minister’s advice is not required

status of proposed action	The proposed action does not require assessment and advice under subdivision A of Division 4 of Part 11 of the EPBC Act.
----------------------------------	--

Person authorised to make decision

Name and position	James Barker Assistant Secretary Assessments (QLD, Tas, Vic) and Governance Branch
--------------------------	--

Signature	s 22(1)(a)(ii)
------------------	----------------

Date of decision	20 April 2018
-------------------------	---------------



EPBC 2018/8187

Mr Pablo Kang
Head, Undersea Cables Taskforce
Commonwealth Department of Foreign Affairs and Trade
RG Casey Building
John McEwen Crescent
BARTON ACT 2600

Dear Mr Kang

**Minister's advice is not required
Coral Sea Cable System – Australia, Papua New Guinea and Solomon Islands
(EPBC 2018/8187)**

I am writing to you regarding the proposed action to provide funding under Australia's foreign aid program to support the installation of a submarine telecommunications cable between Australian, Papua New Guinea and the Solomon Islands, referred under section 161 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

On the basis of the information provided, under section 161A of the EPBC Act, I have determined the proposed action is unlikely to have a significant impact on the environment and therefore advice is not required. As such, the Department will now publish a notice in accordance with s161A(3)(b) of the EPBC Act. A copy of the decision notice is enclosed for your reference.

If you have any questions, please contact s 22(1)(a)(ii) by email at
s 22(1)(a)(ii) , or s 22(1)(a)(ii)

Yours sincerely

s 22(1)(a)(ii)

James Barker
Assistant Secretary
Assessments (Qld, Tas, Vic) and Governance Branch
20 April 2018



CORAL SEA CABLE SYSTEM



Coral Sea Cable System Environmental Management Plan (EMP)

Document ID

CS2-PRJ-PLN-0003-002-VOIA

Document Version:	002
Release date:	27-Aug-18
Confidentiality:	A – All CS2 Stakeholders

Author: s 47F(1)	Reviewed by: s 47F(1)
Date: 27-Aug-18	Date: 27-Aug-18
	Approver: s 47F(1)
	Date: 27-Aug-18

DOCUMENT CONTROL & DISTRIBUTION LIST

Contact for Enquiries and Proposed Changes

If you have any questions regarding this document, please contact:

Name: s 47F(1)
Phone: s 47F(1)
Email: s 47F(1) @riskstrategies.com.au

Document Control

AMENDMENT	DATE	PAGE	DESCRIPTION	AUTHORISED
Issue 1	10-08-18	All	Final draft for submission to Cth	s 47F(1)
Issue 2	27-08-18	All	Amendments following Cth feedback	s 47F(1)

Notification / Distribution List

Job Title	Section/Group	Name
CS2 Project Director	Major Projects	s 47F(1)
CS2 Program Manager	Major Projects	s 47F(1)
CS2 Technical Director	Major Projects	s 47F(1)
CS2 Project Manager	Major Projects	s 47F(1)
CS2 Permitting & Land Access Manager	Major Projects	s 47F(1)

The above notification list is a minimum controlled distribution and it is the responsibility of the persons receiving the notification to further notify other Vocus personnel within their area if required.

Key Document Information

Document			
Title	Environmental Management Plan		
Doc ID	CS2-PRJ-PLN-0003-002-VOIA		
Production			
Produced By (org)	Vocus		
Owner	s 47F(1)	Author(s)	s 47F(1)
Contents			
Contents Description	This document is the Environmental Management Plan (EMP) for the Coral Sea Cable System (CS2) project.		

Contents

1.	Introduction	6
1.1	Scope of this EMP	6
1.2	Abbreviations	7
2	Project Description	8
2.1	Overview of Scope of Works	8
2.2	Project Details	8
2.3	Project Activities Summary	9
2.4	Environmental Assessments	9
2.5	Licences, Permits & Approvals	10
3	Vocus CS2 Project Environmental Commitment	11
3.1	Environmental and Social Safeguard Policy for the Aid Program (2018)	11
4	Legal and Other Requirements	13
4.1	Legislation	13
5	Project Environmental Roles & Responsibilities	15
5.1	Management Structure	15
5.2	Roles & Responsibilities	15
6	Risk Management	17
6.1	Identifying Potential Impacts	17
6.1.1	Project Aspects and Impacts	17
6.2	Environmental Risk Assessment	17
7	Competency, Training and Awareness	19
7.1	Vocus CS2 project team awareness training	19
7.2	ASN Inductions	20
7.3	Task Specific Training and Competency	20
8	Contractor Management	21
8.1	Environmental Management Plan (EMP)	21
8.2	Environmental Management Sub-Plans	21
8.3	Environmental Monitoring	21
8.4	Sub-contractor management	21
8.5	Contractor Monthly Reporting	22
8.6	Other Reporting	22
9	Environmental Incidents & Emergency Management	23
9.1	Emergency Management	23
9.2	Environmental Incidents	23
10	Project Administration	24
10.1	Document & Record Management	24
10.2	Internal Communication	24
10.3	CS2 HSE Meetings	24

Environmental Management Plan

11 Compliance Monitoring & Review..... 25

11.1 Compliance Monitoring Program..... 25

 11.1.1 Scope of Audit and Inspections 25

11.2 Corrective Actions 26

11.3 EMP Review 26

12 Vocus Reference Documents..... 27

1. INTRODUCTION

This document is the Environmental Management Plan (EMP) prepared by Vocus to provide an overview of the systems and processes in place for Vocus to deliver its part of the Coral Sea Cable System (CS2) – a submarine cable system between Australia, Papua New Guinea and the Solomon Islands.

The purpose of this EMP is to provide the framework for managing environmental aspects for the duration of the CS2 project in line with the requirements of:

- Relevant Legislation;
- Clause 8 of the general terms of the Submarine System Supply Contract, executed between the Commonwealth Government of Australia (represented by the Department of Foreign Affairs and Trade (DFAT)) and Vocus Pty Ltd on 15 June 2018 (Contract)
- The Commonwealth's Environmental and Social Safeguard Policy for the Aid Program;
- The environmental referrals to relevant authorities and conditions of consent associated with any Necessary Authorisations; and
- Environmental Management Plan Guidelines, Commonwealth of Australia 2014

This document is designed to ensure clear communication of Vocus arrangements in relation to Environmental Management including monitoring and reporting and has been designed to support continuous improvement of the EMP with the intention of reducing project environmental risks.

This plan should be read in conjunction with the **Project Management and Quality Plan CS2-PRJ-0001-002-VOIG**

1.1 Scope of this EMP

The EMP focuses on the framework that Vocus Communications has put in place to ensure potential environmental impacts are identified and managed for the duration of the project.

In this context, it sets out the requirements and expectations for the following:

- Environmental Management Roles and Responsibilities;
- Contractor Management;
- Both Vocus and its Contractors' responsibilities for managing and monitoring environmental impacts;
- Risk Assessment;
- Environmental monitoring;
- Emergency and Incident management;
- Environmental Compliance Audits;
- Management Plan review.

1.2 Abbreviations

Abbreviations used in this document are shown below:

Abbreviation	Term
ASN	Alcatel-Submarine Network (a subsidiary of Nokia) Principal Subcontractor
CS2	Coral Sea Cable System
CS2 Project Team	Vocus core project team appointed to run the CS2 project
DFAT	Department of Foreign Affairs and Trade
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPBC	Environmental Protection and Biodiversity Conservation
EEZ	Exclusive Economic Zone
HSE	Health, Safety and Environment
MOP	Method of Procedure
PMQP	Project Management and Quality Plan (CS2-PRJ-PLN-0001)
PNG	Papua New Guinea
PNG DataCo	PNG Landing Party
SI	Solomon Islands
SISCC	Solomon Islands Submarine Cable Company (SISCC) Solomon Islands Landing Party
Users	Commercial and recreational users
Vocus	Vocus Pty Ltd.

2 PROJECT DESCRIPTION

A detailed summary of the CS2 project and Vocus scope can be found in **Section 2 of the PMQP**.

The route overview can be found in **2.6.2.1 of the PMQP**

A brief summary has been provided below, noting that the definitive description of Vocus' scope of work and other terms and conditions in relation to the CS2 project is contained in the Contract. Should any discrepancies be evident between the Contract and this document, the general terms and schedules of the Contract take precedence.

2.1 Overview of Scope of Works

Vocus is building:

- An international submarine fibre optic cable system between Australia, Papua New Guinea, and Solomon Islands
- A domestic subsea telecommunications network in Solomon Islands connecting locations in Honiara, Auki, Noro and Taro

The project involves detailed design, route survey, permitting and subsequent construction and commissioning of the submarine cable systems.

The cable system will be built by Vocus Pty Ltd. On acceptance, ownership of the cable will pass to the Commonwealth..

ASN, a competent and qualified contractor has been selected to undertake the design, engineering, manufacturing, quality assurance, planning, installation, project management and coordination of the completion of the international and domestic submarine cable systems.

There is existing infrastructure at the Sydney site. The Cable Landing Station (CLS) will be located within an existing Data Centre and a significant portion of the land cable duct route and seaward HDD has already been constructed.

In Solomon Islands, the CLS will be constructed by the Solomon Islands Landing Party, Solomon Islands Submarine Cable Company (SISCC). ASN will haul submarine and land cable ashore through ducts constructed and provided by SISCC, and install the transmission systems and associated power and electronics equipment in each CLS.

In Papua New Guinea, the CLS will be constructed by the Papua New Guinea Landing Party, PNG DataCo. ASN will haul submarine and land cable ashore through ducts constructed and provided by PNG DataCo, and install the transmission systems and associated power and electronics equipment in each CLS.

2.2 Project Details

Project Component	Description
Customer	Department of Foreign Affairs & Trade (DFAT)
Principal Subcontractor	ASN
Project Type	Engineering, Procurement & Construction

Environmental Management Plan

Project Component	Description
Location(s)	Sydney (AUS) Port Moresby (PNG), Honiara (SI) Taro (SI) Noro (SI) and Auki (SI).
Project Commencement	June 2018
Expected Completion	March 2020

2.3 Project Activities Summary

Project Activities with a potential environmental impact include:

- Marine Route Survey
- Route Clearance & Pre-lay Grapnel Run
- Freighting of the cable to the main lay vessel
- Beach and shore-end works for the cable landings
- Main Lay and Burial Operations
- Post-Lay Inspection and Burial

Vocus requires compliance with the 'Avoidance, Mitigation and Management Measures' as described in the CS2 Scoping Study Environmental Impact Assessment (UCP-PER-RPT-0005) will be outlined in each of ASN Environmental Management Sub-Plans.

Refer Section 8.1.2 of this EMP for further information on Sub-plans.

Refer Section 11.1 of this EMP for details of Vocus Compliance Monitoring program

2.4 Environmental Assessments

The environmental assessments completed for this project as at the date of this document are outlined below:

Type of Survey / Study	Company	Date of Report	Status
UCP-PER-RPT-0005 Environmental Impact Assessment	Jacobs Australia	27 March 2018	Complete

This assessment has identified a number of key environmental risks and hazards for the project which have been incorporated within the Project Environmental Risk Assessment (refer **Section 6 of this EMP**). This document has also been utilised as an ancillary document to formulate this EMP.

Vocus expects that landing parties in SI and PNG will conduct their own impact assessments. Vocus expects conditions of these assessments may apply to the Vocus scope of work. Vocus will request a copy of the Impact Assessments conducted by landing parties in SI and PNG and update and amend this EMP as required.

This document will be updated as these landing party impact assessments become available. This document will also be updated as and when any supplementary environmental impact assessments are conducted by Vocus (if any).

Vocus has provided ASN with a copy of the **Vocus Environmental Impact Assessment UCP-PER-RPT-0005**.

2.5 Licences, Permits & Approvals

Requirements and conditions of licences, permits and approvals are detailed in the **Permit Plan CS2-PRJ-PLN-0003 VOI**. Vocus will monitor compliance with the environmental conditions of these items.

The CS2 Permitting & Land Access Manager will advise the HSE Advisor of any environmental conditions which will be incorporated into this EMP. As required, ASN will also be notified of any specific environmental conditions relevant to their scope of work for inclusion in their own EMP.

Refer **Section 11** of this EMP for Vocus Environmental Compliance Monitoring and Review.

3 VOCUS CS2 PROJECT ENVIRONMENTAL COMMITMENT

Vocus recognises its moral and legal responsibility to minimise damage to the environment caused by work activities and practices.

The objective of this EMP is to actively work towards elimination and reduction of negative affects to the environment by ensuring the mitigation of environmental impacts are incorporated into all levels of the organisation from planning to delivery and advocating best practice techniques where possible.

The key objectives of this EMP are to:

- Minimise our impact on the environment
- Ensure environmental impacts are managed to legislative requirements, licences, approval conditions and community expectations
- Monitor, manage and report on all potential environmental impacts

For the duration of the CS2 Project, and to ensure we meet our objectives, we will ensure:

- Management of our operations in compliance with applicable laws
- That the controls specified in the project's EIA are implemented and monitored
- That environmental risks associated with the project are properly managed
- Clear communication with our contractors, and the Commonwealth on environmental issues

3.1 Environmental and Social Safeguard Policy for the Aid Program (2018)

Vocus and ASN will at all times comply with the requirements of the Commonwealth Environmental and Social Safeguard Policy.

In the development of this EMP, Vocus has considered the first of the five safeguards (4.1 Environmental Protection) and acknowledges our responsibility to ensure that all potential environmental impacts relating to this project are identified and managed.

The policy requirements and Vocus' approach to compliance are summarised below:

Policy Requirement	Vocus Compliance
1. Under the EPBC Act, DFAT must obtain and consider the advice of Australia's Federal Environment Minister before authorising any foreign aid investment that has, will have, or is likely to have, a significant impact on the environment anywhere in the world.	<ul style="list-style-type: none"> • The works will be undertaken in a way consistent with the avoidance, mitigation and management measures in the Environmental Impact Assessment prepared to support DFAT's EPBC Act referral (see 2.4 Environmental Assessment) o • Going forward, any material route variations will be subject to a supplementary EIA which will be delivered to DFAT for assessment of the need for a referral under the EPBC Act.
2. Assess and manage environmental and social risks and impacts	<ul style="list-style-type: none"> • The objective of the processes and controls described in this Environmental Management plan is to achieve compliance with the environmental aspects of the social safeguard policy statement • Other aspects of the social safeguard policy statement are addressed in the Vocus WHS Plan

Environmental Management Plan

Policy Requirement	Vocus Compliance
3. Climate change and disaster risk	<ul style="list-style-type: none"><li>• The project considers that the scope of work for the CS2 project does not contribute to increased risk of climate change or disaster.

4 LEGAL AND OTHER REQUIREMENTS

Vocus will ensure all applicable environmental legislation is identified and complied with.

The Vocus Legal Team maintains a register of all Legislation applicable to Group, including environmental legislation. It monitors changes and receives updates and alerts from various sources, including legal publications, law firms, legal professional bodies and industry bodies.

The Vocus Legal Team will advise the CS2 Project Team (HSE Advisor) of any significant legislative changes or introduction of new legislation which impacts the CS2 Project, and the CS2 Project Team will work with the Legal Team to understand the potential impacts on the CS2 Project.

Any such legislative changes described above will prompt a review of this EMP, refer **Section 11.3 EMP Review**.

Vocus' supply contract with ASN requires ASN to comply with all relevant environmental legislation that applies to their scope of works and activities.

Refer Section 11.2 of this EMP for the Compliance Monitoring program.

4.1 Legislation

AUSTRALIA

FEDERAL (Commonwealth)

- Environment Protection and Biodiversity Conservation Act 1999, and EPBC Regulations 2000
- Environment Protection (Sea Dumping) Act 1981
- Coral Sea Marine Park Management Plan 2018
- Temperate East Marine Park Network Management Plan 2018

STATE OR TERRITORY BASED

New South Wales

- Protection of the Environment Operations Act 1997
- Threatened Species Conservation Act 1974
- Environmental Planning and Assessment Act 1979
- Biodiversity Conservation Act 2016
- Coastal Management Act 2016
- Marine Estate Management Act 2014, and Marine Estate Management Regulations 2009

SOLOMON ISLANDS

- The Environment Act 1998, and Environment Regulations 2008
- Protected Areas Act 2010

Environmental Management Plan

PAPUA NEW GUINEA

- Environmental Planning Act 1978
- Environmental Contaminants Act 1978
- Conservation Areas Act 1978
- Fauna (Protection and Control) Act 1966
- Water Resources Act 1982

5 PROJECT ENVIRONMENTAL ROLES & RESPONSIBILITIES

Vocus CS2 Project team will ensure sufficient resources to implement, maintain and improve the EMP throughout the project.

5.1 Management Structure

The Project Organisational Structure showing the key roles within the CS2 project team can be found in **Section 10 of the PMQP**.

5.2 Roles & Responsibilities

All positions across the project have environmental responsibilities to some extent. These vary in relation to duties described below, but everyone has a base level Duty of Care to prevent Environmental Harm as described in the Environment Protection and Biodiversity Conservation Act 1999.

In addition to the roles and responsibilities for the CS2 project team outlined in **Section 10.2 of the PMQP**, specific roles and responsibilities for environmental management on the CS2 project are detailed below:

Role	Responsibilities
CS2 Program Manager	<ul style="list-style-type: none"> Communication with the Commonwealth (including incident Notification) on environmental issues and matters as required by the contract
CS2 Project Director	<ul style="list-style-type: none"> Approval of this EMP Project Compliance with relevant Environmental Acts and Regulations Awareness of findings and conclusions of the EIA Ensure works proceed with all necessary environmental approvals / permits Ensure all Vocus project personnel receive environmental awareness training Ensure all Vocus Personnel and ASN are aware of their responsibilities
CS2 Permitting & Land Access Manager	<ul style="list-style-type: none"> Identify and monitor compliance with environmental conditions
CS2 Technical Director	<ul style="list-style-type: none"> Ensure changes to scope or schedule of works are communicated to Permitting & Land Access Manager for review
HSE Advisor	<p>Duties will include (as agreed with the Project Director):</p> <ul style="list-style-type: none"> Monitor compliance with EMP and environmental conditions Monitor ASN EMP Implementation Maintain the environmental risk register Promote environmental awareness Participate in project meetings if requested Maintain Audits & Inspections program Escalate any environmental incidents to Program Manager Review contractor monthly reports Facilitate environmental awareness training for CS2 team

Environmental Management Plan

Role	Responsibilities
External Environmental Consultants	<ul style="list-style-type: none">• Specialist input and advice on environmental matters• Surveys and inspections as directed by Vocus• Conduct monitoring programs or prepare environmental reports as directed by Vocus
ASN (Contractor)	<ul style="list-style-type: none">• Develop, monitor and measure their own EMP, including EMP sub-plans• Act in an environmentally responsible manner• Appoint an environmental management representative to ensure implementation of EMP, including any monitoring and reporting requirements• Report incidents and events to Vocus as soon as possible• Satisfactorily perform all environmental works as required by the Vocus' contract

6 RISK MANAGEMENT

Information on the identification and management of all Project Risks can be found in **Section 5 Risk Management in the PMQP**.

Environmental Risks will be documented within the Project Risk Register and monitored for the duration of the CS2 Project.

The project risk register is reviewed regularly and maintained by the CS2 Project Managers. Environmental risks will be reviewed by the Vocus HSE Advisor no less than monthly.

6.1 Identifying Potential Impacts

The environmental impacts for the project have been identified and assessed from the Environmental Impact Assessment and will be monitored through the Vocus Project Risk Register.

Potential environmental risks for the project were identified during the pre-works environmental assessments:

The activities assessed included:

- Planned / unplanned beach disturbance
- Planned / unplanned seabed disturbance
- Planned noise emissions
- Planned / unplanned discharges from vessels and drilling activities
- Displacement of users from planned / unplanned activities

Vocus will require the specific Avoidance, Mitigation and Management control measures for those ASN activities identified within the EIA to be documented by ASN in the Environmental Management Plan or sub plans, contained in ASN's OHSE plan or sub plan.

6.1.1 Project Aspects and Impacts

The EIA describes the expected environmental impact of the various operations together with control measures. ASN will reflect the control measures that are stipulated in the EIA in their or their subcontractor's OHSE plans

Vocus will review these OHSE plans and conduct audits of the operations as part of a planned Compliance Monitoring program (see **Section 11.1 of this EMP**).

6.2 Environmental Risk Assessment

The Vocus HSE Advisor will identify and monitor the environmental risks in the project Risk Register (**see Appendix F in the PMQP**) in consultation with the CS2 project team.

A risk workshop will be conducted prior to the marine route survey to discuss and populate the project risk register with environmental risks.

Environmental risks on the project Risk Register will be reviewed and updated at least monthly by the HSE Advisor.

Environmental Management Plan

Key environmental risks identified through the EIA include, but are not limited to:

Aspect	Potential Impact	Management Document
Water	Erosion and sedimentation from earthworks Vessel discharges Habitat Disturbance	UCP-PER-RPT-0005 CS2 EPBC Supporting Information Document Vocus CS2 Project Risks Register ASN EMP (or Sub-EMP) contained in ASN OHSE Plans
Hazardous Chemicals Use	Pollution from spills	UCP-PER-RPT-0005 CS2 EPBC Supporting Information Document Vocus CS2 Project Risks Register ASN EMP (or Sub-EMP) contained in ASN OHSE Plans
Vessels	Accidental discharge of waste Spills Construction generated waste Injury to marine fauna from contact or entanglement	UCP-PER-RPT-0005 CS2 EPBC Supporting Information Document Vocus CS2 Project Risks Register ASN EMP (or Sub-EMP) contained in ASN OHSE Plans ASN Operational MOP
Marine Flora and Fauna	Habitat Disturbance Introduced marine species Psychological/ behavioural impact	UCP-PER-RPT-0005 CS2 EPBC Supporting Information Document Vocus CS2 Project Risks Register ASN EMP (or Sub-EMP) contained in ASN OHSE Plans
Terrestrial Flora and Fauna	Disturbance of vegetation and habitat	UCP-PER-RPT-0005 CS2 EPBC Supporting Information Document Vocus CS2 Project Risks Register ASN EMP (or Sub-EMP) contained in ASN OHSE Plans
Environmental nuisance	Generation of dust, noise or vibration nuisance for local community during construction	UCP-PER-RPT-0005 CS2 EPBC Supporting Information Document Vocus CS2 Project Risks Register ASN EMP (or Sub-EMP) contained in ASN OHSE Plans

7 COMPETENCY, TRAINING AND AWARENESS

To ensure the CS2 project team and ASN understand their responsibilities and expectations in relation to environmental management, awareness training will occur continuously throughout the project.

All Vocus and Approved Subcontractor personnel involved with this project will receive project specific awareness training and / or briefings to ensure they understand their responsibilities when implementing or complying with this EMP.

The training and awareness requirements for this project have been broken down into the following categories:

- Induction
- Awareness Training
- Task Specific Training
- Environmental Competency / Qualification requirements

Category	Recipients	Frequency	Responsibility
Awareness Training	Vocus CS2 project team	Start of work, then quarterly or more frequently if required	CS2 HSE Advisor
Induction	ASN personnel and CS2 project team (where relevant)	As described in ASN's OHSE Plan	ASN
HSE project specific briefing	ASN personnel	During mobilisation	ASN
Task Specific training	ASN personnel	As required	ASN
Competency /Qualification	Identified Personnel	As required	ASN / Vocus

7.1 Vocus CS2 Project Team Awareness Training

All Vocus team members involved in the project will receive an initial team briefing by the HSE advisor to promote environmental awareness and assist in maintaining effective environmental management for the project. This briefing will address the following topics:

- Vocus Environmental commitment, and requirements of the Environmental and Social Safeguard Policy for the Aid Program
- Overview of this EMP
- Understanding team member Roles and Responsibilities
- Project-specific environmental impacts and controls

The program is designed to periodically reiterate the objectives and specific environmental controls for the project. Team awareness training will be provided once per quarter.

Records of Vocus worker' training records are maintained by Vocus HR department.

The CS2 project team will also be provided with an awareness briefing in any of the following scenarios:

- Awareness and outcomes of environmental events;
- Changes to environmental legislation, and the project impacts
- Any material or changes to the EMP or Vocus environmental management framework

7.2 ASN Inductions

Vocus expects that ASN will provide a project specific induction, including activity and site-specific briefings as required, covering the following topics:

- Overview of the ASN EMP, and sub plans
- Team member Roles and Responsibilities
- Any project specific environmental impacts and controls
- Emergency response and incident notification
- Specific environmental mitigation measures

Any CS2 project team members who visit ASN controlled site will participate in these ASN inductions/ briefings.

ASN will maintain records of induction and training for its workers and subcontractors via the Daily Report.

7.3 Task Specific Training and Competency

ASN is expected to ensure that all personnel directly involved in environmental management for the project are appropriately qualified to undertake the tasks of the position to which they are appointed.

8 CONTRACTOR MANAGEMENT

8.1 Environmental Management Plan (EMP)

The principal subcontractor, ASN is required to submit to Vocus an Environmental Management Plan (EMP) for review by the HSE Advisor prior to the commencement of the marine survey. This plan is ASN's Occupational Health Safety and Environmental Plan.

The HSE Advisor or representative will satisfy themselves that the plan appears comprehensive and adequately addresses the likely environmental impacts given the anticipated nature of the project.

If ASN plans to sub-contract some or all of the work, the EMP must also address any sub-contractor requirements.

The EMP will address the following at a minimum:

- Environmental policy;
- Objectives and targets;
- Identification of legislative requirements, including permits and approvals;
- Roles and responsibilities around delivery of the EMP;
- Environmental risk assessments, Impact identification;
- Environmental monitoring and inspections; and
- Emergency management including impact and contingency response measures.

ASN should ensure that all relevant stakeholders (Vocus and ASN subcontractors) are informed of any revisions.

8.2 Environmental Management Sub-Plans

ASN will submit Environmental Management Sub-Plans (EMSP) developed specifically for all environmental elements associated with the CS2 project.

These may be submitted with the overall EMP, or separately.

8.3 Environmental Monitoring

Environmental monitoring as required in the Avoidance, Mitigation and Management Measures within the Environmental Impact Assessment will be documented in ASN EMP.

All monitoring undertaken by ASN will be recorded in the vessel log including any specific actions arising from the monitoring.

8.4 Sub-contractor Management

All contractors and sub-contractors will be made aware of their environmental obligations through training and awareness activities as described in **Section 7 of this EMP**.

8.5 Contractor Monthly Reporting

ASN HSE data will be submitted to Vocus as part of the Monthly reporting (**refer section 11.2.1 Monthly Project Group in PMQP**).

Any statistics must include any sub-contractors and sub sub-contractors engaged by ASN on the Site.

ASN HSE reporting will be provided as part of the CS2 project weekly and project monthly reporting (**refer Appendix J and K in the PMQP**).

Vocus may request additional information be provided relating to specific incidents or events.

8.6 Other Reporting

In addition to the progress reports provided by ASN, reporting of the following environmental events will be completed by ASN and submitted to the Vocus CS2 Project manager as follows:

Reporting	Timing
Environmental Incidents	Notify immediately (within 24 hours) / Report within 7 days
Infringement notice	Notify immediately (within 24 hours) / Report within 7 days
Statutory documents obtained by ASN as part of the project (e.g. Permits)	Within 1 week of receipt by ASN

9 ENVIRONMENTAL INCIDENTS & EMERGENCY MANAGEMENT

9.1 Emergency Management

Emergency Planning and Response arrangements (such as an Emergency Plan) shall be developed by ASN for all potential emergency situations which may impact upon the environment.

The emergency plan should consider:

- The types of potential incidents or emergencies specific to the scope of works
- The potential environmental impact of the event
- Any contingency response measures

9.2 Environmental Incidents

An environmental incident is defined as an event that has resulted in, or could have adverse environmental impact, such as a major chemical spill.

If such an incident occurs, ASN will follow their OHSE plan and report all events to Vocus as per the process outlined below.

In the event of serious or material harm, ASN will:

- Take immediate action to avoid continuance of the incident (which may include cessation of work) and to minimise the effect of the incident on the environment, as outlined in any EMP or EMSP
- Immediately notify Vocus and EPA or other relevant statutory authority.
- Submit to Vocus for review an incident report within 7 days of the incident. The incident report will include photographs where available and cover details of the incident and proposed corrective actions to avoid a recurrence.
- For serious /material harm provide a written report to each relevant authority
- Consider the need for any required corrective actions to be addressed

Vocus will be notified immediately (within 24 hours) if any of the following scenarios occur or have the potential to occur.

- Serious Environmental Harm
- Material Environmental Harm
- Prosecution by a Regulatory Authority
- Environmental Approval condition breach, or
- Environmental monitoring parameter breach.

Incidents will be reported both verbally and in writing.

Vocus may also participate in, or undertake their own investigation into any serious incident if and when deemed necessary.

Vocus will advise the Commonwealth of any harm or damage to the environment (including contamination or pollution) or any environmental notice served in relation to the CS2 project as required by the Submarine Cable System Supply Contract.

10 PROJECT ADMINISTRATION

10.1 Document & Record Management

All Vocus Documents will be managed in accordance with Vocus **Document Control Procedure**.

Further details on document control for the CS2 project can be found in **Section 14 of the PMQP**.

Documents and records may be sighted by Vocus through the inspection and audit program.

This may include:

- Training, competency and induction records
- Environmental event and investigation reports
- Environmental monitoring data and reports
- Non-conformances and corrective and preventative action reports
- Environmental site inspections and audits
- Regulatory notifications

10.2 Internal Communication

Communication with internal and external stakeholders regarding this projects potential environmental impacts, environmental activities and events will be in accordance with the governance framework outlined in **Section 11 of the PMQP**.

10.3 CS2 HSE Meetings

Vocus CS2 Project team will meet fortnightly to discuss specific WHS and Environmental topics.

Details and meeting agenda can be found in **Section 5.2.1 of the WHS Plan**.

11 COMPLIANCE MONITORING & REVIEW

During the project works, compliance monitoring will be conducted to ensure compliance with legislation as well as the objectives described in this EMP. These monitoring requirements are stipulated below.

11.1 Compliance Monitoring Program

The Vocus Compliance Monitoring Program includes the following:

Activity	Scope	Frequency	Responsibility
EMP Review	ASN EMP included in ASN's OHSE Plans	At project commencement	CS2 HSE Advisor
EMP sub-plan review	ASN EMP sub-plans included in ASN's OHSE Plans	2 weeks prior to commencement of relevant activities	CS2 HSE Advisor
Conditions of Consent review	EIA, Permits	Monthly	CS2 HSE Advisor / CS2 Permitting & Land Manager
Environmental aspects and Impacts review	Environmental Risk Register	Monthly	CS2 HSE Advisor
Review HSE statistics and environmental reporting	ASN Monthly report	Monthly	CS2 HSE Advisor
Desktop Audit	See 11.1.1 below	Once every 12 months	CS2 HSE Advisor
Site Inspection	See 11.1.1 below	Once per landing site	CS2 HSE Advisor / CS2 Technical Director
Vocus EMP review	Vocus EMP	6 monthly	CS2 HSE Advisor
Site / Activity specific Environmental Monitoring	Per ASN EMP / EMSP	Per ASN EMP / EMSP	ASN (see section 8.3 of this EMP)
Legislative review	Vocus EMP	Annually	CS2 HSE Advisor / Vocus Legal Team

11.1.1 Scope of Audit and Inspections

The scope of work to be covered in the audit and site inspection will include the following:

- Compliance with regulations,
- Compliance with licence and approval conditions
- All monitoring and operational reports required by the licences
- Environmental mitigation measures specified in the EMP are being implemented
- Environmental training records are in order
- Environmental events are being recorded and acted upon.

11.2 Corrective Actions

Environmental non-conformances (NC) are situations or events that do not comply with the safeguards and procedures stipulated by the EMP. A NC notice may be issued to ASN by Vocus in response to any of the following:

- As a result of a specific incident or audit findings
- As a result of observations made during a scheduled inspection or site visit
- As a result of regulatory intervention (i.e. regulator notice or fine)
- As a result of non-compliance with approval conditions

The Non-Conformance will be issued in writing, requesting a Corrective Action Plan/ Report to be prepared by ASN and implemented to close out the action.

All non-conformances must be addressed by ASN in writing in accordance with timeframes stipulated in the CS2 contract.

In most cases, non-conformity must be addressed with corrective action. If there is evidence that the non-conformity may be a symptom of a systemic problem, preventative action may also be required.

Corrective action is defined as action taken to eliminate the cause of non-conformity.

Preventative action is defined as action taken to eliminate the cause of a potential non-conformity.

11.3 EMP Review

The EMP will be continually revised throughout the CS2 Project to ensure the continuing suitability, adequacy and effectiveness of the EMP.

Document control of this EMP will be maintained in accordance with Vocus **Document Control Procedure**.

The EMP may be updated throughout the project in response to the following:

- Comments and feedback from the Contractors or Commonwealth;
- Changes to legislative requirements; or
- Changes identified through continuous improvement.
- Following significant environmental incidents
- When there is a need to improve performance in an area of environmental impact

The EMP will be reviewed by the HSE Advisor at intervals not exceeding 6 months.

Any additions or alterations to this plan shall be disseminated to the controlled distribution list

12 VOCUS REFERENCE DOCUMENTS

Document number:	Document Title:
CS2-PRJ-PLN-0001-009-VODG	CS2 Project Management and Quality Plan
N/A	Appendix F – CS2 Project Risks Register template
CS2-PRJ-PLN -0001-001-VODA	CS2 Permits Plan
CS2-PRJ-PLN-0002-003-VODI	CS2 WHS Plan
UCP-PER-RPT-0005	Coral Sea Cable System Scoping Study - Jacobs Environment EPBC Supporting Information Pack
N/A	Supply Contract – Submarine Cable System, 18 June
CS2-PRJ-SPE-0001-001-VODI	CS2 Document Control Procedure



Solomon Islands Submarine Cable Company Limited

Solomon Islands Submarine Cable Project

Public Environment Report

August 2018

Table of contents

1.	Introduction	1
1.1	Background	1
1.2	Project overview	1
1.3	Project justification.....	5
1.4	Purpose of this report.....	5
1.5	Structure of this report.....	8
1.6	Scope and limitations	8
2.	Project details	10
2.1	Cable alignments	10
2.2	Construction phase.....	25
2.3	Operation phase	28
2.4	Project timeframes	30
2.5	Regulatory and legislative framework for assessment.....	30
2.6	Methodology to prepare the PER.....	34
3.	Description of the existing environment	36
3.1	General	36
3.2	Physical and biological environment	36
3.3	Social values.....	55
3.4	Summary of values	56
4.	Assessment of potential impacts	58
4.1	Potential impacts.....	58
4.2	Mitigation measures.....	59
5.	Environmental and social impact management plan	68
5.1	Purpose of this ESMP.....	68
5.2	Scope	68
5.3	Implementation responsibility	68
5.4	Site description	70
5.5	Environmental management controls and procedures.....	70
5.6	Stakeholder Consultation Plan (SCP)	83
5.7	Grievance Management Procedure.....	84
5.8	Training and site induction	85
5.9	Emergency response and incident management	85
5.10	ESMP monitoring, review and reporting	88

6.	Summary and recommendations.....	91
7.	References	94

Table index

Table 2-1	International and Domestic Cable lengths.....	10
Table 2-2	Variety of cable types, applications and features	26
Table 2-3	Proposed schedule	30
Table 3-1	Tidal ranges at a subset of sites	38
Table 3-2	List of volcanoes around the Solomon Islands.....	40
Table 3-3	Summary of values present within each cable alignment	56
Table 4-1	Mitigation measures	60
Table 5-1	Project Role Description and Responsibility	69
Table 5-2	ESMP controls and procedures	71
Table 5-3	Stakeholder Consultation Plan	83
Table 5-4	Incident/emergency contact register.....	86
Table 5-5	Required plans and approvals.....	89
Table 6-1	Conceptual summary of values and potential impacts of relevance to proposed works, which are addressed by the ESMP	93

Figure index

Figure 1-1	Overview of Coral Sea Cable Route	3
Figure 1-2	Solomon Islands cable distribution	4
Figure 1-3	EIA procedural steps (extracted from the Solomon Islands Government EIA Procedural Guidelines (2010))	7
Figure 2-1	Looking east along beach with cable route and BMH indicated in yellow	11
Figure 2-2	Aerial view of Honiara cable landing point and BMH with marine (yellow) and terrestrial (red) routes indicated	12
Figure 2-3	View of BMH and alignment along eastern edge of the property boundary	12
Figure 2-4	Honiara cable landing point and on land cable route.....	13
Figure 2-5	Aerial view of Noro landing point, marine and terrestrial cable routes and CLS	14
Figure 2-6	View of proposed cable landing point at Noro within government easement	15
Figure 2-7	Dense vegetation along alignment through which cable will be trenched	15
Figure 2-8	View of Telekom compound for the proposed CLS (Vocus, 2018)	16
Figure 2-9	Noro cable landing point and on land cable route	17

Figure 2-10 View of Auki landing point	18
Figure 2-11 Auki BMH and proposed seaward ducts	19
Figure 2-12 Cable route along existing kunu road	19
Figure 2-13 Crossing culverts over Langa-linga freshwater lagoon	20
Figure 2-14 Auki cable landing point and on land cable route	21
Figure 2-15 Aerial view of Taro landing point	22
Figure 2-16 BMH and CLS to be located just outside of Telekom fenceline	23
Figure 2-17 Taro cable landing point and on land cable route	24
Figure 2-18 Articulated piping.....	25
Figure 3-1 Marine protected areas in the Solomon Islands.....	37
Figure 3-2 Community Marine Managed Areas in the Solomon Islands	37
Figure 3-3 Volcanoes in the Solomon Islands	40
Figure 3-4 Map showing average annual number of tropical cyclones for Australia and the Pacific Region.....	43
Figure 3-5 Tropical cyclone tracks from 1986-2006 for the Pacific Region.....	44
Figure 3-6 Historical cyclone tracks for the Solomon Islands	44
Figure 3-7 Strangler fig and palms behind recreational facilities (soccer field) to east of Honiara beach landing site, looking across site to west.....	46
Figure 3-8 Shallow reef flat at Noro beach landing site showing coral rubble	48
Figure 3-9 Beach and vegetation in vicinity of Noro landing site	49
Figure 3-10 Vegetation along proposed cable alignment looking towards road.....	49
Figure 3-11 Example seagrasses and algae collected from Kelakwai beach landing site.....	50
Figure 3-12 Lake (left) showing road edge and culvert; drainage point into lake on right side road (right) showing limited water body.....	51
Figure 3-13 Taro Island, Redman Island and the proposed southern marine cable route presented by Fugro 2018b.....	53
Figure 3-14 Taro cable landing beach site with house located on the edge (left) cable route from close to the tree looking towards the beach and house (right)	54
Figure 4-1 Conceptual model of potential impacts.....	67

Appendices

Appendix A - Fugro Australia Marine Pty Ltd (2018a), Desktop Study for the Coral Sea Cable System, Volume 5: Solomon Islands Permitting Issues, Fugro Document No: GPH116414-05

Appendix B - Fugro Australia Marine Pty Ltd (2018b), Desktop Study for the Coral Sea Cable System, Volume 4: Solomon Islands Landings, Fugro Document No: GPH116414-04

Appendix C - Jacobs (2018), Coral Sea Cable Installation Environment Protection and Biodiversity Conservation Act - Section 160 Supporting Information Document, Document No: IW175400-0000-NP-RPT-001 | F

Appendix D - Summary Business Case for Investment Coral Sea Cable System (CS2) and Solomon Islands Domestic System (SISCC, 2018)

Appendix E - SISCC (2016), SISCC Business Plan 2016-2036

Appendix F - DFAT Safeguards

Appendix G - MPA's within the Solomon Islands

1. Introduction

1.1 Background

The Solomon Island Submarine Cable Company (SISCC) is managing the installation of a new submarine telecommunications cable which includes both an international connection between the Solomon Islands and Australia and domestic cable connections between various islands within the Solomon Islands. The international cable system is referred to as the Coral Sea Cable System (CS2). The element of the CS2 that occurs within the Solomon Islands Economic Exclusion Zone (EEZ), inclusive of the international branch into the Solomon Islands and the internal domestic connections, is herein referred to as the Solomon Islands International and Domestic Network (SIIDN).

The installation of submarine telecommunications cables in the Solomon Islands has been under consideration for the last eight years and was previously managed by the Solomon's Oceanic Cable Company (SOCC). Under the management of SOCC the cable installation was subject to two related Initial Environmental Examinations (ADB 2012 and ADB 2014) submitted to the Asian Development Bank in support of the proposed development application processes. Since then, the project has evolved; and now provides opportunity for connection into Papua New Guinea. The CS2, an international cable, will traverse from Sydney into the Coral Sea, where it will branch with one section landing at Port Moresby, Papua New Guinea and the other section landing at Honiara, Solomon Islands.

The SIIDN cable installation, managed by the SISCC, is co-funded by the Solomon Islands and Australian Governments and the overall delivery of the cable installation is currently being supervised by the Australian Department of Foreign Affairs and Trade (DFAT). The SISCC is responsible for delivery of works within the Solomon Islands EEZ, inclusive of seeking all relevant permits and managing construction and operational works.

1.2 Project overview

The SIIDN project will entail the CS2 international connection into Honiara and three domestic cable connections within the Solomon Islands EEZ. These three domestic cables will connect Honiara with the outlying provincial centers of Taro Island (in Choiseul Province), Noro (in Western Province) and Auki (in Malaita Province). The proposed CS2 and SIIDN cable routes are shown in Figure 1-1 and Figure 1-2.

Marine works will include installation of the submarine cable along the seabed, through the intertidal areas up to the terrestrial landing points. The land based components will include the on-shore landing point, land cable duct route from the landing point to a cable landing station (CLS).

A number of technical studies have been undertaken to support the development of the project and have informed the preparation of this Public Environment Report (PER) and the associated Social Impact Assessment (SIA). Key studies include:

- Alcatel, 2018, Coral Sea Cable System (CS2) Site Survey Reports, Site: Solomon Islands Domestic
- Fugro Australia Marine Pty Ltd (2018a), Desktop Study for the Coral Sea Cable System, Volume 5: Solomon Islands Permitting Issues, Fugro Document No: GPH116414-05 (Appendix A)
- Fugro Australia Marine Pty Ltd (2018b), Desktop Study for the Coral Sea Cable System, Volume 4: Solomon Islands Landings, Fugro Document No: GPH116414-04 (Appendix B)

- Jacobs (2018), Coral Sea Cable Installation Environment Protection and Biodiversity Conservation Act - Section 160 Supporting Information Document, Document No: IW175400-0000-NP-RPT-001 | F (Appendix C)
- SISCC (2018), Summary Business Case for Investment Coral Sea Cable System (CS2) and Solomon Islands Domestic System (Appendix D)
- SISCC (2016), SISCC Business Plan 2016-2036 (Appendix E).



Figure 1-1 Overview of Coral Sea Cable Route

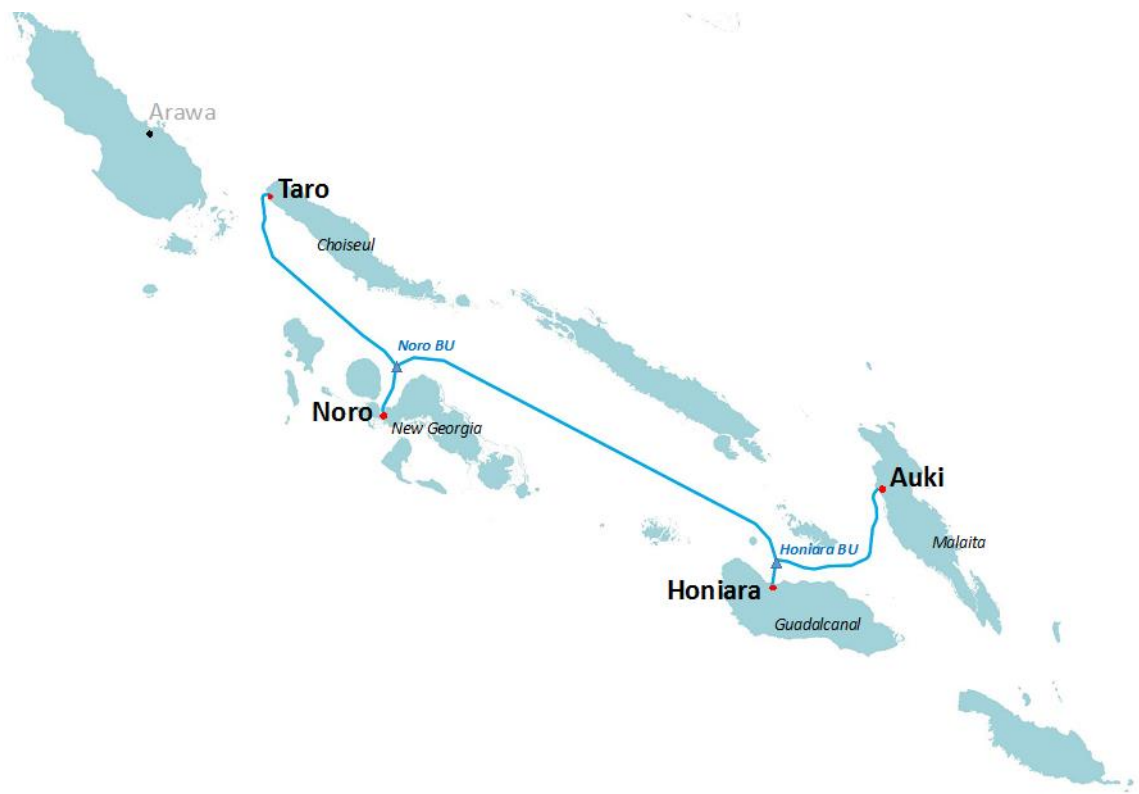


Figure 1-2 Solomon Islands cable distribution

1.3 Project justification

The Solomon Islands currently rely on satellites for international telecommunications connectivity, which is expensive and provides limited capacity of an inferior quality when compared to that provided by fibre-optic international submarine cables.

This project is being undertaken to provide an international fibre-optic submarine cable which will connect the Solomon Islands to the global internet and provide it with an ample and future-proof supply of reliable and low-cost broadband capacity sufficient to meet its needs for at least the next 25 years. It will also provide a domestic submarine cable system connecting initially three other provinces to the international cable gateway in Honiara. This will enable the wider population of the Solomon Islands to access much lower-cost broadband internet and other communications services, thus contributing to its socio-economic development^[2].

Faster and lower cost broadband capacity is expected to have numerous positive development impacts, including reduced transaction costs and increased efficiency for business, government and household communications. Other benefits expected to follow will be new business opportunities, such as a boost to tourism and investments in e-commerce and business process outsourcing facilities. Much improved international and domestic connectivity will facilitate improved public service delivery, and the growth of e-education and e-health services.

Improved connectivity with Pacific Developing Member Countries (PDMCs) should strengthen the existing regional public goods and foster new ones by allowing countries to share knowledge across the limited human resources available in PDMCs.

As summarised in the Summary Business Case for Investment in CS2 and SIIDN (SISCC, 2018) (Appendix D), the robust demand forecast model originally developed under the ADB sponsored SOCC project has remained the basis of SISCC's business plan and strong demand for the services is forecast.

The socio-economic benefits that are predicted to be realised from the project are discussed in the SIA reported separately to this PER¹. Social impacts and controls of relevance to this PER assessment have, however, been captured herein.

1.4 Purpose of this report

The SISCC is seeking decision on need for, and if required, issue of development consent for the SIIDN Project. An environmental impact assessment (EIA) is required as part of the development consent approval (DA) in accordance with S17(1) of the *Environment Act (1998)* (EAct) & Regulation 6 of the Environment Regulations 2008.

The proposed works are considered to be prescribed development of low risk to the environment and as such an EIA through a PER is to be completed in accordance with the Solomon Islands Government EIA Procedural Guidelines, 2010, as illustrated by the flow chart in Figure 1-3.

SISCC engaged GHD to prepare this PER. The objective of this PER is therefore to provide a consolidated report for SISCC to append to the DA to the Ministry of Environment, Climate Change and Disaster Management (MECDM).

^[2] <http://pid.adb.org/pid/LoanView.htm?projNo=44382&seqNo=01&typeCd=3>

¹ SIA is available from Solomon Islands Cable Company

Confirmation of this assessment format and requirement was provided during stakeholder consultation undertaken by GHD and SISCC with the Director of Environment on 24 May 2018. The approach was also confirmed to be relevant as per Fugro 2018a, section 2.1.3.

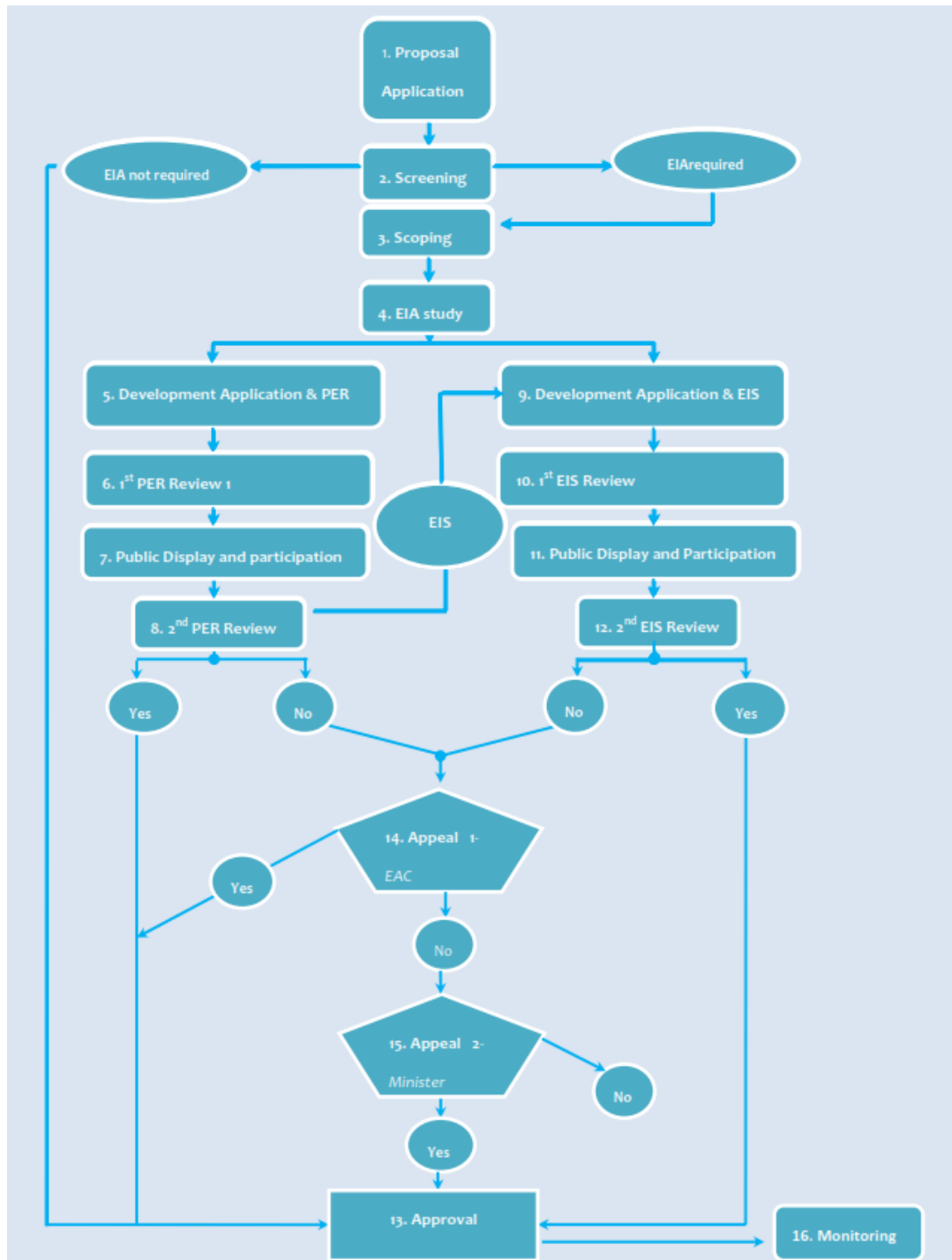


Figure 1-3 EIA procedural steps (extracted from the Solomon Islands Government EIA Procedural Guidelines (2010))

1.5 Structure of this report

To meet the Solomon Islands Government requirements the PER is organised as follows:

1. Introduction - provides a background of the prescribed development;
2. Project details - provides details of the prescribed development;
3. Description of the existing environment - describes the environment likely to be impacted by the prescribed development;
4. Potential impacts – describes the relevant potential environmental and social impacts pertaining to the prescribed development; this section is inclusive of consideration of relevant safeguards and mitigation measures – accordingly this section describes the proposed controls to the potential development impacts with a summary of monitoring obligations;
5. Environmental management plan - provides the proposed safeguards and mitigation measures and monitoring in an environmental management plan framework;
6. Conclusion – a summary of key findings from this PER; inclusive of requirements for any approvals and indication of potential impact management controls or conditions;
7. References - provides the sources whereby the information has been obtained for use within this report).

1.6 Scope and limitations

The CS2 project will require environmental and planning permits and approvals across all landing locations; Australia, PNG and Solomon Islands. DFAT has contracted Jacobs to support environmental permitting processes pertaining to Australian waters (refer Jacobs 2018).

SISCC are managing their obligations for environmental permitting for cable installation and operation in the Solomon Islands. As noted above, GHD have been contracted by SISCC to support that process through delivery of a PER. This PER will inform DA to the Solomon Islands government for land and marine construction works.

The geographic limits of this PER are the terrestrial lands and marine environments associated with proposed cable installation and operational works within the Solomon Islands EEZ. The assessment has taken into account currently proposed cable landing points, cable routes, project funding arrangements and assessment pathways. The scope is also informed by a separate SIA undertaken by GHD, a site visit and stakeholder consultation undertaken from 21 May to 1 June 2018.

The scope of this PER is, therefore, determined to be:

- Description of environmental social values at potential risk of the proposed project across all four cable landing locations inclusive of terrestrial and marine cable routes
- Assessment of potential environmental and social impacts and identification of relevant mitigation measures for the above works pertaining to construction and operation of the cable
- Reporting of impact assessment findings (across both social and environmental phases of works) in accordance with the requirements of the Solomon Islands Government EIA Procedural Guidelines, 2010

This work is not required to address Australian or other international impact assessment guidelines. As such it has taken into account relevant international social impact assessment guidelines as well as DFATs safeguard policies.

This report has been prepared by GHD for Solomon Islands Submarine Cable Company Limited and may only be used and relied on by Solomon Islands Submarine Cable Company Limited for the purpose agreed between GHD and the Solomon Islands Submarine Cable Company Limited as set out in section 1.4 of this report.

GHD otherwise disclaims responsibility to any person other than Solomon Islands Submarine Cable Company Limited arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report where relevant. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Solomon Islands Submarine Cable Company Limited and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

2. Project details

2.1 Cable alignments

The SIIDN project background and overview is provided in Sections 1.1 and 1.2 and proposed cable routes are provided in Figure 1-1 and Figure 1-2.

The following sections describe the proposed development in terms of types of cables to be used, installation methods, and detailed descriptions of the cable alignments and land based works for each of the cable routes. The phases of the development (construction and operation) are also described in the sections below to inform potential impacts and management strategies that would need to be applied during each phase of work. Those elements are addressed later in this report.

The international fibre-optic submarine telecommunications cable will be installed from Sydney to Honiara. Refer to for international and domestic cable lengths.

Table 2-1 International and Domestic Cable lengths

Cable lengths	Length of cables (km)
Total length of international and domestic cable	4,216
Total length of cable from start of PNG EEZ to start of Solomon Islands EEZ	518
Total length of domestic cable routes that will be installed within the Solomon Islands EEZ	1,138
Length of cable from Honiara to Noro	400
Length of cable from Honiara to Auki	148
Length of cable from Noro to Taro	218

Bathymetric information for this project is based on the data reported in the Initial Environmental Examination (ADB 2012), bathymetric charts (BA1713, BA1735, BA1747, BA1750 and BA3995-BA3998), site visit observations and reviews of aerial photographs.

2.1.1 Honiara – CS2 International Cable Connection

The incoming international CS2 branch enters the Solomon Islands EEZ along the abyssal plain at depths of approximately 5,600 m before ascending up the continental shelf into the nearshore environment of Honiara.

The proposed landing location will be positioned a few meters apart from the proposed BMH (located approximately at co-ordinates S09°25.747' / E159°56.993' [Alcatel, 2018]) on the Eastern side of the SMI site (the former G Club) opposite town ground in Point Cruz, Honiara.

The cable will be installed through a single articulated duct that will be pinned to the fringing reef and connected to a shore based BMH. The land based cable will run in a trench from the SMI site, across Tandai Highway around Townground and up the hill to Lengakiki Ridge. This route includes use of an easement over private property up the hill to avoid impact upon users of Hibiscus Avenue and Lengakiki Road during construction works. A CLS will be located on a site located on Lengakiki Ridge. The location of the landing site and the location of the proposed beach manhole (BMH) in Honiara is shown in Figure 2-1, Figure 2-2 and Figure 2-3.

In terms of bathymetry, the seabed rapidly deepens from Honiara beach to about 40 m water depth (WD) once the cable has left the BMH. The seabed drops off steeply at about 20 km offshore to a depth of approximately 700 m WD. The route passes through the Iron Bottom Sound, where numerous ship wrecks are known to be located towards Savo Island. A high point in the bathymetry is encountered at Savo Volcano, in the vicinity of 75 km chainage (approximately) from Honiara. Past Savo Island, the route follows a depression with depth ranges between 2000 m WD and 4500 m WD.

The land section of the domestic cable connection into Honiara will share the same ducts as the international connection from CS2 thus minimising construction impacts.



Figure 2-1 Looking east along beach with cable route and BMH indicated in yellow



Figure 2-2 Aerial view of Honiara cable landing point and BMH with marine (yellow) and terrestrial (red) routes indicated



Figure 2-3 View of BMH and alignment along eastern edge of the property boundary

Figure 2-4 Honiara cable landing point and on land cable route

2.1.2 Honiara – Noro

The route from Honiara to Noro follows the same route as the Honiara – CS2 alignment for the first 42 km, through Iron Bottom Sound, as far as Savo Island, before continuing into New Georgia Sound (Figure 1-2) past Russel Islands before continuing into Noro Beach. The cable passes through Noro Channel, a deep water habitat used by commercial shipping and for port activities. This cable route is approximately 400 km in length.

The Noro beach landing point is located north-east of the Noro town centre. The proposed landing point for the cable will be positioned a few meters apart from the BMH (approximate co-ordinates S08°12.879' / E157°12.268' [Alcatel, 2018]) within a government easement located just outside the centre of Noro, the land located adjacent to Markworth area (Figure 2-5). Once landed, the cable will then proceed from the BMH through the easement, buried to approximately 1.5 m depth. This area is currently covered in dense vegetation (Figure 2-6 and Figure 2-7) which will need to be cleared to support installation works.

Once the cable reaches Niep Road, it will be trenched in an alignment parallel to that road towards the CLS, located in the Solomon Telecom base station site off Niep Road, approximately 0.5 km from the landing site (Figure 2-8). Figure 2-9 shows an aerial of the cable landing point and on land cable route.

The bathymetry through New Georgia Sound as the route turns into Noro appears to be undulating yet grading gradually down to approximately 1800 m before gradually inclining to 600 m. The coral reef extends approximately 45-50 m out to sea before a steep drop off. The 20 m depth contour is approximately 120 m off the landing point, increasing to more than 100 m water depth within 260 m of the landing point.

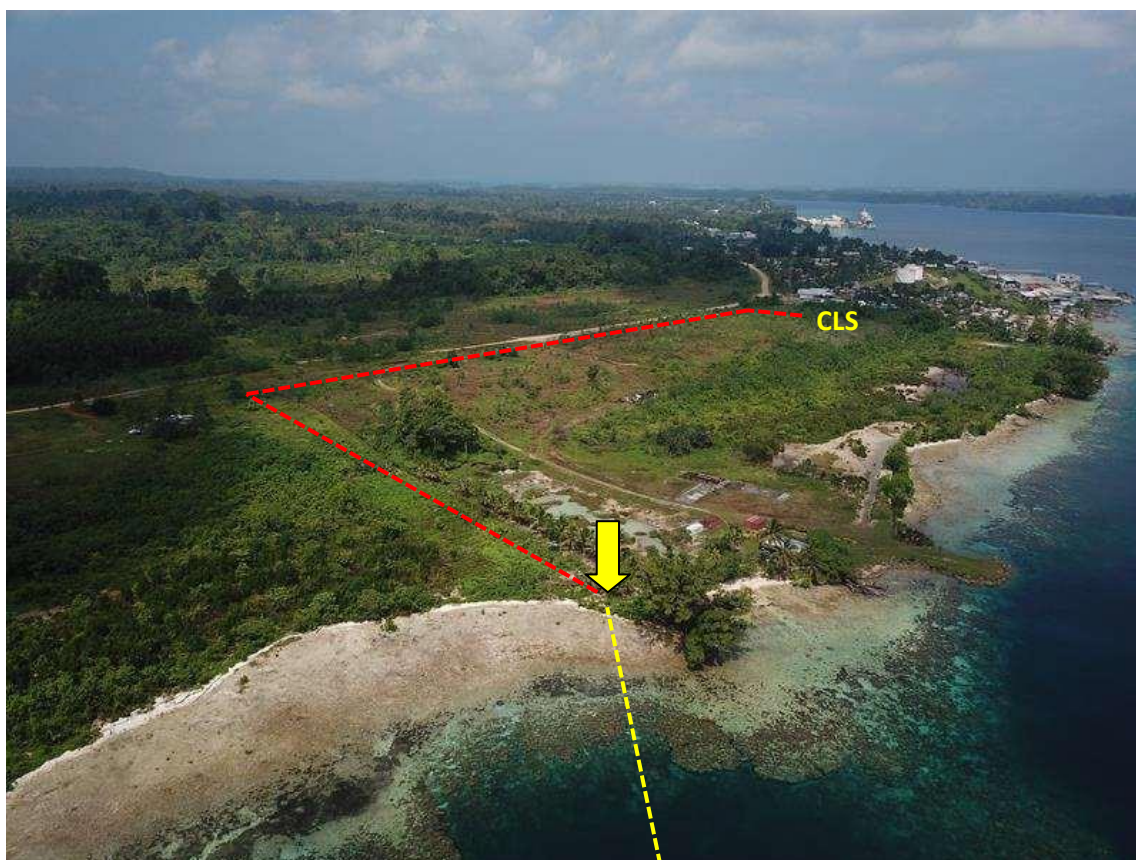


Figure 2-5 Aerial view of Noro landing point, marine and terrestrial cable routes and CLS



Figure 2-6 View of proposed cable landing point at Noro within government easement



Figure 2-7 Dense vegetation along alignment through which cable will be trenched



Figure 2-8 View of Telekom compound for the proposed CLS (Vocus, 2018)

(Source: Vocus pty Ltd, 2018)

Figure 2-9 Noro cable landing point and on land cable route

2.1.3 Honiara - Auki

This domestic cable segment commences at Honiara and heads east towards Auki through the Sealark Channel as shown in Figure 1-2. Having traversed through Sealark Channel, the route drops to 1500 m WD and follows the Indispensable Strait before ascending towards Auki, to the south of Alite Reef. Shallow fringing reefs are present just offshore of the Auki landing point. This section of the submarine cable route is approximately 148 km in length.

The proposed landing point for the cable at Auki will be positioned a few meters apart from the BMH located at the approximate co-ordinates $S08^{\circ}46.226'$ / $E160^{\circ}41.209'$ (Alcatel, 2018) (Figure 2-10, Figure 2-11 and Figure 2-12). Once installed, the cable will extend from the beach alongside the existing Kunu Road (Figure 2-12); this will effectively widen the road by approximately half a meter. The cable alignment will cross the Langa-Langa freshwater lagoon at the bridge over the culverts (Figure 2-13) and head towards the centre of Auki town centre to the CLS site. The route from the landing site to the CLS site is identified in Figure 2-14. Crossing the lagoon along the road, will mitigate the risk of draining or causing ecological damage to the lagoon.

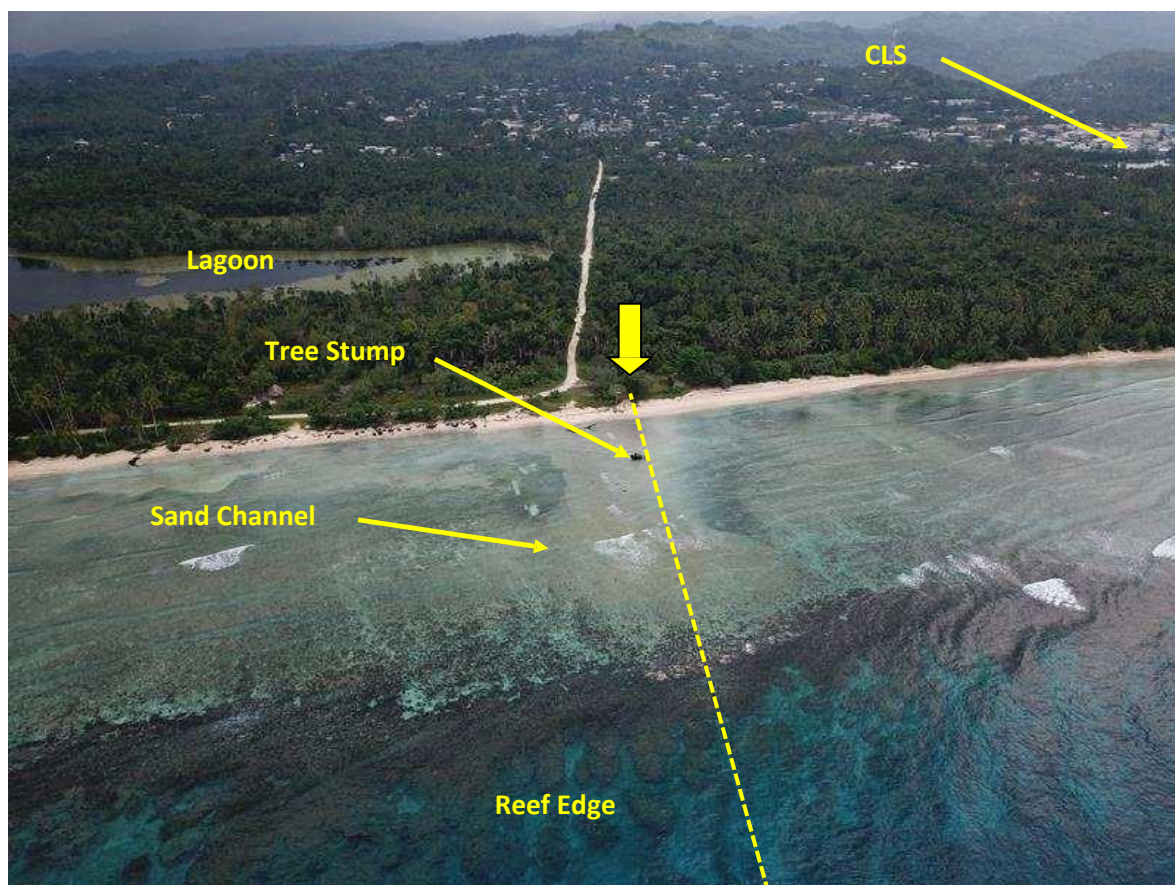


Figure 2-10 View of Auki landing point



Figure 2-11 Auki BMH and proposed seaward ducts



Figure 2-12 Cable route along existing kunu road



Figure 2-13 Crossing culverts over Langa-linga freshwater lagoon

Figure 2-14 Auki cable landing point and on land cable route

2.1.4 Honiara - Taro

This cable is part of the domestic connection branch that lands in Noro. Where the cable branches to Noro via the deep water channel it also continues west continuing to traverse the deep water environment (>1500m WD) of the Solomon's Sea towards Taro, as shown in Figure 1-2. The cable alignment approaches Taro via the deep water shipping channel to the west of the island. This section of the submarine cable route is approximately 218 km in length.

The proposed landing point for the cable at Taro will be positioned a few meters apart from the BMH located at co-ordinates S06°42.759' / E156°23.936' (Alcatel, 2018) (Figure 2-15). Once installed, the cable will be trenched a very short distance from the BMH across a footpath into the CLS to be constructed on Government land adjacent to the existing Telekom compound (Figure 2-15 and Figure 2-16). The overall cable route is identified in Figure 2-17.



Figure 2-15 Aerial view of Taro landing point



Figure 2-16 BMH and CLS to be located just outside of Telekom fenceline

Figure 2-17 Taro cable landing point and on land cable route

2.2 Construction phase

Marine works will include installation of the submarine cable along the seabed, through the intertidal areas to connect into the landing points.

The land based components of the cable system at each site will include the on-shore landing point within a manhole near the beach, and the cable route from the landing point to the CLS.

The cable will be installed by a purpose built cable laying vessel ('cable ship') that will lay the cable directly on the seabed. This vessel will bring the cable into the Solomon Islands and lay the cable through all water depths towards the landing point, stopping just offshore in water depths of approximately 25 m. Depending on vessel draft requirements and water depths; from the 25 m (or shallower) depth contour to the intertidal area the cable may be laid directly on the seabed by other means, such as by the use of remote operated vessels (ROVs) or divers.

Reef habitats commonly fringe most islands in the Solomon Islands. Where reef habitats are present within the shallow waters of the cable route, the cable will be installed in an articulated pipe which will be pinned to the reef. This will provide protection to the cable from anchorage or other activities that may occur in shallow waters. This will also support protection of the reef from any damage the cable may cause if a severe storm occurred, as the pipe will be anchored to the reef to stop the cable moving (refer to Figure 2-18).

A BMH will be installed at each beach landing point to support connection of the cable to landing infrastructure and CLSs will be built at each location. From the BMH to the CLS, the cable will be trenched at approximately 1.5m depth.

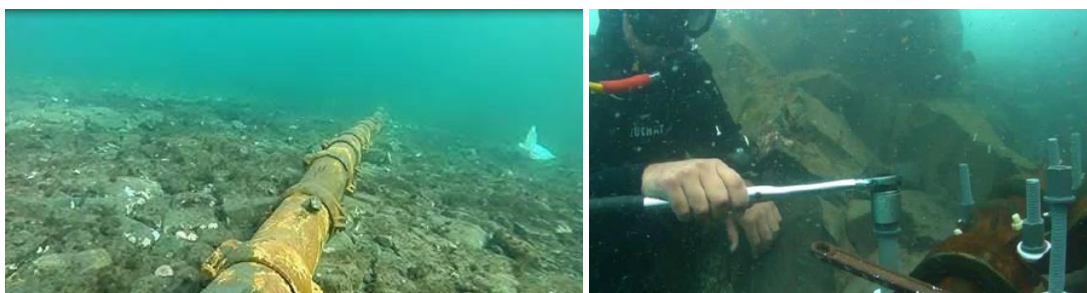


Figure 2-18 Articulated piping

2.2.1 Types of cables

A range of cable types will be installed across the various locations of the project. A description of the range of cable types, features, and applications proposed to be used are shown in Table 2-2.

Table 2-2 Variety of cable types, applications and features

Cable Type	Features	Application
Lightweight (LW)	Core cable with polyethylene insulation for electrical installation but no additional external protection	<ul style="list-style-type: none"> Best used in areas where the seabed is smooth and the cable can be confidently installed in full compliance with the seabed contours Typically used in water depths 2000-8000 m
Lightweight Protected (LWP) or Special Applications (SPA)	Metallic tape and polyethylene outer jacket applied over core with additional abrasion protection and hydrogen sulphide protection	<ul style="list-style-type: none"> Areas of non-uniform or potentially abrasive seabed or where the cable requires extended handling and use in rocky areas with moderate abrasion and/or attack by marine life Ideal for depths up to 6500 m
Light-Wire Armoured (LWA) or Single Armour Light (SAL)	Light single armour wire layer applied to core cable	<ul style="list-style-type: none"> Best for aggressive seabed in water depths up to 2000 m
Single Armoured (SA)	Heavy armour wire layer applied to core cable	<ul style="list-style-type: none"> Best in rocky areas or where the cable is at risk from external aggression and cannot be buried Ideal for depth up to 1500 m
Double Armoured (DA)	Two armour wire layers applied to core cable	<ul style="list-style-type: none"> Best for use in shallow water (<800 m) where the cable is at risk from environmental or external aggression and cannot be buried. Ideal for depth up to 800 m
Double Armoured High Abrasion (DA-HA)	Two heavy armour wire layers applied to core cable	<ul style="list-style-type: none"> Best for use in rocky terrain high likelihood of trawler damage and high abrasion risk Ideal for depth up to 800 m
Rock Armoured (RA)	Short-lay armour wire layer applied over SA cable	<ul style="list-style-type: none"> Best for use in rocky terrain with high risk of abrasion and risk of crushing Ideal for depth up to 200 m

2.2.2 Proposed installation methods

The proposed methods of cable installation will combine the following construction techniques:

- Placement of cable directly on the seabed;
- Use of articulated pipe and pinning (reef works only); and
- Trenching (land-based works only).

Due to the high potential for unexploded ordinance (UXO) within the project area, submarine cable burial methods have been determined to be of too great a risk and as such burial or trenching of the cable into the seabed has been excluded from the proposed project scope. Instead to provide protection to the cable in shallow waters it will be installed within an articulated pipe. Where required, application will also be made to the Solomon Islands Maritime Safety Authority (SIMSA) for a no anchorage exclusion zone to provide protection of damage to the cable from anchor drop.

Placement of cable directly on the seabed

The cable will be laid directly on the seabed from the point it leaves the articulated pipe through to deep waters that exit the EEZ. It will be installed using a purpose built cable laying vessel ('cable ship'). The entire cable is carried on this vessel and laid out slowly as the vessel travels along the cable alignment. This enables the vessel to place the cable onto the seabed in accordance with the required alignment, determined from a marine route survey.

During direct lay operations ships can operate up to a practical maximum of about 5-6 knots, periodically slowing down to control cable tension and pay-out speed. Once a steady-state is achieved, the cable pay-out speed should be approximately the ship's speed plus 2–3%, assuming the seabed topography is fairly constant.

Laying operations undergo constant and accurate monitoring. The ship's position and speed are measured by differential GPS, and the water depth by precision echo-sounders and seabed mapping systems (from the marine route survey), whereas cable pay-out speed and length are recorded by a rotometer. On board, the cable engineer, with the assistance of computer modelling software, will scrutinise the laying progress with constant reference to the engineered route plan, making adjustments if necessary.

Use of articulated pipe and pinning

Use of articulated pipe and pinning usually involves the fitting of a split cast iron piping around the cable which is then pinned or clamped to the seafloor/reef structure using stainless steel fixtures in order to provide minimal impact on the surface in which the cable is being laid and to provide shallow water abrasion and impact protection to the cable. The tasks for this installation method usually comprise the following:

- Survey swim to confirm status of cable alignment prior to installation;
- Fixing of cast iron articulated half shell pipe sections to the cable;
- Bolting of sections using nuts & bolts (nominal one set every 5-10 m);
- Stabilisation of the articulated pipe using saddle clamps pinned into bedrock (nominal spacing 25 m); and
- Survey swim of completed works to confirm installation is complete.

A pre-installation survey swim is usually performed by divers at the start of operations to determine local seabed conditions along the route. Following the survey, the area(s) of the

cable to be protected by the articulated pipe will be confirmed by the supervising representative on site. The survey is used to identify possible locations for the saddle clamps to be fitted and any areas of coral, where pinning into the seabed must be avoided.

In areas where attachment of articulated pipe is applied and coral is present, the cast iron pipe sections are lowered to the seabed in a manner that seeks to avoid or minimise damage to the coral. Pipe sections are fitted in one direction (from BMH seawards) such that there are no gaps in the protection in the areas identified by the survey. Each pipe section is checked to ensure that it is interlocked correctly before fitting the next section. Sections of pipe are fixed in place by fitting self-locking stainless steel nut and bolt sets which are fitted at nominal intervals of 5-10 m. Usually following the completion of the works a video survey is performed to demonstrate that the articulated pipe has been fitted correctly and that the seabed has been cleared of any waste associated with the works.

Articulated piping is proposed for cable protection across the intertidal and reef areas immediately offshore of the BMHs. The piping would extend from the landing point to 15 m to 25 m water depth depending on conditions. This will help protect the reef and cable from any impacts associated with waves, severe storms, other beach activities (e.g. vessel landings) and anchor damage.

Cable trenching on land

Depending on the area and sediment type into which the cable is to be installed on land, trenching will be done using a backhoe or excavator or manual labour (e.g. to dig into sands near the beach). This will be completed from the BMH to the CLS. It will also support delivery of the cable from the BMH to the start of the articulated pipe within the intertidal zone.

2.3 Operation phase

The design life of the cable system is 25 years. Once the cable is installed, there is generally no requirement to access the cable. The CLS units are buildings containing automated systems. Alarms and back-up generators are in-place should power, connectivity or other systems malfunction. In the event of emergency maintenance requirements, specialist telecommunications contractors will attend each site, diagnose and undertake actions to rectify any problems. These are likely to be engineers from one of the licensed operators who are available in each province. The building compounds will be secured and maintained (grass cut) on an ongoing basis by local workers.

Should any maintenance or repair of the cable be required it will be undertaken as described below.

2.3.1 Maintenance

Regular maintenance needed for the satisfactory operation of the cable system is expected to be confined to activities at the CLS'. On rare occasions in the event of a break or fault in the cable, it may be necessary to retrieve the cable from the seafloor. Such breakage or fault is usually caused by external source (most commonly fishing vessels, ships anchors, and, infrequently natural events). Recovery generally entails the use of a specialist cable ship for:

- Location of the cable if a repair is required;
- Retrieval of the section of the cable requiring repair with specially designed grapnels deployed from the repair vessel (or with the assistance of an ROV); and
- Lifting of the damage cable to the surface, repair by splicing new cable into the damaged section; and

- Return of the repaired cable to the seabed.

It is important to note that since the position of the as-laid cable will be accurately known (to +5 m in depths less than 200 m, and +20 m in depths greater than 2000 m); the grappling activity is closely controlled and the cable can be reinstalled along the same alignment, to minimise disturbance to the seabed.

2.3.2 Decommissioning

It is proposed that the marine cable is left *in situ* following decommissioning, while the onshore CLS and ancillary equipment may be decommissioned and demolished should no other related uses for the structures be found. Decommissioning would involve similar works and potential impacts as would result from installation works; these have therefore been considered as part of this impact assessment (refer section 4).

2.4 Project timeframes

The project will be undertaken in following distinct phases as shown in Table 2-3. Nominal dates for activities are below, these will be revised as the overall works program is developed with SISCC.

Table 2-3 Proposed schedule²

Activity	Expected Commencements	Duration
Marine Survey	late Sep 2018	14 days
Construction of BMH, Ducts, CLS Foundations	late Oct 2018	4 Months
Installation of prefabricated CLS	early Apr 2019	12 days
Land Cable Installation	late Aug/early Sept 2019	6 weeks
Marine Cable Installation (International & Domestic)	late June/early July 2019	4 Months
Cable Systems in Service	late Dec 2019	25 years

2.5 Regulatory and legislative framework for assessment

The following is an outline of legislative, institutional and regulatory frameworks for the Solomon Islands, which are relevant to the PER assessment for this project. Fugro (2018a) have also completed a desktop review on permitting and other approvals issues which may affect the Coral Sea Cable. The focus of that review is on operational permits and the reader is directed to that report for details in regards to those elements. Information as it pertains to environmental assessment and permitting is presented following.

2.5.1 Environmental policy and legislation

Environmental management including impact assessment in the Solomon Islands is regulated under the *Environment Act* (1998) and the accompanying statutory instrument, the *Environment Regulations* (2008). The Ministry of Environment, Climate Change, Disaster Management and Meteorology (MECCDMM) is the institution that administers this Act. The Environment and Conservation Division (ECD) within MECCDMM implements the *Environment Regulations* which stipulates the form of assessment, consultation, and development consent process for projects. The ECD is the government agency responsible for assessing development applications on behalf of the Government.

The proposed cable development is required to comply with the *Environment Act* and *Regulations*.

2.5.2 Environment Act

The *Environmental Act* (1998) provides for the protection and conservation of the environment, through the establishment of the ECD and the Environment Advisory Committee.

The core objectives of the Act are as follows:

² Current project timeframe estimates are subject to change depending on contractor, permitting and other conditions

- to provide for and establish integrated systems of development control, environmental impact assessment and pollution control;
- to prevent, control and monitor pollution;
- to reduce risks to human health and prevent degradation of the environment by all practical means, including the following:
 - regulating the discharge of pollution to the air, water and land;
 - regulating the transport, collection, treatment, storage and disposal of wastes;
 - promoting recycling, re-use and recovery of materials in an economically viable manner; and
- to comply with and give effect to regional and international conventions and obligations relating to the environment.

The Act is divided into the following four sections:

- Part I Article 4.1 provides the Act with considerable power which states that in the event of conflict between the *Environment Act* and other legislation, the *Environment Act* shall prevail.
- Part II establishes and defines the powers and role of the ECD.
- Part III establishes the requirements for environmental assessment, review and monitoring. This provides for an environmental assessment to consist of either a Public Environmental Report (PER) or if the development is shown to be of such a nature as to cause more serious impacts then the developer is required to submit an Environmental Impact Statement (EIS) to the MECCDMM.
- Part IV details requirements for pollution control and emissions (noise, odour and electromagnetic radiation) and requirements to permits for the discharge of waste. Noise (restrictions on emitting unreasonable noise) is covered in Article 51(1).

Some of the key functions of the Act are:

- promote coordination among Ministries and government divisions;
- revise and amend the national environmental strategies and programme as necessary;
- develop, coordinate and facilitate implementation of national policy concerning environmental planning, environmental impact assessment and pollution control; and
- monitor and advise on international developments in environmental matters and to ensure the fulfilment of obligations of Solomon Islands under the relevant international and required treaties and conventions.

The proposed cable development is required to comply with the *Environmental Act* (1998) in order to obtain development consent for the construction. The proposed works are considered to be prescribed development of low risk to the environment and as such EIA through a PER is to be completed to inform the development consent application. Confirmation of this assessment format requirement was provided by the Director of ECD on 24 May 2018.

2.5.3 Environment Regulations

The Environment Regulations (2008) establishes the procedures for undertaking the environmental assessment of any projects categorised as 'Prescribed Activities'. The developer is required to first submit a Development Application following which the MECCDMM determines the next step. This will be a choice from the following:

- no further assessment is required,
- a PER is required, or
- where major projects are considered such as logging, large agricultural developments, mining and large scale tourism developments and infrastructure projects, an EIS is required which includes technical, economic, environmental and social investigations.

Both the PER and EIS require public consultation. Following assessment of the PER/EIS and, assuming a determination of approval, by the MECCDMM a Development Consent is issued.

Environmental standards are not provided in the regulations, however the MECCDMM requires the use of WHO standards. Although the regulations provide for licenses to discharge waste or emissions, the enforcement of these will be difficult without defined standards.

It is understood that the proposed cable development is required to comply with the Environment Regulations in order to obtain development consent for the construction works associated with infrastructure installation. Additional information regarding environmental standards to be met by the assessment is provided in Section 2.5.10, relating to obligations required by the Australian Government in support of their co-funding of the project.

As survey to inform route alignment for the cable installation does not relate to prescribed works for construction of infrastructure, it does not trigger need for development consent application. As such, marine hydrographic survey is not included in the assessment completed herein. Survey vessels undertaking any such hydrographic or bathymetric seabed survey will, however, be required to source relevant permissions from SIPA/SIMSA for operation of survey equipment within the Solomon Islands EEZ. That activity is considered separate to this PER.

2.5.4 Marine Conservation Areas

Marine conservation areas within the Solomon Islands EEZ can be designated as Marine Protected Areas (MPAs), Marine Conservation Areas (MCA) or Locally Managed Marine Areas (LMMA). The MECCDMM has the role of national administration of these areas. Local landowner groups normally implement targeted management of the areas themselves. Those groups have been consulted during development of this PER. Mapping of protected areas has also informed cable alignment selection. These activities have sought to mitigate risk of impact upon these areas; this has informed design of controls presented in this PER.

2.5.5 Planning and Development Consent Permission

Proposed cable installation works are defined as development under the *Town and Country Planning Act 1982*. SISCC will, therefore, need to apply for physical planning permission to the Planning and Development Boards of each location where the cable will land and where infrastructure will be established. The information presented within this PER will support that application by providing a full description of the proposed works both on land and through provincial waters, the boundary of which is up to 6 nautical miles from the shoreline.

2.5.6 Transport and Other Infrastructure

Installation works on land will require road works. To secure those permissions, SISCC (or their installation contractor) will be required to submit plans and work descriptions to the Ministry of Infrastructure and Development. That content should include sketches of proposed infrastructure layout, planned work, schedule and environmental management control plans. This should be undertaken for any infrastructure that may also be affected by proposed works; such as water or power. As such, notifications and permissions may also be needed in regards to Solomon Water and Solomon Power. The information presented in this PER will support

those communications by presented proposed construction environment management controls of relevance to mitigating potential environmental impacts.

Within the marine environment there is potential to conflict with other users of the seabed or shipping channels during either project installation or operation. The relevant stakeholders SISCC will be required to consult with are detailed in Fugro (2018a) and include the SIMSA, provincial governments in all sectors of construction/operation and relevant National Government departments, such as the Ministry of Mines, Energy and Rural Electrification, in regards to seabed licenses for petroleum or other exploration activities. Consideration of potential land/seabed use conflicts has informed development of this PER.

2.5.7 Telecommunications Act

The *Telecommunications Act* (2009) provides the regulatory framework for the telecommunication sector and establishes the Telecommunication Commission of Solomon Islands. The Act repeals the *Telecommunications Act* (Cap. 115) and the Solomon Telekom (Limitation of Liability) Act (Cap. 114) and related matters.

The principle objective of the *Telecommunications Act* (2009) is to enhance long-term wellbeing of the population of the Solomon Islands, the inclusiveness and fairness of its society and the productivity of its economy by improving the availability, affordability, quality of service and kinds of telecommunications services in the Solomon Islands.

This act is relevant to the proposed development as this will continue to ensure provision of adequate, sustainable and efficient telecommunication services in all sectors of development, and also this could put in place a reliable telecommunications infrastructure and ensure service inter-connectivity nationally and internationally. It is understood that confirmation of applicability of this Act will be carried out through legal counsel with SISCC. Fugro (2018a) notes that SISCC will be required to seek a license to operate under this Act.

2.5.8 Fisheries Act

The *Fisheries Act* (1998) provides the framework for fisheries management and development, including licensing of fishing vessels and processing plants. It also lists prohibited fishing methods and provides for the establishment of Marine Protected Areas (MPAs) and the preparation of coastal management plans. The Act regulates the utilisation and conservation of marine resource.

It is understood that the confirmation of applicability of this Act will be carried out through legal counsel with SISCC.

2.5.9 Shipping Act

The *Shipping Act* (1998) consolidates and amends the laws relating to shipping and seamen to control the registration, safety and manning of ships, and to give effect to certain international maritime conventions, and other related purposes.

It is understood that confirmation of applicability of this Act will be carried out through legal counsel with SISCC. During the construction phase it may be necessary to consider the Shipping Act. This will mainly be in relation to safety in maritime shipping movements during construction works and securing a no anchor zone over cable alignment in Honiara near the coastline. The former would be managed through notification a maritime notification of cable ship movements and requirement to avoid interaction. The latter would be secured through notification of, and request to include, a no anchor zone on maritime navigation charts.

Notification to mariners of ship movements during construction can be undertaken by the cable laying ship via the Regional Harbour Master. Notification and request to implement a no anchor zone within the navigational charts can be undertaken via request to the Solomon Islands Maritime Safety Authority. This will require coordinates of the installed cable to be known and would be managed by SISCC following installation.

Additional information of relevance to survey operations, permissions and regulations (e.g. with respect of permit to work in vicinity of ship wrecks) is also provided in Fugro (2018a); that content has informed potential risks and impact mitigation measures described by this PER.

2.5.10 DFAT Policies

The Australian Government's DFAT is responsible for managing funding provided to foreign countries through the Australian Aid program. As part of that DFAT requires projects funded by Australian aid investments to demonstrate adequate management of environmental and social impacts of relevance to the funded project. In support of that, DFAT has developed a number of policies that work to ensure that the effective design and implementation of investments leads to improved and positive development outcomes within the country receiving the aid and developing the project. The principles and practices that should be adhered to for the protection of the environment and children are outlined in DFAT's Environmental and Social Safeguard Policy for the Aid Program (DFAT 2018) and Child Protection Policy, 2017 (DFAT, 2017). This Safeguard Policy describes principles and practices inclusive of:

- Do no harm and maintain the health, diversity and productivity of the environment
- Identify, assess and manage environmental and social impacts
- Effectively engage with stakeholders
- Work effectively with country laws to avoid imposing duplicate or unnecessary safeguard assessment or management requirements not of relevance to country requirements or risks
- Effectively identify and manage environmental and social risks to promote improved outcomes
- These safeguards have been taken into account in preparing the PER.

How this PER has considered and addresses the DFAT safeguards is identified in Appendix F.

2.5.11 International Treaties and Agreements

Solomon Islands is a signatory to a number of International environmental agreements including those for regional agreements; chemicals, waste and pollution; biodiversity and climate. These are described by the Solomon Islands Government under their "International Obligations" information available online at: <http://www.mecdm.gov.sb/about-us/divisions/environment-conservation.html>.

The requirements of the Solomon Islands government for delivery of a PER takes into consideration the governments delivery against these agreements.

2.6 Methodology to prepare the PER

The PER has been completed based on a review of relevant primary and secondary information sources, site visits, and consultations to determine the existing environment conditions surrounding the proposed cable routes and landing sites. This was completed in order to carry

out a detailed analysis of environmental and social impacts of the proposed activities. The following is an outline of the broad activities undertaken for the project:

- Desktop reviews of historic and current site information
- Consultations with Solomon Island Government regulators, DFAT, client and key stakeholders, including provincial government, customary land and public
- Site visits to support consultation and inspection of each of the landing sites and cable alignments proposed for:
 - Honiara;
 - Noro;
 - Auki; and
 - Taro
- Geospatial, route alignment and other data analysis, including conceptual modelling, to support ability to:
 - Describe environmental and social values of relevance to the proposed works
 - Identify potential impacts or risks to values identified
 - Describe relevant management and mitigation measures and
 - Develop a project specific Construction Environment Management Plan
- Report findings in a PER format in support of a DA consent
- The following sections of this PER document present the findings of the PER with regard to values, protection mechanisms and outcomes expected based on assessments completed for this PER.

3. Description of the existing environment

3.1 General

The Solomon Islands is made up of hundreds of coral atolls and volcanic islands forming an archipelago stretching approximately 1,600 km across the South-western Pacific Ocean. The total land area is approximated to be 28,300 km² (Fugro 2018b).

The islands rise steeply from a deep ocean floor and have very little underwater shelf area. Coral reefs characteristically surround the islands, either close to the shore (fringing reef) or further offshore (barrier reef). There is coastal lagoon enclosed between the shore and barrier reefs. The unique geography and scattered nature of islands has given rise to considerable environmental and ecological diversity, which is evident at the four project sites.

The submarine cable routes will traverse various offshore terrains including; seismically and volcanically active areas of irregular relief containing; deep depressions and high ridges. Seismic and volcanic activity is common and sub-sea slope failures and turbidity flows have been recorded previously within Solomon Island waters.

Land based alignments will primarily coincide with existing road infrastructure to avoid impact to undisturbed areas. There will be a need to clear vegetation primarily at the sites of Noro and Auki where cable alignment overlaps with areas currently in use for market gardens as well as vegetated areas within government easements.

The following sections describe the physical, biological, and social environmental values associated with the area of influence for the Solomon Islands Cable installation works.

3.2 Physical and biological environment

3.2.1 Marine Protected Areas (MPAs)

There are 22 marine protected areas within the Solomon Islands and one designated marine conservation area (Arnavon Marine Conservation Area). The marine protected areas are informally designated and are located on Figure 3-1. The other marine protected areas are informally designated and include the customary management areas established in Roviana and Vonavona Lagoons. The figure below illustrates the MPA in the Solomon Islands (Figure 3- 2) and a list of names of these areas is presented in Appendix G.

Additionally, a number of marine conservation areas have been established by communities in Marau Sound, Ngella, Marovo Lagoon, Tetepare, Roviana Lagoon and Gizo. Similar areas are likely to be established for marine resource management in the Shortland Islands, Russell Islands, Three Sisters Islands, Leli Island, Lau Lagoon, Suafa Bay, Langalanga Lagoon, Are'Are Lagoon and Small Malaita, Northern Isabel and Northern Choiseul (Figure 3-2).

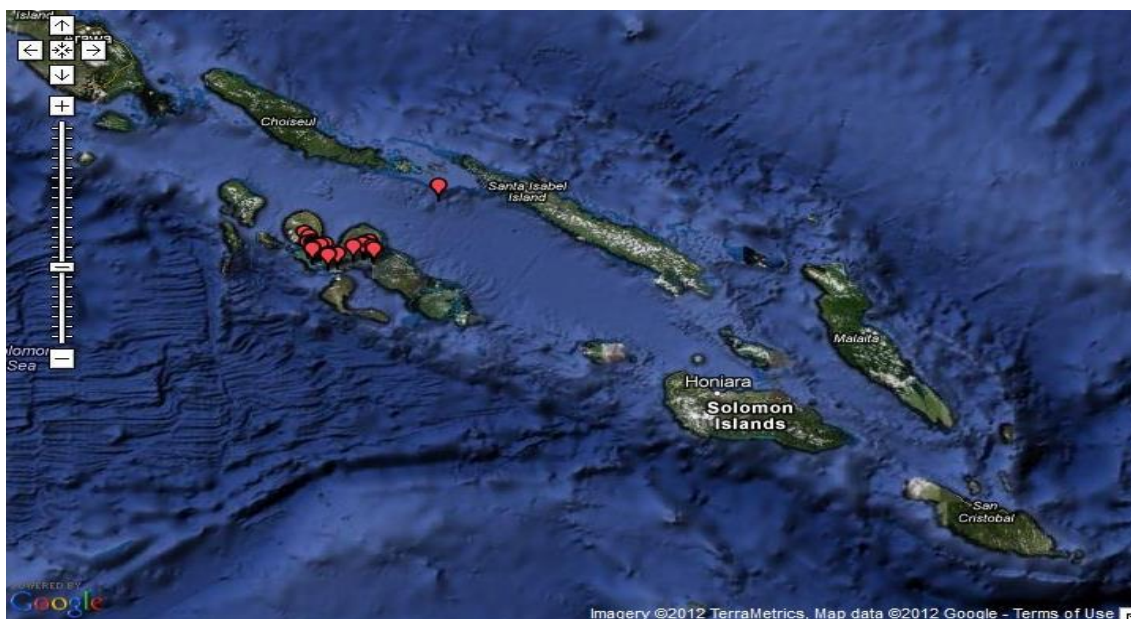


Figure 3-1 Marine protected areas in the Solomon Islands

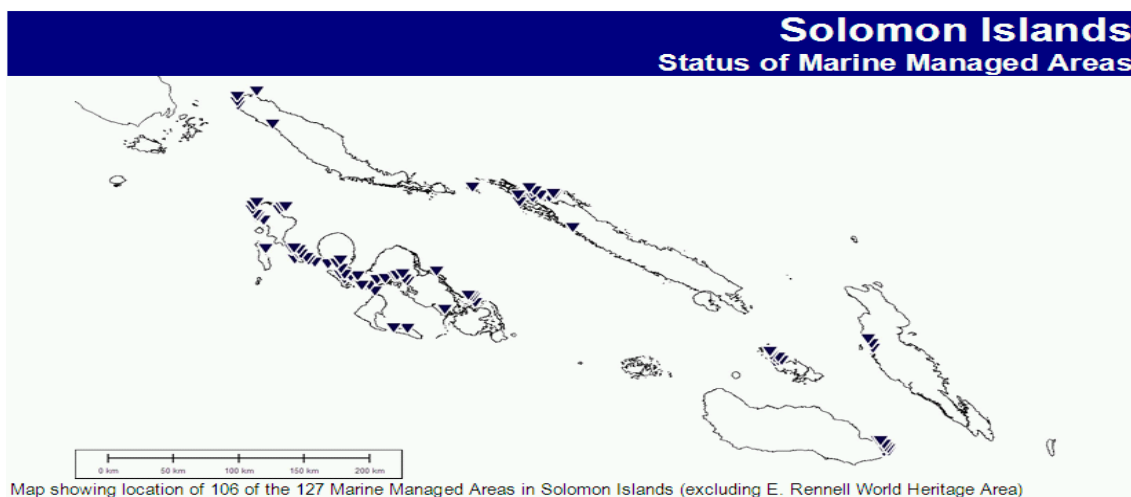


Figure 3-2 Community Marine Managed Areas in the Solomon Islands

3.2.2 Threatened and protected species

As with other Pacific Nations, there is currently little understanding of threatened and protected species knowledge in the Solomon Islands. At present there are no regional resource documenting the types of species that exist and/or are threatened in the Solomon Islands or the Pacific region. Data is often dispersed, taxonomic expertise is absent, and nomenclature and classification systems can be disputed for various species.

Cetacean species are common in Solomon waters and their habitat is usually major rivers, mangroves and open ocean environments such as oceanic islands, oceanic fronts and upwelling, seamounts, canyons, deep-sea trenches and the water column itself. As one of the few equatorial regions worldwide where hemispherical oceanic exchange of a wide variety of marine life occurs, The Nature Conservancy conducted a survey in 2006 to trace movements of these cetaceans. According to a survey, cetacean movements between the South Pacific and North Pacific are known or suspected (depending on the species) to occur through the major island passages of the Solomon Islands' archipelago, such as Indispensable Strait, Bougainville Strait - separating the Solomon Islands from Papua New Guinea (PNG), Manning Strait and New Georgia Sound. These areas have been classified as the migratory corridor for these

marine mammals. There is no known readily available information on their seasonal migrations.

3.2.3 Substrate – offshore and onshore

Knowledge of seabed conditions and sediment types are a key component of submarine cable installation projects as the nature of seabed sediment and existence of reef may impose constraints on cable placement methods and result in unnecessary impacts on the local environment. There is little information available on the distribution of seabed sediments and associated morphology throughout the Solomon Islands for both the offshore and inner shore coastal zones along any of the proposed routes.

3.2.4 Hydrothermal vents and seamounts

Active hydrothermal vent and seamount fields were discovered in the early 2000s at Grover Seamount in the San Cristobal Arc and Starfish Seamounts in the northern New Hebrides arc in the eastern Solomon Islands (McConachy, 2002). The arc-related vent field discoveries in the eastern Solomons are associated with quite localised, gas-rich hydrothermal plumes (methane and carbon dioxide). Hydrothermal vents in the Solomon Islands are common in parts of Marovo, Vella lavela, Simbo and Kavachi in the Western Solomon's and also in Santa Cruz and Savo.

Hydrothermal vents are known to support an abundance of ecological values which inhabit the vent surroundings. Fauna near vents depend on bacteria that are able to convert sulphur found in the vent's fluids into energy through chemosynthesis. The organisms are short lived in their nature and depend on the lifespan of the vents. Likewise, seamounts are a unique ecosystem with high biodiversity in the open ocean.

3.2.5 Wave climate, currents and tides

It is understood that on eastward-facing coastlines, such as Honiara, local seas and swell waves generated by trade winds are generally persistent and form the dominant component of the local wave environment (Gillie, 1992). Typical current strength in the region has been measured to be around 4 knots. The tidal gauge at Honiara indicates that the tides are usually diurnal, i.e. one high and one low tide each day. This is a common occurrence for the Solomon Islands. The tide levels between mean lower low water (MLLW) and mean higher high water (MHHW) ranges between 0.37 and 0.84 m for Honiara. It is clear that the tidal ranges are relatively small. The relevant tidal ranges for a subset of the sites are summarised below in Table 3-1. Given the consistency in ranges across Honiara and Auki, these are considered to be consistent and relevant also for Noro and Taro.

Table 3-1 Tidal ranges at a subset of sites³

	MHHW (m)	MLHW (m)	MHLW (m)	MLLW (m)
Honiara	0.84	0.78	0.62	0.37
Auki	0.79	0.78	0.46	0.25

There is a local phenomenon that occurs where the sea level drops to its lowest level around the month of June and this phenomenon is typically referred to as 'dry reef'. This phenomenon impacts the beaches with low lying coral reefs and hardstand features such as Honiara, Noro and Auki.

³ <https://www.tidetime.org/australia-pacific/solomon-islands/>

3.2.6 Coastal erosion

Coastal erosion (such as the undermining of trees) has been noted at several of the landing sites through observations and anecdotal evidence from local sources (Fugro 2018b). Fugro determined that only a few coastal areas in the South Pacific have been surveyed or mapped often enough to develop consistent and reliable data on shoreline changes and rates of change. Furthermore, no information is available on the magnitude of storm surges associated with cyclones, nor does there appear to be high resolution contour data. The landing sites for this project have not been monitored previously and hence this lack of basic information impedes the carrying out of any detailed coastline erosion assessment, storm bite prediction, and quantitative analysis of flooding and inundation risk.

3.2.7 Natural hazards

Geological hazards

A summary of relevant geological information for the cable routes and landing sites is outlined below:

- Volcanoes are located at proximity to the proposed international route that enters the Solomon Islands EEZ and traverses to Honiara. These are located on Mborukua Island and also Kavachi Submarine Volcano. The latter is one of the most active submarine volcanos in the region.
- Honiara is located on Guadalcanal Island. The landing sites will be on alluvium soils. Volcanoes have been identified on the Northern end of the island. The cable will be at a safe distance away from these volcanoes. On the proposed route from Honiara to Noro, there exists at least one volcano on the island of Savo.
- Noro is located on the New Georgia Islands which has a number of active volcanoes scattered around the island. Based on the geological maps, the geology of the island comprises mainly of volcanic rock such as Andesite. Limestone raised reefs are located offshore of the landing site at Noro. They are also located offshore of the landing at Taro, further west of Noro within the Choiseul Province. No active volcanos have been identified on Taro. In the interest of protecting the submarine cable from abrasion it is best to minimise the reef areas where the cable may be placed and/or ensure appropriate armouring for both the protection of the cable and the reef substrate.
- The proposed route from Honiara to Auki does not appear to traverse near any extreme geological features; however the proposed route does pass through Sealark Channel.
- Auki is located on Malaita Island and the landing point is surrounded by shallow rocky reefs. Malaita Island comprises of Micocene Sediments. No volcanoes have been identified on this island.

Volcanoes

The volcanoes of the Solomon Islands form a NW-SW trending island chain continuing along to the Bougainville Island chain (which forms part of Papua New Guinea) as seen in Figure 3-3. The islands belong to a volcanic arc caused by the subduction of the oceanic crust of the small Solomon Plate under the Pacific Plate. New Georgia Sound constitutes the junction between the New Georgia-Kolombangara-Vella Recent volcanic province and the older Choiseul Cretaceous-Early Tertiary basaltic platform. The main observed faulting is NW-SE⁴. It is understood that this area is tectonically complex, marked by the interaction of several closely

⁴ SOPAC Final Report – CST Area - SOPACMAPS

spaced oceanic microplates separated by subduction zones and short spreading centres, such as one extending from SE New Guinea to Kavachi volcano⁵. The volcanoes in the vicinity of the Solomon Islands are listed in the table below and shown in Table 3-2.

It is understood that four volcanoes in the Solomon Islands have been active in recent history. They are Savo, Kavachi, Cook and Tinakula. Kavachi is a submarine volcano which erupts frequently. Cook is also a submarine volcano however there are doubts of its level of activeness. Both Savo and Tinakula are island volcanoes that have erupted frequently in recent history and have been responsible for considerable damage to surrounding areas of the islands resulting in high death tolls.

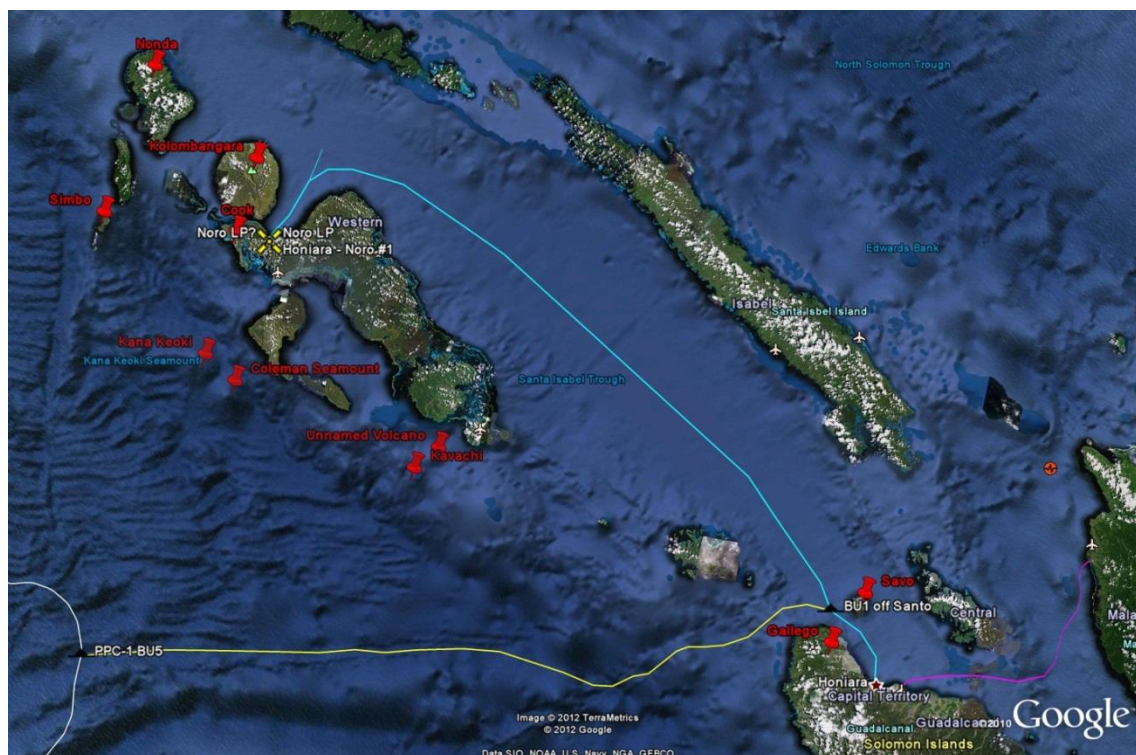


Figure 3-3 Volcanoes in the Solomon Islands

Table 3-2 List of volcanoes around the Solomon Islands

Name of Volcano	Type of Volcano / Current Status	Location
Nonda	Stratovolcano - Dormant	Solomon Islands, -7.67°S / 156.6°E
Kolombangara	Stratovolcano - Dormant	Western Province, Solomon Islands, -7.95°S / 157.08°E
Cook	Submarine volcano – Dormant (Last eruption 1991)	Western Province, Solomon Islands, -8.25°S / 157.06°E
Simbo	Stratovolcano – Dormant (Last eruption ~1910)	Simbo Island, Solomon Islands, -8.28°S / 156.52°E
Kana Keoki	Submarine volcano – Dormant	Western Province, Solomon Islands, -8.75°S / 157.03°E
Coleman Seamount	Submarine volcano - Dormant	Western Province, Solomon Islands, -8.83°S / 157.17°E
unnamed	Submarine volcano - Dormant	Western Province, Solomon Islands, -8.92°S / 158.03°E

⁵ <http://www.volcanodiscovery.com/solomon-islands.html>

Kavachi	Submarine volcano – Dormant (Eruptions in the last 20 years - 2007, 2004, 1999-2003, 1999, 1998, 1997, 1991)	Solomon Islands, -9.02°S / 157.95°E
Savo	Stratovolcano - Dormant	Central Province, Solomon Islands, -9.13°S / 159.82°E
Gallego	Volcanic field - Dormant	Guadalcanal Province, Solomon islands, -9.35°S / 159.73°E
Tinakula	Stratovolcano – Restless (Eruptions in the last 20 years - 2012, 2008-2011, 2006-07, 2002, 2001-02, 2002-2001, 1999, 1995, 1989-90)	Santa Cruz Islands, Solomon Islands, -10.38°S / 165.8°E

Earthquakes

The Solomon Islands are subject to earthquakes and tsunamis. It is understood that seismic activity in the Solomon Islands is generally due to the underthrusting of the Solomon Sea Plate beneath the north western islands of the Solomons, however the tectonic system is complex and the distribution and intensity of earthquakes is varied.

A number of small earthquakes have occurred in the Solomon Islands within the past month, registering below 5 on the Richter scale. Severe/strong earthquakes measuring over 6 on the scale have occurred relatively frequently in the last few years; including one registered at Auki about a year ago in about 4 km WD⁶. More devastating earthquakes have not occurred in recent history but at least more than 5 years ago. Of geographical relevance to the proposed cable a devastating earthquake took place on 2 April 2007 in Gizo, Western Province, near the cable landing for Noro and cable passage to Taro. Its magnitude was calculated by the United States Geological Survey (USGS) as being at 8.1 on the Richter scale. The tsunami that followed the earthquake killed 52 people and resulted in extensive damage to the natural environment. According to the USGS, the focus was 10 km deep and 40 km South South-East of Gizo township on New Georgia Islands. There were numerous aftershocks, the largest of which had a magnitude of 6.2.⁷

Local earthquakes in the coastal zone may directly result in the subsidence or uplift of the shore zone and adjacent terrestrial and marine areas. Subsidence of this nature has been observed at locations such as Noro. Cable land routes and installation will need to take account of this potential risk.

Tsunami

Tsunamis are caused by vertical displacement of seabed fault lines during earthquakes, or by other processes such as a volcanic eruption, volcanic collapse or submarine landslide. Tsunami-generating earthquakes tend to be shallow and of relatively-large magnitude (i.e. greater than Richter magnitude 7), hence the occurrence of a large, shallow earthquake located beneath the ocean will more often than not produce a tsunami, providing there is vertical offset of the sea floor. Currently, the Pacific Tsunami Warning Centre in Hawaii provides tsunami warning advice for the Pacific Island Countries, including the Solomon Islands.

It is understood that the tsunamis experienced in the Solomon Islands originate from earthquakes occurring in the following locations:

- locally;

⁶ https://www.earthquaketrack.com/p/solomon-islands/recent?mag_filter=6

⁷ <http://www.met.gov.sb/index.htm>

- elsewhere in the Solomon Sea (near Bougainville); or
- other parts of the Pacific Rim.

Most of the tsunamis recorded in the past have been generated by submarine earthquakes. The damage and impacts from tsunamis to the coastal zone in the areas of interest have not been well documented; however records indicate a total of 1290 people have died on the Solomon Islands in relation to tsunamis that have occurred since 1899⁸. The strongest tidal wave registered to date within the Solomon Islands reached a height of 59 meters and at least two people are known to have died from this event. However other events since that tsunami have had more widespread impact in terms of injuries, distribution of property and impacts to the economy. Construction and operational activities will need to maintain vigilant watch for tsunami risk and take evasive action to maintain safety of the workforce should a tsunami warning be issued.

3.2.8 Climatic hazards

Tropical cyclones

Solomon Islands lies in the area prone to tropical cyclones. A number of tropical low pressure systems occur each year over the Solomon Islands at times when the equatorial trough is in the vicinity; however few of these develop into tropical cyclones. Average frequency of cyclone occurrence is between one and two per year, tending to increase southward as illustrated in Figure 3-4 and Figure 3-5. Figure 3-5 has been generated based on 36 years of data from 1969 to 2005.

Tropical cyclone season in the Solomon Islands is generally considered to extend from November to April. However, there have been cyclones such as Cyclone Namu and Cyclone Ida that have occurred in mid-May, 1986 and late May-early June 1972.⁹ In addition, tropical cyclones will naturally result in abnormally high ocean tides which may rise up to 3-6 m above the regular tide. This is due to the pooling of sea water by the frictional effect of very strong winds persistently gusting on shore as the cyclone approaches a shallow coastline. This can result in inundation of low lying coastal plains which in turn impacts on beach profile change/seasonal beach oscillation (at some areas as much as 0.5-1 m in beach elevation and 5-

⁸ <https://www.worlddata.info/oceania/solomon-islands/tsunamis.php>

⁹ Solomon Islands Final Report – Natural Hazards and risk assessment in the Solomon Islands – R J Blong – July 1991

10 m in beach width).

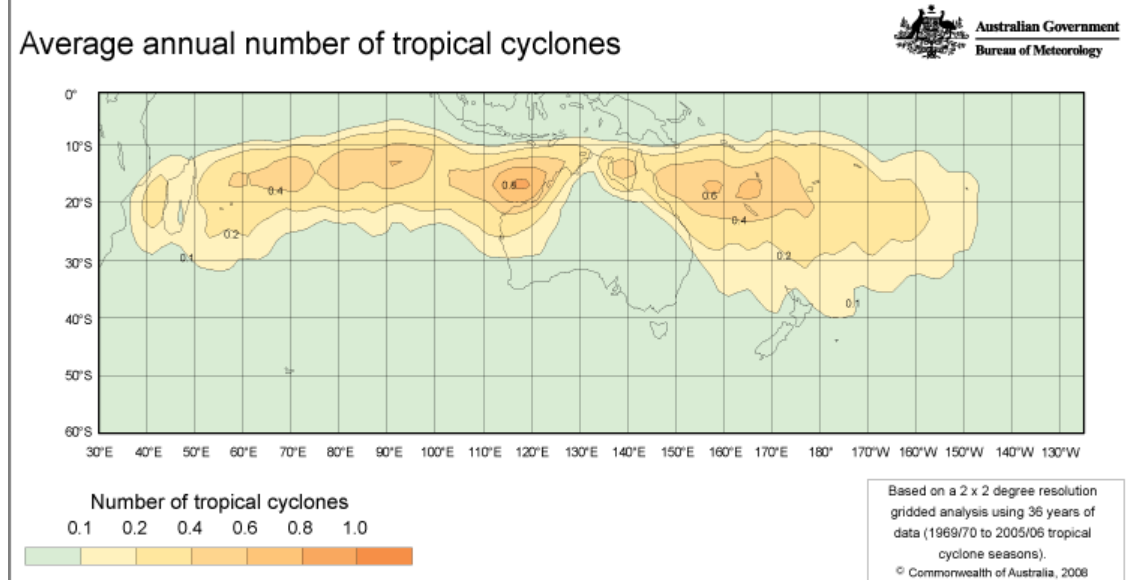


Figure 3-4 Map showing average annual number of tropical cyclones for Australia and the Pacific Region

Tropical Cyclone Information for the Australian Region

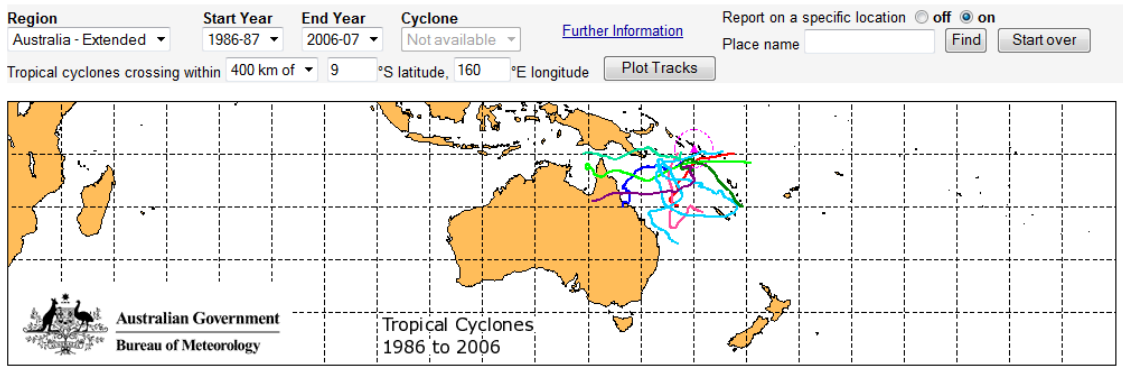


Figure 3-5 Tropical cyclone tracks from 1986-2006 for the Pacific Region¹⁰

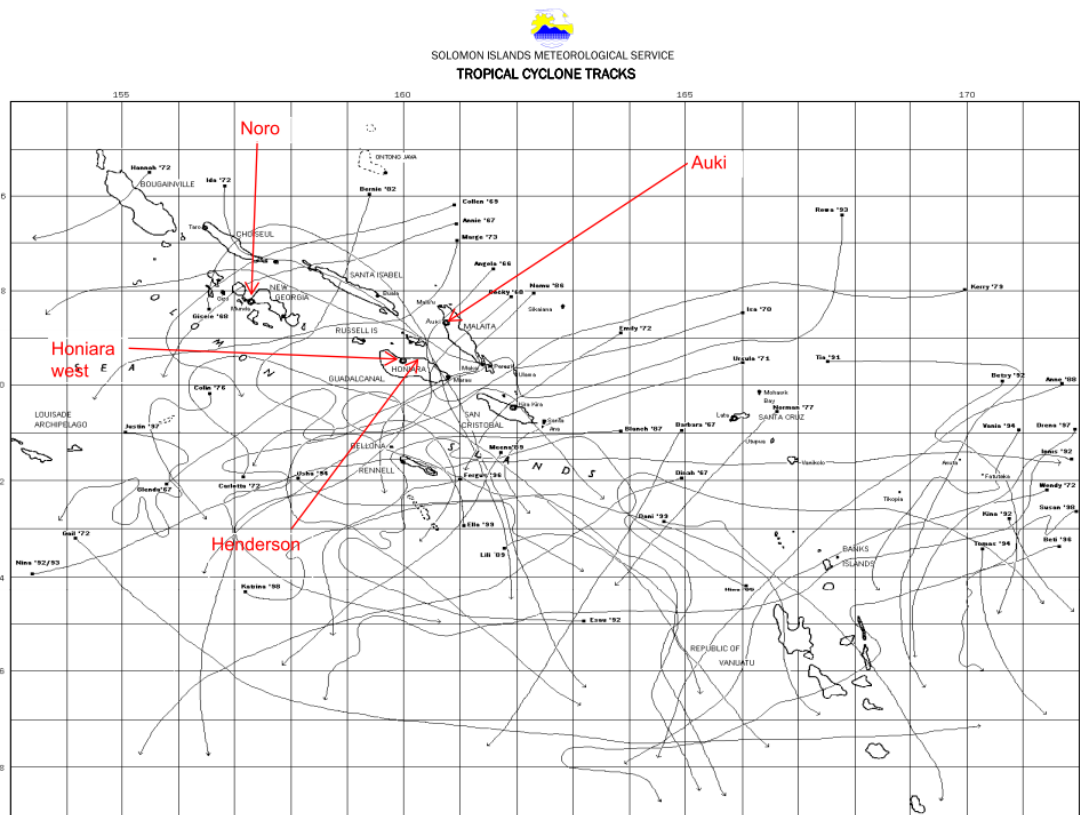


Figure 3-6 Historical cyclone tracks for the Solomon Islands¹¹

Sea level rise

Historical rates of local sea-level change in the Pacific region are variable and dependent on both local and regional factors. In addition changes in sea level can also be associated with non-climatic change processes such as:

- movements in tectonic regimes; and

¹⁰ <http://www.bom.gov.au/cyclone/history/tracks/index.shtml>

¹¹ www.met.gov.sb

- "abnormal" conditions associated with El Nino/Southern Oscillation (ENSO) events (such events have occurred in 1972, 1977/78, 1982/83, 1987, and a recent prolonged moderate event from 1990-1994);

The South Pacific Sea Level and Climate Monitoring Project is an initiative to establish a regional network to monitor the sea level and the possible impact of climate change. The project was developed by the Australia Government in response to concerns raised by the member countries of the South Pacific Forum on the potential impacts of the enhanced greenhouse effect on climate and sea levels in the region. Monitoring stations in the Pacific have only recently been setup and hence the available records cover 10-20 years of data only. The sea level rise predictions gathered during the literature review indicate various and ranging records of both increasing and decelerating sea level rise.

Of the landing sites proposed for cable installation, Taro is at greatest risk of inundation from sea level rise (Albert *et al.* 2016; Peralta 2016). The design and construction of the BMH and CLS will need to take into consideration inundation risk and risk of sea level rise.

Sharks and crocodiles

Sharks and crocodiles are found throughout the Solomon Islands and sightings/attacks are common. Sightings of saltwater crocodiles are common in the Western Province, especially in parts of Noro and Munda. In recent history the frequency of crocodile attacks has been increasing; the most recent fatality recorded has been anecdotally noted in social media was a diver who was indicated to have been attacked in early 2018. In 2017 numerous attacks were reported and a girl was killed in the western provinces. Crocodiles are currently protected however the government is considering control programs to deal with the increasing number of attacks. In Auki, the lake located in the vicinity of the cable route, is crocodile habitat and all cable contractors working adjacent and within the marine environment will need to adopt safety controls to manage the risk of crocodile attack.

In regards to shark bites, sharks are unlikely to attack divers or cable installation equipment as they are likely to be displaced from the area of works due to habitat disturbance. Sharks are usually found in the depth range from the surface to 2,500 m water depth. Regardless, measures to protect works from crocodile attacks should include consideration of risk from sharks and other dangerous marine fauna.

3.2.9 Cable landing environments

Honiara landing

The Honiara landing can be broadly described as a mix of rocky reef and coral rubble/sandy beach and is characterised by low energy processes. From the intertidal zone towards land the beach profile increases gradually into a coral rubble fore dune. To the immediate west of the landing site established vegetation includes a large strangler fig (*Ficus benghalensis*, Figure 3- 7). This tree is not considered native to the area but likely the root system is supporting dune stability.

To avoid impact upon this tree and interference with other facilities occupying this area the landing site was positioned to the east (approximately -9.428741, 159.949311), to come ashore in an area that is already substantially developed, supporting infrastructure (buildings, roads). The tenure is currently government land with a cadastral boundary extending into the sea; the inner 200 m water marine waters comprise customary lands (Figure 2-2).



Figure 3-7 Strangler fig and palms behind recreational facilities (soccer field) to east of Honiara beach landing site, looking across site to west

Beach sediments within this area consist of pebbles and broken coral of pieces approximately 1-5 cm in length. The beach may be subject to high energy waves and/or erosion based on observations such as the undermining of trees and anecdotal evidence from local residents.

Once the cable traverses across the grassed beach dune into the BMH it will be trenched through existing compound infrastructure between buildings and along the compound access road. It will be buried up to 1 m into the ground to avoid potential impact/interference with the cable from any future works.

The alignment will connect with, and then travel briefly along Mendana Avenue, crossing at the roundabout into Sana Place and then travel in a trench towards Hibiscus Avenue/Lenggakiki Road (shown on Figure 2-4). At the junction with Hibiscus Avenue the cable trench will cross the road and connect into a private easement to travel up the hill to connect into the CLS to be positioned on top of Legnakiki Ridge, in lands secured for this purpose, refer Figure 2-4.

An alternative alignment was considered, however it was considered to have too much risk of impact upon existing recreational facilities and interference with vegetation; such as the large fig tree as roots would need to be removed to support trenching works. As such, realignment was informed by potential social and environmental impacts to select the preferred alignment shown.

Use of the private easement has been negotiated with the land owner by SISCC; legal framework for this agreement is currently being completed by SISCC. This alignment will avoid impact upon users and infrastructure associated with Hibiscus Avenue and Lenggakiki Road, the other route via which the cable could have accessed the CLS. This route was not selected given potential impact upon road users during construction and also for potential future impact to cable infrastructure following installation.

Noro landing

The Noro landing is a deepwater port, approximately 12 km northwest of Munda Airport. The cable passes through the Noro channel within Hathorn Sound, which ranges in depth from >60 m to circa 30 m nearshore. This deepwater access is used for commercial port activities. The landing point is located approximately 2.2 km to the north of the Noro township. Bathymetry, as for elsewhere in the Solomon Islands, shoals steeply with transition from deepwater habitat across a coral fringing reef to shallow intertidal reef within a few hundred meters of the shoreline. Anchoring within the Sound within this part of Noro is prohibited. This provides protection to the subtidal cable infrastructure. The landing point is characterised by hard coral flats with the intertidal reef exposed at low time.

As Fugro (2018b) reports, an inwater visual assessment of the cable landing point was completed in July 2014 using snorkelling. That survey indicated the reef systems located within the area of influence of the cable were in healthy condition with substantive live coral cover. Interspersed with the coral and sand patches were seagrasses, algae and numerous other benthic primary producers (sponges, coralline algae etc). Invertebrates included molluscs, echinoderms, crustaceans and polychaete worms typical of shallow reef systems. These areas are also known to support numerous fishery species (juveniles and adults) targeted recreationally, commercially and for subsistence.

The lower reef slope was reported to support between 70-85% cover of healthy diverse coral communities in water depths from 10 m to > 30 m water depths. Dominant species were reported to include *Pocillopora* spp., *Symphyllia* spp., *Stylophora* spp. and *Sinularia* spp. In shallower areas of the upper reef slope, live cover decreased to be less than 50%. The deeper water species were still dominant but in lower cover; *Porities* spp. colonies were also prevalent, particularly in shallow waters. In 2014 it was noted that the reef crest spanned approximately 40 m in very shallow (<0.8 – 4 m) waters (Figure 2-5) and this demarcated a change in habitat conditions. In waters less than 4 m habitats were observed to be dominated by coral rubble with little live cover.

The 2014 site observations were consistent with those made during the 2018 site visit. As far as was plausible without an inwater inspection, the subtidal deepwater reef systems were observed to still be in relatively good health. Shallow intertidal reef systems within the cable landing point were, however, observed to mainly support invertebrates (including juvenile sea cucumbers) and fish. The shallow nature of the reef flat within this location and its exposure during low tide means most of the reef flat is characterised by coral rubble (Figure 3-8). Turtle nesting is not known to occur in the area with beaches being limestone and rocky rubble with very short unvegetated dune systems.



Figure 3-8 Shallow reef flat at Noro beach landing site showing coral rubble

The beach area is also characterised by coral rubble and coral sands. Within the land area large trees are present, including specimens of: *Mimusops elengi*, *Calophyllum inophyllum*, *Casuarina equisetifolia*, and *Tespesia populneoides* (Figure 3-6). A storm water drain is also located in close proximity to the landing site. This is connected to a shallow tidal lagoon immediately behind the foredune and associated with residential property. Previous assessments indicate this lagoon may be used for fish farming; it may also be used to stage water release from the residential facilities into the nearby coastal system.

The alignment is being considered so as to avoid impact to as many of the beach stabilising trees and any residential infrastructure as far as practicable/feasible. Where required, trees and roots will be cleared to support cable landing.

The cable trench is planned to be installed adjacent a fence line within a government easement abutting lands currently used for residential housing, market gardens and subsistence. The BMH is planned to be located at an elevation of approximately 10 m above mean sea level on a dune ridge inland from the beach landing. From that point, the cable trench will connect to the nearby unsealed road and run along the edge of that road back towards Noro to connect into the CLS.

As the landscape along the cable alignment is heavily vegetated this will require significant clearing of plants including palms, ferns, weeds, grasses and some naturally occurring food plants such as paw paws and taro. To the north of the cable alignment market gardens exist; alignment is being planned to avoid impact upon these. Alignment occurs adjacent an existing unsealed road; risk of future impacts to the cable should road upgrade occur informs use of the vegetated road verge for cable trench alignment.



Figure 3-9 Beach and vegetation in vicinity of Noro landing site



Figure 3-10 Vegetation along proposed cable alignment looking towards road

Auki landing

Auki, the provincial capital of Malaita province, serves as the main administrative, educational and economic centre for the province and is one of the largest provincial towns in Solomon Islands. The Auki domestic cable landing point is situated at Kelakwai beach, near the southeastern end of the Langa freshwater lagoon on the northwest coast of Malaita Island.

An inwater visual assessment of the cable landing point was completed in July 2014 using snorkelling (ADB 2014, Fugro 2018b). That survey indicated that the nearshore coastal environment is described by a shallow water intertidal reef flat of sands, rubble and seagrasses. Directly offshore of that limestone reef crest and slope drops quickly into deepwater. The reef crest is approximately 20 m wide and helps break waves from incoming oceanic swells. Hard and soft corals are generally low profile species typically of high energy environments. Coralline and macro algae, sponges and sea whips are also typical of these environments.

The 2014 survey noted that the reef crest was generally always submerged in 1-2 m water; the upper reef slope supported higher coral diversity from circa 2 m water depth down to 30 m water depth. Up to 25% live coral cover was reported; mainly short digitate and encrusting species such as *Porites* spp.

Although an inwater survey was not completed during the 2018 site visit, observation of shallow subtidal seagrass meadows and beach wrack confirmed the reef flat continues to support extensive seagrass meadows. Species include *Cymodocea* spp., *Thalassia* spp. and *Halodule* spp. The meadows were intermixed with various algae such as *Padina* (Figure 3-11).



Figure 3-11 Example seagrasses and algae collected from Kelakwai beach landing site.

The cable is proposed to land on the beach within a vegetated fore dune located at an elevation of about 1.5 m above mean sea level. The dune supports grasses and coastal trees (e.g. *Thespesia populneoides*) (Figure 2-11). The beach sediment is composed of medium gravel, sand with shell and coral pieces (3-10 cm in length). The surrounding area behind the beach is of relatively low gradient and the sediment along the cable route is predominantly compacted coral sand and clay with some shell and pebble content.

Behind the beach dune system the area is generally low lying and the groundwater table appears to be shallow with much of the lands behind the beach dune swampy in nature. Fugro (2018b) suggests the elevation of the back beach/dune may represent a depositional feature or tectonic uplift, which is common in this area.

While the reef crest and lagoon system will afford some protection to the beach environment from severe storms/waves; trees within this area will also be offering stabilisation to the beach environment. Selection of the cable landing point and BMH installation area have taken this into account to minimise need for any vegetation clearing. The cable alignment has also considered potential for interference with other users; the beach environment is accessed by the coral sand road by nearby residents for recreational activities.

The nearest residents to the landing live in Lilisiana Village. This village lies 100-200 meters to the south-east of the existing road from the beach. The village and surrounding area supports households, school facilities and market gardens.

To the direct north of the BMH is a lake. The unnamed road that facilitates access to the beach near the cable landing point also crosses the headwaters of the lake. The road is built up higher than the lake level and supports water retention within the lake. Lower lying lands on the south-eastern side of the road drain into ditches beside the road with water channelled into the lake via a culvert that runs beneath the road (Figure 3-12). Surrounding lands are, therefore, swampy in nature and used for market garden crops of sago and swamp taro.



Figure 3-12 Lake (left) showing road edge and culvert; drainage point into lake on right side road (right) showing limited water body

As shown by the alignment displayed on Figure 2-9, the cable is proposed to be trenched 1.5 m into the ground along the unnamed road that provides access to the beach. At a point 637 m from the beach and 395 m from the lake the cable will turn south to traverse through village before reconnecting to a different unnamed road. The cable will be trenched (1.5 m deep) into the easement beside the road, pass between government buildings and eventually connect into the CLS located in the main town centre (Figure 2-9).

A potential alternative cable alignment was also considered within this area that would reduce need for disturbance to the road. It would, however, require greater land clearing of vegetation. That alignment is currently being discussed with customary land holders to understand which option would provide the least impact to village and garden activities. The proposed and assessment alignment is the current preferred option. It is also the option considered likely to require the most disturbance of existing road infrastructure and, hence, has the greatest potential to interfere with other road users. As such, it has been used for this assessment as representing the worst case scenario. Should any alternative alignments be selected at a later time, the assessment completed here is considered to be of direct relevance to addressing impacts that may occur from that alignment.

Taro landing

Taro island is the provincial capital of Choiseul Province. It is located in Choiseul bay off the northwest coast. Significant infrastructure currently occurs on the island including the Taro Hospital, which is the main referral hospital for health care in the Choiseul Province. Other government offices and infrastructure located on the island include Royal Solomon Islands Police and RAMSI and Telekom.

Prior to World War II Taro Island supported a coconut plantation. Today much of the island is occupied by the grass airport runway (to the north, crossing the entire island), solar farm (adjacent the airport and nearby swamp area), residential housing, school facilities and government infrastructure.

Primary mode of transport on the island is by walking. Small craft are used to support transit between Taro Island and other nearby islands.

The island is low lying with only 5% of the island (two hectares) considered to be more than 3 m above sea level (Fugro 2018b) and research (e.g. Albert *et al.* 2016) has shown it is highly susceptible to sea level risk, raising concerns that residents and infrastructure may need to be relocated in the near future. Studies are, however, considering how the island can be made resilient to any future sea level risk to avoid impact upon residents and infrastructure.

The proposed cable alignment will connect with Taro Island from deepwater channel access to the south of the island (Figure 3-13). To the north, this channel is marked to support navigational passage for the freighter and ferry commercial shipping movements. The cable will follow the deepwater channel to connect into a beach landing site on the eastern edge of the island, south of the commercial port.



Figure 3-13 Taro Island, Redman Island and the proposed southern marine cable route presented by Fugro 2018b

Fugro 2018b reported that the channel depth immediately off the landing site is estimated to be 12-26 m of depth. As such, the cable may be surface laid by the cable laying ship to a point immediately offshore, and then floated ashore to be installed into the BMH.

The reef crest flat in this area are typical of islands in the Solomon Islands. This area shoals steeply into deepwaters and supports a mix of limestone blocks, coral rubble, live hard and soft corals and other invertebrates. This area is not known to support any seagrasses and turtles, while known to pass through the channel are not known to use any of the areas on the island for nesting. The beach in this area is short and supported by trees similar to those found on other islands.

Approximately 48 m from the beach dune is the Telekom telecommunications facility; located inside a fenced and gated plot about 44 x 28 m in size. The cable is planned to be installed using an articulated pipe across the reef flat, trenched through the shallow beach dune and installed into a CLS that will be established immediately adjacent the Telekom building (Figure 2-15).

Immediately in front of the Telekom building and proposed CLS is a public path. The cable will need to be trenched through this area and that will briefly interrupt use of the path to transit to/from market and other buildings. There are suitable other alternative routes and, as such, this is not considered to be an impact of concern for the proposed landing. Fishing in the channel area is not considered to be common. Small craft accessing the island tie up or anchor at a location further north along the channel, adjacent to the market area. Immediately adjacent the landing site, to the south, is a residential house complex built across reclaimed lands back to the beach dune and path area. This area is not going to be affected by the cable landing. The owner was consulted during site visitation and indicated support for the cable installation.



Figure 3-14 Taro cable landing beach site with house located on the edge (left) cable route from close to the tree looking towards the beach and house (right)

3.3 Social values

3.3.1 Honiara

As the capital of the Solomon Islands, Honiara serves as the main administrative, educational and economic centre for the country. The main economic activities in Honiara are in the services sector, including wholesaling, retailing, banking, restaurant and hotel related businesses (UN Habitat, 2012).

The cable approach to the Honiara landing through the Savo Sound, is known as the Iron Bottom Sound. The region contains numerous shipwrecks and aeroplane wrecks and is considered by some government agencies (including the US Navy) as sacred waters from World War II which took place in the Solomon Islands between 1942 and 1943.

The landing site at Honiara is approximately 1.5 km west of the city center on a government owned property. The property is 0.75ha in size and was previously an expatriate club known as the 'G Club'. Now owned by the MPF, the site includes several buildings, a sheltered seating area, small sports field, hard courts, a disused pool and gymnasium (refer to Figure 2-2). Several of the buildings are used by the University of the South Pacific (USP) for Pacific TAFE courses.

The property borders the beach to its north, Mendana Avenue to its south, on the other side of the eastern fence of the property are office buildings on a private property. Along the cable route from the beach landing to the CLS, the social environment includes main roads like Mendana Avenue, Hibiscus Avenue/Lenggakiki Road. These are busy roads and provide arterial connectivity for the city. A mixture of commercial and residential use is noted along either sides of the roads, until the cable turns into a provide property easement with established residential use along the easement.

Fishing for subsistence/consumption or for cash is common in Solomon Islands, and although the cable landing point area is not a regular fishing ground or launch point, local fishermen are very likely to informally and irregularly fish these beaches and waters.

3.3.2 Noro

Noro is the main industrial center in the Western Province. Noro has grown rapidly over recent years, from 3,365 persons in 2009 to 6,054 in 2016. Known as 'Tuna Town' in the Solomon Islands, Noro is home to the country's two biggest commercial fishing companies: Soltuna Fishing and Processing, and the National Fisheries Development. Together, the two companies employ 1,550 people, and the majority of workers are female (Noro Town Council, 2017). Many of the employees live in a village directly next to the cannery. Noro hosts the country's second international seaport, particularly busy for fishing vessels and timber shipments. There are several schools, shops and services, and a market located in Noro town.

Noro is connected to Munda by a well-maintained highway, linking to a post office, Telekom office, bank, rural hospital and police post as well as schools and tourist accommodation. Further industrial growth is planned for Noro and expansion of the tourism industry is also proposed for Munda, which is a key destination for scuba divers.

The proposed landing point for the cable is located just outside the centre of Noro, on the land adjacent to the property owned by the Markworth group. The cable route on the land will be through a Utility Easement designated by the Government of Western Province. At the time of site visit it was noted that the easement was primarily vacant bushland with three informal vegetable gardens located up the rise towards the coral road reserve, which had banana, cassava, potato plantations made by three separate families that lived in the neighbouring

village. Two houses are located at a fair distance on either side of the easement. The coral road connects to Neip Road on one side and an old saw mill on the other. The coral road is used mainly as a pedestrian walk way by people of the village and those accessing Noro town from the saw mill. Some cars were also observed on the road reserve.

3.3.3 Auki

Auki is the capital of Malaita Province, with a population of around 5,000 persons in 2009 (Solomon Islands National Statistics Office, 2009). Auki is the main port, with shipping services to Honiara and to other parts of the island and a daily market providing the focal points of the town. As the provincial capital, it is a main service town with several government offices, post office, Telekom office, bank, several primary and high schools, local market, several stores, service stations, market and some tourist accommodation.

Once on land the cable route will be partly located on an unnamed road, past a fresh water lagoon and through the Lilisiana Village within the customary land of the Aisisiki Group, and then partly along existing roads through the town till it connects to the CLS in town near the market.

Within the customary land the cable route travels past approximately 20 houses in close proximity and the edge of the Alotaa School boundary. Along the roads beyond the customary land there are mainly houses located on either sides of the road and commercial use along the roads in town.

The beach and waters in the vicinity of the cable landing point is used for fishing and recreational activities by the locals.

3.3.4 Taro

Taro island is the provincial capital of Choiseul Province. It is mainly a service town with a hospital, government offices and infrastructure located on the island; these include the Royal Solomon Islands Police and RAMSI and Telekom. A market occurs daily visited by surrounding island residents and the island is serviced by an airport with 2-3 flights from Honiara per week.

The cable landing point is at a small beach, with a house located on one side and the beach used by the home owner to keep their boats. There are other houses on the other side of the beach, but further away from the landing point. The cable crosses a small road which is used for pedestrian access to the main town centre/market area by the households in that area and sometimes to access the airport from the town centre.

Fishing or recreational use was not observed in the vicinity of the beach where the cable will land.

3.4 Summary of values

The values known to exist within the area of influence at each of the cable landing locations are summarised in Table 3-3. These values have potential to be affected by the proposed cable works.

Table 3-3 Summary of values present within each cable alignment

Location	Honiara	Noro	Auki	Taro
Marine Protected Areas	None overlapping	None overlapping	None overlapping	None overlapping

Location	Honiara	Noro	Auki	Taro
Hydrothermal Vents and Seamounts	None overlapping	None overlapping	None overlapping	None overlapping
Threatened and Protected Species	Occasionally overlapping from transient movements	Occasionally overlapping from transient movements	Occasionally overlapping from transient movements	Occasionally overlapping from transient movements
Coral Reefs	Present on reef crest	Present on reef crest	Present on reef crest	Present on reef crest
Seagrass Meadows	None overlapping	Present on reef crest	Present on reef crest	None overlapping
Mangroves and coastal trees	None overlapping	Present	Present	Present
Lagoons and Estuaries	None overlapping	Adjacent; man made	Adjacent alignment	None overlapping
Terrestrial Protected Areas	None overlapping	None overlapping	None overlapping	None overlapping
Crocodile Habitat	Nesting areas absent	Nesting areas absent	Nesting areas absent	Nesting areas absent
Residential housing, and commercial operations	Present	Present	Present	Present
Community use (schools, recreational use, roads)	Present	Present	Present	Present
Private land ownership	Present	Not present	Not present	Not present
Customary land ownership	Not present	Not present	Present	Not present
Government land ownership	Present	Present	Present	Present

4. Assessment of potential impacts

4.1 Potential impacts

This section provides an analysis of the potential environmental and social impacts of the project for the following stages of the project:

- Construction Phase – cable laying activities from the existing cable stations, along the land based routes, through the beach/intertidal zone and offshore, including potential environmental impacts, impacts to communities and cultural values, and influence of natural hazards and geological features; and
- Operations Phase - during operation of the cable and any maintenance that may be required.

4.1.1 Construction phase

Below is a list of the potential environmental and social impacts considered for this project.

Offshore cable laying

- Mobilisation of sediment
- Vessel and underwater noise emissions
- Artificial lighting
- Vessel discharges
- Atmospheric emissions
- Invasive marine species
- Marine fauna collision/entanglement
- Accidental waste release from vessels
- Seabed disturbance
- Interference with other users of the marine environment

Onshore cable laying

- Mobilisation of sediment
- Artificial lighting
- Atmosphere emissions
- Interference with other users of the lands through which the cable will traverse

4.1.2 Operation phase

Cable maintenance carries same impact risks as installation work impacts listed above.

4.1.3 Decommissioning phase

Decommissioning and demolishing of onshore CLS and ancillary equipment carries same impact risks as installation work impacts listed above.

Potential impacts are detailed in Table 4-1. A conceptual model summarising the potential impacts is provided below in Figure 4-1.

4.2 Mitigation measures

Table 4-1 presents a description of potential impacts that could occur as a result of the project; and identifies relevant management and mitigation strategies. These are provided with the aim to avoid and/or minimise potential impacts to various environmental or social aspects associated with the proposed works. Mitigation measures provided represent the minimum requirements that should be adopted during the construction, operational or decommissioning phases of the project.

Table 4-1 Mitigation measures

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
Offshore works – Operation of the sea vessel	Collision with marine fauna from vessel movements and disturbance to marine megafauna.	Marine works are planned to avoid turtle nesting periods. Survey equipment will be used with output frequencies and sound energy density levels below the threshold for marine mammals. Vessel crews to keep watch of cable laying areas for possible occurrences of dolphins, whales, turtles and dugongs. Should there be any sightings of any of the marine mammals in the vicinity of the work area, the vessel will execute measures to avoid collisions and/or disturbances; this may include not changing course suddenly but decreasing speed to enable animal to move out of vessel pathway.	The vessel Principal Contractor will manage project timeframes and activities to avoid disturbance to marine fauna. Interference with any marine megafauna should be reported by the Contractor to the relevant regulatory authority. Details to be noted should include the date and location of the interference, description/identification of the megafauna and any corrective action taken.
	Off-shore release of potential contaminants, pollutants (including hydrocarbon spills) from off-shore activities.	All chemicals (environmentally hazardous) and hydrocarbons will be stored in closed, secure and appropriately bunded areas on board the vessel; Storage of materials should not be in areas at risk of inundation; Any equipment or machinery with the potential to leak oil will be enclosed in continuous bunding or will have drip trays in place where appropriate; A Material Safety Data Sheet will be available for all chemicals and hydrocarbons in locations nearby to where the chemicals/wastes are stored; Spill clean-up equipment will be located where chemicals and hydrocarbons are stored and frequently handled (i.e. 'high risk' areas) and the quantity of spill recovery materials will be appropriate to the quantity of stored chemicals. Spills will be cleaned up immediately; Any contaminated material collected will be contained on board for appropriate onshore disposal;	The vessel Principal Contractor will ensure potential contaminants, pollutants (including hydrocarbon spills) are managed in accordance with this ESMP and relevant legislative requirements. An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP.

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>Refuelling operations will be a manned operation and in the event the refuelling pipe is ruptured the fuel bunkering activity will cease by turning off the pump;</p> <p>Any lifting equipment will be rated, certified and lifting will only be conducted in suitable weather and sea state conditions. Items on board the vessel will be securely sea-fastened to reduce the chance of dropped objects polluting the seafloor.</p>	
	Off-shore release of emissions from off-shore activities.	<p>Where appropriate, at night vessel deck lighting will be switched off and spot lights directed inboard to reduce direct light spill onto marine waters. Vessel machinery should be maintained in accordance with the manufacturer's specifications to reduce noise emissions;</p> <p>Catalytic converters and exhaust filters will be correctly fitted where appropriate and available to minimise diesel exhaust emissions. Idling time of diesel engines should be limited and engines should not be overloaded;</p> <p>Vessel engines will hold a valid and current International Air Pollution Prevention Certificate (IAPPC); and</p> <p>Ozone-depleting substances (ODS) will not be deliberately released in the course of maintaining, servicing, repairing or disposing of systems or equipment, and through good maintenance, fugitive emissions will be minimised.</p>	<p>The vessel Principal Contractor will ensure potential emissions are managed in accordance with this ESMP and legislative regulatory requirements.</p> <p>An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP.</p>
	Waste generated during off-shore works impacting upon the marine environment.	<p>Sea vessel operations will comply the standards set out by MARPOL at all times.</p> <p>Any waste generated on the vessel including (but not limited to) sewage, oily water, plastics and food waste will be collected and disposed of onshore or in accordance with MARPOL.</p>	<p>The vessel Principal Contractor will ensure waste streams generated during off-shore works are managed in accordance with this ESMP and legislative regulatory requirements.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>Scupper plugs or equivalent will be available on vessel decks where chemicals and hydrocarbons are stored and frequently handled (i.e. 'high risk' areas);</p> <p>Non-hazardous, biodegradable detergents will be used for deck washing.</p>	<p>An inspection checklist will be developed by the vessel Principal to monitor and report on compliance with this ESMP.</p>
<p>Offshore works – Placement of cable on the seabed</p>	<p>Disturbance to the seabed within the path of cable laying (including benthic layer, sea grass meadows, kelp and other marine vegetation) and impacts to marine fauna.</p>	<p>The cable laying route in deep waters will be positioned to avoid underwater features such as rocky reefs.</p> <p>A pre-laying cable survey will identify any debris along the proposed cable laying route. The route may be adjusted to avoid</p>	<p>The vessel Principal Contractor will ensure the measures to minimise risk of introduction or spread of invasive species are carried out in accordance with the ESMP and relevant regulatory requirements.</p> <p>The vessel Principal Contractor will ensure certificates and risk assessments have been obtained and are valid prior to commencement of construction.</p> <p>Should the vessel crew identify risk of any marine pest introduction; the vessel Principal Contractor will notify the relevant regulatory authority for the jurisdiction in which the observation has been made. That regulatory authority will advise on the required course of action.</p> <p>The vessel Principal Contractor will avoid installation of cable across any ecologically sensitive areas by adhering to the pre-determined route position list. The vessel Principal Contractor will not anchor in</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>these areas and minimise the requirement for further seabed disturbance from pre-lay grapnel runs.</p> <p>Cable placement activities to include detailed records of cable locations to enable relative certainty of cable position during cable maintenance grapnel activities.</p> <p>Ecologically sensitive areas will be identified and avoided if possible.</p> <p>If vessel anchoring is required, it will be avoided in any ecologically sensitive areas such as seagrasses or rocky reefs.</p>	sensitive habitats except in the event of an emergency requirement.
	Interference with other users of the area affected by cable laying	<p>Stakeholder consultation with the commercial fishing industry, and others, who could be affected by offshore works;</p> <p>Visual observations will be conducted by trained watch keepers on all vessels 24 hours per day to support management of collision risk or entanglement / interference with other users.</p>	<p>The vessel Principal Contractor will ensure measures to minimise interference with other users are managed in accordance with this ESMP and any instructions from maritime safety.</p> <p>The vessel Principal Contractor will develop and implement activity relevant safety management plans that prescribe measures to mitigate risk of interference with other users, inclusive of submitting a notice to mariners and maintaining the security of work areas in shallow waters from risk of interference with recreational or other vessel traffic.</p>
	Disturbance of any wrecks or unexploded ordnance.	<p>A pre-laying cable survey will identify if any wrecks or unexploded ordnance are within the proposed cable route;</p> <p>In the event that the proposed cable routes traverse wrecks, the route should be modified based on the results of the survey in order to avoid laying cable through, over or immediately adjacent to any wrecks;</p>	If required, a qualified maritime archaeologist should review findings to assist the marine geophysicist choose a suitable cable route that will avoid cultural material.

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>If, during cable laying operations, a wreck is encountered, measures should be undertaken to lay the cable around the wreck, where possible. If a wreck is disturbed, measures will need to be undertaken to minimise the impacts, inform the appropriate authorities, keep records of the impact and notify a qualified maritime archaeologist, where required.</p>	
<p>Onshore works – Onshore site establishment (including temporary facilities and stockpiles). Onshore trenching. Repair/upgrade the vehicle access tracks to the beach. Excavation of material. Construction site decommissioning and make good.</p>	<p>Potential disturbance to native vegetation in areas to be cleared.</p>	<p>Minimise the construction area footprint and avoid, where possible, disturbance to native vegetation; Place site depots, equipment compounds and stockpile areas on previously cleared areas away from trees, bushes and native grasses, where possible; Avoid work/storage within the drip-line of trees to prevent damage to the tree roots and soil compaction. Use existing access tracks where possible to minimise additional disturbance; Reinstate any areas of vegetation, including road verges, which have been impacted during the construction phase;</p>	<p>The vessel Principal Contractor will ensure measures to minimise reef disturbance are managed in accordance with this ESMP and relevant legislative requirements.</p> <p>The Contractor and Site Clerk will ensure measures to minimise vegetation disturbance are managed in accordance with the ESMP.</p> <p>An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.</p> <p>All disturbed grounds will be reinstated to condition equivalent or better to that pre-Construction works. At decommissioning all installed cable infrastructure will be removed unless agreed otherwise with regulators.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
	Impact to the natural movement of surface and groundwater	<p>Existing natural drainage paths and stormwater facilities not blocked or restricted.</p> <p>Runoff from unsealed areas at the construction sites does not enter stormwater drains or natural drainage lines.</p> <p>Control surface run-off entering and leaving the work areas and divert stormwater around stockpiles.</p> <p>Cleared areas to be stabilised / rehabilitated promptly and where possible enhance the natural value of these areas.</p>	An inspection checklist will be developed by the Contractor to monitor and report on compliance with the ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.
	Impact to water quality	Minimise runoff, erosion and associated water quality issues resulting from sediment disturbances during onshore works, particularly around waterbodies or road verges that drain to coastal waters or wetlands.	An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.
	Noise and vibration from construction activities may impact on nearby sensitive receptors including residential dwellings	Work hours will be between 6am and 6pm Monday to Saturday only.	The Contractor will ensure works occur within the given periods.
	Waste generated during construction inappropriately disposed of and impacting the environment.	<p>All waste generated during construction to be appropriately disposed if not able to be re-used on site - No plastics are to enter any waterway or ocean.</p> <p>No burning or burial of hazardous waste on site.</p> <p>Any food waste should be contained and removed from site regularly to prevent attracting pest species.</p>	<p>The Contractor will ensure waste is managed in accordance with this ESMP.</p> <p>An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP.</p> <p>The Site Clerk will routinely inspect the vessel and operational procedures against the Inspection Checklist to ensure compliance with ESMP requirements.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
	Disturbance of sediments	All sediment that is disturbed during the trenching process will be restored as trenches are backfilled	An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.
	Disturbance of crocodile habitat	Vessel crews and hired workers should keep watch when laying cable in areas where there are possible occurrences of crocodiles. Any sightings should be reported to the site clerk, including date and location, identification and description.	Sightings of crocodiles should be reported to the Site Clerk, including the date and location of the sightings, as well as identified and description of the animal (size, behaviour).
	Impacts to road, water or power networks.	The Project will be required to submit plans and work descriptions to the Ministry of Infrastructure and Development, and will include sketches of the proposed infrastructure layout, planned work, schedule and environmental management control plans. Notifications and permissions may be required from Solomon Water and Solomon Power if the cable route will impact on water or power networks.	SISCC will require the Contractor to submit plans and work descriptions to relevant regulatory stakeholders to manage risk of interference with other services. The Contractor will seek all relevant permissions prior to installing any infrastructure with potential to interfere with other services.
	Interference with other users of the area affected by cable laying	Cable corridor will traverse through areas including roads, footpaths, private lands and public spaces. During installation works or operational maintenance other users of these spaces will be affected to manage safety and environmental risks. This will include impacts upon traffic passage. Stakeholders with potential to be affected will be notified of proposed construction works and relevant management plans will be in place to mitigate risk of safety or traffic incidents occurring.	The Contractor will develop site relevant traffic, safety and construction management plans that prescribe measures to mitigate risk of interference with other users. The Site Clerk will ensure described measures are implemented.

Figure 4-1 Conceptual model of potential impacts

5. Environmental and social impact management plan

5.1 Purpose of this ESMP

This ESMP seeks to provide guidance to avoid and/or minimise potential environmental and social impacts associated with the proposed cable works. It also identifies potential mitigation measures and management strategies that should be adopted during construction or operational works to manage risk of environmental or social harm occurring.

The purpose of the ESMP is to:

- Provide for works to be carried out in accordance with applicable legislation, guidelines, policies and/or standards;
- Outline measures to monitor and control potential risk of environmental or social impacts occurring as a consequence of the proposed works;
- Provide government, community and other stakeholders with assurance that environmental and social issues associated with the works are managed appropriately; and
- Allocate responsibilities for the implementation of relevant impact/risk management measures.

The proposed ESMP will address the following phases of the proposed works:

- Construction of land based infrastructure to support cable landing
- Construction and laying of cable infrastructure across land and water environs out to the Solomon Islands EEZ
- Operation of the cable infrastructure

5.2 Scope

It is understood that Contractors will be engaged to install land based cable infrastructure, inclusive of the BMH and CLS infrastructure. Separate Contractors will be engaged to install the submarine and terrestrial telecommunications cables. Other Contractors may also be engaged during operational works to support any operational maintenance works required. This ESMP should be read, understood and adapted for use by all Contractors across all phases of works.

5.3 Implementation responsibility

Managing environmental and social issues and promoting awareness of such during project related site works is an essential component of responsible project management. It requires the active consideration of environmental, social, health and safety issues as a prerequisite to all works. This section identifies the parties who will be responsible for implementation of key management measures required to avoid or minimise likely impacts.

The roles and responsibilities of key participants in implementing the ESMP for the project are outlined below:

- The SISCC Principal
- The Site Clerk (also referred to as site supervisor, assigned by the Contractors Principal)
- Contractors and Staff

The Construction Contractors will be responsible for ensuring this ESMP is implemented by all staff or any subcontractors involved with the construction works.

The SISCC Principal will ensure that all contractual documents specifically quote an ESMP in terms of responsibility for addressing and implementing relevant environmental and social requirements. The contractual documents should also indicate that the Contractor is responsible for ensuring legislative and ESMP compliance controls are maintained on site.

The SISCC is responsible for confirming, and if required, obtaining, Development Consent from the ECD within MECCDMM. Alternatively, the SISCC is responsible for obtaining a waiver of Development Consent requirements. The SISCC Principal will provide such to the Contractor in support of project delivery.

The Contractor is responsible for obtaining all other relevant approvals/permits/licences prior to works commencing.

The Contractor will appoint a Site Clerk who will have overall responsibility for ensuring that all employees, subcontractors, and persons involved with the planning and carrying out of the proposed works are familiar with their obligations to comply with environmental or social requirements.

Successful implementation relies upon support for, and compliance with, the ESMP's requirements from all involved parties. outlines the phases of the project and the responsibilities of the principal, Site Clerk and contractor(s) and staff during the phases of the project.

Table 5-1 Project Role Description and Responsibility

Phase	Role	Responsibility
Planning	SISCC Principal	<ul style="list-style-type: none"> Responsible for the overall supervision and co-ordination of the project. Responsible for ensuring environmental compliance during the design phase. Responsible for undertaking appropriate land access consultation, negotiation and compensation with private, government, customary landholders and informal vegetable garden owners in Noro. Responsible for consultation with stakeholders and public notification about the project. Responsible for review of the draft ESMP and preparation of final ESMP prior to construction commencing, including finalisation of the SCP and Grievance Management Procedure. Agree procedures for emergency response. Agree frequency and method of auditing, monitoring and other matters which are to be reported to SISCC.
Construction or Operational works	SISCC Principal	<ul style="list-style-type: none"> Key contact and representative of SISCC Responsible for ensuring contracts adequately identify requirement for ESMP adherence and compliance Responsible for reporting any breaches of ESMP conditions to the ECD within MECCDMM Responsible for regular progress reporting to DFAT

	Contractor Principal	<ul style="list-style-type: none"> • Responsible for obtaining all required site licences to support effective implementation of the ESMP and completion of all works with regards to legislative obligations • Responsible for ensuring reviewing, updating and revising the ESMP to be consistent with legislative requirements for site works • Responsible for ensuring adherence and compliance with the ESMP including preparation of management plans and workforce strategy as outlined in the ESMP • Responsible for reporting any breaches of ESMP or legislation to the SISCC • Responsible for appointing an appropriate Site Clerk to oversee all ESMP requirements
	Site Clerk	<ul style="list-style-type: none"> • Responsible for supervising, managing and implementing environmental and social controls, requirements, licences and procedures described by the Contractor Principal and/or the ESMP • Conducts environmental audits/monitoring during all stages to ensure implementation of requirements • Ensures provision of appropriate training or site instructions to site staff to enable them to meet their environmental and social obligations • Maintains records of site works, including any training regarding adherence to ESMP requirements, site incident reports or site complaints management • Responsible for the emergency response procedure for environmental, health, safety or other social incidents and reporting of such to the Principal
	Contractor(s) and staff	<ul style="list-style-type: none"> • Implement environmental and/or social controls described by the ESMP and/or Site Clerk • Report all incidents to the Site Clerk

5.4 Site description

Site identification details are summarised in Section 2 of this PER.

Detailed description of environmental and social values of the site that have potential to be affected by the proposed works are also described by this PER. This has informed identification of those management controls and procedures considered to be minimum requirements for implementation as part of this ESMP.

5.5 Environmental management controls and procedures

The required management objectives to be adhered to for implementation of this ESMP are summarised in Table 5-2.

Table 5-2 ESMP controls and procedures

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
Offshore works – Operation of the sea vessel	Collision with marine fauna from vessel movements and disturbance to marine megafauna.	<p>Marine works are planned to avoid turtle nesting periods. Survey equipment will be used with output frequencies and sound energy density levels below the threshold for marine mammals.</p> <p>Vessel crews to keep watch of cable laying areas for possible occurrences of dolphins, whales, turtles and dugongs.</p> <p>Should there be any sightings of any of the marine mammals in the vicinity of the work area, the vessel will execute measures to avoid collisions and/or disturbances; this may include not changing course suddenly but decreasing speed to enable animal to move out of vessel pathway.</p>	<p>The vessel Principal Contractor will manage project timeframes and activities to avoid disturbance to marine fauna.</p> <p>Interference with any marine megafauna should be reported by the Contractor to the relevant regulatory authority. Details to be noted should include the date and location of the interference, description/identification of the megafauna and any corrective action taken.</p>
	Off-shore release of potential contaminants, pollutants (including hydrocarbon spills) from off-shore activities.	<p>All chemicals (environmentally hazardous) and hydrocarbons will be stored in closed, secure and appropriately bunded areas on board the vessel;</p> <p>Storage of materials should not be in areas at risk of inundation;</p> <p>Any equipment or machinery with the potential to leak oil will be enclosed in continuous bunding or will have drip trays in place where appropriate;</p> <p>A Material Safety Data Sheet will be available for all chemicals and hydrocarbons in locations nearby to where the chemicals/wastes are stored;</p> <p>Spill clean-up equipment will be located where chemicals and hydrocarbons are stored and frequently handled (i.e.</p>	<p>The vessel Principal Contractor will ensure potential contaminants, pollutants (including hydrocarbon spills) are managed in accordance with this ESMP and relevant legislative requirements.</p> <p>An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>'high risk' areas) and the quantity of spill recovery materials will be appropriate to the quantity of stored chemicals. Spills will be cleaned up immediately;</p> <p>Any contaminated material collected will be contained on board for appropriate onshore disposal;</p> <p>Refuelling operations will be a manned operation and in the event the refuelling pipe is ruptured the fuel bunkering activity will cease by turning off the pump;</p> <p>Any lifting equipment will be rated, certified and will lifting will only be conducted in suitable weather and sea state conditions. Items on board the vessel will be securely sea-fastened to reduce the chance of dropped objects polluting the seafloor.</p>	
	Off-shore release of emissions from off-shore activities.	<p>Where appropriate, at night vessel deck lighting will be switched off and spot lights directed inboard to reduce direct light spill onto marine waters. Vessel machinery should be maintained in accordance with the manufacturer's specifications to reduce noise emissions;</p> <p>Catalytic converters and exhaust filters will be correctly fitted where appropriate and available to minimise diesel exhaust emissions. Idling time of diesel engines should be limited and engines should not be overloaded;</p> <p>Vessel engines will hold a valid and current International Air Pollution Prevention Certificate (IAPPC); and</p> <p>Ozone-depleting substances (ODS) will not be deliberately released in the course of maintaining, servicing, repairing</p>	<p>The vessel Principal Contractor will ensure potential emissions are managed in accordance with this ESMP and legislative regulatory requirements.</p> <p>An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		or disposing of systems or equipment, and through good maintenance, fugitive emissions will be minimised.	
	Waste generated during off-shore works impacting upon the marine environment.	<p>Sea vessel operations will comply the standards set out by MARPOL at all times.</p> <p>Any waste generated on the vessel including (but not limited to) sewage, oily water, plastics and food waste will be collected and disposed of onshore or in accordance with MARPOL.</p> <p>Scupper plugs or equivalent will be available on vessel decks where chemicals and hydrocarbons are stored and frequently handled (i.e. 'high risk' areas);</p> <p>Non-hazardous, biodegradable detergents will be used for deck washing.</p>	<p>The vessel Principal Contractor will ensure waste streams generated during off-shore works are managed in accordance with this ESMP and relevant legislative requirements.</p> <p>An inspection checklist will be developed by the vessel Principal Contractor to monitor and report on compliance with this ESMP.</p>
	Introduction or spread of invasive pest species	<p>No ballast water exchange will take place in waters less than 200 m deep or within 12 nautical miles from nearest land;</p> <p>All ballast water exchange details are to be recorded in a ballast water log;</p> <p>A biofouling vessel risk assessment (VRASS) must be carried out within sufficient time prior to mobilisation to site to enable any required cleaning operations to be undertaken;</p> <p>The vessels will be in possession of a current International Anti-fouling System Certificate to verify that it complies with the International Convention on the Control of Harmful Anti-fouling Systems on Ships;</p>	<p>The vessel Principal Contractor will ensure the measures to minimise risk of introduction or spread of invasive species are carried out in accordance with the ESMP and relevant regulatory requirements.</p> <p>The vessel Principal Contractor will ensure certificates and risk assessments have been obtained and are valid prior to commencement of construction.</p> <p>Should the vessel crew identify risk of any marine pest introduction; the vessel Principal Contractor will notify the relevant regulatory authority for the jurisdiction in</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>If an introduced or declared pest species is identified on site or on vehicles/vessels during operations or is suspected, then the vessel contractor will immediately (within 24 hours) notify the relevant regulatory authority for the jurisdiction in which the observation has been made. That regulatory authority will advise on the required course of action.</p>	<p>which the observation has been made. That regulatory authority will advise on the required course of action.</p>
	<p>Safety at sea during severe storms or other natural hazard event.</p> <p>Storms, cyclones or other severe weather events have potential to interfere with cable installation works and safe operation of the vessel.</p>	<p>Captain of the vessel will plan ships passage and works to maintain safety and take evasive action as required, with adherence to international vessel operating standards for safety at sea.</p>	<p>Vessel Captain will be responsible to maintain safety of vessel and crew during vessel operations. Any amendments to installation schedule or plan in regards to safety will be reported to the Contractor Principal.</p>
<p>Offshore works – Placement of cable on the seabed</p>	<p>Disturbance to the seabed within the path of cable laying (including benthic layer, seagrass meadows, kelp and other marine vegetation) and impacts to marine fauna.</p>	<p>The cable laying route in deep waters will be positioned to avoid underwater features such as rocky reefs.</p> <p>A pre-laying cable survey will identify any debris along the proposed cable laying route. The route may be adjusted to avoid these areas and minimise the requirement for further seabed disturbance from pre-lay grapnel runs.</p> <p>Cable placement activities to include detailed records of cable locations to enable relative certainty of cable position during cable maintenance grapnel activities.</p> <p>Ecologically sensitive areas will be identified and avoided if possible.</p>	<p>The vessel Principal Contractor will avoid installation of cable across any ecologically sensitive areas by adhering to the pre-determined route position list. The vessel Principal Contractor will not anchor in sensitive habitats except in the event of an emergency requirement.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>If vessel anchoring is required, it will be avoided in any ecologically sensitive areas such as seagrasses or rocky reefs.</p>	
	<p>Interference with other users of the area affected by cable laying.</p>	<p>Stakeholder consultation with the commercial fishing industry, local subsistence fishers near cable landing sites and others, who could be affected by offshore works; Visual observations will be conducted by trained watch keepers on all vessels 24 hours per day to support management of collision risk or entanglement / interference with other users.</p> <p>Notice to mariners to be issued to warn all ships and recreational craft to maintain safe operating distance from cable ship and tender vessels.</p>	<p>The vessel Principal Contractor will ensure measures to minimise interference with other users are managed in accordance with this ESMP and any instructions from maritime safety.</p> <p>The vessel Principal Contractor will develop and implement activity relevant safety management plans that prescribe measures to mitigate risk of interference with other users, inclusive of submitting a notice to mariners and maintaining the security of work areas in shallow waters from risk of interference with recreational or other vessel traffic.</p>
	<p>Disturbance of any wrecks or unexploded ordnance.</p>	<p>A pre-laying cable survey will identify if any wrecks or unexploded ordnances (UXOs) are within the proposed cable route;</p> <p>In the event that the proposed cable routes traverse wrecks or UXOs, the route should be modified based on the results of the survey in order to avoid laying cable through, over or immediately adjacent to any wrecks or UXOs;</p> <p>If, during cable laying operations, a wreck or UXO is encountered, measures should be undertaken to lay the cable around the wreck, where possible and safely avoid</p>	<p>If required, a qualified maritime archaeologist should review findings to assist the marine geophysicist choose a suitable cable route that will avoid wrecks and UXOs</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		any UXOs. If a wreck or UXO is disturbed, measures will need to be undertaken to minimise the impacts, inform the appropriate authorities, keep records of the impact and notify a qualified maritime archaeologist, where required.	
	Disturbance to reefs	Articulated pipes to be used, with the cable installed within the pipe and pinned to the reef, to both protect the cable across reef areas and to minimise the impact of the cable moving and causing abrasion to the reef.	The vessel Principal Contractor will ensure measures to minimise reef disturbance are managed in accordance with this ESMP and relevant legislative requirements.
	<p>Safety during installation in relation to severe storms, tsunamis or other natural hazards inclusive of crocodile and shark attack.</p> <p>Storms, cyclones or other severe weather events have potential to interfere with cable installation works and safety of the installation crew.</p>	<p>During diver placement of cable on seabed and pinning of cable to reef there is potential risk of crocodile attack or impact from other dangerous marine fauna. There are also risks associated with diving activities and work under/over water. Captain of the vessel will plan all installation activities to maintain safety and take evasive action as required, with adherence to international vessel operating standards for safety at sea. A diver supervisor will be required to plan and supervise all diver related activities for safety management. All crew will be familiar with safety at sea working conditions, including controls to manage risk of man-over-board. These will form part of the crew induction processes.</p>	<p>Vessel Captain will be responsible to maintain safety of vessel and crew during all vessel operations. The cable installation Contractor Principal will appoint a diver supervisor to oversee safety of any diver related activities, including development of dive safety plans as/if required. Vessel Captain will require all crew to be inducted to vessel safety operations including drills for man-over-board.</p> <p>Any amendments to installation schedule or plan in regards to safety will be reported to the Contractor Principal.</p>
Onshore works – Onshore site establishment (including temporary facilities and stockpiles).	Land access and easement management	Access to land for securing cable easement will need to be negotiated with landholders. SISCC will consult and negotiate voluntary land access with all affected	SISCC will consult with all relevant parties and engage legal advisors and any required compensation negotiation will be

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
<p>Onshore trenching and construction.</p> <p>Repair/upgrade the vehicle access tracks to the beach.</p> <p>Excavation of material and installation of cable and associated infrastructure.</p> <p>Construction site decommissioning and make good.</p>		<p>landholders including Commissioner of Lands, Provincial Government, Customary groups and private owners.</p>	<p>undertaken in accordance with applicable legislation.</p> <p>SISCC has initiated land access consultation with all landholders since June 2018 and will continue to engage through the land access and compensation negotiation process.</p>
	<p>Involuntary economic displacement of informal vegetable gardens in Noro</p>	<p>Further consultations is required with the households who tend the vegetable gardens located along the government utility easement in Noro to correctly identify who uses the plots, the number of plants within each and determine the appropriate amount of compensation per household, in accordance with applicable legislation.</p> <p>Notify Noro Town Council about timing of construction activities and seek their assistance to relocate the gardens to alternate land to avoid any livelihoods impacts on the families.</p>	<p>SISCC will consult with all relevant parties and engage legal advisors and any required compensation negotiation will be undertaken in accordance with applicable legislation.</p>
	<p>Access and disturbance to customary waters and land in Auki</p>	<p>SISCC will engage in further consultations and land access negotiations with the customary owners - Mr Jonathan Malai who is the leader of the Aisisiki group. These negotiations will be held in accordance with legal advice sought by SISCC.</p> <p>SISCC will engage with the other eight claimants of the customary land, and provide information about the project.</p>	<p>SISCC will consult with all relevant parties and engage legal advisors and any required compensation negotiation will be undertaken in accordance with applicable legislation.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>This will help to minimise group conflicts therefore minimise the risk to the project.</p> <p>In collaboration with Mr Jonathan Malai, SISCC will consult with the households and the school in the Lilisiana village to inform them about the project construction activities.</p>	
	Construction workforce benefits	<p>To maximise the benefits from the project SISCC, through its contractors' terms and conditions will ensure that:</p> <ul style="list-style-type: none"> • Preference is given to local workforce where possible and suitable • No child labour or illegal migrant workers will be engaged on the project • Non-residential workers who will be accommodated at the site for short durations will conduct themselves within legal and good citizen behaviour code of conduct. 	<p>SISCC will include these condition as part of any appointed Contractor's terms and conditions and monitor through review of tender submissions and regular reporting.</p> <p>Contractors will be responsible to implement such aspects within their workforce strategy.</p>
	Potential disturbance to native vegetation in areas to be cleared.	<p>Minimise the construction area footprint and avoid, where possible, disturbance to native vegetation;</p> <p>Place site depots, equipment compounds and stockpile areas on previously cleared areas away from trees, bushes and native grasses, where possible;</p> <p>Avoid work/storage within the drip-line of trees to prevent damage to the tree roots and soil compaction.</p> <p>Use existing access tracks where possible to minimise additional disturbance;</p>	<p>The Contractor and Site Clerk will ensure measures to minimise vegetation disturbance are managed in accordance with this ESMP.</p> <p>An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		Reinstate any areas of vegetation, including road verges, which have been impacted during the construction phase;	All disturbed grounds will be reinstated to condition equivalent or better to that pre-Construction works. At decommissioning all installed cable infrastructure will be removed unless agreed otherwise with regulators.
	Impact to the natural movement of surface and groundwater	Existing natural drainage paths and stormwater facilities not blocked or restricted. Runoff from unsealed areas at the construction sites does not enter stormwater drains or natural drainage lines. Control surface run-off entering and leaving the work areas and divert stormwater around stockpiles. Cleared areas to be stabilised / rehabilitated promptly and where possible enhance the natural value of these areas.	An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.
	Impact to water quality and coastal habitat stability from construction works	Minimise erosion and runoff and associated water quality issues resulting from sediment disturbances during onshore works, particularly around waterbodies or road verges that drain to coastal waters or wetlands. Rehabilitate areas immediately post works to avoid ongoing erosion risk. Consider beach stabilisation requirements to manage risk of future erosion due to wave or other action.	An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.
	Noise and vibration and dust from construction activities may impact on nearby sensitive receptors	Work hours will be between 6am and 6pm Monday to Saturday only.	The Site Clerk will ensure works occur within the given periods and ensure all machinery and equipment used for construction is maintained in good order

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
	including residential dwellings and schools	All machinery and equipment used for construction is maintained in good order.	
	Waste generated during construction inappropriately disposed of and impacting the environment.	All waste generated during construction to be appropriately disposed if not able to be re-used on site - No plastics are to enter any waterway or ocean. No burning or burial of hazardous waste on site. Any food waste should be contained and removed from site regularly to prevent attracting pest species.	The Contractor will ensure waste is managed in accordance with this ESMP. An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.
	Disturbance of sediments, erosion risk potential	All sediment that is disturbed during the trenching process will be restored as trenches are backfilled.	An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP. The Site Clerk will use that checklist to ensure compliance with ESMP requirements.
	Disturbance of crocodile habitat	Vessel crews and hired workers should keep watch when laying cable in areas where there are possible occurrences of crocodiles. Any sightings should be reported to the Site Clerk, including date and location, identification and description.	Sightings of crocodiles should be reported to the Site Clerk, including the date and location of the sightings, as well as description of the animal (size, behaviour).
	Impacts to road, water or power networks.	The Project will be required to submit plans and work descriptions to the Ministry of Infrastructure and Development, and will include sketches of the proposed infrastructure layout, planned work, schedule and environmental management control plans.	The SISCC will require the Contractor to submit plans and work descriptions to relevant regulatory stakeholders to manage risk of interference with other services. The Contractor will seek all relevant permissions prior to installing any infrastructure with potential to interfere with other services.

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<p>Notifications and permissions may be required from Solomon Water and Solomon Power if the cable route will impact on water or power networks.</p>	
	<p>Interference with other users of the area affected by cable laying (traffic and site safety and access)</p>	<p>Cable corridor will traverse through areas including roads, footpaths, private lands and public spaces. During installation works or operational maintenance other users of these spaces will be affected to manage safety and environmental risks. This will include impacts upon traffic passage. Stakeholders with potential to be affected will be notified of proposed construction works and relevant management plans will be in place to mitigate risk of safety or traffic incidents occurring. These should include measures to (but not limited to):</p> <ul style="list-style-type: none"> • Minimise traffic and access disruption • Maintain safe access to all adjacent properties • Maintain safety of surrounding communities, school children where the cable route is located near schools in Taro and Auki through fencing or putting barriers to restrict access to construction sites, • Consultation with key stakeholders to inform them about construction activities (such as private property owners, users, Honiara Council and provincial governments in Noro, Auki and Taro and the Aisisiki Group, residents of the Lilisiana village and schools near the cable route in Auki and Taro) 	<p>The Contractor will develop site relevant traffic, safety and construction management plans that prescribe measures to mitigate risk of interference with other users. The Site Clerk will ensure described measures are implemented.</p>

Construction Activity	Potential Impacts	Controls / Actions	Inspection / Criteria/ Target/ Responsibility
		<ul style="list-style-type: none"> Gather community feedback through a grievance redress procedure 	
	Sea level rise affecting infrastructure security	Detailed design should give consideration to sea level rise potential risks and design trench, CLS, BMH and coastal stability infrastructure to take account of such risks.	Contractor Principal will be responsible for ensuring that detailed design takes account of sea level rise risk mitigation measures.
	Storms, cyclones or other severe weather events have potential to interfere with cable installation works and safety of the installation crew and staff.	An emergency response plan will be developed to manage safety of staff/crew in response to any natural hazard risks.	Contractor Principal will be responsible for development of a site specific emergency response plan that is inclusive of response to natural hazard emergencies. Site Clerk will be responsible for implementation of the plan and reporting of any action taken to Contractor Principal.

5.6 Stakeholder Consultation Plan (SCP)

In accordance with the ESMP, a Stakeholder Consultation Plan (SCP) will be prepared and implemented by SISCC in conjunction with the contractors. The SCP outlines potential methods of consultations and communication, stakeholders to be consulted, the timing and purpose of consultations. The consultation plan should be read in conjunction with the mitigation strategies in Table 5-2.

Methods of consultations/communication

Various forms of communication will be required for effective consultations. Some appropriate forms of communication for this Project are listed below:

- Face to face meetings with government officials, directly affected persons and land owners
- Written communication in the form of letters, notifications or legal agreements to ministries, other government offices, communities, affected persons and land owners
- Community information sessions specifically around project sites

It is recognised that there will be other consultation efforts and methods that will be deployed by SISCC for the benefit of the project.

Stakeholder Consultation Plan

Table 5-3 presents a consolidated consultation plan to comply with DFAT requirements for meaningful consultations through the project implementation and operational phases.

Table 5-3 Stakeholder Consultation Plan

Project phase	Stakeholders to be consulted	Purpose of consultation
Prior to construction	Community at proposed project sites – Honiara, Noro, Auki and Taro (including the GST group in Auki)	Create general awareness about the project, disseminate project information and engage with community for confirmation and further identification and management of social impacts
	Land owners of proposed project sites – private property owners and customary land owners	Initiation of land access process, with initial meetings, notifications and land access negotiations to arrive at an agreement
	Vegetable farmers / growers in Noro	Confirm who the families are, the size of plots/number of plants, and initiate compensation process as per the legislative compensation process and rates
	Department of Fisheries, Department of Mining, SIMSA, provincial governments of Guadalcanal, Malaita, Western Province and Choiseul and local governments of Honiara, Noro Auki and Taro	To generate awareness about the project, its potential social and environmental impacts, timing of project construction, discussing required co-operation from the agencies and providing notifications within their jurisdictions
	Construction contractor	To inform the contractor about the project terms and conditions particularly regarding maximising compliance with the ESMP and their role in consultation and grievance redress.

During construction	Land owners at project sites, local community around project sites	Maintain contact to inform any changes to project construction program or any unidentified project impacts, attend to grievances or inquires, provide information on safety around project sites
	Department of Fisheries, maritime office, harbour master	Maintain contact to update information on the movements of the Marine Survey Ship and the Cable Laying Ship
Operation	Landholders, maritime authorities	Consult with property owners prior to accessing their land for any maintenance activities as per the negotiated agreement drawn prior to construction. For maintenance work of cable in case of breakage or damage to cable.

5.7 Grievance Management Procedure

To meet the requirements of the Solomon Islands Government EIA Procedural Guidelines, 2010 and DFAT Environmental and Social Safeguards, 2018, a Grievance Management Procedure will be put in place. Grievance Management Procedure detailed below will be adopted where relevant in addressing any potential grievances raised in response to the project.

For land access

To ensure fair process is in place consultation and land access and easement compensation negotiation will be carried out with all private property owners by SISCC's legal advisors and compensation negotiation will be undertaken in accordance with applicable legislation.

Should land owners not be satisfied that SISCC is progressing with fair and reasonable intentions, an independent party may represent the land owner's interests in identifying and/or raising the issue with the SISCC Principal to seek resolution. The cost for the third party assessors, if required, will be negotiated and agreed between SISCC and the landholders.

The Land and Titles Act does not include grievance redress mechanisms for negotiated agreements (be they transfers, leases or easements) where these are not under the auspices of the Commissioner of Lands. However the Telecommunications Act requires service providers to advise land owners as to how they can access impartial legal advice, with this advisory service pre-empting a grievance redress requirement, as the negotiation is not underpinned by default compulsory acquisition.

During construction

During construction and to a lesser extent, operation of the project it is possible that people may have concerns with the project's environmental and social performance. In order to capture and address these concerns the grievance management procedure will allow affected persons to register their complaints and provide the project an opportunity to resolve them.

This grievance management procedure places ultimate responsibility for grievance resolution with SISCC, however on site complaints can also be directly addressed by the Contractor's Site Clerk.

If the complaint is straightforward then the Site Clerk will resolve the complaint immediately. If the complaint is complicated and outside the control of the Site Clerk, it will then be referred to the Contractor Principal, who will have 48 hours to respond with an appropriate mechanism to resolve the complaint and will communicate such to the affected person.

The Contractor Principal should maintain records of all complaints and resolution procedures and report these to SISCC on a schedule agreed through contract conditions.

If the affected person is not satisfied with the complaint resolution, they may be able to take the complaint to the SISCC. If the affected person is dissatisfied with the outcome, they may appeal to the National Court, which will initially be at their own cost.

All complaints made to the Site Clerk are to be documented in a register that will be maintained by the Site Clerk or Contractor Principal at the site. Details of the complaint should be recorded by date, name, contact address and reason for the complaint. A duplicate copy of the entry will be given to the affected person for their record at the time of registering the complaint and another copy of the complaint will be sent to the Contractor Principal.

Complaints are to be responded to within 48 hours and then further updates if required to be provided every two days, until the complaint is resolved. Complaints resolution via the Site Clerk will be free of charge to the affected person. The complaints register will show a record of who within the Contractors staff has been directed to deal with the complaint and the outcome of the complaint. The register will also record other details such as the date and time when the action was commissioned, complaint was resolved, when and how the affected person was informed of the decision. The register is then signed off by the person who is responsible for the decision and dated. The register is to be kept at the SISCC Offices or at the Contractors site office near the project sites; registers are to be maintained as public documents.

During operation

Very few complaints are expected to arise during operations. It is anticipated that complaints during operations will be mainly about cable vandalism, unlikely incidences where anchors or fishing gear might be caught in the cable and potential environmental impacts during cable maintenance works.

SISCC will ensure contact details for any complaints are made available to any member of the public through display of information on the CLS infrastructure. During operations should any person wish to report an incident to SISCC's representatives they should use those details. SISCC's representatives will respond within 48 hours of receipt of the complaint following the same procedure as that described above for management during construction.

5.8 Training and site induction

The Contractor Principal will require that the Site Clerk instructs all employees, sub-contractors and visitors of their obligations in relation to the ESMP and legislative requirements of relevance to all site works. Each person will be made aware of and have an understanding of their obligations and duties detailed in this ESMP and will be familiar with the components relevant to their role.

During construction works, the Contractor Principal must ensure that each operative is trained to use the machinery and materials on site efficiently and safely. The Site Clerk is responsible for making sure that all required ESMP, environment, social, health and safety controls are implemented on site.

5.9 Emergency response and incident management

The following sections provide an outline of emergency response procedures and protocols, including responsibilities, to enable effective response with minimal environmental harm or disruption.

5.9.1 Environmental incidents (Notification of environmental harm)

For a particular incident, the requirement for notification in accordance with legislation depends on the extent of harm or the potential damage to the environment. To ensure that SISCC has a consistent approach to incident reporting, the SISCC Principal must be contacted immediately or as soon as possible, after the site has been made safe following any environmental harm incident.

The Contractor's Site Clerk will, therefore, be responsible for:

- Identification of any onsite incident through onsite observation of activities/communication with onsite team undertaking works
- Ensuring an immediate assessment of the potential onsite and offsite impacts of any observed incident
- Consulting (if necessary) with government, emergency services or regulatory authorities, where these authorities can provide assistance with mitigation of impacts
- Instigating appropriate steps to mitigate the impact/s
- Advising the Contractor Principal of any incident and actions taken.

The Contractor Principal will provide details of the incident notification to the SISCC Principal within 48 hours of the site being made safe or incident occurrence.

The SISCC Principal will notify appropriate authorities within 5 working days of incident notification and work with authorities to provide any required/requested information relating to the incident details and/or management.

5.9.2 Emergency response plan

Emergencies that may occur during the construction phase of the project include:

- Storm conditions i.e. wave action, high tides, tsunamis, earthquakes, flooding, uncontrolled erosion.
- Fire
- Chemical spill
- Explosion
- Wildlife Injury
- Damage to power or services infrastructure
- Personnel injury

5.9.3 Emergency response contacts register

Prior to the commencement of any site works, the Contractor Principal and Site Clerk are to agree on communication procedures for emergency response. This should include which emergency services should be contacted in the event of an emergency occurring on site. A suggested format for recording these contacts is provided by Table 5-4.

Table 5-4 Incident/emergency contact register

Organisation	Title	Telephone Number
Principal (SISCC Representative)	TBC	TBC
Contractor Principal	TBC	TBC
Contractor Site Clerk	TBC	TBC

Emergency Services	TBC	TBC
---------------------------	-----	-----

It is the responsibility of the Site Clerk to contact any emergency services (e.g. health, police, other) should these be needed. It is also the responsibility of the Site Clerk to induct and instruct site staff in the emergency response procedures, including requirement for communication and management of any observed incidents. Staff working on site are required to report any incidents to the Site Clerk to support effective response.

5.9.4 Emergency response procedures

To minimise the risk of an environmental accident or emergency during construction phase of the Project and to ensure emergencies are managed appropriately, the Contractor, Site Clerk and all staff are to follow these general procedures:

- Ensure that an Emergency Response Plan is maintained as part of the site ESMP kept in place readily available to site staff to support response to any accidents or incidents that may impact on the environment or safety. This should include contact details of all relevant emergency services determined by the Contractor Principal and Site Clerk.
- The Site Clerk is to ensure that all personnel are made aware of the requirements of the Emergency Response Plan and ESMP and of required communication of any issues observed on site.
- Material Safety Data Sheets for all relevant materials used or stored on site for the construction works shall be kept on site by the Site Clerk.
- Spill Response Kits, fire extinguishers and/or other emergency response equipment should be fully maintained and readily available where risk of fire or chemical spill exists.
- In the event of an emergency the Contractor's Site Clerk is to notify the Contractor's Principal as soon as possible but no later than 48 hours post incident occurrence. The Site Clerk will also notify any relevant emergency services.
- Following an emergency, the affected areas shall be monitored and remediated as required by site relevant legislative obligations.

Follow up action is to be undertaken to ensure adequate provisions are implemented to minimise or eliminate the risk of reoccurrence of the emergency.

Once immediate mitigation steps have been undertaken and the incident contained. All incidents/emergencies will be reported to the SISCC Principal by the Contractor Principal. The Contractor Principal is to inform the SISCC Principal of the following:

- Time and location of the emergency or incident
- The environmental harm or nuisance caused, or threatened to be caused by the emergency/incident
- Any rectification or remediation work undertaken
- Actions to be taken to prevent further incidents/emergencies and mitigate any environmental harm and/or nuisance caused by the incident/emergency

Non-conformance with this plan shall be documented by the Contractor Principal and corrective action undertaken to ensure future conformance.

The process for investigating, revising and reporting emergency incidents should follow that described by ESMP implementation in Section 5.10.

5.10 ESMP monitoring, review and reporting

The ESMP will only be effective if it is appropriately managed and utilised, and as such, it is important that regular review, monitoring and reporting is carried out. This will ensure that the measures, responsibilities, criteria and corrective actions remain achievable, effective and suitable to the project, whilst maintaining compliance with relevant legislation and policy.

5.10.1 Site specific monitoring, review and reporting

Monitoring to demonstrate ESMP effectiveness

The construction Site Clerk will undertake daily site walk overs to ensure the controls outlined in the ESMP are being applied. If they are not being applied, the Site Clerk will take action by reporting to the Contractor Principal. The Contractor Principal will then determine if further action is required.

Investigation and review of ESMP

Any reported incidents will be investigated within 48 hours by the Principal to determine need for further action.

Should any changes to site activities or ESMP controls be deemed to be required to maintain effective control against environmental or social harm, the Contractor Principal will direct what change is required to occur. The Site Clerk will be instructed on such change and be responsible for implementation of such on site.

Records

Records will be maintained by the Contractor Principal of:

- Any incidents reported by the Site Clerk
- Findings of investigations undertaken by the Contractor Principal or Site Clerk
- Changes made to the ESMP or instructed to the Site Clerk to be implemented on site to avoid recurrence of such incidents. The process for review of the ESMP is noted in Section 5.7.2 following.

Records will be maintained by the Site Clerk of any monitoring required to be completed by any approvals, licences or Conditions of Consent granted for the proposed works

Reporting

The Site Clerk will communicate to the Principal contractor weekly construction progress checks in regards to confirmation that ESMP controls are in place. The Site Clerk will also communicate any complaints made by Contractor(s), staff or public. The Contractor Principal will maintain records of such and provide progress reports to the SISCC Principal in accordance with contractual requirements.

5.10.2 Overall ESMP monitoring, review and reporting

The overall responsibility of monitoring, review and reporting of the ESMP rests with SISCC. During planning and construction phase SISCC will monitor site activities on a daily bases. Through the site monitoring and review and reporting process, SISCC will collect all the necessary information from Contractors or Site Clerks to ensure compliance with the ESMP. Should any updates to the ESMP be deemed to be required by contractors or Site Clerks to support ongoing relevance of the ESMP, the Contractors Principal and/or Site Clerk will need to agree to such updates with the SISCC Principal prior to implementation; except in the event of

emergency response. Following any emergency response, required ESMP updates will be notified to the SISCC Principal by the Contractors Principal as soon as safety practical.

Monthly progress reporting by SISCC to its Board of Directors will record compliance and shortfalls with the ESMP. These progress reports will be consolidated and submitted to the DFAT and the Solomon Islands Ministry of Environment at a frequency agreed between SISCC and the parties through the project planning, construction and operations phase.

Any shortfalls of the ESMP will be addressed through revision and updating, as appropriate, to maintain ongoing relevance and intent of the controls prescribed within the ESMP for protection of social and environmental values from project works across all phases of work.

5.10.3 Required plans and approvals

The following table summarises the appropriate plans and/or approvals that will be required for the project as prescribed by the ESMP.

Table 5-5 Required plans and approvals

List	Details
Inspection checklist	An inspection checklist will be developed by the Contractor to monitor and report on compliance with this ESMP.
Material Safety Data Sheet	A Material Safety Data Sheet will be available for all chemicals and hydrocarbons in locations nearby to where the chemicals/wastes are stored;
International Air Pollution Prevention Certificate	Vessel engines will hold a valid and current International Air Pollution Prevention Certificate (IAPPC)
Ballast Water Log	All ballast water exchange details are to be recorded in a ballast water log
Biofouling vessel risk assessment	A biofouling vessel risk assessment (VRASS) must be carried out within sufficient time prior to mobilisation to site to enable any required cleaning operations to be undertaken
International Anti-fouling System Certificate	The vessels will be in possession of a current International Anti-fouling System Certificate to verify that it complies with the International Convention on the Control of Harmful Anti-fouling Systems on Ships
Land access	Access to land for securing cable easement will need to be negotiated with landholders. SISCC will consult and negotiate voluntary land access with all affected landholders including Commissioner of Lands, Provincial Government, Customary groups and private owners
Notification and permission for impacting on other networks	SISCC will require the Contractor to submit plans and work descriptions to relevant regulatory stakeholders to manage risk of interference with other services. The Contractor will seek all relevant permissions prior to installing any infrastructure with potential to interfere with other services, this will include notification to mariners.

List	Details
Traffic, safety and construction management plans	The Contractor will develop site relevant traffic, safety and construction management plans that prescribe measures to mitigate risk of interference with other users. The Site Clerk will ensure described measures are implemented.
Emergency response plans	The Contractor will develop an emergency response management plan that will support delivery of works in regards to safety in the event of emergency or incident on site.
Grievance management plan	The Contractor will develop a grievance management plan which will enable complaints or grievances to be effectively managed.

6. Summary and recommendations

This document provides a detailed assessment of the environmental and social matters associated with the installation, operation and decommissioning of a proposed international and domestic cable network within the Solomon Islands. It also prescribes necessary controls that must be adhered to in order to mitigate identified risks to social and environmental values. Key background to this project is outlined below:

- The installation of an international submarine cable in the Solomon Islands has been under consideration for the last eight years and was previously initiated by the Solomon's Oceanic Cable Company (SOCC). The current project being undertaken by the Solomon Islands Submarine Cable Company (SISCC) has evolved to support international cable connectivity into Honiara and domestic cable connectivity between four provinces of the Solomon Islands.
- The Solomon Islands currently rely on satellites for international telecommunications connectivity, which is expensive and provides limited capacity of an inferior quality when compared to that provided by fibre-optic international submarine cables.
- This project will connect the Solomon Islands to the global internet and provide it with an ample and future-proof supply of reliable, high-quality and low-cost broadband capacity enabling the wider population of the Solomon Islands to access much lower-cost broadband internet and other communications services, with a positive impact on its socio-economic development.
- The project is co-funded by the Solomon Islands and Australian Governments and the overall delivery of the project is being supervised by the Australian Department of Foreign Affairs and Trade (DFAT). The SISCC is responsible for delivery of works within the Solomon Islands EEZ, inclusive of seeking all relevant permits and managing construction and operational works.

Accordingly, the SISCC, along with Vocus Communications is seeking decision on development consent for the elements of the Project that will occur within the Solomon Islands EEZ. An environmental impact assessment (EIA) is required as part of the development consent approval (DA) in accordance with S17(1) of the *Environment Act (1998)* (EAct) & Regulation 6 of the Environment Regulations 2008. The proposed works are considered to be prescribed development of low risk to the environment and as such an EIA through a PER is to be completed in accordance with the Solomon Islands Government EIA Procedural Guidelines (2010). SISCC engaged GHD to prepare the PER.

The PER has been undertaken using a combination of desktop review, site visitation and consultation. The PER provides a consolidated report across environment and social values that have potential to be affected by the project; inclusive of presenting relevant impact mitigation and management controls.

On the basis of the assessment completed by the PER it is concluded that potential impacts are able to be controlled through application of a project specific Environment and Social Management Plan (ESMP). That plan has been described within this PER and addresses all phases of works across construction, operation and decommissioning. The ESMP also takes into account environment and social safeguards prescribed by DFAT in support of meeting co-funding agency requirements.

This PER and all content herein, inclusive of the ESMP, are considered of relevance to:

- Seeking permission from the MECDMM for Development Consent, this is the primary purpose of this PER;
- Contractors seeking to undertake works of relevance to the proposed project; the ESMP is considered of primary relevance as it prescribes specific impact management and mitigation controls and requirements for monitoring, review and evaluation to demonstrate controls are being effective; and
- Any stakeholders, community or other interested parties who wish to understand what works are proposed, what environment and social elements may be affected by the proposed works and how impacts are expected to be controlled; the ESMP includes procedures for forward notification of planned works as well as grievance resolution procedures should complaints be raised.

The key environmental and social elements of relevance to the proposed works, and the controls that will seek to mitigate risks to those elements are summarised following. They are described in detail within the main PER document.

Key environmental and social values of relevance to proposed works:

- Areas used for recreation
- Areas used for housing, transport, public services and commercial industry
- Historic and customary values inclusive of shipwrecks and customary lands
- Marine and terrestrial species inclusive of coral reefs, seagrasses, fishes, mangroves, taro, paw paw and other plants and animals of importance for fishing, coastal stability protection, market garden farming, recreational and biodiversity benefits

These values and the potential impacts that are able to be controlled of relevance to the proposed works are summarised in Figure 6-1. The ESMP presents all relevant controls and should be referred to for details.

Taking into consideration all elements assessed under the PER, it is recommended that the PER be appended to a Development Consent Application to the MECDMM and that the Minister give consideration to approval of the Development Consent on the provision that the ESMP described by the PER is adhered to during all phases of works.

Table 6-1 Conceptual summary of values and potential impacts of relevance to proposed works, which are addressed by the ESMP

7. References

- ADB (2012). *Solomon Oceanic Cable Company Initial Environmental Examination, Proposed Loan and Grant, Solomon Islands: Broadband for Development Project*. Asian Development Bank. Available from: <https://www.adb.org/sites/default/files/linked-documents/44382-022-sol-ieeab.pdf>
- ADB (2014). *Solomon Oceanic Cable Company Initial Environmental Examination*. SOL Broadband for Development Project. Asian Development Bank. Available from: <https://www.adb.org/sites/default/files/linkeddocuments/44382-022-sol-ieeab.pdf>
- Albert, S., Leon, J. X., Grinham, A. R., Church, J. A., Gibbes, B. R., & Woodroffe, C. D. (2016). Interactions between sea-level rise and wave exposure on reef island dynamics in the Solomon Islands. *Environmental Research Letters*, 11(5), 054011. Available from <http://iopscience.iop.org/article/10.1088/1748-9326/11/5/054011/pdf>
- Alcatel (2018). *Coral Sea Cable System (CS2) Site Survey Reports, Site: Solomon Islands Domestic*. Alcatel
- DFAT (2017). *DFAT Child Protection Policy*. Department of Foreign Affairs and Trade. Canberra.
- DFAT (2018). *Environmental and Social Safeguard Policy for the Aid Program 2018*. Department of Foreign Affairs and Trade. Canberra.
- Fugro (2018a). *Desk top study for the Coral Sea cable system. Volume 5: Solomon Islands Permitting Issues*. Fugro Australia Marine Pty Ltd report for Vocus Group Pty Ltd. Fugro Document No: GPH116414-05.
- Fugro (2018b). *Desk top study for the Coral Sea cable system. Volume 4: Solomon Islands Landings*. Fugro Australia Marine Pty Ltd report for Vocus Group Pty Ltd. Fugro Document No: GPH116414-04.
- Gillie, R. (1992). *Ranadi Beach Coastal Erosion Study: Honiara, Guadalcanal, Solomon Islands*. Prepared for the South Pacific Applied Geoscience Commission (SOPAC) Coastal and Nearshore Program, Solomon Islands project SI. 17. SOPAC Technical Report 152. Solomon Islands
- Jacobs (2018). *Coral Sea Cable Installation. Environment Protection and Biodiversity Conservation Act – Section 160 Supporting Information Document*. Report to Vocus Group Pty Ltd. Document No. IW175400-0000-NP-RPT-001.
- McConachy, T (2002) *Submarine Hydrothermal Processes in Volcanic Arcs, Back Arcs and Continental Shelf Settings in the SW Pacific*. CSIRO Exploration and Mining, NSW.
- Noro Town Council (2017) *Three years development plan: policy objectives, target projects and programs and activities 2017-2019 (plan 2019)*, Noro Town Council.
- Peralta, E. (2016). 'Window Into The Future': *Scientists Document Disappearing Islands*. NPR. Retrieved 10 May 2016.
- SISCC (2018). *Summary Business Case for Investment Coral Sea Cable System (CS2) and Solomon Islands Domestic System*. Solomon Islands Submarine Cable Company Pty Ltd.
- SISCC (2016). *SISCC Business Plan 2016-2036*. Solomon Islands Submarine Cable Company Pty Ltd.
- Solomon Islands National Statistics Office (2009). *Provincial Profile of the 2009 Population & Housing Census: Malaita*. Solomon Islands Government.
- Solomon Islands Government (2010). *Environmental Impact Assessment Guidelines*. Solomon Islands Government: Ministry of Environment, Conservation and Meteorology. Solomon Islands.

UN Habitat (2012). *Solomon Islands: Honiara Urban Profile*. United Nations Human Settlements programme (UN Habitat). Available: <https://unhabitat.org/books/solomon-islands-honiara-urban-profile/>

Appendices

Appendix A - Fugro Australia Marine Pty Ltd
(2018a), Desktop Study for the Coral Sea Cable
System, Volume 5: Solomon Islands Permitting Issues,
Fugro Document No: GPH116414-05

Appendix B - Fugro Australia Marine Pty Ltd
(2018b), Desktop Study for the Coral Sea Cable
System, Volume 4: Solomon Islands Landings, Fugro
Document No: GPH116414-04

Appendix C - Jacobs (2018), Coral Sea Cable Installation Environment Protection and Biodiversity Conservation Act - Section 160 Supporting Information Document, Document No: IW175400-0000-NP-RPT-001 | F

Appendix D - Summary Business Case for Investment Coral Sea Cable System (CS2) and Solomon Islands Domestic System (SISCC, 2018)

Appendix E - SISCC (2016), SISCC Business Plan 2016-2036

Appendix F - DFAT Safeguards

DFAT's Environmental and Social Safeguard Policy for the Aid Program

DFAT is committed to promoting sustainable economic development through the Australian aid program. The Environmental and Social Safeguard Policy for the Australian Aid Program provides a structured approach to assessing and managing environmental and social impacts.

The table below provides an overview of how the PER is aligned with the principles of DFAT's Environmental and Social Safeguard Policy for the Aid Program.

Element	Alignment
<p>Principle 1: Do no harm</p> <p>Seek to protect the rights, health, safety, and livelihoods of people including children, women, indigenous people, and other vulnerable or disadvantaged groups. Maintain the health, diversity and productivity of the environment.</p>	<p>PER</p> <p>The regulatory and legislative frameworks relevant to the project are outlined in section 2.5 of the PER. This section identifies the objectives and functions of these acts and regulations, and how the PER addresses these.</p>
	<p>SIA</p> <p>Social risks and impacts associated with health, safety and livelihoods of the surrounding community have been identified and described in SIA section 5 and measures to address these risks and impacts are provided in SIA section 6.</p>
<p>Principle 2: Identify, access and manage environmental and social impacts</p> <p>Identify potential environmental and social risks in the early stages to allow for avoidance, or where avoidance is not possible, minimise, mitigate or offset. Assess and manage direct and indirect environmental and social impacts through management plans and monitor and report on their delivery.</p>	<p>PER</p> <p>Section 5.3 of the PER outlines requirements of monitoring as part of the ESMP. Section 5.6 of the PER outlines mitigation measures that are to be implemented to avoid and/or minimise potential impacts to environmental aspects associated with the works. The mitigation measures provided represent the minimum requirements that should be adopted during the construction phase of the project.</p>
	<p>SIA</p> <p>Social risks were identified early on in the process through site inspections and suitable design changes have been incorporated to avoid and minimise social impacts. A full description and assessment of impacts is provided in SIA section 5.</p>
<p>Principle 3: Engage effectively with stakeholders</p> <p>Provide affected people with access to information about the investment, its risks and potential social and environmental impacts. Engage with affected parties and other stakeholders early and ensure</p>	<p>PER</p> <p>Section 5.5.4 of the PER outlines the details of providing community information, as well as outlines the Grievance Management Procedure that will be put in place.</p>

<p>consultations include directly and indirectly affected parties. Provide accessible and culturally appropriate grievance redress mechanisms and ensure they are handled promptly, transparently and without retribution or cost to the party that raised the concern.</p>	<p>SIA</p> <p>SISCC and GHD teams undertook stakeholder consultation as part of the preparation of the SIA and the Public Environment Report (PER). In addition SISCC has been involved in ongoing stakeholder consultation with stakeholders and will continue to do so through the planning and delivery of the project (SIA sections 3.2.4, 6.3.2, 6.3.7)</p>
<p>Principle 4: Work effectively with partners</p> <p>Comply with partner country safeguard laws and policies and where possible build partners' capacity to develop and implement environmental and social governance systems. Work with partners to manage safeguard risks in a way that maximises the use of country systems and avoids imposing duplicate or unnecessary safeguard assessment and management planning requirements.</p>	<p>PER</p> <p>Section 2.5 of the PER outlines legislative, institutional and regulatory frameworks for the Solomon Islands that are relevant to the project. This section notes that the Solomon Islands is a signatory of a number of international environmental agreements. The requirements of the Solomon Islands government for delivery of a PER takes into consideration the governments delivery against these agreements.</p> <p>SIA</p> <p>SIA section 3.3.3 provides a list of relevant legislation in Solomon Islands that is relevant to social issues, which are mainly related to land access. They are addressed in SIA section 5.4 and 6.3.</p>
<p>Principle 5: Promote improved environmental and social outcomes</p> <p>Where possible, promote improved environmental and social outcomes by integrating ecologically sustainable development into aid investments. Improve the implementation and outcomes of aid investments by effectively identifying and managing environmental and social risks.</p>	<p>PER</p> <p>Section 4 of the PER identifies the potential environmental risks associated with the project, as well as providing mitigation measures to manage these. Section 5.6 also provides mitigation measures aimed at avoiding and/or minimising potential impacts to various environmental aspects associated with the construction works.</p> <p>Section 5 of the SIA identifies, categorises, describes and assesses the social impacts associated with the project.</p> <p>SIA</p> <p>Social benefits from the project are outlined in SIA section 5.3 and improved outcomes through management and mitigation of social impacts are presented in SIA section 6.</p>

DFAT's Child Protection Policy

DFAT has a zero tolerance approach to child exploitation or abuse and recognises that it is a shared responsibility of all adults to prevent this. DFAT, as part of their child protection framework, produced the Child Protection Policy which articulates DFAT's zero tolerance

approach and includes expectations for DFAT staff and funded partners in the management of child protection risks.

The table below provides an overview of how the PER is aligned with the requirements of DFAT's Child Protection Policy.

Element	Alignment
<p>Principle 1: Zero tolerance of child exploitation and abuse</p> <p>DFAT work to minimise the risks of child exploitation and abuse and trains its staff and partners on their obligations under this policy.</p>	<p>The SIA considers this principle within the workforce policy for the project. SISCC and its contractors will not engage child labour for any construction and operational work.</p>
<p>Principle 2: Assess and manage child protection risk and impact.</p> <p>Careful management to identify, mitigate, manage or reduce risks to children that may be associated with DFAT functions and programs.</p>	<p>Safety risks to children and others around construction sites are considered in the construction safety management in the SIA for the project.</p>
<p>Principle 3: Sharing responsibility for child protection</p> <p>Commitment, support and cooperation of partner organisations and individuals who help deliver programs administered by DFAT.</p>	<p>SISCC through its terms and conditions to engage cable construction contractors, will ensure the responsibility of child protection is shared by all parties involved in delivering the project.</p>
<p>Principle 4: Procedural fairness</p> <p>DFAT will apply procedural fairness when making decisions that affect a person's rights or interests.</p>	<p>NA</p>
<p>Principle 5: Recognition of the best interests of the child</p> <p>Australia is a signatory to the UN Convention on the Rights of the Child. Committed to upholding the rights of the Child and Australia's obligations under this convention. In all actions concerning children, the best interests of the child shall be a primary consideration.</p>	<p>As per response to Principles 1, 2, 3 above.</p>

Appendix G - MPA's within the Solomon Islands

MPA Site Name	Designation * international	Designation Status	Date Designated	Total Area (km2)
Arnavon Islands	Marine Conservation Area	Designated	1995	82.70
Barasipo	Marine Protected Area	Informally designated	2004	3.533
Baraulu/Bule Lavata	Marine Protected Area	Informally designated	2002	1.032
Barivuto	Marine Protected Area	Informally designated	2004	1.622
Buni	Marine Protected Area	Informally designated	2004	1.428
Dunde	Marine Protected Area	Informally designated	2004	1.046
Ha'apai	Marine Protected Area	Informally designated	2003	1.261
Irii Pasapasa	Marine Protected Area	Informally designated	2004	0.421
Kekehe	Marine Protected Area	Informally designated	2004	2.721
Kida	Marine Protected Area	Informally designated	2003	0.725
Kinamara	Marine Protected Area	Informally designated	2003	1.363
Kindu	Marine Protected Area	Informally designated	2003	0.764
Koqu Rua	Marine Protected Area	Informally designated	2005	0.359
Kozou	Marine Protected Area	Informally designated	2002	0.452
Lodu Hokata	Marine Protected Area	Informally designated	2005	0.335
Nazareti	Marine Protected Area	Informally designated	2003	2.120
Niumala	Marine Protected Area	Informally designated	2005	3.114
Nusa Hope Mangrove	Marine Protected Area	Informally designated	2005	0.884
Nusa Hope/Heloro	Marine Protected Area	Informally designated	2002	1.138
Nusa Roviana	Marine Protected Area	Informally designated	2003	2.017
Olive	Marine Protected Area	Informally designated	2003	1.567
Saika	Marine Protected Area	Informally designated	2003	1.602

GHD

Level 9

145 Ann Street

T: 61 7 3316 3000 F:61 7 3316 3333 E: s 47F(1)@ghd.com

© GHD 2018

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

4131708-

91958/https://projects.ghd.com/oc/SQOC1/solomonislandscables/Delivery/Documents/EIA

PER/4131708-REP-A-Solomon_Cables_PER_22082018.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	GHD	s 47F(1)	on file	s 47F(1)	on file	10/08/2018
1	GHD	s 47F(1)	On file	s 47F(1)	On file	24/08/2018

www.ghd.com

