

Title of Proposal - North Galilee Water Scheme_Water Infrastructure

Section 1 - Summary of your proposed action

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

1.1 Project Industry Type

Transport - Water

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

Adani Infrastructure Pty Ltd (Adani) is an Australian wholly owned subsidiary within the Adani Group of companies ultimately held by Adani Enterprises Ltd (an entity listed on the National Stock Exchange of India). Adani proposes to construct and operate the North Galilee Water Scheme (NGWS) to provide a secure and reliable water supply under a commercial agreement to the operators of the Carmichael Coal Project (CCP) located approximately 160 kilometres (km) north-west of Clermont in Central Queensland in the northern Galilee Basin. The operations period for the Project is for a proposed 60 years.

The NGWS includes three major components: water harvest and storage infrastructure, the Stage A pipeline and the Stage B pipeline (and relevant associated infrastructure). While referred to as “Stages”, these components will not necessarily be developed in sequence. The Stage B component is located wholly within the footprint of the CCP rail corridor (SP1) which has already been subject to assessment under the EPBC Act as part of the approval for the CCP Environmental Impact Statement (EPBC 2010/5736). The action for which Adani is submitting a referral under the EPBC Act is for the construction and operation of the water harvest and storage infrastructure and the construction and operation of the Stage A pipeline components. Associated infrastructure herein is discussed in relation to these two components only.

The NGWS Project is related to another action (proposed by Adani Mining Pty Ltd) in the area, being the Carmichael Coal Mine and Rail Project (CCP) (EPBC 2010/5736). The NGWS will provide a secure and reliable water supply under a commercial agreement to the operators of the CCP. Nevertheless, The Action is separate and distinct from the CCP action. In addition to having different proponents, The Action will require:

- A separate financial investment decision; and
- Separate applications for State and local government approvals.

The following provides a brief synopsis of the main elements of The Action. A detailed description is provided in the NGWS EPBC Act Environmental Assessment (refer Section 1.9) which is provided as supporting documentation to this referral.

Water Harvest and Storage Infrastructure

The harvest and storage infrastructure includes construction and operation of flood harvesting infrastructure that will pump water from the river into an off-stream storage, and then supply water to the CCP via pipeline.

The main components of the harvest and storage infrastructure are:

- An intake pump station, diesel fuel tanks and intake channel from the Suttor River (up to 1.15 hectare (ha) of vegetation clearing required);
- Buried pipeline from the Suttor River to the Belyando Junction dam (construction corridor of 30 metres (m) with a disturbance footprint of 15 m width with respect to existing remnant or non-remnant vegetation) for 3.8 km and a total of approximately 5.7 ha disturbance);
- Upgrade to the existing Belyando Junction 2.2 GL dam on the Belyando Junction property to a nominal 10 GL capacity. This requires an estimated footprint area of approximately 170 ha including the dam and associated infrastructure. Borrow pits will be established to provide construction materials for the dam;
- Access tracks required for construction and logistical purposes;
- Two laydown areas immediately adjacent to the dam and intake pump station area (approx. 1.5 ha each in size); and
- Temporary construction camp to house the workforce during construction.

Stage A (Belyando) – Pipeline and associated infrastructure

Stage A includes the supply of water to the CCP via pipeline and associated infrastructure.

The main components of this Stage are:

- The buried Belyando Pipeline located within a 30 m construction corridor along a 49 km route that crosses four minor watercourses and one major watercourse. The pipeline construction requires a 30 m corridor, with a 15 m disturbance footprint of existing remnant or non-remnant vegetation (within the 30 m corridor) and has an impact area of approximately 73.5 ha;
- The Gregory Developmental Road break tank and pump station covering a footprint of approximately 0.09 ha within an already pre-cleared area; and
- Two laydown areas (1.5 ha each in size) will be positioned immediately adjacent to the pipeline corridor, being:
 - Mount Douglas Station at CH18.7; and
 - Disney Station at CH36.0.

The water take facilitated by The Action, has been assessed by the Queensland Government Department of Natural Resources, Mines and Energy (DNRME) and a water licence has been granted to enable that extraction. The water licence grants a capped allocation determined by impact assessment against Environmental Flow Objectives (EFOs) and Water Allocation Security Objectives (WASOs). The criteria establish the requirements for adequate environmental flows and water allocation for potable and agricultural purposes.

This referral provides an analysis of the licensed water offtake for the NGWS and its impact on downstream river volumes (as released into Lake Dalrymple) and overall flooding extent. Whilst the extraction of water does not form a component of The Action as referred, this analysis has been included to inform an understanding and assessment of potential impacts to downstream Matters of National Environmental Significance (MNES) fauna and flora consequentially resulting from the licenced water extraction. It is not expected that any MNES will be consistently subject to a reduction in future flood inundation from the NGWS water offtake, and as such any impacts, should there be any, will be negligible and of short duration. As such there is not considered to be any significant residual impact on MNES from the water take. Therefore, this component has been excluded from the referred action (see Section 4 of the attached Environmental Assessment report).

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

Area	Point	Latitude	Longitude
Water Harvest and Storage Area	1	-21.456897326426	146.90968081669
Water Harvest and Storage Area	2	-21.459134005895	146.90796420292
Water Harvest and Storage Area	3	-21.451145707355	146.89388797001
Water Harvest and Storage Area	4	-21.451465247701	146.88496157841
Water Harvest and Storage Area	5	-21.455299677222	146.87946841435
Water Harvest and Storage Area	6	-21.456897326426	146.87466189579
Water Harvest and Storage Area	7	-21.459773050868	146.87294528202
Water Harvest and Storage Area	8	-21.457855907543	146.8664221497
Water Harvest and Storage Area	9	-21.45370201051	146.86264559941
Water Harvest and Storage Area	10	-21.451145707355	146.86058566288
Water Harvest and Storage Area	11	-21.447950265392	146.84925601201
Water Harvest and Storage Area	12	-21.436126521418	146.85131594853
Water Harvest and Storage Area	13	-21.436765667212	146.85406253056
Water Harvest and Storage Area	14	-21.440920046634	146.85337588505
Water Harvest and Storage Area	15	-21.440600483186	146.85165927128
Water Harvest and Storage Area	16	-21.446352518155	146.85097262577
Water Harvest and Storage Area	17	-21.448269812739	146.85989901738
Water Harvest and Storage Area	18	-21.445074307763	146.86058566288
Water Harvest and Storage Area	19	-21.440600483186	146.85921237187
Water Harvest and Storage Area	20	-21.437404810207	146.85955569462
Water Harvest and Storage Area	21	-21.434848221432	146.8619589539
Water Harvest and Storage Area	22	-21.433250330705	146.86607882695

Area	Point	Latitude	Longitude
Storage Area			
Water Harvest and Storage Area	23	-21.434528644686	146.86951205449
Water Harvest and Storage Area	24	-21.437724380654	146.87328860478
Water Harvest and Storage Area	25	-21.441239609382	146.87500521855
Water Harvest and Storage Area	26	-21.446672069002	146.87878176884
Water Harvest and Storage Area	27	-21.449867538972	146.88461825566
Water Harvest and Storage Area	28	-21.449867538972	146.89526126103
Water Harvest and Storage Area	29	-21.457216854165	146.90968081669
Water Harvest and Storage Area	30	-21.456897326426	146.90968081669
Stage A Pipeline and Associated Infrastructure	1	-21.833450575071	146.91689059452
Stage A Pipeline and Associated Infrastructure	2	-21.833450575071	146.91723391728
Stage A Pipeline and Associated Infrastructure	3	-21.776073829945	146.94229647831
Stage A Pipeline and Associated Infrastructure	4	-21.752160072803	146.94813296513
Stage A Pipeline and Associated Infrastructure	5	-21.712932890083	146.95087954716
Stage A Pipeline and Associated Infrastructure	6	-21.703682645736	146.94607302861
Stage A Pipeline and Associated Infrastructure	7	-21.693474789689	146.9453863831
Stage A Pipeline and Associated Infrastructure	8	-21.681671054205	146.94057986454
Stage A Pipeline and Associated Infrastructure	9	-21.55623664952	146.95396945195
Stage A Pipeline and Associated Infrastructure	10	-21.548573010304	146.92032382206

Area	Point	Latitude	Longitude
Stage A Pipeline and Associated Infrastructure	11	-21.531967070113	146.90762088017
Stage A Pipeline and Associated Infrastructure	12	-21.527815288276	146.89938113408
Stage A Pipeline and Associated Infrastructure	13	-21.4792625763	146.89526126103
Stage A Pipeline and Associated Infrastructure	14	-21.472872855266	146.88908145146
Stage A Pipeline and Associated Infrastructure	15	-21.470316888359	146.87843844609
Stage A Pipeline and Associated Infrastructure	16	-21.465204820008	146.87809512333
Stage A Pipeline and Associated Infrastructure	17	-21.460092572303	146.87225863652
Stage A Pipeline and Associated Infrastructure	18	-21.458814482357	146.87363192753
Stage A Pipeline and Associated Infrastructure	19	-21.463926774895	146.8798117371
Stage A Pipeline and Associated Infrastructure	20	-21.469038888087	146.8798117371
Stage A Pipeline and Associated Infrastructure	21	-21.471594877418	146.89079806523
Stage A Pipeline and Associated Infrastructure	22	-21.4792625763	146.89766452031
Stage A Pipeline and Associated Infrastructure	23	-21.526537793064	146.90109774784
Stage A Pipeline and Associated Infrastructure	24	-21.530370244991	146.90933749394
Stage A Pipeline and Associated Infrastructure	25	-21.546976367844	146.92169711308
Stage A Pipeline and Associated Infrastructure	26	-21.554640091405	146.95602938847

Area	Point	Latitude	Longitude
Stage A Pipeline and Associated Infrastructure	27	-21.559110409839	146.95602938847
Stage A Pipeline and Associated Infrastructure	28	-21.679756843817	146.94229647831
Stage A Pipeline and Associated Infrastructure	29	-21.693793796143	146.94778964238
Stage A Pipeline and Associated Infrastructure	30	-21.702087715934	146.94847628788
Stage A Pipeline and Associated Infrastructure	31	-21.712294961286	146.95328280644
Stage A Pipeline and Associated Infrastructure	32	-21.751841195792	146.95053622441
Stage A Pipeline and Associated Infrastructure	33	-21.777349118378	146.94435641484
Stage A Pipeline and Associated Infrastructure	34	-21.834725352668	146.92032382206
Stage A Pipeline and Associated Infrastructure	35	-21.833450575071	146.91689059452

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

The Action is situated near the north-western boundary of the Brigalow Belt Bioregion which covers much of Central Queensland extending from Townsville south to Narrabri in New South Wales. The Action traverses the Charters Towers Regional Council and Isaac Regional Council local government areas (LGAs). Climate in the area is described as arid to subhumid with distinct wet and dry seasons. The Action lies largely within the Belyando Downs subregion of the Brigalow Belt Bioregion. The address of the lots traversed by the water harvest and storage infrastructure and the Stage A pipeline components are listed below.

The Belyando Junction dam expansion and associated utility infrastructure developments are located within the Lot 3 SP278559 and a stock route (401CHAR). The Stage A Pipeline traverses Lot 1 on SP147334, Lot 2 on SP147334 (Mount Douglas Station), the Gregory

Developmental Road, Bowen Developmental Road, an Unnamed Road, and Lot 4 on SP116046 (Disney Station). The land use of the properties is rural (low intensity cattle grazing). Approximately 455 m of the Stage A Belyando Pipeline will be located in the GBSDA (Rail Corridor Precinct).

Water Harvest and Storage Infrastructure (included in the Referral)

- 3 SP278559, grazing native vegetation, freehold
- Stock route (401CHAR), Stock route (gazetted), State Land
- 3 SP278559, grazing native vegetation, freehold

Stage A Belyando Pipeline (included in the Referral)

- Stock route (401CHAR), Stock route (gazetted), State Land
- 3 SP278559, grazing native vegetation, freehold
- 1 SP147334, grazing native vegetation, freehold
- 2 SP147334, grazing native vegetation, freehold
- Gregory Developmental Road, Bowen Developmental Road, and Unnamed Road, stock route (gazetted), State Land
- 4 SP116046, grazing native vegetation (some cropping), leasehold
- 3235 SP156095, grazing native vegetation (some cropping), leasehold

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

Total referral area – Water Infrastructure and Stage A pipeline = 623.63 ha. The area does not include Stage B.

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title. Multiple lots within the Galilee Basin area

1.8 Primary Jurisdiction.

Queensland

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

No

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

Yes

1.10.1 Is there a local government area and council contact for the proposal?

No

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

Start date 10/2019

End date 05/2069

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

State and Local Government Planning Framework

The Action is located within the Isaac Regional Council and Charters Towers Regional Council local government areas. Additionally, a small section of the southern tip of the Stage A is within the Galilee Basin State Development Area (GBSDA). The Action will cross a number of administrative areas, including those identified as:

‘Rural Zone’ as defined in the Belyando Shire Planning Scheme 2008 as administered by the Isaac Regional Council; ‘Rural Planning area’ as defined in the Dalrymple Shire Planning Scheme 2006 as administered by the Charters Towers Regional Council; and GBSDA as administered by the Queensland Government Office of the Coordinator-General.

The following State and local regulatory framework applies to The Action:

• State Development and Public Works Organisation Act 1971, including the Galilee Basin State Development Area Development Scheme 2015; • Planning Act 2016, including the following local instruments:

- Belyando Shire Planning Scheme 2008

- Dalrymple Shire Planning Scheme 2006

• Transport Infrastructure Act 1994; • Nature Conservation Act 1992; • Vegetation Management Act 1999; • Building Act 1975; • Fisheries Act 1994; • Forestry Act 1959; • Land Act 1994; and • Water Act 2000.

The following permits and confirmations have been obtained by Adani for the NGWS Project:

• Material Change of Use (MCU) Development Permit assessed by Charters Towers Regional Council for the upgrade of an off-stream flood harvesting storage and associated infrastructure

(Belyando Junction dam and intake) (MC15/94). The MCU Development Permit submitted to and approved by CTRC for the upgrade of an off-stream flood harvesting storage and associated infrastructure was an impact assessable MCU development application. Refer to Appendix A of the Environmental Assessment Report for the approval and associated conditions.;

- Operational Works Development Permit for taking or interfering with water and high impact earthworks in a wetland protection area assessed by the Queensland Government State Assessment and Referral Agency. This covered the intake, pump and gravity diversion infrastructure;
- Grant of a Water Licence from the Strategic Reserve of unallocated water in Sub-catchment E of the Burdekin Basin (Suttor River) – extracting 12.5 GL per annum (reference 617268). The assessment by the Queensland Department of Natural Resources, Mines and Energy (DNRME) involved targeted public consultation (including with downstream users), assessment of potential riparian impacts, assessment of water source and demand, and modelling of the take against environmental flow objectives. The water licence grants a capped allocation determined by impact assessment against Environmental Flow Objectives (EFOs) and Water Allocation Security Objectives (WASOs). The criteria establish the requirements for adequate environmental flows and water allocation for potable and agricultural purposes. Refer to Appendix A of the Environmental Assessment Report for the water licence and associated conditions; and
- Confirmation from the Department of Agriculture and Fisheries (DAF) that an Operational Works Development Permit for Waterway Barrier Works was not required for activities associated with the Belyando Junction dam.

The above-listed development permits and the water licence are provided as an appendix to Attachment B (EPBC Act Environmental Assessment). An approvals matrix has been developed to provide a summary of approvals required for the NGWS Project and their status (Appendix B of the attached EPBC Act Environmental Assessment).

Several additional State and local consents will need to be obtained for the project, including but not limited to:

- MCU Development Permit for a Major Utility (pipeline) in the Charters Towers Regional Council; and
- Operational works permit for excavation or filling in Isaac Regional Council.

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

Statutory public consultation has been completed for:

- Water Licence for the take of water from Sub-catchment E of the Burdekin Basin (Suttor River) – extracting 12.5 GL per annum (reference 617268). This involved a statutory Indigenous stakeholder consultation period and targeted landholder and downstream user consultation.
- The MCU Development Permit by Charters Towers Regional Council for the upgrade of an off-stream flood harvesting storage and associated infrastructure (Belyando Junction dam and intake) (MC15/94).

Consultation with all relevant landholders along the pipeline route has also been completed and in-principle land-use and access agreements have been secured.

In addition, there are two registered Native Title claims associated with the land to be traversed

by the NGWS Project. These being the Wangan and Jagalingou People (QC2004/006) Area Agreement and the Jangga People (QCD2012/009) Area Determination.

Sections of the NGWS are located on lease land, state land and freehold properties. The proposed tenure for the pipeline does not extinguish native title in these locations. Adani have progressed native title negotiations and various consultations with the relevant Indigenous groups and have Cultural Heritage Management Plans (CHMP) in place for the Project.

The public consultation process is further discussed in Section 7.1.4 of the attached Environmental Assessment Report.

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

Commonwealth

A comprehensive EIS assessing potential impacts on MNES for the CCP, received approval under the Commonwealth Government EPBC Act on 14 October 2015 (EPBC 2010/5736). While, the NGWS has been considered a separate project and the infrastructure was not included in that EIS, the Stage B component of the NGWS is located wholly within the footprint of the CCP rail corridor (SP1) which was subject to the assessment. The Action directly adjoins the CCP rail corridor in the south. As such, relevant species and habitat information from the CCP EIS has been utilised to inform the assessment of the infrastructure included in this referral.

Queensland

Impact assessments for various components of the NGWS (including those that form The Action) have been completed. The relevant assessments relate to the approvals listed in Section 1.12 and are listed as follows:

- NGWS Riverine Protection Permit Application (CDM Smith 2015);
- NGWS – Belyando Junction Dam: Material Change of Use Report (CDM Smith 2015);
- NGWS – Environmental Assessment Report (CDM Smith 2015);
- NGWS - Commonwealth Matters of National Environmental Significance Review (CDM Smith 2018); and
- NGWS EPBC Act Environmental Assessment (CDM Smith July 2019) (attached to this submission).

A MCU Development Permit was submitted to and approved by Charters Towers Regional Council for the upgrade of an off-stream flood harvesting storage and associated infrastructure. This was an impact assessable MCU development application and considered impacts on ecology, soil, water resources and cultural heritage impacts. Both desktop and onsite ecological

assessments were undertaken in March and May 2015 for the area that was proposed to be disturbed.

The NGWS EPBC Act Environmental Assessment provides an updated collation of all information accessed from the previous reports based on the current footprint / design and including responses for more detailed information (as requested by DotEE) regarding potential impacts to MNES resulting from the project.

The water take facilitated by The Action, was assessed by the Queensland Government DNRME. The process involved an impact assessment against EFOs and WASOs. The criteria establish the requirements for adequate environmental flows and water allocation for potable and agricultural purposes.

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

No

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

Yes

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation).

The NGWS Project is related to another action (proposed by Adani Mining Pty Limited) in the area, being the Carmichael Coal Mine and Rail Project (CCP) (EPBC 2010/5736). The NGWS will provide a secure and reliable water supply under a commercial agreement to the operators of the CCP. Nevertheless, The Action is separate and distinct from the CCP action. In addition to having different proponents, The Action will require:

- A separate financial investment decision
- Separate applications for State and local government approvals.

There is potential in the future for the NGWS to supply additional resource-extraction projects that are located in the surrounding region. At this stage there are no water supply agreements executed and the current State Government approved water licence for the NGWS is conditioned to supply the CCP only.

Section 2 - Matters of National Environmental Significance

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

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

- [Profiles of relevant species/communities](#) (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- [Significant Impact Guidelines 1.1 – Matters of National Environmental Significance](#);
- [Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies](#).

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

No

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

No

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

No

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

Yes

2.4.1 Impact table

Species	Impact
Section 1.10 of the attached Environmental Assessment report provides a detailed analysis of the potential presence of all MNES as	N/A

Species	Impact
<p>identified from database search records and the EPBC Act Protected Matters Search Tool. Section 3 provides a detailed analysis of potential habitat for the MNES identified as potentially occurring within The Action and wider NGWS Project area. Section 4 provides an assessment of the potential impacts to MNES from The Action's activities and Section 5 outlines the mitigation measures to be applied to reduce The Action's potential impacts. Section 6 provides a detailed analysis of the potential for 'significant residual impacts' as per the MNES Significant Impact Guidelines 1.1 (DotE 2013). The following provides a summary of the presence of the nominated MNES and significant impact assessment based on The Action's activities.</p>	
Ornamental Snake - Vulnerable	<p>Impact Assessment Result: The species has been detected in the area surrounding the NGWS Project. There are suitable cracking clay soils within The Action footprint including extensive gilgai formations, although much of this area remains cleared of remnant vegetation. Under the Draft Referral guidelines for the nationally listed Brigalow Belt reptiles (DSEWPac 2011) (BBR Guidelines) habitat within The Action may be considered as 'important habitat' for Ornamental Snake. This area will be impacted by clearing activities including a maximum of 32.35 ha of suitable habitat within the water harvest and storage infrastructure area, and 34.36 ha of suitable habitat within the Stage A footprint. It is unlikely this habitat will retain the necessary characteristics to support the species following completion of construction and subsequent vegetation rehabilitation activities. There is also a low potential for construction to impact the breeding cycle. Under the BBR Guidelines (SEWPac 2011) clearing 2 or more hectares of 'important habitat' may constitute a high risk of significant impacts on the species. Therefore, The Action may be considered to have a 'significant residual impact' on Ornamental Snake.</p>
Squatter Pigeon - Vulnerable	<p>Impact Assessment Result: The species occurs across a broad swathe of central and northern Queensland as a single interbreeding</p>

Species	Impact
Black-throated Finch (southern) - Endangered	<p>population. There is no 'important population' identified in the area. The Action requires clearing approximately 131.14 ha of potentially suitable habitat along a largely narrow (maximum 30 m width) construction corridor that may be adjusted (narrowed) in suitable woodland where possible during construction. There is abundant similar woodland habitat adjacent to and surrounding The Action. Under the definition provided in the MNES guidelines (DotE 2013) as issued and referred to by DotEE, the individuals occurring in The Action cannot be considered an important population. None of the nine-part tests of significance (refer Table 6-6 in the attached Environmental Assessment report) conclude a significant impact on the species. As such there will be no significant residual impact on an 'important population'.</p> <p>Impact Assessment Result: The regional population is centred within the continuous woodlands generally located 60 km west of The Action . Construction clearing requires clearing a maximum of 19.48 ha of potentially suitable habitat. Of this, 5.39 ha occurs within the Stage A pipeline along a narrow (maximum 30 m width) construction corridor that may be adjusted (narrowed) in suitable riparian woodland during construction. Nevertheless, clearing will occur in areas in which the species is not known to occur. Once construction has been completed the Stage A pipeline will be rehabilitated with native grass species (dependent on the ground layer composition of adjacent habitat), excepting a 10 m wide operational maintenance track. No hydrological impacts are predicted on potential suitable downstream habitat i.e. reduction in waterhole levels or extent of riparian woodlands) as a result of water extraction for the NGWS. Although again, it is not known if the species occurs in this area. It is considered unlikely the NGWS offtake will impact the availability or quality of habitat to the extent the species is likely to decline. There have been no recent records (post 1980s) within 5 km of the referral footprint. The species is not known to occur close to or downstream of the majority of the</p>

Species	Impact
	NGWS or Action area. The Action's activities are considered unlikely to significantly impact the species.
Koala (Qld, NSW and ACT populations) - Vulnerable	<p>Impact Assessment Result: There is no 'important population' identified in the area. Given the paucity of records the species evidently occurs in very low densities in the area. There is abundant suitable woodland habitat for the Koala in the region adjacent to and surrounding The Action. The Action requires clearing a maximum of 22.37 ha of suitable habitat along a largely narrow (maximum 30 m width) construction corridor that may be adjusted (narrowed) in suitable riparian woodland where possible during construction. Remnant forests in the area are naturally open and Koalas are mobile animals. No hydrological impacts are predicted on suitable downstream riparian habitat as a result of water extraction for The Action. Under the definition provided in the MNES guidelines (DotE 2013) as issued and referred to by DotEE, the individuals occurring in the referral area cannot be considered an important population. None of the nine-part tests of significance (refer Table 6-11 in the attached Environmental Assessment report) conclude a significant impact on the species. As such there will be no significant residual impact on an 'important population'.</p>
Waxy Cabbage Palm - Vulnerable	<p>Impact Assessment Result: There is no population/individuals within or near The Action. The nearest individuals appear to be located approximately 50 km downstream of the NGWS offtake site. These individuals might be considered part of an 'important population.' The only conceivable impact arising from The Action is the potential for individuals located downstream to be impacted by a decline in water/flood levels from the proposed water extraction regime. Modelling of the downstream impact of the NGWS water extraction rate indicates the flood inundation extent will be highly variable occur across years based on flow in the catchment (refer Section 2.4 and 4.3 of the attached Environmental Assessment report). Flow rates across most years are very unlikely to be regularly impacted (i.e. across</p>

Species	Impact
	<p>years) by the NGWS water offtake to the extent that the riparian-associated habitat for Waxy Cabbage Palm will be impacted (i.e. not subject to flooding inundation). The Action is not expected to have more than a negligible impact on any downstream populations. It is uncertain whether the individuals / population occurring downstream of the NGWS offtake site may be considered an 'important population'. The impact of the NGWS offtake will be highly variable across years and is considered unlikely to have an impact on the downstream population. None of the above nine-part tests of significance conclude a significant impact on the species. As such there is not considered to be any significant residual impact on an 'important population' of Waxy Cabbage Palm as per the MNES guidelines.</p>
Bluegrass - Vulnerable	<p>Impact Assessment Result: There is no important population known from the referral area, surrounds or downstream and no individuals have ever been recorded in the wider area (i.e. the nearest records of the species are approximately 95 km distant). There is suitable habitat present downstream of The Action for the species (heavy clay soils). Modelling of the downstream impact of the NGWS water extraction rate shows very minor reduction in overall flood extent on suitable habitat for Bluegrass (refer Section 3.4.6.3 of the Environmental Assessment report) and no impacts are expected (should the species occur). There is no definition provided in the MNES guidelines (DotE 2013), or any species specific guideline regarding the existence of suitable habitat for the species where it has not been detected. Therefore, there is no 'important population' of Bluegrass in the area. None of the nine-part tests of significance (refer Table 6-15 in the attached Environmental Assessment report) conclude a significant impact on the species. As such there will be no significant residual impact on an 'important population' of Bluegrass as per the MNES guidelines.</p>
Brigalow (Acacia harpophylla dominant and codominant) - Vulnerable	<p>Impact Assessment Result: The Brigalow TEC does not occur within the Referral area. Flood modelling of the proposed extraction of water</p>

Species	Impact
	<p>from the Suttor River predicts a limited and variable change (across years) to flood extent on downstream Brigalow TEC communities generally restricted to mid-sized flood events. The occurrence of these communities is based on unconfirmed vegetation mapping. There is no evidence these communities will rely on flooding from the Suttor River itself to sustain community integrity. The Referral area will not require clearing of any occurrences of this TEC. Downstream reductions in flood extent are not predicted to impact this community. There is no evidence to conclude there will be a 'significant impact' on occurrences of this TEC as a result of the referred activities.</p>

2.4.2 Do you consider this impact to be significant?

No

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

No

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

No

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

No

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

No

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

No

2.10 Is the proposed action a nuclear action?

No

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

No

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

No

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

No

Section 3 - Description of the project area

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

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

EXISTING ENVIRONMENT

REGIONAL

The NGWS Project elements for the purpose of the referral area was deemed to be inclusive of the water harvesting and storage infrastructure and Stage A pipeline and associated infrastructure. This has been described throughout as The Action.

The Action is situated near the north-western boundary of the Brigalow Belt Bioregion which covers much of Central Queensland extending from Townsville to Narrabri in New South Wales. Climate in the area is described as arid to subhumid with distinct wet and dry seasons. The Action lies largely within the Belyando Downs subregion of the Brigalow Belt Bioregion. The dominant vegetation communities present are as follows:

- Brigalow (*Acacia harpophylla*) and gidgee (*Acacia cambagei*) communities on fine textured clay soils;- Reid river box (*Eucalyptus brownii*) (usually with other eucalypt species) communities on Cainozoic sediments with a thick sandy surface layer; and- Coolabah (*E. coolabah*) open woodland on alluvial plains, clay levees and texture contrast soils.

The referral area is dominated by vegetation communities located on the following land zones (as described by Neldner 2012):

- Land zone 3 - recent Quaternary alluvial systems (alluvial river and creek flats); and- Land zone 4 - Tertiary-early Quaternary clay plains (clay plains).

The Action occurs in an agricultural area primarily used for cattle grazing. As a result of historic and current grazing activities, much of the landscape has been cleared of woody vegetation. Vegetation remaining is associated with elevated rocky areas, rivers, creeks and minor drainage lines. There are also several protected areas in the region containing large tracts of vegetation including Willandspey Regional Park, Blackwood National Park, and Nairana National Park. The Stage A pipeline lies adjacent to the eastern boundary of Nairana National Park for part of its length; however, there will be no impact to the park itself. The remaining protected areas lie more than 10 km from The Action and no protected area will be traversed for site access.

The following sections describe the ecological values of each stage of The Action as they relate to MNES as evaluated during the site surveys.

Regional Aquatic Values

The NGWS Project is located primarily within the Belyando Basin and partly within the Suttor Basin, characterised by wide floodplains of braided rivers and creeks associated with the Belyando River Basin. Within these basins, The Action is located within the Belyando Floodplain, Carmichael River Sub-catchment, Mistake Creek Sub-catchment and the Upper Suttor River Sub-catchment.

The Belyando Basin covers an area of approximately 35,000 km². Most of the Referral area is within the Belyando sub-catchment while a small section of the Stage A pipeline lies within the Suttor River sub-catchment. Both sub-catchments are located within the Burdekin River Basin. The Burdekin River is one of Australia's largest rivers and is known to carry significant sediment during flow periods. The Burdekin River is one of the largest single sources of sediment and fresh water to the Great Barrier Reef lagoon (NQ Dry Tropics 2015).

The Belyando River drains semi-arid inland areas bound by the Great Dividing Range in the west and the Denham and Drummond Ranges to the east. It flows in a northerly direction before joining the lower reaches of the Suttor River, which then joins the Burdekin River entering the Burdekin Falls Dam approximately 90 km downstream of the Referral area. Cattle grazing is the dominant land use of the area with a small percentage of the land used for dryland cropping of cereals.

Review of the gauging sites in the Belyando River area indicate the flow regime is highly seasonal with natural flows peaking from December to April (the wet season) with low to negligible flows experienced from May to November (the dry season). Wet season flood events are usually of a relatively short duration. Although rainfall shows a strong seasonal bias, river flows are more associated with individual events and there are periods of no rainfall during the wet season. The water quality in the Belyando Basin is known to have moderately elevated suspended sediment concentrations and loads during the wet season event flows.

The nearest wetland listed on the Directory of Important Wetlands of Australia (DIWA) database is the Scartwater Aggregation which lies on the Suttor River approximately 33 km north of The Action (or approx. 50 km downstream). This wetland flows into Dalrymple Lake (Burdekin Dam). There are also several coastal wetlands listed on the DIWA database located downstream of the Burdekin Falls Dam. The dam; however, heavily regulates downstream water flows and the Suttor and Belyando Rivers contribute a comparatively low percentage of incoming flow (Burrows 1999).

A review of aquatic MNES for the region shows there are no threatened freshwater aquatic species in the Burdekin catchment. A desktop assessment conducted as part of the CCP EIS identified 51 fish species known to occur within the Burdekin Basin (GHD 2012a) and 17 fish species as likely to occur in the CCP Project area (i.e. the Carmichael River and tributaries). Field surveys recorded 11 fish species (GHD 2012a). A comprehensive survey of the fish fauna from the Belyando-Suttor river systems recorded a total of 15 fish species (Burrows et al. 2009). None of the species recorded in either survey are listed as threatened species under State or Commonwealth legislation. It is considered these results will be indicative of that found in aquatic habitats in the Referral area as The Action is within this river system. Aquatic vegetation was found to be limited within the CCP studies with only four species identified during surveys.

WATER HARVEST AND STORAGE INFRASTRUCTURE

There is an existing 2.2 GL capacity dam at Belyando Junction Station. The Action will include increasing the volume of the existing dam to 10 GL. The dam will be fed by an intake pump station on the Suttor River which will transfer water through a buried pipeline to the expanded Belyando Junction dam. Construction for the water storage infrastructure will require a temporary construction camp and access road. The open channel intake and delivery pipelines run approximately 4 km in length although a final layout for the pipelines has not been decided at the time of this documentation.

Vegetation

Field assessments confirmed that no Brigalow occurs within or near the proposed area to be cleared for the flood-harvesting pump station. Riverine vegetation on both the Belyando and Suttor Rivers is dominated by Coolabah (RE11.3.3) and River Red Gum (*E. camaldulensis*) (RE11.3.25) in the canopy. Ground cover has been extensively impacted by cattle access and the introduced Guinea Grass (*Megathyrsus maximus*).

A flood-harvesting intake pipeline associated with the Belyando Junction dam extends approximately 4 km through cleared lands to the east where it crosses an anabranch of the Belyando/Suttor River with an existing river impoundment also dominated by Coolabah and River Red Gum vegetation communities.

Fauna

The existing Belyando Junction dam provides habitat value for a variety of waterbirds and is a source of permanent water, potentially providing additional water sources for MNES fauna such as Squatter Pigeon (southern) and Black-throated Finch (southern). Both species require access to permanent water sources. Expansion of the dam site will have a minor impact on remnant vegetation restricted to eucalypt woodlands directly to the north which may be impacted by extending the capacity of the current dam. The extended dam area (adjacent to the western side of the existing dam, is located entirely on cleared cattle grazing land dominated by the introduced Buffel Grass and holds little value for terrestrial MNES fauna.

An extensive pool/waterhole was present at the Suttor River site of the proposed intake pump and at the Stage A pipeline crossing at the time of all surveys in these areas. These riverine habitats provide suitable forage trees for Koala (where red gums occur). The waterholes may provide suitable water sources for both Squatter Pigeon (southern) and Black-throated Finch (southern). Squatter Pigeon has been seen during surveys in the area. Signs of Koala presence (scratches / scats) were observed downstream of the NGWS offtake site. Black-throated Finch has not been recorded in the wider area since the 1980s.

STAGE A

Stage A consists of a 15 m wide nominal construction footprint, within a 30 m construction corridor, that extends 48 km in an approximate north-south direction commencing at the Belyando Junction dam located at the northern extent. There will be a final 10 m wide pipeline operational corridor. The pipeline runs south towards the Bowen Developmental Road and then diverts along the eastern boundary of Nairana National Park for 13 km before turning south-

west along the Gregory Developmental Road which it then follows for 4 km before running due south through Disney Station for approximately 14 km to the CCP SP1 rail corridor. The overall construction footprint area of the Stage A pipeline covers 75.7 ha.

Vegetation Assessment

The Stage A pipeline crosses an extensive alluvial clay plain and both the anabranch (as also crossed by the intake pipeline) and the main channel of the Belyando River. A thin strip of unmapped Brigalow (not large enough to qualify as a TEC) is crossed by the pipeline 600 m south-east of the dam area. Vegetation along both rivers was formerly mapped as containing Brigalow TEC vegetation communities (RE11.3.1); however, no Brigalow was observed at or near the Belyando River crossings.

The proposed pipeline extends south from the Suttor River for 5 km then turns south-east for another 3 km. The alignment then turns east and follows the Bowen Developmental Road for 4 km. The majority of this stretch of alignment has been cleared for grazing with only small patches of remnant vegetation occurring dominated by Gidgee (RE11.3.3 and 11.4.6) or Coolabah (RE11.3.5).

The pipeline then turns south along the eastern boundary of Nairana National Park. Most of this area has been cleared in the past and is now largely regrowth Gidgee on gilgai formations. Along this southern section, approximately 3.4 km of habitat formerly mapped as potential Brigalow TEC (RE11.4.8) was found to be solely gidgee woodland (RE11.4.6).

South of Nairana National Park, the proposed pipeline will cross the Gregory Development Road and run just outside the Gregory Developmental Road easement for 4 km. This is non-remnant habitat comprising regrowth Acacia and Eucalyptus spp. or grasslands on stony soils. The pipeline then turns south onto Disney Station where it initially traverses sparse eucalypt woodland for 1.2 km before entering a cleared easement (varying between 30-50 m wide) dominated by the introduced Buffel Grass. The easement extends for 6 km to the south and encompasses several patches formerly mapped as potential Brigalow TEC (RE11.3.1 and 11.4.8) that cross the easement. Although some Brigalow was observed the majority of this habitat was dominated by Gidgee (RE11.4.6) (Plate 3-7) and no remnant vegetation was observed in the easement itself. Beyond the easement the alignment continues for 7 km on an approximate south-west trajectory through predominantly cleared lands where two small patches of Coolabah woodland will be impacted.

Fauna Assessment

The Stage A pipeline to the south of the dam area initially passes through RE11.3.3 and cleared habitat which provides suitable habitat values for Ornamental Snake.

Immediately south of the Belyando River the pipeline crosses through largely cleared lands with some patches of remnant woodlands which comprise trees that are suitable for Koala. Scratches and scats attributable to Koala were identified in Coolabah woodland to the south of the Belyando River crossing during the March – April 2019 assessment. Examination of aerial imagery and the site assessment indicates that a large section of the cleared habitat in this portion (extending 6 km south of the Belyando River crossing) of the pipeline is potentially suitable for Ornamental Snake as extensive formations of gilgais occur. Inspection of this clay

plain showed degraded soil structure due to moderate impact of cattle trampling. South of this section of the pipeline this habitat flattens out (i.e. gilgai habitat disappears) and has been cleared providing little value to MNES fauna.

Habitat along the Bowen Developmental Road is also largely cleared. A patch of potential Brigalow TEC (mapped by DNRME as containing RE11.4.8 and 11.4.9) on the north side of the road was found to comprise a mixture of Gidgee (RE11.4.6) and Acacia woodlands (RE11.7.2). Squatter Pigeon (southern) was observed in the sandy habitat near this area. To the east of this patch the pipeline passes through further sandy habitat with little value for MNES species. Although some minor gilgai habitat was observed there were no soil cracks or fallen woody debris likely to provide shelter for the species.

The eastern boundary of Nairana National Park is now largely regrowth gidgee on cracking clay soils with often abundant gilgai formations. The gilgai habitat along much of this section was found to be in good condition and is likely to provide suitable habitat for Ornamental Snake. The species was recorded along this section during the March 2019 survey. Suitable habitat extends for approximately 11.3 km south whereupon the alignment heads up a hill and the substrate changes. The vegetation communities here occur on land zones 5 and 11 and comprise eucalypt woodlands what will provide some value for Koala. Squatter Pigeon (southern) may also be associated with this habitat (it is known from land zone 5) although the nearest permanent water is approximately 1.2 km west of this section of the pipeline.

The pipeline then follows the Gregory Development Road for 4.2 km and passes through non-remnant lands on stony soils that present little value to any MNES species. The pipeline continues south into the Disney Station property initially passing through sparse woodland suitable for Koala and then along a cleared easement passing through gently hilly encompassing Acacia woodlands interspersed with eucalypt woodlands that may also provide foraging habitat for Koala. The easement itself provides little value for MNES fauna as it is cleared of vegetation and is largely dominated by Buffel Grass. However, Squatter Pigeon (southern) was observed in this section along a sandy creek lined by Reid River Box in 2015 and again during the March/April 2019 assessment. South of the easement the pipeline passes through predominantly cleared habitat. Examination of aerial imagery and site assessments confirmed cracking clay soils occur throughout including some areas of gilgai formations that may be suitable for Ornamental Snake. Inspection of accessible areas showed extensive degradation due to the presence of cattle and Buffel Grass.

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

The NGWS Project is located primarily within the Belyando Basin and partly within the Suttor Basin characterised by wide floodplains of braided rivers and creeks associated with the Belyando River Basin. Within these basins, The Action is located within the Belyando Floodplain, Carmichael River Sub-catchment, Mistake Creek Sub-catchment and the Upper Suttor River Sub-catchment.

The Belyando Basin covers an area of approximately 35,000 km². Most of The Action is within the Belyando Sub-catchment while a small section of the Stage A pipeline lies within the Suttor River Sub-catchment. Both sub-catchments are located within the Burdekin River Basin. The Burdekin River is one of Australia's largest rivers and is known to carry significant sediment

during peak flow periods. The Burdekin River is one of the largest single sources of sediment and fresh water to the Great Barrier Reef lagoon (NQ Dry Tropics 2015).

The Belyando River drains semi-arid inland areas bound by the Great Dividing Range in the west and the Denham and Drummond Ranges to the east. It flows in a northerly direction before joining the lower reaches of the Suttor River, which then joins the Burdekin River entering the Burdekin Falls Dam approximately 90 km downstream of The Action. Cattle grazing is the dominant land use of the area with a small percentage of the land used for dryland cropping of cereals.

Review of the gauging sites in the Belyando River area indicate the flow regime is highly seasonal with natural flows peaking from December to April (the wet season) with low to negligible flows experienced from May to November (the dry season). Wet season flood events are usually of a relatively short duration. Although rainfall shows a strong seasonal bias, river flows are more associated with individual events and there are periods of no rainfall during the wet season. The water quality in the Belyando Basin is known to have moderately elevated suspended sediment concentrations and loads during the wet season event flows.

A detailed analysis of the potential impacts of the NGWS water offtake on annual river flows is provided in Section 2 of the attached Environmental Assessment report. The analysis is based on modelling derived from 51 years of river flow data (1968-2018) as recorded at the St Ann's river gauge located downstream of the water offtake site. Flow rate data, as provided in Table 2-6 of the attached Environmental Assessment, indicates a highly variable recorded maximum flow rate across years varying from as little as 21 m³/s in 1961 up to 5,856 m³/s in 1973. The average maximum flow rate across the data was 1,140 m³/s. Actual days of river flow was also highly variable with as little as 45 days of flow recorded in 1961, and up to 351 days of flow recorded in 2010.

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

An assessment of the soil classification of the area was undertaken by reviewing the ASRIS 2011 data, Land Resources Areas (LRAs), as well as a review of the site specific soil sample records in the locality to further define the local soil physical attributes and confirm applications of LRA descriptions.

Soils within the area are understood to be five to six million years old and more than 36 m deep (Coventry et al. 1985). The predominant soils across the Stage A pipeline are vertisols and kandosols, with some small areas of chromosols, dermosols, and rudosols. Management considerations of these soils and their key features are summarised below. Vertisols typically have a uniform clay texture, shrink-well properties and smooth surfaces on the faces of soil aggregate. Kandasols are shallow to deep red and brown gradational soils and uniform sands, often on crests and upper slopes.

Vertisols

- Topsoils have moderate fertility- Topsoils have medium to heavy clay textures and therefore soil workability may make stripping difficult- Subsoils are mildly to moderately alkaline, sodic and saline at depth and have high Calcium to Magnesium (Ca:Mg) ratios - Due to high cation

exchange capacity and exchangeable Ca and Mg levels and clay mineralogy, these subsoils are unlikely to be highly dispersive- They have a low dust potential.

Kandosols

- May have some ferruginised rock outcrop- Low fertility and low Plant Available Water Capacity, and have limited agricultural productivity- Medium to high dust potential- These soils are relatively stable when undisturbed but materials may have low coherence following disturbance and, therefore, be susceptible to soil erosion- The soil materials throughout these profiles allow for flexibility in the use of these materials.

Chromosols

- Dominant throughout the wider region- Feature a strong texture contrast between the topsoil and subsoil.

Rudosols

- Distributed throughout parts of the region- Characterised by a lack of horizontal development, other than the accumulation of organic matter in the A1 horizon.

Dermosols

- Present in small land units throughout the region- Lack a strong texture between the A and B horizons, but generally have a strong B2 horizon.

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

The site for The Action is within an area that has been degraded by agricultural activities and is not considered to have outstanding features.

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

There is a single TEC identified within or near the Referral area: Brigalow (*Acacia harpophylla* dominant and codominant). It is noted there will be no impact from vegetation clearing of Brigalow TEC as ground-truthing did not identify any instances of this community within the referral area. The Action is predicted to impact a maximum of 26.92 ha of remnant vegetation through vegetation clearing during construction. This includes 4.04 ha of Gidgee woodland (RE 11.4.6) listed as Endangered under the State's Vegetation Management Act 1999 (VM Act), and up to 15.13 ha of remnant vegetation comprising Coolabah woodland (RE11.3.3) listed as Of Concern under the VM Act. The remaining vegetation communities are all listed as Least Concern under the VM Act comprising a range of sclerophyll vegetation including Red Gum woodlands (RE11.3.25 and 11.3.27 – 4.84 ha), *Acacia* dominated woodland (RE 11.3.5 – 0.51 ha), and mixed eucalypt woodlands including Narrow-leaved Ironbark (RE11.5.9 and 11.11.15c – 2.4 ha). The remaining non-remnant habitat within the footprint is lands cleared for cattle grazing and is often dominated by the introduced Buffel Grass (particularly on cracking clay

soils – land zone 4). For further information refer to Section 3.2.2 of the attached Environmental Assessment report.

Flood impact modelling has been carried out based on comparing the baseline scenario (without water extraction for the NGWS) with the offtake required by the NGWS and is detailed in Section 2 of the Environmental Assessment report. The comparison has been carried out on three years of flood data with varying flood levels: 1981; 2001 and 2017. An additional 'steady state' scenario was carried out based on the apparent level of flow required to begin filling the Scartwater Aggregation lagoons (140 cumecs at the St Ann's river gauge) and the maximum take by all water users including Adani (14.71 cumecs) as proposed by DotEE. Tables 2-9 to Table 2-12 within the Environmental Assessment report detail the predicted reduction in flood inundation per DNRME mapped vegetation community polygons for each of the modelled flood scenarios.

The downstream riparian vegetation along the Suttor River is all mapped (under the State's DNRME vegetation mapping) as a mixed vegetation polygon including River Red Gum open forests / woodlands (RE 11.3.25 and 11.3.37, both considered as Least Concern under the VM Act), an estimated 10% of which may comprise Brigalow TEC vegetation on alluvial soils (RE11.3.1, considered Endangered under the VM Act). This extends until approximately 50 km north of the water offtake site. In addition, there are a number of mixed polygons adjacent to the main river channel which may include varying amounts of Brigalow vegetation on alluvial soils (RE 11.3.1) and clay soils (RE11.8.4 and 11.4.9) (Refer to Figure 3?7 and Figure 3?8 in the attached Environmental Assessment report). Similar to the Referral area itself the most dominant offstream vegetation community mapped as occurring downstream of The Action and within the modelled flood inundation areas is Coolabah woodland (RE 11.3.3).

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

The topography associated with The Action is relatively flat, featuring long undulating plains. Topographic features in the Referral area range between 160 m AHD to 280 m AHD. The proposed Stage A pipeline corridor traverses steeper undulating terrain between the approximate chainages of 25 km to 42 km. The maximum relief is where the Belyando Pipeline is adjacent to the Nairana National Park and there are two areas where construction will occur on slopes over 7%, which have been identified as areas of high erosion risk.

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

The Action occurs in an agricultural area primarily used for cattle grazing. As a result of historic and current grazing activities, much of the landscape has been cleared of woody vegetation and is dominated by introduced pasture. Vegetation remaining is associated with elevated rocky areas, rivers, creeks and minor drainage lines. Disturbance to remnant vegetation has been minimised during the design phase. Where possible pipeline corridor selected utilises existing cleared tracks and easements. The pipeline corridor is set at a width of 30 m. Where there is existing remnant and non-remnant vegetation, the maximum width of clearing will be 15 m within the overall construction corridor. Further details specifically on flora and fauna current conditions are presented in Section 3.1 of this referral.

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

There are no Commonwealth Heritage Places within the Referral area within close proximity to The Action.

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

Indigenous cultural heritage studies undertaken as part of the adjacent CCP have identified possible indigenous cultural heritage artefacts located within proximity of the utility infrastructure. The CCP (GHD 2012) literature suggests there is considerable evidence for a close association of discrete archaeological deposits with soaks and gilgais, which are common in the area. Potential impacts include disturbance or damage to unknown cultural sites and values during construction activities. Cultural heritage inspections will be undertaken to ensure duty of care under the ACH Act and identify and preserve any located artefacts within the construction footprint.

There are two registered active Native Title claims associated with the land to be traversed by the NGWS Project. These being the Wangan and Jagalingou People (QC2004/006) Area Agreement and the Jangga People (QCD2012/009) Area Determination.

Given the nature of the cultural heritage agreements and management process that has been progressed by Adani, it is not anticipated that there will be any major impacts that will significantly impact on Indigenous heritage values surrounding the utility infrastructure.

The Aboriginal Cultural Heritage Act 2003 (ACH Act) protects Indigenous cultural heritage in Queensland. To comply with the duty of care provision under section 23 of the Act, a proponent of a project is to prepare a CHMP, which is an agreement between the proponent and the native title claimants covering the identification and management of Indigenous cultural heritage.

To meet Adani's obligations under the ACH Act, Adani and Jangga People entered into an Early Works Cultural Heritage Clearance Agreement in June 2011 and a CHMP in May 2013. The CHMP was updated in May 2015. The CHMP commits to ensuring that assessments are undertaken prior to commencement of project activities and management arrangements as agreed are implemented. In accordance with these agreements:

- An initial geotechnical survey of the management area (as detailed in the CHMP) was undertaken in May 2015 by Jangga Traditional Owner field officers assisted by Everick Heritage;- Consultants (Everick). A survey report was provided to Adani in June 2015 by Everick;- A cultural heritage survey of the entire management area was undertaken in June 2015. A survey report was provided to Adani in July 2015 by Northern Archaeology Consultants (NAC);- A meeting was held in July 2015 to allow Jangga Operations Pty Ltd (Jangga Operations) and NAC to present the findings of the surveys to Adani; andFollowing consideration of cultural heritage and project design constraints, a meeting was held between Jangga Operations, NAC and Adani to finalise appropriate cultural heritage mitigation strategies over the entire management area. The management plan was signed off on 21 July 2015.

Adani have consulted with Jangga Operations regarding the NGWS Project and required water extraction. Consent for the water licence application and release of unallocated water (in accordance with this supporting document) was provided by Jangga Operations.

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

The Action will be located on a mixture of lands currently classified as freehold, leasehold and easement tenure. The tenure of land is predominately leasehold and freehold. State land includes stock route and road reserves. An easement will be secured over the pipeline corridor prior to operation.

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

There are no other current land uses known, proposed or reasonably foreseeable for the Referral area other than the existing cattle grazing and supporting activities that occur over this landscape.

Section 4 - Measures to avoid or reduce impacts

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

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

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

Appendices I and J of the Environment Assessment Report provide a concept erosion and sediment control plan and construction environmental management plan, respectively.

Mitigation measures have been developed to minimise impacts associated with construction and operation of the NGWS Project. Mitigation strategies have been developed based on the following criteria:

- Avoid potential impacts where possible;
- Minimise the severity and/or duration of the impact; and
- Offset unavoidable impacts.

VEGETATION MANAGEMENT

Construction and Operation

To ensure The Action does not result in additional unforeseen direct impacts to remnant vegetation, the following mitigation measures will be implemented:

- Prior to and during construction works, design may be further altered (such as narrowing clearing within pipeline corridors) to avoid unnecessary clearing of remnant vegetation communities and potential habitat for threatened fauna species where possible;- Vegetation located adjacent to the construction works will be appropriately marked to avoid unnecessary clearing / vegetation damage; and- The direct loss of habitat during construction will be unavoidable. Following pipeline construction of the Stage A pipeline the trenching area will; however, be rehabilitated with ground cover species consistent with the adjacent areas, i.e. where native species occur the pipeline will be rehabilitated with native grasses. Clearing for construction will primarily take place for the most part in already cleared lands or land without remnant or non-remnant vegetation and the corridor will be 30 m in width. Where clearing of remnant and non-remnant vegetation is required for the pipeline, this will require a 15 m clearing corridor (within the construction corridor) which is not expected to prevent movement of fauna species where remnant vegetation occurs. No impacts to habitat connectivity are

expected as a result of construction.

Rehabilitation

A Rehabilitation Management Plan (RMP) for all disturbed areas associated with The Action will be prepared by a suitably qualified person prior to the operations. Rehabilitation management elements are outlined in Section 5.1.2 of the Environmental Assessment report. The final rehabilitation plan will include any rehabilitation requirements associated with State planning approvals.

DUST

Dust is not anticipated to significantly impact terrestrial habitat in the area surrounding The Action. Air quality measures during construction and operation will be implemented to minimise the generation of dust or minimise the potential for nuisance dust and emissions from diesel combustion. Mitigation measures will target high dust risk areas such as the Kandosol soils. General awareness of minimising dust levels and its benefits will be instructed to workforce personnel and a complaint management process shall be developed to ensure complaints are registered and appropriately addressed.

Construction

Management and mitigation measures include:

- Regular dust suppression watering of tracks, roads and disturbed work areas;- Establish and communicate onsite speed limits to construction and maintenance personnel;- The size of cleared areas shall be minimised to limit exposed areas and thus wind erosion;- All valid complaints about dust will be logged in a register and promptly investigated;- Disturbed areas will be stabilised at the completion of works; and- An Air Quality Sub Plan within the draft CEMP (refer Appendix I) has been developed, and will be communicated to staff and implemented onsite.

Operations

- Exhaust stacks will be a minimum of 3 m and have vertical release;- Diesel fuel equipment will be serviced and maintained; and- Ensuring all vehicles and equipment are suitably fitted with exhaust systems that minimise gaseous and particulate emissions to meet vehicle design standards.

The potential impacts to MNES, including threatened fauna and flora because of the activities, and suggested mitigation measures are outlined below.

NOISE

Noise is not expected to have a significant effect on local MNES fauna populations.

Nevertheless, the following measures will be implemented to reduce any impacts which may result from construction and operational noise:

- A Noise Management Sub Plan within the draft CEMP (refer Appendix I) has been developed, and will be communicated to staff and implemented onsite;
- Noise will be mitigated by properly maintaining all equipment used onsite in accordance with manufacturers specifications;
- Enforcing speed limits to ensure that all operations are operating at the lowest possible noise level to minimise the impacts of noise and vibration upon wildlife;
- Ensuring mine vehicles and traffic are strictly controlled and do not operate in areas (such as threatened species habitat) outside of the needs of the Project construction;
- Designated access routes and unloading areas and parking areas; and-
- Specified work hours to be adhered to. If work required outside of normal hours consultation to be undertaken with landholders.

FAUNA MANAGEMENT

The Project requires the clearing of vegetation and therefore potential habitat for MNES fauna. As such direct fauna mortality during construction has the potential to occur. In addition, vehicle collisions during construction and operation pose a threat to a number of species, including listed species such as Koala and Squatter Pigeon (southern).

A draft Significant Species Management Plan (SSMP) will be developed for those MNES fauna species known or likely to occur on the site. The plan will identify potential impacts on those species (including identified habitat) as a result of activities throughout the life of The Action (construction, operation and decommissioning). The impacts from The Action will largely be during construction and temporary. The Plan will detail specific management measures to be implemented to mitigate impacts and incorporates adaptive management principles to allow for the adoption of new measures where necessary as The Action progresses.

General fauna management measures will be implemented as part of the SSMP and will establish protocols for pre-clearing surveys, and data collection regarding fauna incidents.?

Measures to mitigate impacts include:

- Prior to any vegetation disturbance a trained ecologist or other qualified environmental specialist will be onsite to remove fauna (if required). Hollow-bearing trees will be marked and hollows inspected for the presence of arboreal fauna prior to tree-felling. All fauna recorded during pre-clearing surveys will be recorded on a dedicated fauna register. Construction areas that pose a risk to fauna will be fenced off where practical;
- The SSMP will include measures for monitoring and recording wildlife road collision incidents throughout construction and operation to help remediate 'high risk' collision areas and set conditions for attending to injured native wildlife;
- Appropriate speed limits will also be in place throughout site works and all contractors will be educated on the risks to local fauna to minimise impacts when driving; and-
- To reduce the risk of mortality to native wildlife, no domestic animals will be allowed onsite.

The Action will impact habitat for the Ornamental Snake. To potentially avoid a significant impact the following is recommended:

- Preferably undertake construction in the dry season when the species is generally dormant;

- Minimise trench open periods and undertake daily trench inspections for trapped individuals;
- Ensure that the open trench (end of active pipe installation) left overnight during the pipeline construction period is left ramped to allow nocturnal fauna to escape where it becomes entrapped. A fauna spotter should examine trenching in the morning prior to any works in order to remove any remaining fauna, of particular importance where habitat for Ornamental Snake occurs;
- A qualified fauna spotter catcher should be present to inspect gilgai habitat considered as 'important habitat' for ornamental snake immediately prior to any clearing and for the fauna spotter to be present during clearing operations to prevent potential injury or death to fauna; and
- If a significant impact is unavoidable, and the above measure cannot be practically implemented, offsets should be considered. This may be satisfied through the establishment of an Offsets Management Plan to include offsetting impacts such as those potentially required for impacting 'important habitat' for Ornamental Snake.

SURFACE WATER EXTRACTION CONTROLS

The NGWS maximum annual offtake has been set under the water license conditions. The modelling results of the downstream flooding impact of the proposed offtake has been summarised in Section 2 of the Environmental Assessment report. The results show the impact is likely to be highly variable from year to year naturally dependent on upstream rainfall conditions at the time. Nevertheless, the modelling results were based on conservative flow data (low flow years) and indicate an average annual reduction in river volume flowing downstream into Lake Dalrymple of 1.9%. The impact to flood extent is also highly variable from year to year and there are no consistent flood reduction impacts to dependent vegetation (and associated MNES) likely to occur.

The NGWS water harvesting infrastructure in the Suttor River is a relatively simple structure using a lateral offtake weir. The height of the offtake weir will be constructed to a height below that corresponding to a river flow rate of 30 m³/s as measured at the St Ann's gauging station allowing the weir to fill before pumping begins when that flow rate is detected. The Suttor River Intake Pump Station will pump water from the river within the conditions detailed in the State's water license as follows:

- At no more than 11.6 m³/s for a maximum daily allowance of 830 ML; and- For an annual maximum allowance of 12.5 GL.

The pump station will be constantly monitored and an appropriate flow monitoring device will be installed and validated by an Authorised Meter Validator as per the NGWS license conditions. The flow control may include height gauging instrumentation and / or a telemetric flow meter which will allow for constant transmission of flow data to offsite control facilities.

EROSION AND SEDIMENT CONTROLS

Erosion and sedimentation in active construction areas cannot be eliminated. However, impacts can be controlled and with proper mitigation measures adverse effects to adjacent habitats and surface waters can be avoided or minimised.

The following mitigation measures are proposed to avoid potential erosion and sedimentation impacts that could occur as a result of construction activities:

- Preparation of a certified Erosion and Sediment Control Plan (ESCP) prior to construction and implementation during activities. The ESCP is to ensure construction activities are being undertaken in accordance with best management practices and the International Erosion and Control Association (IECA) Guidelines (2008). A Concept ESCP is provided in Appendix J of the Environmental Assessment report;
- Vegetation will be preserved with only the minimum amount of land required construct and cleared at any one time. Where possible, both temporary and permanent construction and infrastructure footprints are to be located in within natural clearings or previously cleared areas;
- Where possible, construction and major earthworks will be scheduled to be undertaken during the dry season; and-
- Progressive rehabilitation of pipeline corridor trenches will be undertaken. Disturbed land (apart from the 10 m operational corridor) will be returned to pre-existing vegetative, habitat condition, including cattle grazing, or native habitat as soon as possible after the completion of works. In order to maintain the existing surface water flow characteristics as much as practicable, the following measures will be implemented: Displacement of floodplain storage will not occur given that all pipeline crossings will be trenched and the waterway bed reinstated; Disturbed areas will be reinstated and regraded to maintain the existing flowpaths and catchment characteristics; Installation of erosion control measures where required, such as geojute erosion control matting, to enhance reinstatement on slopes or highly erodible soils; Sub-soiling or ripping to remove the compaction of the working width during rehabilitation; Prevent driving off the right of way (ROW) by ensuring an adequate number and suitable location of access points and maintaining the right of way access roads (including the road along the ROW); Post-construction monitoring should be undertaken for a minimum of 2 years; Barriers to flow, such as on-ground pipelines and raised road embankments, will include appropriate provision of drains and culverts at concentrated flow paths and low points to maintain existing flow patterns; and Works within the watercourse will be suitably stabilised so as to not impact on existing geomorphological processes of the river systems.

WEED AND PEST MANAGEMENT

Weed and pest management will be an important and integral part of proposed site management activities and will be detailed in the Land Use Management Plan. This Plan will include measures and monitoring to be developed and managed in accordance with the requirements of the Biosecurity Act, and will include the following measures:

- Implementation of erosion and sediment control mechanisms to prevent the ingress of weed material into the work site;
- Implement control strategies outlined in the Department of Agriculture and Fisheries (DAF) weed and pest animal fact sheets and other relevant government biosecurity management strategies;
- Pre-construction weed mapping should be undertaken to accurately determine the extent of weeds and pests;
- Vehicle wash down procedures;- Minimise the use of off-road vehicle movements;

- Onsite waste disposal strategies (particularly for food wastes) to be employed that will not encourage the presence of pest fauna;
- Strategies for the storage of construction and operation materials / equipment to be employed that will not encourage the presence of resident pest fauna;
- Regular onsite inspections of site infrastructure / equipment for resident pest fauna and establishment of register for pest sightings; and
- Monitoring and weed and pest inspections particularly in response to reported outbreaks or from complaints or adjacent property owners.

Waste storages are not likely to have significant impacts on native flora and fauna within the Study area, as all waste produced as a result of The Action will be stored and disposed of appropriately, as per the relevant legislation.

BUSHFIRE RISK

Fire management is an essential component to all construction projects and as such, the following measures have been developed to reduce the potential impacts of a site fire:

- Fire management measures for The Action will be developed and implemented within the draft CEMP (Appendix I);
- Specific onsite smoking areas should be designated;
- Onsite burning of any material should not be undertaken;
- Ensure onsite fire-fighting equipment is regularly maintained and adequate staff training is implemented; and
- Weed management during and following pipeline trench rehabilitation to prevent habitat degradation and potential increased fire risk.

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

It is not anticipated that there would be significant impact to the following MNES as a result of The Action:

- World Heritage values of a declared World Heritage property
- No World Heritage Properties occur in or immediately adjacent to the proposed disturbance area
- National Heritage values of a National Heritage Place
- No National Heritage Values occur in or immediately adjacent to the proposed disturbance

area

- Declared Ramsar wetland - No Ramsar wetlands occur in or immediately adjacent to the proposed disturbance area- Commonwealth marine area
- No Commonwealth marine areas occur in or immediately adjacent to the proposed disturbance area
- Commonwealth land
- No Commonwealth land occurs in or immediately adjacent to the proposed disturbance area.

Adani does not anticipate there will be impacts to listed migratory species. There is little habitat suitable for Migratory wetland bird species within, adjacent to, or near the Referral area. The Project has potential to increase the availability of habitat for these species through the expansion of the Belyando Junction Dam.

Potential significant impacts to threatened species and communities are assessed in Section 2.4.1 of this referral.

No potential significant residual impacts to threatened communities or species excepting 'important habitat' for Ornamental Snake (listed as Vulnerable under the EPBC Act). It is proposed that should these impacts be considered as 'significant' by DotEE then an Offset Management Plan (OMP) will be required. The OMP will identify suitable lands in the wider area which may be suitable for habitat regeneration and increase (in the long term) the availability of wooded habitat suitable for the species in the wider area.

Section 5 – Conclusion on the likelihood of significant impacts

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

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

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

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

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

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

The Action exceeded the significant impact referral threshold for the Ornamental Snake. The assessment provided above in Section 2.4.1 and in the attached Environmental Assessment report (refer to Attachment B), concludes that there are potential impacts of up to 66.71 ha of what may be classed as 'important habitat' (under DotEE guidelines) for Ornamental Snake habitat during construction.

Adani considers the impacts of the Action on Ornamental Snake are not significant given:

- The regional availability of suitable habitat for the species and the very minor proportion of this habitat The Action will impact;
- Avoidance, mitigation measures and rehabilitation will be undertaken during construction and operation to further reduce potential impacts; and
- An OMP will be established should these impacts be considered by DotEE, after consideration of the assessment, as being 'significant' under the EPBC Act

Adani considers The Action is not a controlled action under the EPBC Act.

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

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

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

The Proponent (Adani Infrastructure Pty Ltd) has adhered to its regulatory responsibilities in association with other projects and approvals obtained for a number of projects in Australia including the Rugby Run Solar Farm. The proponent has allocated the resources required to assess the potential environmental impacts associated with this referral and the resources required to implement the mitigation and management measures outlined in this referral.

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

The Proponent (Adani Infrastructure Pty Ltd) has not been the subject of any such proceedings.

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

Yes

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

Please refer to attachment for a copy of Adani's Environmental Policy.

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

Yes

6.4.1 EPBC Act No and/or Name of Proposal.

Adani Infrastructure Pty Ltd (the Party taking The Action) previously referred the NGWS Project (EPBC 2018/8191). The project was determined to be a controlled action. This referral has been

formally withdrawn.

Adani Infrastructure Pty Ltd (the Party taking The Action) has previously referred the Whyalla Solar Farm Project under the EPBC Act (EPBC 2017/7910). The Project was determined to not be a controlled action.

Section 7 – Information sources

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

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

Reference Source	Reliability	Uncertainties
The Atlas of Living Australia (ALA) (2019), Atlas of Living Australia - species database, Available at: https://www.ala.org.au/ .	High	None Known
Blakers, M, Davies, SJJF, and Reilly, PN (eds.) (1984). The atlas of Australian birds. Royal Australasian Ornithologists Union, Melbourne University Press, Melbourne.	High	None Known
Burrows DW (1999). An initial environmental assessment of water infrastructure options in the Burdekin catchment. Report prepared for the Department of Natural Resources (December 1999).	High	None Known
Burrows D, Davis A and Knott M (2009). Survey of the freshwater fishes of the Belyando-Suttor system, Burdekin catchment, Queensland. Australian Centre for Tropical Freshwater Research, James Cook University.	High	None Known
CDM Smith (2013), Carmichael Coal Mine and Rail Project Supplementary Environmental Impact Statement. Volume 4, Appendix C5 –Quarry Applications.	High	None Known
CDM Smith (2014), Moray Power Project - Environment Assessment Report, Appendix A – Moray Power Applications.	High	None Known

Reference Source	Reliability	Uncertainties
Prepared for Adani Mining Pty Ltd (November 2014).		
CDM Smith 2018 NGWS, Commonwealth Environmental Significance Impact Review Report, prepared for Adani Infrastructure (April 2018).	High	None Known
Coaldrake, JE (1971). 'Variation in some floral seed and growth characteristics of <i>Acacia harpophylla</i> (Brigalow).' Australian Journal of Botany, vol. 19, pp. 335-342.	High	None Known
Costanza, R, de Groot, R, Sutton, P, van der Ploeg, S, Anderson, SJ, Kubiszewski, I, Farber, S and Turner, RK (2014) 'Changes in the global value of ecosystem services', Global Environmental Change, vol. 26, pp. 152-158.	High	None Known
Crome, F and Shields, J (1992). The parrots and pigeons of Australia: The national photographic index of Australian wildlife. Angus and Robertson, Pymble.	High	None Known
Department of the Environment (DotE) (2013). Matters of National Environmental Significance: significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999, Commonwealth Department of the Environment, Canberra.	High	None Known
DotE (2014). EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory), Commonwealth of Australia.	High	None Known
NSW Department of Environment and Conservation (DEC) (2005). <i>Dichanthium setosum</i> - Profile. Available at: http://www.threatenedspecies.e	High	None Known

Reference Source	Reliability	Uncertainties
environment.nsw.gov.au/tsprofile /profile.aspx?id=10221. Department of Environment and High Science (DES) 2019, Dichanthium setosum – species profile (WetlandInfo). Queensland Department of Environment and Science. Available at: https://wetlandinfo. des.qld.gov.au/wetlands/ecolog y/components/species/?dichant hium-setosum	High	None Known
Department of the Environment, High Water, Heritage and the Arts (DEWHA) 2008, Threat Abatement Plan for Predation by the European Red Fox. Department of the Environment, Water, Heritage and the Arts, Canberra. Available at: http://w ww.environment.gov.au/biodive rsity/threatened/publications/tap /foxes08.html .	High	None Known
DEWHA (2008a). Approved Conservation Advice for Livistona lanuginosa (Waxy Cabbage Palm). Canberra: Department of the Environment, Water, Heritage and the Arts.	High	None Known
DEWHA (2008b). Approved Conservation Advice for Dichanthium setosum. Canberra: Department of the Environment, Water, Heritage and the Arts.	High	None Known
DEWHA (2009). Significant impact guidelines for the endangered black-throated finch (southern) (Peophila cincta cincta). Commonwealth Department of Sustainability, Environment, Water, Populations and Communities, Canberra.	High	None Known
Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2011). Threat abatement plan	High	None Known

Reference Source	Reliability	Uncertainties
for the biological effects, including lethal toxic ingestion, caused by cane toads. Canberra, ACT: Commonwealth of Australia.		
DSEWPac (2011). Draft referral guidelines for the nationally listed Brigalow Belt reptiles. Commonwealth Department of Sustainability, Environment, Water, Populations and Communities, Canberra.	High	None Known
Dique, DS, Preece, HJ, Thompson, J and Villiers DL (2004). 'Determining the distribution of a regional koala population in south-east Queensland for conservation management.' Wildlife Research, vol. 31, pp. 109-117.	High	None Known
Eco Logical Australia (2017), Pre-clearance Survey Reports for the CRN – MCU1 (Moray Downs Property, Cassiopeia Property, Elgin Downs Property, Old Twin Hills Property, and Disney Property). Prepared for Adani Mining Pty Ltd (October 2017).	High	None Known
Ellis, WAH, Melzer, A, Carrick, FN and Hasegawa (2002). 'Tree use, diet and home range of the koala (Phascolarctos cinereus) at Blair Athol, central Queensland.' Wildlife Research, vol. 29, pp. 303-311.	High	None Known
Frith, HJ (1982). Pigeons and doves of Australia. Rigby, Adelaide.	High	None Known
Garnett, ST, Szabo, JK and Dutson, G 2011, The Action Plan for Australian Birds 2010, CSIRO Publishing, Canberra	High	None Known
GHD (2012). Mine Technical Report: Terrestrial Ecology, Carmichael Coal Mine and Rail	High	None Known

Reference Source	Reliability	Uncertainties
Project. Prepared for Adani Mining Pty Ltd (November 2012).		
GHD (2013). Report for Offsite Infrastructure Ecological Assessment. Prepared for Adani Mining Pty Ltd (July 2013).	High	None Known
GHD (2014). Carmichael Coal Mine and Rail Project. Black-throated Finch Management Plan, Final AEIS Document. Prepared for Adani Mining Pty Ltd (February 2014).	High	None Known
Henderson, RJF 1997, Queensland Plants Names and Distribution, Queensland Herbarium: Indooroopilly	High	None Known
Higgins, PJ and Davies, SJF (eds.) (1996). Handbook of Australian, New Zealand and Antarctic birds, Vol. 3, Snipe to pigeons. Oxford University Press, Melbourne.	High	None Known
Higgins, PJ, Peter, JM and Cowling, SJ (eds.) (2006). Handbook of Australian, New Zealand and Antarctic birds Vol. 7, Boatbills to starlings, Part B, Dunnock to starlings. Oxford University Press, Melbourne.	High	None Known
Hume, ID, and Esson, C (1993). 'Nutrients, antinutrients and leaf selection by captive koalas (Phascolarctos cinereus).' Australian Journal of Zoology, vol. 41, pp. 379–392.	High	None Known
IECA (2008). Best Practice Erosion and Sediment Control Guidelines. International Erosion Control Association (Australasia).	High	None Known
Jacobs (2015). Carmichael Coal Mine and Rail Project, Moray-Carmichael Road Environmental Assessment Report. Prepared for Adani	High	None Known

Reference Source	Reliability	Uncertainties
Mining Pty Ltd (February 2015). Martin, RW, Handasyde, KA and Krockenberger, A (2008). 'Koala.' In: S Van Dyck and R Strahan (eds.), The mammals of Australia. 3rd edn. Reed New Holland: Sydney. pp. 198–201.	High	None Known
Melzer A (2012). 'Ornamental Snake.' In: Queensland Threatened Animals. Edited by: Curtis, L.K., Dennis, A.J., McDonald, K.R., Kyne, P. M. and Debus, S.J.S. CSIRO Publishing, Collingwood.	High	None Known
Mitchell D 2015, Australian Koala Foundation – National Koala tree planting list, Australian Koala Foundation, Available at: https://www.savethekoala.com/sites/default/files/20150212_AKF_National_Koala_Tree_Planting_List.pdf .	High	None Known
Moore, BD and Foley, WJ (2000). 'A review of feeding and diet selection in koalas (Phascolarctos cinereus).' Australian Journal of Zoology, vol. 48, pp. 317-333.	High	None Known
Neldner, V.J., Wilson, B.A., Thompson, E.J. and Dillewaard, H.A. (2012). Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland. Version 3.2. Updated August 2012. Queensland Herbarium, Queensland Department of Science, Information Technology, Innovation and the Arts, Brisbane.	High	None Known
NSW NPWS (2003). Threatened species of the New England Tablelands and north- west slopes of New South Wales. NSW Parks and Wildlife Service, Coffs Harbour.	High	None Known

Reference Source	Reliability	Uncertainties
North Queensland (NQ) Dry Tropics (2015). Our Region. Accessed 17/06/2015 at http://www.nqdrytropics.com.au/about-the-region/ .	High	None Known
Petit, NE and Dowe, JL (2003). 'Distribution and population structure of the vulnerable riparian palm <i>Livistona lanuginosa</i> A.N.Rodd (Areceae) in the Burdekin River catchment, north Queensland', Pacific Conservation Biology, vol. 9, pp. 207-214.	High	None Known
Rodd, AN (1998), 'Revision of <i>Livistona</i> (Arecaceae) in Australia.' Telopea. Vol. 8, pp. 49-153.	High	None Known
Squatter Pigeon Workshop 2011, Proceedings from the workshop for the Squatter Pigeon (southern) - 14-15 December 2011. Toowoomba Office of the Queensland Parks and Wildlife Service.	High	None Known
Squatter Pigeon Workshop 2011, Proceedings from the workshop for the Squatter Pigeon (southern) - 14-15 December 2011. Toowoomba Office of the Queensland Parks and Wildlife Service.	High	None Known
Wilson S 2015, A field guide to the reptiles of Queensland 2nd ed., New Holland Publishers, Chatswood.	High	None Known

Section 8 – Proposed alternatives

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

8.0 Provide a description of the feasible alternative?

During the NGWS Project design process, a number of alternative scenarios were considered to evaluate the relative social, economic and environmental advantages and disadvantages of different alternatives. The following discusses the results of the original analysis which were used to select the current NGWS Project scope (inclusive of the components of the NGWS project that comprise The Action described in this referral).

NO DEVELOPMENT ALTERNATIVE

The NGWS provides a secure and reliable water supply to the CCP under a commercial agreement. The NGWS has secured the Queensland Approval (water licence) required to extract floodwater for this purpose. Not developing the NGWS was not considered an option as within this infrastructure, the water licence would be sterilised. Water harvested would in effect be stored without any operational transport mechanism to the CCP mine. The NGWS has considered several water sources and components in order to service the CCP. The consequences of not proceeding for outweigh the consequences of proceeding, including both economic, social and infrastructure benefits for the region and State.

EXTERNAL WATER SUPPLY ALTERNATIVES

Given the rural nature of the northern Galilee Basin, there are limited existing water supplies in the region. Landholders in the area predominantly use groundwater bores and/or surface water harvesting. The closest existing large-scale water supply is in the Burdekin Falls Dam (Lake Dalrymple), located approximately 150 km to the north-east of the CCP. Alternative water source options were considered in the early planning stages of a water scheme. A detailed analysis has been undertaken by Adani with input from recognised firms including GHD, Hyder, Caliber and Engeny, as well as CDM Smith. In September 2014, CDM Smith was engaged by Adani to revise and refine the water supply strategy to ensure a secure and reliable source of water can be delivered within the Project schedule of the CCP. This review considered the following water sources:

- Local flood harvesting dam (new dam on the Moray Downs property taking water away from the Belyando River – leasehold held by Adani);
- Local flood harvesting dam (existing and/or upgraded dam on the Disney property taking water from Mistake Creek);
- Construction water bores (use of existing bores and supplementing them with additional bores adjacent to the mining lease area;

- Regional flood harvesting dams (existing and upgraded dams on the Belyando Junction property taking water from the Suttor River downstream of the confluence with the Belyando River;
- Accessing water from the Burdekin Falls Dam (Lake Dalrymple); and
- Accessing water from the Burdekin to Moranbah Pipeline.

It is not feasible to source water from other locations given the remote location of the CCP. The combined option of the regional flood harvesting dams and pipelines (Stage A and B) were selected by Adani and CDM Smith to be the preferred supply scheme to support the CCP and other potential proposed projects.

NGWS OPTIONS ASSESSMENT

Extraction Points

Several extraction points on the Belyando River, Suttor River and Mistake Creek Integrated Quantity Quality Model (IQQM) modelling was undertaken to identify the most reliable source which maintained compliance with the Water Resources (Burdekin Basin) Plan (WRP).

The NGWS considered various extraction points including:

- The Belyando River anabranch (within closer proximity to the Belyando Junction dam); and
- Two locations on the Suttor River below the confluence with the Belyando River.

The Belyando River anabranch extraction point was unsuitable as the modelled reliability analysis showed that harvesting from the anabranch does not provide favourable or reliable 95-percentile or 98-percentile results. Model results for the Suttor River indicated; however, that this option is preferred as it provides a suitably reliable yield compared to flood harvesting from the anabranch.

Pipeline Route Options

CDM Smith (2015) has undertaken a desktop assessment and multi-criteria analysis (MCA) to identify pipeline corridors to connect the chosen water sources to the CCP and northern Galilee Basin resources area. The objectives of this assessment were to:

- Identify a route that is highly acceptable;
- Minimise the disturbed areas by following existing road and/or rail corridors and other cleared corridors; and
- Avoid MNES and other environmentally sensitive areas.

CDM Smith undertook a corridor selection assessment of several route options for NGWS which included field validation work to confirm that the preferred corridors selected from the desktop analysis were based on suitably reliable data.

While other options were considered, the Stage B alignment was selected to follow the CCP SP1 rail corridor to minimise environmental impact and encumbrances on properties and road infrastructure.

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

No

Section 9 – Contacts, signatures and declarations

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

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

Organisation

9.2 Organisation

9.2.1 Job Title

Head of Env and Sustainability

9.2.2 First Name

Hamish

9.2.3 Last Name

Manzi

9.2.4 E-mail

reception.bne@adani.com.au

9.2.5 Postal Address

GPO Box 2569
Brisbane QLD 4001
Australia

9.2.6 ABN/ACN

ABN

16606764827 - ADANI INFRASTRUCTURE PTY LTD

9.2.7 Organisation Telephone

07 3223 4800

9.2.8 Organisation E-mail

reception.bne@adani.com.au

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

Not applicable

Small Business Declaration

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

Signature:..... Date:

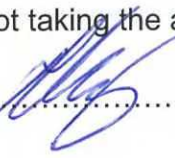
9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

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

Person proposing the action - Declaration

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

Signature: ..... Date: 9/9/17.....

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

Signature:..... Date:

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Head of Environment and Sustainability

9.5.2 First Name

Hamish

9.5.3 Last Name

Manzi

9.5.4 E-mail

reception.bne@adani.com.au

9.5.5 Postal Address

GPO Box 2569
Brisbane QLD 4001
Australia

9.5.6 ABN/ACN

ABN

16606764827 - ADANI INFRASTRUCTURE PTY LTD

9.5.7 Organisation Telephone

07 3223 4800

9.5.8 Organisation E-mail

reception.bne@adani.com.au

Proposed designated proponent - Declaration

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

Signature:  Date: 7/9/19

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

Managing Principal Environmental Services

9.8.2 First Name

Mark

9.8.3 Last Name

Imber

9.8.4 E-mail

imberms@cdmsmith.com

9.8.5 Postal Address

Level 4, 51 Alfred Street
Fortitude Valley QLD 4006
Australia

9.8.6 ABN/ACN

ABN

88152082936 - CDM SMITH AUSTRALIA PTY LTD

9.8.7 Organisation Telephone

07 3828 6900

9.8.8 Organisation E-mail

imberms@cdmsmith.com

Referring Party - Declaration

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

Signature: [Signature] Date: 6 Aug 19

Appendix A - Attachments

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

1. 1000244_NGWS_EPBC_Environmental_Assessment_Final_Rev0_010819_PART_1.pdf
2. 1000244_NGWS_EPBC_Environmental_Assessment_Final_Rev0_010819_PART_2.pdf
3. Appendix_A_Approvals.pdf
4. Appendix_A_Approvals_Updated.pdf
5. Appendix_B_Approval_Matrix.pdf
6. Appendix_C_Project_Area_Detailed.pdf
7. Appendix_D_EPBC_Act_Search.pdf
8. Appendix_E_Species_List_and_Habitat_Assess_Sheets.pdf
9. Appendix_F_Flood_Mapping.pdf
10. Appendix_G_Habitat_Mapping.pdf
11. Appendix_H_Scartwater_Lagoon_Flush_Memo.pdf
12. Appendix_I_Concept_ESCP.pdf
13. Appendix_J_CEMP.pdf
14. Appendix_J_CEMP_Updated.pdf
15. Environmental_Policy.pdf
16. Local_Government_Approval.pdf
17. Local_Government_Approval_Updated.pdf
18. Referral_Boundary_and_Points.pdf
19. Referral_Shapefiles.zip
20. State_Approvals.pdf
21. State_Approvals_Updated.pdf