Department Transport and Main Roads

Townsville Northern Access Intersection Upgrade Project

EPBC Referral

Photo source: G. Calvert TMR 2015

March 2016

Australian Government
Department of the Environment

Referral of proposed action

What is a referral?

The Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. (Further references to 'the Minister' in this form include references to the Minister's delegate.) To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be undertaken. These decisions are made within 20 business days, provided sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by or on behalf of a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C)
- A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
    - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
    - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's website:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.

- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.
- the Policy Statement titled Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources.
- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act). If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referrals Gateway (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act or another law of the Commonwealth. Information is available on the Department's web site.

Is your action in the Great Barrier Reef Marine Park?

If your action is in the Great Barrier Reef Marine Park it may require permission under the Great Barrier Reef Marine Park Act 1975 (GBRMP Act). If a permission is required, referral of the action under the EPBC Act is deemed to be an application under the GBRMP Act (see section 37AB, GBRMP Act). This referral will be forwarded to the Great Barrier Reef Marine Park Authority (the Authority) for the Authority to commence its permit processes as required under the Great Barrier Reef Marine Park Regulations 1983. If a permission is not required under the GBRMP Act, no approval under the EPBC Act is required (see section 43, EPBC Act). The Authority can provide advice on relevant permission requirements applying to activities in the Marine Park.

The Authority is responsible for assessing applications for permissions under the GBRMP Act, GBRMP Regulations and Zoning Plan. Where assessment and approval is also required under the EPBC Act, a single integrated assessment for the purposes of both Acts will apply in most cases. Further information on environmental approval requirements applying to actions in the Great Barrier Reef Marine Park is available from http://www.gbrmpa.gov.au/ or by contacting GBRMPA's Environmental Assessment and Management Section on (07) 4750 0700.

The Authority may require a permit application assessment fee to be paid in relation to the assessment of applications for permissions required under the GBRMP Act, even if the permission is made as a referral under the EPBC Act. Further information on this is available from the Authority:

Great Barrier Reef Marine Park Authority

2-68 Flinders Street PO Box 1379
Townsville QLD 4810
AUSTRALIA

Phone: + 61 7 4750 0700
Fax: + 61 7 4772 6093

www.gbrmpa.gov.au

What information do I need to provide?

Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently. If a section of the referral document is not applicable to your proposal enter N/A.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in blue text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below three megabytes (3mb) as they will be published on the Department's website for public comment. To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referrals Gateway (email address below) for advice. Attachments larger than three megabytes (3mb) may delay processing of your referral.

Note: the Minister may decide not to publish information that the Minister is satisfied is commercial-in-confidence.

How do I pay for my referral?

From 1 October 2014 the Australian Government commenced cost recovery arrangements for environmental assessments and some strategic assessments under the EPBC Act. If an action is referred on or after 1 October 2014, then cost recovery will apply to both the referral and any assessment activities undertaken. Further information regarding cost recovery can be found on the Department's website at: http://www.environment.gov.au/epbc/publications/cost-recovery-cris

Payment of the referral fee can be made using one of the following methods:

- EFT Payments can be made to:

  BSB: 092-009
  Bank Account No. 115859
  Amount: $7352
  Account Name: Department of the Environment.
  Bank: Reserve Bank of Australia
  Bank Address: 20-22 London Circuit Canberra ACT 2601
  Description: The reference number provided (see note below)

- Cheque - Payable to "Department of the Environment". Include the reference number provided (see note below), and if posted, address:

  The Referrals Gateway
  Environment Assessment Branch
  Department of the Environment
  GPO Box 787
  Canberra ACT 2601

- Credit Card

  Please contact the Collector of Public Money (CPM) directly (call (02) 6274 2930 or 6274 20260 and provide the reference number (see note below).

Note: in order to receive a reference number, submit your referral and the Referrals Gateway will email you the reference number.

How do I submit a referral?

Referrals may be submitted by mail or email.

Mail to:

Referrals Gateway
Environment Assessment Branch
Department of Environment
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are required.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- Follow up with a mailed hardcopy including copies of any attachments or supporting reports.

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment.

The Department will write to you within 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any other Commonwealth, state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The action can proceed if undertaken in a particular manner (subject to any other Commonwealth, state or local government requirements). The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action is likely to have a significant impact a decision will be made that it is a controlled action. The particular matters upon which the action may have a significant impact (such as World Heritage values or threatened species) are known as the controlling provisions.

The controlled action is subject to a public assessment process before a final decision can be made about whether to approve it. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

The proposed action would have UNACCEPTABLE impacts and CANNOT proceed

The Minister may decide, on the basis of the information in the referral, that a referred action would have clearly unacceptable impacts on a protected matter and cannot proceed.

Compliance audits

If a decision is made to approve a project, the Department may audit it at any time to ensure that it is completed in accordance with the approval decision or the information provided in the referral. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes. If your project is in the Great Barrier Reef Marine Park and a decision is made to approve it, the Authority may also audit it. (See "Is your action in the Great Barrier Reef Marine Park," p.2, for more details).

For more information

- call the Department of the Environment Community Information Unit on 1800 803 772 or
- visit the web site http://www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Townsville Northern Access Intersections Upgrade (TNAIU) Interim Solution and Full Scope Project

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) and associated geographic information system (GIS) vector (shapefile) dataset showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(i).

1.1 Short description

Under the Bruce Highway Action Plan (BHAP), the Townsville Northern Access Intersections Upgrade (TNAIU) Project is considered a "High Priority 1" project for 'Capacity improvement'. The TNAIU Project consists of two components, an Interim Solution addressing immediate 'black spot' traffic areas, and a Full Scope (Duplication) project, which will include duplicating the existing Bruce Highway from Veales Road to Heales Creek near Saunders Beach Road, Townsville; a distance of 7.1km. Refer Attachment A. Note however that the final Duplication scope does include a second bridge crossing downstream (north of the existing bridge). Assessment of the bridge duplication has been included in this referral. Refer Attachment B.

1.2 Latitude and longitude

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

Table 1: Bounding Coordinates of Project Area

Location ID	Latitude			Longitude		
Section 1: West of Black River	degrees	minutes	seconds	degrees	minutes	seconds
1	19	12	34	146	35	31
2	19	12	35	146	35	30
3	19	13	13	146	36	32
4	19	13	23	146	36	56
5	19	13	37	146	37	38
6	19	13	39	146	37	52
7	19	13	42	146	38	16
8	19	13	48	146	38	39
9	19	14	04	146	39	14
10	19	14	03	146	39	14
11	19	13	46	146	38	28
12	19	13	40	146	38	16
13	19	13	38	146	37	53
14	19	13	35	146	37	40
15	19	13	27	146	37	23
16	19	13	16	146	36	43
17	19	13	11	146	36	32
18	19	12	50	146	35	57

1.3 Locality and property description

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

The TNAIU Interim Solution and Full Scope Project will continue on the Bruce Highway and be contiguous with the Townsville Ring Road Project Section 4 (previously referred; referral number 2012/6562). Works will be undertaken by the Queensland Department of Transport and Main Roads (TMR) on either side of the Black River, and will include duplicating the existing bridge to the north of the current bridge alignment. The TNAIU Interim Solution works includes a 1.4km section of the Bruce Highway approximately 500m east of Black River and west of Black River from the intersection of the Bruce Highway with Bowden Road to the intersection of the Bruce Highway with Pope Road. The TNAIU Full Scope Project will include the TNAIU Interim Solution area but will be extended east to Veales Road and west to Heales Creek along the alignment of the existing Bruce Highway, located approximately 7km to the north-west of Townsville. Both scopes of work are primarily within the Bruce Highway road reserve, with minor resumption of State Land and private land required. Refer to Attachment B.

1.4	Size of the development footprint or work area (hectares)	The estimated works footprint of the TNAIU project (both interim and full scope) is 46.8ha of which 10.49ha comprises the existing Bruce Highway and intersections and access roads, and 1.3ha the Black River bridge approaches and riparian areas.
1.5	Street address of the site	Not applicable

1.6 Lot description

Describe the lot numbers and title description, if known.

A pipeline easement, Lot 1 PER201930, traverses the Bruce Highway near the intersection of Black River Road and the Bruce Highway. The interim solution includes resumption of a small portion of Lot 123 CP906679 (reserve tenure land) and the full scope includes resumption of a small portion of Lot 5 RP723620 (freehold tenure land).

1.7 Local Government Area and Council contact (if known)

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

Not applicable: Project is within the Townsville City Council Area, however it is not subject to Council approval.

1.8 Time frame

Specify the time frame in which the action will be taken including the estimated start date of construction/operation.

Proposed TNAIU Interim Solution works are to begin in 2016. At the time of the Business Case (October 2015) the timing of the TNAIU Full Scope Project was considered to be delivered within the 2019-20 to 2022-23 timeframe.

1.9	Alternatives to proposed action Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?	X	No, the proposed works are restricted to the existing Bruce Highway road reserve (to the greatest extent possible), no alternatives outside of the proposed footprint are considered feasible.
			Yes, you must also complete section 2.2
1.10	Alternative time frames etc Does the proposed action include alternative time frames, locations or activities?	x	No
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	State assessment Is the action subject to a state or territory environmental impact assessment?	X	No
			Yes, you must also complete Section 2.5

1.12	Component of larger action Is the proposed action a component of a larger action?	X No	No Yes, you must also complete Section 2.7
1.13	Related actions/proposals Is the proposed action related to other actions or proposals in the region (if known)?	X No	No, however this project is contiguous with the Townsville Ring Road Section 4. The Ring Road terminates at the eastern extent of this TNAIU Full Scope Project.
1.14	Australian Government funding Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	No X Yes	No Yes, The Australian Government and the Queensland Government are partners in the delivery of a 10-year program of works to 2022-23 for the Australian Government's Fix the Bruce Highway Policy, which includes the full scope Townsville Northern Access Intersections Upgrade (TNAIU) project. The project has a Total Outturn Cost of $72m, made up of a $57.6m federal contribution (80%) and a $14.4m state contribution (20%). A National Partnership Agreement for Land Transport Infrastructure Projects (for 2014-15 to 2018-19) – "the NPA" – has been developed between the Australian Government and the Queensland Government to outline funding priorities, funding arrangements and governance requirements. The TNAIU project does not have a funding allocation within the NPA period of 2014-15 to 2018-19. However, it is listed along with other projects in the NPA under "Bruce Highway – Additional/other funding (Election 2013 adjustment)", which shows a $57.6m federal funding commitment (80% of the project's total outturn cost) beyond 2018-19. The interim solution scope would be funded by accelerating a portion of the TNAIU project funding, which is currently beyond 2018-19.
1.15	Great Barrier Reef Marine Park Is the proposed action inside the Great Barrier Reef Marine Park?	X No	No Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.7.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

The proposed action comprises upgrades to the Bruce Highway and adjacent road intersections which will be undertaken in two stages. Combined, the two stages of the project are referred to as the Townsville North Access Intersection Upgrade (TNAIU). The TNAIU will occur along a section of the Bruce Highway.

The first stage of the project (TNAIU Interim Solution) has two sections, the first section starts 850m west of the intersection of the Bruce Highway and Veales Road for a distance of 1.4km (the section ends 500m east of Black River). The main section will be undertaken from the intersection of the Bruce Highway and Bowden Road immediately west of Black River and continue to approximately the intersection of the Bruce Highway and Pope Road, a distance of 2.56km. This interim solution addresses immediate concerns regarding poor safety and high crash rates by constructing a service road and upgrading intersections on the Bruce Highway.

The TNAIU Interim Solution involves the following elements and activities –

- Wide centre line treatment (WCLT), including formation and seal widening of the existing Bruce Highway alignment;
- Construction of a service road to consolidate the multiple property accesses along this section of the Bruce Hwy; and
- Relocation of Bowden Rd / Bruce Highway intersection.

Preliminary layout of the TNAUI Interim Solution is shown in Attachment B. Proposed TNAIU Interim Solution works are to begin in 2016. At the time of the Business Case (October 2015) the timing of the TNAIU Full Scope Project was considered to be delivered within the 2019-20 to 2022-23 timeframe.

The second stage of the project (TNAIU Full Scope) will be undertaken from the intersection of Veales Road with the Bruce Highway east of the Black River, and continue for approximately 7.1km along the alignment of the existing Bruce Highway west to Heales Creek.

The TNAIU Full Scope Project will include the TNAIU Interim Solution area and includes duplication of the Black River Bridge.

The TNAIU Full Scope Project (Attachment B) is currently in the concept design stage only and is proposed to include the following elements and activities –

- Tie-in and duplication of the Bruce Highway from two to four lanes at the exit of the Ring Road near Veales Road;
- Intersection upgrades, including Veales Road, Mt Kulburn Drive, Bowden Road service exit, Black River Road, Pope Road, Greenvale Street, and Saunders Beach Road;
- Duplication of the Bruce Highway from two to four lanes within existing highway road reserve from Veales Road west to approximately Saunders Beach Road; and
- Duplication of the bridge over Black River, to be located on the northern (downstream) side of the existing bridge.

2.2 Alternatives to taking the proposed action

This should be a detailed description outlining any feasible alternatives to taking the proposed action (including not taking the action) that were considered but are not proposed (note, this is distinct from any proposed alternatives relating to location, time frames, or activities – see section 2.3).

The 'do nothing' alternative was not considered a feasible option owing to the poor safety record of this section of the Bruce Highway and the immediate need to improve a National Highway traffic accident 'black spot" location.

All other alternatives considered were design variations only of similar alignment and intersection upgrades which were all within the Bruce Highway and adjacent road intersection reserves. Therefore, in this respect no other alternative for the project, other than within the Bruce Highway existing road reserve was considered.

2.3 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative time frames, locations or activities (in section 1.10) you must complete this section. Describe any alternatives related to the physical location of the action, time frames within which the action is to be taken and alternative methods or activities for undertaking the action. For each alternative location, time frame or activity identified, you must also complete (where relevant) the details in sections 1.2-1.9, 2.4-2.7, 3.3 and 4. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, time frames or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

Not applicable, works footprint are within the existing Bruce Highway road reserve and adjacent road intersections. Some state land and private land may be impacted.

2.4 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (e.g. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

Commonwealth transport, land use policy and planning framework

The Brisbane-Cairns Corridor Strategy (2007) was jointly developed and coordinated by the former Federal Department of Transport and Regional Services, former Queensland Department of Main Roads and former Queensland Transport. It provides a framework for the development of this National Network corridor.

The TNAIU Full Scope Duplication Project addresses the Corridor Strategy in a number of areas. The Corridor Strategy identified as a short- term strategic priority (to 2015): "continue land use and transport planning to address emerging road and rail capacity issues in growing regional centres, including especially [coastal regional centres including Townsville]".

It identified longer-term key challenges (beyond 2015) to:

- Maintain safety;
- Improve reliability and connectivity;
- Maintain freight efficiency; and
- Support the rapid economic growth occurring along the corridor.

The TNAIU Full Scope Project also reflects the increasing federal policy emphases on:

- Freight and export capacity and potential bottlenecks;
- Improving economic productivity by improving motorway performance; and
- Maximising the life of new and existing infrastructure.

In particular, it aligns with the National Urban Policy (May 2011), National Ports Strategy, and draft National Land Freight Strategy discussion paper. The National Urban Policy includes the stipulation that "the Australian Government will apply the principles and objectives of the National Urban Policy to future investment in infrastructure to the second Nation Building Program and other Commonwealth investment programs".

Queensland Government transport, land use policy and planning framework

The Bruce Highway Technical Advisory Group was tasked by the Queensland Government to compile a 10-year Crisis Action Plan to address the Bruce Highway crisis. To that end the Bruce Highway Action Plan (BHAP) was developed to bring the highway out of crisis and meet standards commensurate with the strategic nature of the highway. The BHAP has three priority areas: safety, flooding and capacity. The TNAIU project targets and contributes to two of the three priority categories for investment (safety and capacity).

The BHAP identifies the TNAIU Full Scope Project, i.e. duplication from Veales Road to Heales Creek, as a capacity improvement. However, it was identified that with a delivery timeframe of 5-10 year the poor safety record and high crash rate of the section of the Bruce Highway would continue. Therefore, an Interim Solution, subject to a separate investigation has been identified and progressed. It is noted that the interim solution is required to be consistent with this TNAIU Full Scope Project to satisfy funding intents. While the TNAIU Full Scope Project aims to address capacity issues, the Interim Solution is aimed at addressing the safety concerns relating to the intersections and the multiple property access on the northern site between Bowden and Pope Road intersections. The goal is to provide safer intersections and property accesses with decreased crashes and severity of incidents. The project has been progressed with some urgency due to the frequency of crashes at the intersections in the project area.

The Options Assessment considered a number of factors (including safety, cost and consistency with this TNAIU Full Scope Project) and options for the TNAIU Interim Solution.

Due to other construction works occurring on the Bruce Highway in the vicinity, works undertaken to date include a pre-interim solution of minor widening, line marking and speed signage. The main construction works associated with this Interim Solution project are scheduled to occur between July and December 2016.

This referral therefore also includes the area of TNAIU Interim Solution.

Federal and state environment and heritage legislation

For the TNAIU Interim solution TMR undertook an Environment Scoping Report, with the purpose of identifying preliminary matters for further study and assessment. Subsequent to this, a Review of Environmental Factors (REF), including an Environment Management Plan Planning (EMP(P)), identifying the potential impacts and mitigations measures is in preparation.

The TNAIU Interim and Full Scope Project will be assessed and managed under a range of relevant state legislation and subordinate regulation, including:

- Environment Protection Act 1994 and subordinate protection policies;
- Nature Conservation Act 1992;
- Water Act 2000;
- Land Protection (Pest and Stock Route Management) Act 2002;
- Fisheries Act 1994;
- Aboriginal Cultural Heritage Act (2003); and
- Torres Strait Islander Cultural Heritage Act (2003).

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.11) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.
Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

Not applicable

2.6 Public consultation (including with Indigenous stakeholders)

Your referral must include a description of any public consultation that has been, or is being, undertaken. Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral. Where appropriate include copies of documents recording the outcomes of any consultations.

Indigenous stakeholders

The Bindal people are the registered claimants for the northern Townsville coastal area.
TMR has previously engaged with the claimants in developing a Cultural Heritage Management Agreement for the Townsville Ring Road Project which adjoins this project. In accordance with the Aboriginal Cultural Heritage Act 2003, Part 3, Section 23 'Cultural heritage duty of care', TMR, North Queensland Region (Townsville office) is continuing to maintain a consultative relationship with traditional owner stakeholders, the Bindal aboriginal groups.

2.7 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.12) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

Not applicable, both the TNAIU Interim Solution and the TNAIU Full Scope Project are addressed in this referral as a large part of the works footprint is shared.

3 Description of environment & likely impacts

3.1 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.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- 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; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

3.1 (a) World Heritage Properties

Description

The nearest World Heritage property is the Great Barrier Reef World Heritage Area (GBRWHA) which is approximately 7.5 km downstream from the Bruce Highway project area. All the waterways intersected by the Bruce Highway in the project extent (which includes Black River) ultimately drain into Black River which then discharges into the GBRWHA at Halifax Bay.

Nature and extent of likely impact

Address any impacts on the World Heritage values of any World Heritage property.

No quantifiable impacts will be made on the GBRWHA. Black River does not flow for approximately 9 months of the year and works to be undertaken for the bridge duplication will be subject to strict erosion and sediment control measures. Additionally, works will primarily be undertaken during the period of the year when Black River has ceased to flow.
At other locations along the alignment, erosion and control measures will also be in place for the construction period, controls will (at a minimum) include rock check dams and silt fences at strategic locations. The drainage lines that will be impacted through clearing for culvert works are minor and ephemeral, and form part of the existing Bruce Highway road drainage network.

3.1 (b) National Heritage Places

Description

The Great Barrier Reef World Heritage Area (GBRWHA) is listed as a National Heritage Place however the Australian Heritage Council has not assessed the GBRWHA against the National Heritage List criteria. Therefore, the natural heritage values have been considered the same as the world heritage values for the GBRWHA (SEWPAC, 2010).

Nature and extent of likely impact

Address any impacts on the National Heritage values of any National Heritage place.

The duplication of the Black River bridge will be undertaken during the year when Black River has ceased to flow and sediments cannot be transported downstream. Impacts on National Heritage values are commensurate with those on the GBRWHA, that is, no significant impact on heritage values is anticipated from this project.

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

There are no Ramsar wetlands in the region that will be affected by this project.

Nature and extent of likely impact

Address any impacts on the ecological character of any Ramsar wetlands.

Not applicable

3.1 (d) Listed threatened species and ecological communities

Description

A review of the Protected Matters Search Tool identified the following species as either having habitat, or potentially having habitat, within a five kilometre radius of the Project Area. Based on desktop reviews of available data, including the EPBC Act conservation advice for each species and as compared with the habitat conditions as confirmed with field work, an assessment of the probability of occurrence is given for each species.

Table 2: Listed EPBC Act Threatened Species

Species	Common Name	EPBC Status	Probability of Occurrence
Birds			
Erythrotriorchis radiatus	Red goshawk	Vulnerable	Very low. Species habitat requirements are not met within the Project Area and nesting in the locality is extremely unlikely owing to lack of trees greater than 20m, and lack of potential bird prey.
Neochmia ruficauda ruficauda	Star finch	Endangered	Not present. There have been few records of this finch within its confirmed known range, and no records outside of its range. The Project Area is outside of the known distribution, which extends northwards only as far as Bowen (approximately 200km to the south of the Project Area). Targeted searches within its range in 1996 and 1998 failed to locate any birds.
Poephila cincta cincta	Black-throated finch (southern)	Endangered	Known to occur. One record within Project Area exists. Essential habitat factors are partially represented through presence of suitable perennial and annual grass species important to their diet. Nesting trees also available, with the most suitable habitat located between approximately opposite the Bowden Road to Black River Road intersections where permanent water is available from a property dam within 500m. Vegetation thickening, particularly by Melaleuca viridiflora, limits grass resources and habitat suitability in much of the proposed footprint of the interim solution. Dense exotic grasses in places preclude ready access for the birds to access the ground for fallen seed, and the general environmental integrity of the area has been compromised through previous clearing, ongoing disturbance with vehicles, high population of cats and irregular fire. While fire management in the wider landscape can be beneficial to maintenance of black-throated finch habitat, irregular fire arising from burning of dumped rubbish arguable does not fulfil this management aspect. The Project Area is generally suboptimal in terms of quality of essential habitat factors, but does offer opportunistic foraging. A Significance of Impact Assessment (see Attachment E) has concluded that the Project may impact on populations of black-throated finch if the Black River bridge duplication restricts connectivity north and south across the Bohle Plains in this location.

Rostratula australis	Australian painted-snipe	Endangered	Very low. No permanent water or wetlands within project area, preferred habitat conditions not present. May be migrant visitors to Black River during periods of flow.
Tyto novaehollandiae kimberli	Masked owl	Vulnerable	Low. The species has a sparse population extending over a wide geographical range, and habitat factors which includes rainforest, Melaleuca swamps and littoral zones which are not present in the Project Area. Large trees with hollows do provide potential nesting resources, however surveys did not identify their presence.
Frogs			
Litoria dayi	Australian lace-lid	Endangered	Not present. The project area is outside the existing known range of this frog. It is a rainforest obligate species requiring access to fast flowing perennial watercourse. Habitat factors are not represented within the Project Area. Black River does not meet the habitat factors for this species.
Mammals			
Dasyurus hallucatus	Northern quoll	Endangered	Very low. There are few records in the Townsville area, generally restricted to rocky foot slopes and ridges of adjacent ranges, and the species is seldom encountered. A low rocky ridge is present on the southern side of the Bruce Highway, east of Black River. This area is outside of the Project Area footprint. Suitable rocky habitat is not present within the Project Area.
Hipposideros semoni	Semon's leaf-nosed bat	Endangered	Very low. Species was not recorded via echo-location analysis in the project area, and is unlikely to occur. Preferred habitat factors including rainforest and tall eucalyptus woodland are not represented within the Project Area.
Mesembriomys gouldii rattoides	Black-footed tree-rat	Vulnerable	Very low. Habitat preferences of tropical savannah woodland are not present within the Project Area.
Phascolarctos cinereus	Koala	Vulnerable	Very low. While there are reliable anecdotal records of koalas occurring in the Townsville area there are no substantiated records in the Project Area locality. Koalas may occur in the region with a very low population density distributed over a large area which makes an estimation of likely occurrence in the area extremely problematic. The known populations of koalas are restricted to Magnetic Island, with anecdotal recordings of koalas in the Bohle Plains area at Alice River approximately 10km to the south of the Project Area. All records have been primarily in habitats dominated by ironbark (Eucalyptus crebra) and blue gum (Eucalyptus tereticornis). The vegetation in the Project Area has limited connectivity with preferable habitats of this type. Although E crebra is found within the Project Area, it occurs as isolated individuals and not as part of a E crebra dominated community. Surveys did not find any evidence of koalas' utilising the Project Area (tree scratches, scats).
Pteropus conspicillatus	Spectacled flying-fox	Vulnerable	Unlikely. This is a species primarily associated with rainforest or wet sclerophyll areas and Townsville represents the southernmost limit of normal distribution. Suitable dietary species for the spectacled flying-fox are sparse within the Project Area and the Project Area does not contribute any unique or critical habitat resources. There are no known roosting colonies in proximity.
Rhinolophus robertsi	Large-eared horseshoe bat	Endangered	Unlikely to occur. Distribution models predict a range that extends to just south of Townsville, however there are no confirmed records of this species in the Bohle Plains region, with the closest confirmation being at Alligator Creek, approximately 40km to the south-east. While not a cave obligate species, known roosts are associated with caves, and abandoned mines, primarily in rainforest and sclerophyll woodland areas. Analysis of SongMeter and ANABAT echolocation data over an equivalent 16 nights of recording did not detect this species (refer Attachment D).

Saccolaimus saccolaimus nudicluniatus	Bare-rumped sheathtail bat	Critically endangered	Known to occur from confirmation of echolocation calls from four sites (refer Attachment D and Attachment E). Data indicated that while the bats were detected at each site, this only occurred 1-3 times per night and the calls detected were at a low intensity, suggesting that the bats were some distance away, perhaps 50-100m. This is still within Project Area for most recorded sites. Thus the species does forage in the Project Area, but the presence of tree roosts cannot be determined without further investigation. On the basis of occurring as foragers alone, the Project will not have significant impact on this species as there are areas of high quality foraging woodlands in the vicinity of the Project Area (including southern side of the Bruce Highway). Further surveys are required to determine whether or not the bats have roosting trees in the Project Area. Field surveys identified a number of potential habitat trees (Eucalyptus platyphylla) which have hollows that may serve as possible roost entrances. Roost trees are very rare, and the removal of roost trees (if presence) may constitute a significant impact on this species.
Xeromys myoides	Water mouse	Vulnerable	Very low probability of occurrence. Habitat factors for this species including littoral zones, marine intertidal areas are not met for this species in the Project Area. Although the EPBC and Atlas of Living Australia predicts its potential occurrence, the species has never been recorded from the Townsville area, and the nearest known confirmed sighting is south of Proserpine 260km southeast of the Project Area.
Plants			
Cajanus mareebensis		Endangered	Does not occur. Project Area is outside the known range for this species and known habitat factors including granite derived sandy soils with lower horizons of impeded drainage are not present.
Marsdenia brevifolia		Vulnerable	Unlikely occur. Species is known from the wider Townsville area, mostly from rocky Eucalyptus crebra woodland with relatively undisturbed groundcovers, the closest records are at Magnetic Island (18km to the north-east), and near Paluma (45km to the north-west) Flora surveys did not identify this species in the Project Area.
Phaius australis	Lesser swamp orchid	Endangered	Does not occur. While some habitat factors, such as presence of ephemeral wetlands are present, flora surveys did not identify this species. There are no records from the North Queensland coastal plain.
Phalaenopsis rosenstromii	Native moth orchid	Endangered	Does not occur. This is an upland rainforest species; suitable habitat is not represented in the Project Area.
Tephrosia leveillei		Vulnerable	Does not occur. Project Area is outside the species known distribution and suitable habitat factors, including associated vegetation community types, are not present.
Reptiles			
Caretta caretta	Loggerhead turtle	Endangered	Does not occur. Marine species with no habitat factors represented in Project Area.
Chelonia mydas	Green turtle	Vulnerable	Does not occur. Marine species with no habitat factors represented in Project Area.
Denisonia maculata	Ornamental snake	Vulnerable	Very low. Preferred habitat factors for this species includes brigalow/belah woodland on clay soils and gilgai developments. No records exist for the Townsville coastal plain.
Dermochelys coriacea	Leatherback turtle	Endangered	Does not occur. Marine species with no habitat factors represented in Project Area.
Egernia rugosa	Yakka skink	Vulnerable	Very low. Project Area is outside the known distribution of a fragmented population that occurs over a very wide area of Queensland. Preferred habitat factors including brigalow/mulga woodlands are not present in the Project Area.

Eretmochelys imbricata	Hawksbill turtle	Vulnerable	Does not occur. Marine species with no habitat factors represented in Project Area.
Lepidochelys olivaceae	Olive Ridley turtle	Endangered	Does not occur. Marine species with no habitat factors represented in Project Area.
Natator depressus	Flatback turtle	Vulnerable	Does not occur. Marine species with no habitat factors represented in Project Area.
Sharks			
Pristis pristis	Largetooth sawfish	Vulnerable	Does not occur. Marine/freshwater species with no habitat factors represented in Project Area.
Pristis zijsron	Green sawfish	Vulnerable	Does not occur. Marine/freshwater species with no habitat factors represented in Project Area.

Table 3: Listed EPBC Act Threatened Ecological Communities

Name	Component Qld Regional Ecosystems	EPBC Status	Probability of Occurrence
Broad leaf tea-tree (Melaleuca viridiflora) woodlands in high rainfall coastal north Queensland	RE: 7.3.8, 7.5.4, 8.3.2, 8.5.2, 8.5.6	Endangered	Not present. None of the component regional ecosystems are present in the Project Area and the Project Area is outside the distribution of all of these communities. The project area is south of the Wet Tropics bioregion, so Melaleuca viridiflora communities are outside the definition for these threatened communities.

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

Black-throated finch (southern): Poephila cincta cincta

There is a single existing record of a black-throated finch within the highway road reserve. The species was observed to be foraging and accessing water along a drain in the road reserve that occurs approximately opposite the Black River Road intersection with the Bruce Highway.

The EPBC Act Policy Statement 3.13: *Significant impact guidelines for the endangered black-throated finch (southern) Poephila cincta cincta* identifies actions that may lead to the loss, degradation and/or fragmentation of black-throated finch habitat and may have a significant impact on the subspecies. These actions are not exclusive and include:

- clearing of grassland and/or grassy woodland
- damming or disrupting the natural flows of creeks and rivers
- earthworks or excavation
- pasture improvement (to previously unimproved grassland)
- changes in management regimes, such as burning, slashing and grazing
- construction of roads, structures and/or hard surfaces
- construction of temporary or permanent structures for storage and accommodation
- the introduction of domestic and agricultural animals
- the introduction of exotic plants, particularly exotic grasses, and
- substantial increases in human traffic and/or recreational activities (e.g. trail bike riding, dog walking etc).

The effect of the Project on each of the above are presented in Table 4:

Table 4: Actions that may have a significant impact on black-throated finch habitat

Action	Significance of Project impact
Clearing of grassland and/or grassy woodland	The total area of vegetation to be removed for the project includes approximately 8.8ha of native vegetation of which 4.9ha includes small mosaics of grasslands that provide foraging opportunities for black-throated finches. These small areas are interspersed throughout one section of the road reserve west of the Black River, on the northern side of the highway. In this locality the grasslands/grassy woodland areas are highly impacted by a number of factors, including thickening of woodland (Melaleuca viridiflora regrowth), extensive non-native grass and other weed species incursions and dominance, recreational use (motorcycles, ATVs, BMX) and use of the reserve for utilities including transmission lines, water pipelines, and Telstra fibre optic cable. Foraging habitat is present, however represents only opportunistic foraging, and does not represent a critical resource for black-throated finch in the locality. There is a very high representation of suitable habitat factors elsewhere in the immediate Bohle Plains and it is unlikely that black-throated finch utilise the grassland/grassy woodland in anything other than an opportunistic and transitory manner. While the clearing of this small area of grassland/woody grassland represents a local impact, it does not have a significant impact on the overall availability of habitat resources for black-throated finches in the region.
Damming or disrupting the natural flows of creeks and rivers	There are no perennial watercourses through the Project Area, and the only disruptive measures to natural flows within the Project Area is the use of culverts along drainage lines and the Black River bridge. These will be designed to allow natural flow where possible and potential construction impacts will be managed through the implementation of Environmental Management Plans. The Project will not require damming or any permanent disruption to natural flows of creeks and rivers and thus will not interfere with any permanent water sources essential to black-throated finches. Permanent water is available at a number of rural property dams north and south of the Bruce Highway outside the Project Area, and actions associated with the Project will not have any quantifiable impacts on these resource areas (mitigation measures will be implemented during construction).
Earthworks or excavation	Earthworks and excavation will be integral to the Project. Direct and cumulative impacts of earthworks and excavation will be managed through Erosion and Sediment Control Plans to be developed for the various stages of the Project and in accordance with the relevant Environment Management Plan(s). Earthworks associated with the wide centre line treatment for the TNAIU Interim Solution will primarily be for the purposes of the widening of the existing Bruce Highway within already cleared areas and will have no direct impact on the black-throated finch as the level of earthworks are commensurate with the existing road (i.e. batters). The construction of the property access and Bowden Road intersection upgrade for the TNAIU Interim solution will involve earthworks and excavation that have the potential to impact on foraging and nesting areas. The earthworks will be directly associated with the road works, however no significant cutting or filling is anticipated. Ephemeral drainage lines that are subject to earthworks will be required to be managed through design (e.g. scour protection) and during construction. The majority of the duplication of the Bruce Highway requires earthworks and removal of the remaining vegetation within the road reserve. This will result in permanent loss of opportunistic foraging habitat. Potential impacts include those associated with the direct vegetation clearing and potential indirect impacts associated with erosion and sedimentation at/near drainage lines. Design of culverts will be required to include appropriate scour protection, and during construction will require management of potential impacts. Most earthworks for the full duplication will be associated with the abutments and approaches to the duplicated Black River bridge. Design of the bridge, abutments and piers will be required to consider appropriate erosion and sediment control measures. Earthworks in this instance will require the removal of most riparian vegetation within the highway road reserve and result in the permanent loss of opportunistic habitat. Revegetation of the Black River bridge excavation and overall project earthworks areas will include multiple approaches. Where practical, hydromulching with grass species that contribute to the diet of the black-throated finch can be utilised in areas that may be subject to more regular maintenance: e.g. about culverts, drainage areas, batters. Along the river banks where non-native grasses would be expected to recolonise in the absence of maintenance, revegetation with flood tolerant species of shrubs, small trees, and ground layer stoloniferous grasses and herbaceous

	species with soil binding root properties will provide some protection to transiting birds and generally reduce the erosion risk. The use of shotcrete concrete pads (of a final size to be determined by survey, but not less than 5m by 5m) as scour and bank protection will provide a series of low habitat "stepping stones". The pads will have the advantage of restricting guinea grass growth, and the rough surface of the shotcrete will naturally accumulate silts and organic debris that will enable the establishment of small herbaceous species, annual grasses and other fine rooted vegetation to become established, but preclude coarse rooted perennial grasses such as guinea grass from recruiting. The overall impact of the earthworks and excavations on black-throated finch habitat, as partially offset through revegetation programs, is not a significant impact in the context of the available of undisturbed habitat in general proximity (within 5km) of the Project Area.
Pasture improvements (to previously unimproved grassland)	This action not applicable to this Project: The Project does not convert any existing pasture to another pastoral regime. Mixed mosaics of exotic and native grassed areas (approximately 4.9ha in total) will be cleared. Where practical, hydromulching with grass species that contribute to the diet of the black-throated finch can be utilised in areas that may be subject to more regular maintenance: e.g. about culverts, drainage areas, batters.
Changes in management regimes, such as burning, slashing and grazing	This action is not applicable to this Project. The Project is occurring within land uses that are almost entirely transportation related. TMR does undertake vegetation management for weed control that includes slashing, however grazing and burning do not occur within the road reserve as part of TMR management. This will continue into the future Project construction and operation phases.
Construction of roads, structures and/or hard surfaces	This action is the primary Project feature. The Project involves two scopes of work: an Interim Solution that includes widening of the existing Bruce Highway, construction of a property access service road and intersection upgrades, and a Full Scope Project that includes a duplication of the existing Bruce Highway and construction of a duplicated bridge over Black River. The Full Scope project has the highest potential for significant impacts on black-throated finches with regards to this action/threat as it will require the removal of the majority (if not all) of the 4.9ha of habitat that includes foraging and potential nesting areas within the road reserve and result in road infrastructure. Note that it is considered that the Interim Solution, while directly clearing only a portion of the 4.9ha, may act as a barrier and fragment the remaining vegetation within the road reserve reducing its suitability for black-throated finches. As foraging is currently most likely to occur on an opportunistic and transitory basis, and field work identified only limited suitable nesting opportunity areas, vegetation clearance of habitat for the Interim Solution and Full Scope Project does not represent a significant impact on the black-throated finch. The highest risk of significant impact is the duplication of the Black River bridge. Black River represents the most important local corridor for movement of black-throated finches from north to south in the Bohle Plains area. The bridge duplication has the potential to disrupt this movement corridor and may result in the isolation of the northern population from the southern population. Mitigation measures will include separating the bridges as far as practical to allow sunlight penetration and vegetation growth beneath and adjacent the bridges. Where practical, hydromulching with grass species that contribute to the diet of the black-throated finch can be utilised in areas that may be subject to more regular maintenance: e.g. about culverts, drainage areas, batters. Along the river banks the use of shotcrete concrete pads (of a final size to be determined by survey, but not less than 5m by 5m) as scour and bank protection will provide a series of low habitat "stepping stones". The pads will have the advantage of restricting guinea grass growth, and the rough surface of the shotcrete will naturally accumulate silts and organic debris that will enable the establishment of small herbaceous species, annual grasses and other fine rooted vegetation to become established, but preclude coarse rooted perennial grasses such as guinea grass from recruiting. Notwithstanding. it is expected that for the construction period that black-throated finches will not use this river as a fly way, potentially having a minor and temporary impact on corridor movements across their range.
Construction of temporary or permanent structures for storage and accommodation	Laydown areas, site offices and other temporary structures will be located within the general Project Area for the construction period. The siting of these will be chosen with respect to the location of vegetation to be retained and other habitat features (such as roost trees for other species). Generally, most of these facilities will be located off site in previously disturbed areas, as that most of the available area will be converted into roads and associated infrastructure for the Full Scope Project into the future.

The introduction of domestic and agricultural animals	This action will not arise from Project activities. No introduction of domestic and agricultural actions will happen as a result of this project, and it is most likely that the Project will result in a lesser number of feral and domestic animals, such as roaming cats and dog packs, within the road reserve areas.
The introduction of exotic plants, particularly exotic grasses	A high number of exotic plants, including exotic grasses, are already present within the Project Area and have an existing impact on black-throated finch habitat features within the road reserve. The TNAIU Project will result in the majority of the existing infestations of exotic plants being successively removed as a consequence of the various construction phases. The re-introduction of exotic plants following construction will be mitigated using a combination of techniques. Where practical, hydromulching with grass species that contribute to the diet of the black-throated finch can be utilised in areas that may be subject to more regular maintenance: e.g. about culverts, drainage areas, batters. Along the river banks where non-native grasses would be expected to recolonise in the absence of maintenance, revegetation with flood tolerant species of shrubs, small trees, and ground layer stoloniferous grasses and herbaceous species with soil binding root properties will provide some protection to transiting birds and generally reduce the erosion risk. The use of shotcrete concrete pads (of a final size to be determined by survey, but not less than 5m by 5m) as scour and bank protection will provide a series of low habitat "stepping stones". The pads will have the advantage of restricting guinea grass growth, and the rough surface of the shotcrete will naturally accumulate silts and organic debris that will enable the establishment of small herbaceous species, annual grasses and other fine rooted vegetation to become established, but preclude coarse rooted perennial grasses such as guinea grass from recruiting. Additionally, the TNAIU Project will require substantial areas, e.g. road sides and batters, which will be maintained clear of regrowth vegetation (including tall exotic grasses) as part of safety requirements for highway traffic visibility.
Substantial increases in human traffic and/or recreational activities (e.g. trail bike riding, dog walking etc).	The TNAIU Project will not result in increases in human traffic and/or recreational activities. The Project will result in a major curtailment of existing trail bike and off-road vehicle activities with the implementation of the Full Scope Project, and a partial reduction as a result of the Interim Solution Project.

Essential Habitat factors for the black-throated finch are represented in the Project Area over an area of approximately 4.9ha. These factors include the presence of perennial and annual grass species preferred in the diet of the black-throated finch and presence of potential nesting trees. The nearest permanent water source to the most optimal nesting areas is approximately 350m. Further west along the road reserve there are another 6 watering sources, however few of these are within 500m of suitable nesting areas and there are intervening land uses that include a cattery, wrecking yard and truck haulage business. The Project Area generally has been impacted by weed incursions, notably alien species such as guinea grass (*Megathyrsus maximus*) and chinee apple (*Ziziphus mauritiana*), irregular fire, illegal clearing, and vehicle and recreational access. Overall habitat for the black-throated finch is present, but is regarded as suboptimal for anything other than opportunistic foraging.

The impact of the duplication of the Black River bridge will be dependent on the design and construction attributes for the bridge. A duplicated bridge that is parallel and adjacent to the existing bridge will result in a shade effect arising from a minimum 20m width that will exclude grass growth and deter the local black-throated finch population from utilising the riparian corridor of Black River to connect to habitat resources north and south of the Bruce Highway. This may result in the fragmentation of the existing population, potentially disrupt the breeding cycle of the species, and result in isolation of habitat resources.

A number of mitigation measures have been identified and implemented successfully elsewhere in Queensland (e.g. Qld TMR, 2015 *Fauna Sensitive Road Design*, volumes 1 and 2) that reduced the risk of shading impacts deterring fauna undercrossing of bridges. These particularly include:

- locating the bridges as far apart as practically possible,
- increasing the height of the bridges,
- reducing the impact of batters and pylons footprints through limiting the amount of concrete used,
- reducing the opportunities for recruitment of non-native species.

Implementation of the above measures will reduce the impact of shading, as sunlight is able to penetrate between the bridge spans and create environments more conducive to the species continuing to use the riparian areas. If the duplicated bridge is located as far as is practically possible to the northern edge of the road reserve, then a gap of approximately 20m may be available. However, there are site constraints to consider in the design/location of bridge including (but not limited to) the location of the ambulance station. Therefore, TMR will design the bridge at the maximum distance possible from the existing bridge within the road reserve taking into account the *Fauna Sensitive Road Design* as well as physical design constraints. . This gap between the existing bridge and the duplicated bridge will substantially increase light availability, reduce the shading effect, and allow effective rehabilitation and revegetation between the bridges.

Overall, provided that the impact measures as identified for the Black River bridge are implemented, the risk of the TNAIU Project resulting in a significant impact on black-throated finches is minimised. The risk is higher should the duplicated bridge be built immediately adjacent to the existing bridge, and in this instance this component of the TNAIU Project would be deemed to have a significant impact on black-throated finches.

Bare-rumped sheathtail bat: Saccolaimus saccolaimus nudicluniatus

In the present survey period *S. saccolaimus nudicluniatus* was detected at each of the four sites monitored but only rarely, with only 1 -3 passes per night. Calls detected at the sites were low level suggesting that the bats were some distance away, perhaps 50-100m. Given the proximity of some sites to each other (approximately 100m apart between A and D) and the timing of the calls it is possible that the stations may have recorded the same bat.

Notwithstanding, while it has been confirmed that the bare-rumped sheathtail bat occurs within and utilises foraging resources in the Project Area, analysis of the echo-location calls suggests that it does so on an intermittent and infrequent basis.

This is not unexpected, given that Project Area is cleared for highway and property access, and the habitat remaining is primarily dominated by *Melaleuca viridiflora*, interspersed with mosaics of low woodland and vegetation associated with highway drainage lines.

There are some emergent *Eucalyptus platyphylla* canopy species that have hollows that potentially may serve as roosting areas. Potential roosting trees for this species are extremely rare within the project area and given the low utilisation rates recorded within the Project Area it is unlikely that there are roosting trees in the Project Area. Nocturnal surveys of these trees and stag watching did not identify any bats leaving or entering any trees. Notwithstanding, it is inconclusive as to whether this bat species occupies the site in a roosting or breeding colony capacity.

On the basis of the frequency of foraging occurrence as recorded, the TNAIU Project will not have a significant impact on reducing foraging opportunities as the small area of available habitat is poor quality and represents only a very small percentage of the total available habitat within the general area. Within a 1km buffer of the Project Area, the Qld Regulated Vegetation Management mapping identifies 374.5ha of regulated remnant vegetation that potentially could provide foraging resources and/or roosting trees. The removal of less than 1.5% of this regulated remnant vegetation for the project does not represent a significant impact on bare-rumped sheathtail bat foraging resources.

Specific tree hollow surveys (as noted) have not been undertaken. Once the road alignments (clearing limits) are surveyed and marked, inspection/survey of trees will be conducted to identify any roosts. Until the tree hollow surveys are undertaken, it is not possible to make a determination on the significance of the impact of the TNAIU Project on this species.

Squatter pigeon: Geophaps scripta

The Squatter pigeon (southern) (*Geophaps scripta scripta*) is listed as ‘vulnerable’ under the EPBC Act and has been reported as occurring within the broader Townsville region, and more specifically has been recorded in the vicinity of the Project Area within the nearby (within 5km) Ring Road 4 TMR project site.

Field surveys did not identify squatter pigeons within the Project Area, and habitat assessments for this species were carried out that concluded essential habitat factors in the Project Area were suboptimal for foraging and breeding. Existing site impacts that contribute to the degradation of the site as possible habitat included a high prevalence of dominant non-native grass species including extensive areas of clearways maintained along the highway embankments and side road intersections and driveway access, irregular fire regimes, a high level of ongoing disturbance related to recreational access by vehicles, bikes and ATVs, and a high population of feral/domestic cats utilising the road reserve. Suitable habitat for squatter pigeons is very well represented outside of the Project Area. Therefore, it is very unlikely that squatter pigeons would occur within the Project Area.

Northern Quoll: Dasyurus hallucatus

There are few records of the northern quoll in the immediate Townsville area, the closest confirmed record being at Mt Louisa, approximately 10km east of the Project Area. However, this record was believed to be an individual that was accidentally transported, and in the wider region, northern quoll populations are known to survive on Mount Elliot and Saddle Mountain, Cape Cleveland and Cape Upstart (Burnett 2008).

The species is preferentially reliant on rocky habitat to provide shelter and breeding areas and is seldom seen outside of habitats that do not have these features. There is a low rocky ridge located on the southern side (but outside) of the Project Area immediately east of Black River. This locality does include habitat factors necessary for the northern quoll, but the existing Bruce Highway provides a significant linear barrier to any local north/south movement and it is extremely unlikely that northern quolls would venture from their rocky habitat areas across the highway into the proposed works area. No expansion works for the TNAIU Project are proposed that would impact on the potential habitats of the northern quoll in the area, and the project generally is not expected to have any significant impact on this species.

Koala: Phascolarctos cinereus

The only locally confirmed records for the koala occur on Magnetic Island, however the koala is included in this assessment because of reliable anecdotal records of koalas occurring in the wider Townsville region, including from Oak Valley (30km to the south-east) and with one report of a koala on the Alice River, approximately 10km to the south of the Project Area, but within the general Bohle Plains locality. The estimation of koala populations and general abundance in the Townsville region is extremely difficult owing to the apparent very low density over a potentially wide distribution area and with no confirmed records other than Magnetic Island. All observations, both anecdotal and confirmed, have been of koalas in *Eucalyptus crebra* dominated woodland habitat, where the woodlands are contiguous with large areas of similar floristic composition, or in riparian areas with *Eucalyptus tereticornis* as the characteristic species. *E crebra* is represented in the Project Area, but does not form extensive areas of woodland, and the species are limited to isolated trees, either retained as shade/feature trees in cleared areas along the highway road reserve, or as sparsely distributed individuals. *E tereticornis* does not occur in the Project Area. Surveys undertaken of the Project Area did not identify any characteristic evidence of koalas utilising the area, i.e. no tree scratches or scats. The area of vegetation impacted by the project is alienated from contiguous areas of vegetation north and south of the highway by the North Coast Railway Line, the Bruce Highway itself, clearing associated with linear infrastructure including water supply pipelines and high voltage transmission infrastructure, and access roads and driveways. It is unlikely that koalas could access the road reserve remnant vegetation in the first instance, and there are insufficient supporting habitat resources to maintain a koala presence in the Project Area. The TNAIU Project will not have any quantifiable impacts on koalas.

3.1 (e) Listed migratory species

Description

A review of the Protected Matters Search Tool identified the following (Table 5) listed migratory species as either having habitat, or potentially having habitat, within a five kilometre radius of the Project Area. Based on desktop reviews of available data, including the EPBC Act conservation advice for each species, and as compared with the habitat conditions confirmed with field work, an assessment of the probability of occurrence is given for each species.

It should be noted that this list excludes Migratory Marine Species (such as the Loggerhead turtle (Caretta caretta)). Marine habitat factors do not occur within the Project Area. Also note that due to similar habitat for Migratory Wetland Species, these species have been partially grouped together in Table 5.

Table 5: Listed EPBC Act Listed Migratory Terrestrial Species

Species	Common Name	EPBC Status	Probability of Occurrence
Migratory Marine Birds			
Apus pacificus	Fork-tailed swift	Marine migratory	Low. Known in the wider area and may overfly the Project Area due to non-breeding habitat features.
Sterna albifrons	Little tern	Marine migratory	Low. Known in the wider area and may overfly the Project Area. No breeding or significant habitat features identified due to partial ephemeral nature of the Black River and location in comparison to coastal areas.
Migratory Terrestrial Species			
Cuculus optatus	Oriental cuckoo	Terrestrial migratory	Very low. Non-breeding habitat only: Habitat factors for this species are not represented within the Project Area.
Hirundapus caudacutus	White-throated needletail	Terrestrial migratory	Very low. May overfly the Project Area. No habitat factors for roosting or nesting are represented in the locality.
Merops ornatus	Rainbow bee-eater	Terrestrial migratory	Known to occur in Project Area and observed on site. Species is primarily an aerial insectivore, foraging within the canopies of woodlands and in open areas. Species nests in hollows in creek banks, drainage lines, road side cuttings etc. While it is possible that some areas of the banks of Black River could be utilised, most of the bank area was densely infested with the introduced grasses and no nesting areas were observed in field work.
Monarcha trivirgatus	Spectacled monarch	Terrestrial migratory	Does not occur. Species is a wet sclerophyll specialist and habitat factors for this species do not occur in the Project Area.
Motacilla flava	Yellow wagtail	Terrestrial migratory	Very low. Non-breeding habitat only. Species requires well-watered open grasslands and fringes of wetlands. Roosts in mangroves and other dense vegetation not represented in the Project Area.
Myiagra cyanolecua	Satin flycatcher	Terrestrial migratory	Very low. May overfly the site. Habitat preferences are not present on site and presence of invasive plant species, notably rubber vine (Cryptostegia grandiflora) is a recognised threatening process which is occurring within the Project Area.
Rhipidura rufifrons	Rufous fantail	Terrestrial migratory	Very low. Habitat factors including vegetation community types are not present for this species.
Migratory Wetland Species			
Actitis hypoleucos	Common sandpiper	Wetland migratory	Low. Species are recorded to have occurred within 10km of the Project Area (either through the Department of Environment and Heritage Protection Wildlife Online searches or through previous surveys
Ardea alba	Great egret, White egret		
Ardea ibis	Cattle egret		

Arenaria interpres	Ruddy turnstone		of the area within 10km, namely the Ring Road Project Section 4). The majority of the Project Area and immediate vicinity do not contain wetland habitat areas to support the EPBC listed species. As species have been recorded within 10km, it is anticipated that migratory wetland species may overfly the Project Area. However, the Black River at times throughout the year has temporary wetland features (such as ponding/pooling of water). This may be conducive to the temporary attraction of these migratory wetland birds. However, during the site survey no specific habitat features for migratory wetland species were observed within the Project Area, therefore occurrence is anticipated to be low.
Calidris acuminata	Sharp-tailed sandpiper		
Calidris alba	Sanderling		
Calidris canutus	Red knot, Knot		
Calidris ferruginea	Curlew sandpiper		
Calidris ruficollis	Red-necked stint		
Calidris tenuirostris	Great Knot		
Charadrius leschenaultii	Greater sand plover, Large sand plover		
Charadrius mongolus	Lesser sand plover, Mongolian plover		
Gallinago hardwickii	Latham's snipe, Japanese snipe		
Heteroscelus brevipes	Grey-tailed tattler		
Limicola falcinellus	Broad-billed sandpiper		
Limosa lapponica	Bar-tailed godwit		
Limosa limosa	Black-tailed godwit		
Numenius madagascariensis	Eastern curlew		
Numenius minutus	Little curlew, Little whimbrel		
Numenius phaeopus	Whimbrel		
Pandion haliaetus	Osprey		
Pluvialis fulva	Pacific golden plover		
Pluvialis squatarola	Grey plover		
Tringa glareola	Wood sandpiper		
Tringa nebularia	Common greenshank, Greenshank		
Tringa stagnatilis	Marsh sandpiper, Little greenshank		
Xenus cinereus	Terek sandpiper		
Charadrius bicinctus	Double-banded plover	Wetland migratory	Very low. These species have no known records within 10km of the Project Area. However, there is potential that species may overfly the Project Area on occasion.
Charadrius veredus	Oriental plover, Oriental dotterel		
Gallinago megala	Swinhoe's snipe		
Gallinago stenura	Pin-tailed snipe		
Heteroscelus incanus	Wandering tattler		

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

Listed migratory species are extremely unlikely to utilise any part of the Project Area on any but the most transient and opportunistic basis. There is no permanent water within the Project Area to provide foraging resources for water fowl and the extent of low, weed dominated regrowth offers minimalist resources for breeding and roosting. Following periods of rain ephemeral drainage lines may provide temporary foraging resources, but these are very minor and would be accessed in only the most opportunistic foraging. The Black River traversing the Project Area provides the most significant resources for migratory species, however this river flows only intermittently during the wet season, December to April, drying to a series of isolated pools and otherwise during the year is a dry river bed. The riparian areas of the river are intensely disturbed and

dominated by introduced species which provide little to no habitat values for migratory species. It is considered that the design of the duplicated bridge, being consistent with the existing bridge, would not result in any significant upstream or downstream impact upon the hydrological situations (i.e. off-site habitat values are not anticipated to be impacted).

Erosion and sediment control plans to be implemented for the project will limit the risk of sediment entering into and having any potential impact on the Black River or its tributaries. The bridge duplication works will occur outside of the wet season (December to April) when the river bed is dry and there are no possibilities for sediments to be transported off site.

One migratory species, the rainbow bee-eater (Merops ornatus) was noted on site during the field inspections drinking from water ponded from road side runoff following recent heavy rain in the area. This bird nests in tunnels in river/creek/dam banks, road side cuttings, and other similar localities. These features are limited in the Project Area with the Black River (outside the works footprint) providing the most suitable nesting habitat. Parts of the Black River bank may provide opportunities for rainbow bee-eaters to build nesting tunnels, but in the region of the bridge duplication area no such opportunities were observed

The TNAIU Project will not have any significant or quantifiable impact either directly on listed migratory species, or their habitat.

3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

Not applicable

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth marine area.

Not applicable

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description

If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

Not applicable

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

Not Applicable

3.1 (h) The Great Barrier Reef Marine Park

Description

The Great Barrier Reef Marine Park Area (GBRMPA) is located 7.5km north of the Project Area. Drainage lines traversing the Bruce Highway form part of the tributary network of Black River that empties into Halifax Bay immediately adjacent the marine park.

Nature and extent of likely impact

Address any impacts on any part of the environment of the Great Barrier Reef Marine Park.

It is expected that there will be no significant impacts on the GBRMPA. Erosion and sediment control plans to be implemented for the project will limit the risk of sediment entering into and having any potential impact on the Black River or its tributaries. The bridge duplication works will occur outside of the wet season (December to April) when the river bed is predominately dry and there are limited possibilities for sediments to be transported off site.

All efforts to minimise disturbances to drainage lines traversed by the Project Area will be undertaken in accordance with the Environmental Management Plan(s) for the project.

3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description

If the action is a coal seam gas development or large coal mining development that has, or is likely to have, a significant impact on water resources, the draft Policy Statement Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources provides further details on the type of information needed.

Not applicable

Nature and extent of likely impact

Address any impacts on water resources. Your assessment of impacts should refer to the draft Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources.

Not applicable

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:
- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area;
- will be taken on Commonwealth land; or
- will be taken in the Great Barrier Reef marine Park.

Your assessment of impacts should refer to the Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies and specifically address impacts on:
- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	Is the proposed action a nuclear action?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))

3.3 Other important features of the environment

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 above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

3.3 (a) Flora and fauna

The total TNAIU works footprint is approximately 47ha of which Category B remnant vegetation as mapped by the Queensland Department of Natural Resources and Mines (DNRM) Regulation Vegetation Management Map represents 1.76ha, and Category R (reef-regrowth vegetation) represents 5.2ha. It should be noted however that Category R mapping has included cleared areas, including the Bruce Highway, and that the actual extent (minus these cleared areas) is 3.13ha.

In total, there is approximately 16ha of vegetation that will be impacted by the proposal. While Regulated Vegetation mapping formally identifies 1.76ha as remnant, the balance (i.e. 14.24ha) comprises native vegetation in varying stages of regrowth. This vegetation comprises a mosaic of weed species and native vegetation, and is highly impacted by a number of factors including:

- dominant weed species (notably guinea grass, Megathyrsus maximus);
- footprint of the old Bruce Highway and intersections (which still includes deteriorated pavement in some sections);
- clearing and associated trenching for of Telstra fibre optic cable;
- a high degree of recreational use: including off road motorcycling, ATV tracks; and
- fire.

Habitat conditions for native fauna on site are similarly poor for the most part. The main habitat area being the thin band of vegetation between a highly developed and mostly cleared rural-residential subdivision and the existing Bruce Highway, with the various intersections, driveways and service access roads further contributing to fragmentation of the habitat

values. The riparian area of the most significant waterway, Black River, is highly disturbed dominated by introduced species, notably guinea grass on the banks, and paragrass and hymenachne along the waters edge.

Threatened or Near Threated species as identified under the Queensland Nature Conservation (Wildlife) Management Regulation 2006 that are known or predicted to occur in the project area are listed in Table 6 (note special least concern species are not included within the table). These are based on a 10km buffer of the Project Area from the Queensland Wildlife Online database (refer Attachment F).

Table 6: Wildlife Online NCA Listed Species known, or with a likelihood of occurring in the Project Area

Species	Common Name	NCA Status/EPBC Status	Probability of Occurrence
Esacus magnirostris	Beach stone-curlew	Vulnerable/Not listed	Very low. Primarily a littoral species and occasionally locally nomadic along major watercourses in coastal area. are limited in the Project Area. May rarely venture upstream along Black River.
Poephila cincta cincta	Black-throated finch (southern)	Endangered/Endangered	One record within the Project Area. Essential habitat factors suboptimal with occasional mosaics of suitable foraging areas. Unlikely to occur except on a transitory and opportunistic basis following rain and grass seed development. Black River riparian corridor provides key connectivity for populations north and south of the Bruce Highway.
Rostratula australis	Australian painted-snipe	Vulnerable/Endangered	Very low. No permanent water or wetlands within Project Area, preferred habitat conditions not present. Black River flows only intermittently and no permanent wetland habitat factors present in the bridge duplication area.
Numenius madagascariensis	Eastern curlew	Vulnerable/Critically endangered	Very low. No permanent water or wetlands within Project Area, preferred habitat conditions not present. Black River flows only intermittently and no permanent wetland habitat factors present in the bridge duplication area.

3.3 (b) Hydrology, including water flows

The Project Area traverses ten watercourses identified on the Queensland vegetation management watercourse and drainage features mapping. Of these, only the Black River is identified as a major watercourse (6th order watercourse) but is not a perennial watercourse. Black River may flow intermittently during the wet season December to April, but otherwise is dry for the majority of the year. Four watercourses east of the Black River are modified overland flows with constructed drains beneath the Bruce Highway. These only carry water during and following rainfall events into roadside spoon drains and do not form any natural watercourse features identifiable in the field. Roadside drains empty into the Black River, which in turn enters the Coral Sea in Halifax Bay.

West of Black River five watercourse features are natural drainage features that are ephemeral in nature, but may carry water for up to several weeks following rain. There are sufficient water resources for the riparian vegetation of these watercourses to be clearly demarcated. None of these watercourses are named, with four of these being tributaries of Black River, with the westernmost drainage line a tributary of Healy Creek (outside the Project Area).

Other water/hydrological factors to consider include coastal and wetland areas. The Queensland Department of Environment and Heritage Protection (EHP) coastal mapping identifies that the Project Area, or immediate surrounding area, is not within the Coastal Management District, nor is it subject to coastal hazards of erosion prone areas or storm tide inundation (EHP, 2016c). Additionally, EHP wetland mapping identified that the Project Area does not include any Wetland Protection Areas.

3.3 (c) Soil and Vegetation characteristics

The project area is within the Bohle Plains, a geomorphology area comprising alluvial plains fan and channel infills. Soils are thus from a mosaic of alluvial derived materials, with soil horizons that may comprise extensive clay/sand structures.

Vegetation characteristics are dependent on the drainage condition and type of underlying soil material. In the main soils of higher clay content are generally more poorly drained, and are characterised by Melaleuca viridiflora (tea tree) regrowth or Eucalyptus platyphylla. In better drained areas on sandy alluvium, riparian woodland or sclerophyll woodland may develop, characterised by various combinations of Eucalyptus/Corymbia, with occasional vine forest elements in riparian areas. Within the Project Area all vegetation communities have been compromised by past (and ongoing) disturbance, weeds and fire. The bed of Black River is sandy alluvium, with riparian vegetation dominated by introduced species, with saplings/regrowth of Casuarina cunninghamiana and Melaleuca leucadendra sparsely distributed on the banks.

3.3 (d) Outstanding natural features

There are no outstanding natural features within or immediately adjacent the Project Area that would be impacted by the proposed TNAIU works. The nearest significant natural terrestrial feature is the Townsville Town Common Regional Park (Conservation Park), at the mouth of the Bohle River approximately 5.8km to the north east of the closest point of the Project Area. The Great Barrier Reef World Heritage Area is approximately 5.7km to the north of the Project Area.

3.3 (e) Remnant native vegetation

The Project Area is within the Townsville Plains Province of the Brigalow Belt Northern Bioregion. Remnant native vegetation has been identified by the Qld Regulated Vegetation Management Map as occurring over approximately 1.76ha along the project footprint. The Qld Vegetation Supporting Map identifies the remnant vegetation within the works footprint as comprising a 'least concern' regional ecosystem.

Regional ecosystems within the works footprint are listed in the table below and shown in Attachment C.

Table 7: Regional Ecosystems (RE) within the TNAIU Project Footprint

Regional Ecosystem	Description	Field Observations	Area (as mapped)
11.3.25b	Riverine wetland or fringing riverine wetland. Melaleuca leucadendra and/or M. fluviatilis, Nauclea orientalis open forest.	Field observations do not match extent of mapping. A minor component impacted by weeds, recreational use and fire. Most of community mapped as 11.3.25b is in fact 11.3.12	1.54ha
11.3.12	Melaleuca viridiflora with occasional M. argentea +/- M. dealbata woodland to open woodland on alluvial plains	Most common community, occurring as primarily regrowth within the road reserve.	0.22ha
11.12.9	Eucalyptus platyphylla, Corymbia dallachiana woodland on igneous rocks	This locality has been cleared and comprises almost exclusively grass.	0.39ha
11.3.35	Eucalyptus platyphylla, Corymbia clarksoniana woodland on alluvial plains	Small area of moderate integrity woodland	0.11ha
Non remnant			44.34ha
Total Remnant			2.26ha

RE 11.3.25b is mapped over a larger extent than was confirmed in the field. RE 11.3.25b is a riparian community, and field observations confirmed that this floristic/landform association generally only persisted as a depauperate minor fringe, often less than 5m wide, on either side of ephemeral drainage lines traversing the Bruce Highway. The majority of the polygons mapped as RE 11.3.25b are in fact more characteristic of RE 11.3.12, Melaleuca viridiflora woodland.
From field observations, the remnant vegetation comprises four broad communities:

- Cleared. Maintained as cleared areas by either TMR for highway safety aspects or by adjacent landholders. Where not regularly mown the dominant feature is introduced guinea grass (Megathyrsus maximus) often in association with other introduced grass species. There are occasional trees (e.g. Eucalyptus crebra, Corymbia dallachiana, Eucalyptus platyphylla) retained as shade or feature trees.
- Low woodland dominated by Melaleuca viridiflora. This comprises the dominant vegetation in those areas not maintained as cleared grassed areas. M. viridiflora is the characteristic species, however other species such as C. dallachiana, E crebra, Grevillea parallela, Petalostigma pubescens, may be locally more frequent. The understorey is variable, and primarily constitutes a mosaic of groundcovers varying from small patches (<50m^2) of high diversity native grass/sedgelands in poorly drained areas, to extensive areas of dominance by introduced weed species primarily guinea grass, snakeweed (Stachytarpheta sp) and hyptis (Hyptis suaveolens), with occasional areas of belly-ache bush (Jatropha gossypifolia), chinee apple (Ziziphus mauritiana) and rubber vine (Cryptostegia grandiflora).
- Fringing riparian vegetation, often severely impacted by guinea grass and chinee apple favoured by disturbance patterns including recreational use, fire. Mangos are common, with Melaleuca fluviatalis, Melaleuca leucadendra

Lophostemon grandiflorus, Pandanus cookii characteristic in less impacted areas. Very minor vine forest elements including Milletia pinnata, Ficus opposita, Cryptocarya triplinervis, are occasionally represented in these areas. Leucaena (Leucaena leucacephala) forms occasional thickets. Along Black River the riparian vegetation is simple, dominated by guinea grass on the banks, and paragrass and hymenachne at the waters edge.

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

The project will be undertaken on the Bohle Plains, a lowland coastal feature generally flat to very mildly undulating, with elevation varying between 15m AHD to 20m AHD. The bed of Black River is approximately 11m AHD.

3.3 (g) Current state of the environment

The Project Area is within the bounds of the Bruce Highway road reserve. This road reserve is used for many utility functions, and supports high voltage transmission line easements, lower voltage transmission network distributions, property driveways, major road intersections, Telstra fibre optic cable network, and service roads to properties (additional to driveways directly from the highway). The majority of the proposed works area is subsequently cleared of remnant vegetation; and excepting the Black River, all the waterways are heavily modified drains for the purposes of highway drainage. The existing highway is a dual lane carriageway, with a 100km/hr speed limit. Subsequently vegetation clearways are maintained for line of sight safety reasons on the sides of the highway in accordance with Queensland standards.

There are numerous rural-residential properties on either side of the highway in the Project Area, and the road reserve is subject to numerous ongoing impacts including dumping of vegetation garden waste, fire, and recreational use of wider sections of the road reserve by motorcycle trail bikes (predominantly).

Nearly all riparian areas are subject to heavy infestations of introduced species. Primarily this includes guinea grass (Megathyrsus maximus), paragrass (Urochloa mutica) and hymenachne (Hymenachne amplexicaulis). Outside of these areas most woodland areas are similarly infested with introduced species, including guinea grass, but also thatch grass (Hyparrhenia rufa), grader grass (Themeda quadrivalvis), chinee apple (Ziziphus mauritiana), bellyache bush (Jatropha gossypifolia) and rubber vine (Thunbergia grandiflora) all distinctive components.

Small areas of Melaleuca viridiflora woodland occur as mosaics within parts of the road reserve. Some of the woodland areas have high diversity values, particularly amongst the grass, sedge and forb species, and emergents of Eucalyptus platyphylla, Corymbia dallachiana and Eucalyptus crebra occur in varying densities. These woodland areas provide potential habitat factors for the black-throated finch and bare-rumped sheathtail bat.

Black River provides a key riparian fauna corridor north and south of the Bruce Highway. The riparian areas are heavily impacted by introduced species, with saplings/young trees of Casuarina cunninghamiana and Melaleuca leucadendra occurring as sparsely distributed individuals.

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

The Great Barrier Reef World Heritage Area (GBRWHA) is listed as a National Heritage Place. At its closest point the GBRWHA is approximately 7.5km north of the Project Area.

3.3 (i) Indigenous heritage values

There are no listed indigenous heritage values on the Queensland Cultural Heritage Register or Database that will be affected by this project.
TMR are continuing to negotiate with the relevant traditional landholders of the area and cultural heritage surveys of the project area for any evidence of indigenous site values are yet to be undertaken.

3.3 (j) Other important or unique values of the environment

Black River is a key landscape feature for black-throated finches in the Bohle Plains region. Black-throated finches are locally nomadic, and require access to a mosaic of resources throughout the year including areas of suitable perennial/annual grasses, access to permanent water, and areas of remnant vegetation with a minimum patch size of 40 – 50ha with suitable nesting trees available. Increasing urbanisation and transport networks are decreasing connectivity between these resource requirements for local populations of black-throated finches, possibly leading to declines in the species numbers in different locations.

Populations of black-throated finches occur north and south of the Bruce Highway in the project locality east and adjacent to the Black River. Populations south of the Bruce Highway, primarily in the Alice River, Black River rural areas, are

increasingly becoming isolated from populations north of the Bruce Highway through increasingly dense urban subdivisions at Beach Holm, Jensen, Deeragun, and Mount Low.

The riparian areas of Black River provide a critical and possibly the only remaining viable corridor for black-throated finch north and south of the Bruce Highway on the Bohle Plains west of Townsville. During the course of investigations for this project, black-throated finches were noted on the northern side of the Bruce Highway off Brabon Road, adjacent to Black River, but outside the works footprint and general survey area.

3.3 (k) Tenure of the action area (eg freehold, leasehold)

The proposed TNAIU Project is to be undertaken predominately within the existing Bruce Highway and adjacent road intersection reserves. Tenure is road reserve. A small area of reserve tenure land and freehold land will be acquired for the TNAIU Project works.

3.3 (l) Existing land/marine uses of area

Not applicable: The project area is road reserve.

3.3 (m) Any proposed land/marine uses of area

Not applicable: The project will not change any land uses in the area.

4 Environmental outcomes

Provide descriptions of the proposed environmental outcomes that will be achieved for matters of national environmental significance as a result of the proposed action. Include details of the baseline data upon which the outcomes are based, and the confidence about the likely achievement of the proposed outcomes. Where outcomes cannot be identified or committed to, provide explanatory details including any commitments to identify outcomes through an assessment process.

If a proposed action is determined to be a controlled action, the Department may request further details to enable application of the draft Outcomes-based Conditions Policy 2015 and Outcomes-based Conditions Guidance 2015 (http://www.environment.gov.au/epbc/consultation/policy-guidance-outcomes-based-conditions), including about environmental outcomes to be achieved, details of baseline data, milestones, performance criteria, and monitoring and adaptive management to ensure the achievement of outcomes. If this information is available at the time of referral it should be included.

General commitments to achieving environmental outcomes, particularly relating to beneficial impacts of the proposed action, CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, and conditions of approval, if your proposal proceeds to these stages).

The TNAIU Project is to be undertaken primarily within road reserve of the Bruce Highway with small areas of State Land and private property affected. The TNAIU Project will require the removal of approximately 0.91ha of remnant vegetation mapped as 'essential habitat' under the essential habitat layer of the regulated Qld Vegetation Management mapping for the black-throated finch. An additional 3.99ha of regrowth vegetation mapped as 'non-remnant' but retaining some essential habitat factors (i.e. presence of native grasses for foraging and potential nest trees) will also be removed. This overall represents less than 1.5% of the total potentially available habitat for the black-throated finch and bare-rumped sheathtail bat (374.6ha of regulated remnant vegetation) within a 1km radius of the Project Area.

The primary mechanism in achieving an environmental outcome in relation to MNES has been the adoption of the existing Bruce Highway road reserve as being the development footprint for the project. Alternative positions of the Bruce Highway upgrade in the original preliminary planning phase of the project were rejected for a number of reasons, including environmental, and for the TNAIU Project no alternatives to the current proposed design and footprint advanced to the current planning phase.

5 Measures to avoid or reduce impacts

Note: If you have identified alternatives in relation to location, time frames or activities for the proposed action at Section 2.3 you will need to complete this section in relation to each of the alternatives identified.

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.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is,
- how the measure is expected to be effective, and
- the time frame or workplan for the measure.

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.

Provide information about the level of commitment by the person proposing to take the action to achieve the proposed environmental outcomes and implement the proposed mitigation measures. For example, if the measures are preliminary suggestions only that have not been fully researched, or are dependent on a third party's agreement (e.g. council or landowner), you should state that, that is the case.

Note, the Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided on the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, if your proposal proceeds to these stages).

Owing to the nature of the project as a highway expansion, it is not possible to avoid or reduce the works area to mitigate vegetation and habitat loss impacts within the project footprint, and it is expected that the entirety of the 4.9ha of vegetation deemed as having some habitat values to MNES (black-throated finch) will be removed during the course of the project for construction, maintenance and highway safety requirements. A number of approaches to the mitigation of general impacts, e.g. erosion and sediment control, have been identified and are presented in the following:

Table 8: Summary of Measures to Mitigate Impacts on MNES.

General environmental management controls for the site as a whole will inform the Planning and Construction Environmental Management Plans for the project:

- Implement a Pest Management Plan for the site (this should include the control of cats);
- Implement a Fire Management Plan for the Project Area during construction;
- Develop and implement an Erosion and Sediment Control Plan(s) for the Project Area for construction;
- Site inductions to be undertaken by all people working/ entering the site;
- Clearing of vegetation should be staged and timed to limit impacts on bats and threatened bird species;
- The extent of clearing should be clearly delineated and marked to ensure that the clearing area does not exceed the area absolutely necessary for the project
- Implement a Weed Management Plan for the site (this should include a wash down area and weed control through both chemical and mechanical means); and
- General observance of storage and use of hazardous materials.

Black River Bridge Duplication

The duplication of the Black River bridge represents the single highest risk element of the project in terms of the potential for impacts on MNES, notably the black-throated finch. The populations of black-throated finch in the Bohle Plains area are locally nomadic and require year round access to a variety of habitat resources.

Linear transport networks and ongoing urban development is increasing the alienation of these habitat resources from ready access by black-throated finch. The Black River riparian area represents the most significant viable corridor connecting black-throated finch populations north and south of the Bruce Highway, and enables access to the variety of habitat resources necessary for foraging, breeding and watering.

Bridges are known to be impediments to faunal movement owing to the 'shading' effect where sunlight cannot reach beneath the bridge. The duplication of the Black River bridge immediately adjacent to the existing bridge will result in a deep shade obstruction with the combined bridges 20m (minimum) in width restricting all direct sunlight. This width is sufficient to negate vegetation growth beneath the bridge, thus reducing food and shelter, and creates a deep shade impact that has been demonstrated through research to provide a barrier to fauna unwilling to venture into these areas (EINZ 2009).

For this project TMR have indicated that for purposes of mitigating the impacts of dual bridges on MNES that they will adopt a design that locates the duplicated bridge as far north (downstream) of the existing bridge as possible within the available road corridor. The bridges will be approximately 10m wide each, and the adoption of a maximum separation distant possible between the bridges significantly offsets the shade effect of bridges side by side, and will enable sunlight to directly reach beneath the spans of the bridges.

A number of mitigation measures have been identified and implemented successfully elsewhere in Queensland (e.g. Qld TMR, 2015 Fauna Sensitive Road Design, volumes 1 and 2) that reduced the risk of shading impacts deterring fauna undercrossing of bridges. These particularly include:

- locating the bridges as far apart as practically possible;
- increasing the height of the bridges;
- reducing the impact of batters and pylons footprints through limiting the amount of concrete used; and
- removal of exotic weeds and implementing detailed rehabilitation and revegetation programs particular to the affected species.

Implementation of the above measures will reduce the impact of shading, as sunlight is able to penetrate between the bridge spans, and create environments more conducive to the species continuing to use the riparian areas.

As mentioned previously, if the duplicated bridge is located as far as is practically possible to the northern edge of the road reserve, then a gap of approximately up to 20m may be available. However, there are site constraints to consider in the design/location of bridge including (but not limited to) the location of the ambulance station and width of the road reserve. Therefore, TMR will design the bridge at the maximum distance possible from the existing bridge within the road reserve taking into account the Fauna Sensitive Road Design as well as physical design constraints. This gap will substantially increase light availability, reduce the shading effect, and allow effective rehabilitation and revegetation between the bridges.

Overall, provided that the impact mitigation measures as identified for the Black River bridge are implemented, the risk of the TNAIU Project resulting in a significant impact on black-throated finches is minimised. The risk is higher should the duplicated bridge be built parallel to the existing bridge, and in this instance this component of the TNAIU Project would be deemed to have a significant impact on black-throated finches.

In formulating mitigation measures provided in Table 8 below, potential risk factors were listed in the 'Significant impact guidelines for the endangered black-throated finch (southern) (Poephila cincta cincta)' (DEWHA 2009), the 'Recovery plan for the Bare-rumped Sheathtail Bat Saccolaimus saccolaimus nudicluniatus 2007-2011' (Schulz, M. & B. Thomson, 2007) and the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance' (DEWHA 2013).

Table 8: Summary of Measures to Mitigate Impacts on MNES

MNES Matter	Potential Risk Factor	Proposed Mitigation Measures
Black-throated finch	Clearing and fragmentation of foraging habitat (grasslands and grassy woodlands)	The TNAIU Interim Solution component of the project will not require the clearing of all the vegetation within the road reserve. This component involves the widening of the shoulders of the existing Bruce Highway into cleared areas on either side of the highway, alterations to the Bowden Road intersection, and the construction of a side access road for properties on the northern side of the road reserve, west of Black River. This will enable an average width of 85% of the identified habitats to be retained in the medium term (within a decade). However, while the Interim Solution will directly clear only a portion of the 4.9ha, the Bowden Road works and the side access road may act as a barrier and fragment the remaining vegetation within the road reserve reducing its suitability for black-throated finches. The TNAIU Full Scope component of the project will involve the construction of a two lane expansion of the Bruce Highway east and west of the Black River (including a bridge over the river), and it is assumed that all habitat will be lost within this full scope of works. Total available habitat to be lost is approximately 4.9 ha including 0.95ha of mapped Essential habitat for the black throated finch, <1.5% of the total available habitat within a 1km radius of the Project Area. Vegetation clearing activities will only be undertaken in accordance with a staged vegetation clearing plan, with hand clearing of vegetation in riparian areas to minimise vehicular disturbance of these areas. Prior to any vegetation removal, a site clearance survey will be undertaken to ensure that no black-throated finches are nesting in the works areas.
Black-throated finch	Clearing and fragmentation of nesting areas within proximity to water sources	The nearest permanent water source to the most optimal nesting areas is approximately 350m. Further west along the road reserve there are another 6 watering sources, however few of these are within 500m of suitable nesting areas and there are intervening land uses that include a cattery, wrecking yard and truck haulage business. Pre-clearance surveys will be undertaken in the potential nesting area to ensure nests, if present, have been vacated prior to vegetation clearing. If nests are present, the preferred clearing period is between July and September to avoid peak breeding season (Feb-June), allowing time for fledglings to leave the nesting areas. This will enable effective avoidance of physical disturbance of the species if nest trees are located. Vegetation clearing for the construction areas will be limited to the minimum necessary to comply with clear way requirements, to accommodate works in a manner that does not comprise safety or operational requirements, and provides for lay down areas, stockpiles/storage areas and other ancillary works areas.

MNES Matter	Potential Risk Factor	Proposed Mitigation Measures
		Vegetation to be retained will be clearly demarcated on a clearing plan to ensure vegetation removal is restricted to the minimum required to meet the above outcomes. An erosion and sediment control plan that identifies measures specific to minimising impacts on riparian vegetation will be implemented.
Black-throated finch	Alteration in grass species composition or seed availability	The implementation of both the TNAIU Interim Solution component and the TNAIU Full Scope component will result in the successive reduction and composition of grass species and seed availability as vegetation is further cleared to allow the full duplication of the highway to be undertaken. The existing suitable foraging areas occur as small mosaics within disturbed woodland patches with a total area of approximately 4.9ha. These small mosaics provide opportunistic foraging. The loss of these small areas will be partially offset by rehabilitation programs that have elements that will limit the reintroduction on non-native species following construction. Given the extensive representation of suitable foraging areas of native grasses in the wider Bohle Region, the change in composition of the small area of grass species present in the Project Area will not have a significant impact on habitat resources critical to the species.
Black-throated finch	Inappropriate grazing regimes	No grazing is undertaken with the existing road reserve in the Project Area, and this situation will not change with the implementation of the TNAIU Project. Therefore, this aspect is not considered to be potential risk to black-throated finch habitats.
Black-throated finch	Inappropriate fire regimes	The Project Area is subject to irregular fire, and in the locality of the potential black-throated finch habitat areas is primarily the result of the burning of illegally dumped rubbish. The implementation of both the TNAIU Interim Solution component and the TNAIU Full Scope component will result in the reduction and ultimately the cessation of a fire regime in the Project Area. The Project Area will be part of the management of national highway road reserves, incorporating vegetation and weed management practices that will severely restrict the opportunities for any inappropriate fire regime.
Black-throated finch	Introduction/spread of invasive species	The Project Area is heavily infested by a number of weed species that contribute to habitat degradation. For the TNAIU Interim Solution component a weed management plan that includes removal/control of declared weed species will be implemented within the road reserve. Weed washdown requirements will be incorporated into construction contract documentation and the requirements strictly adhered to in relation to preventing invasive species currently not present, e.g. giant rats-tail grass, from becoming established in the Project Area. The contractor will also be responsible for the spot control of declared weeds including bellyache bush, hymenachne, rubber vine and chinee apple as part of the contractor's site establishment works. The property access side road and Bowden Road batters can be seeded with native local perennial grasses, or similar performing substitutes to provide foraging opportunities for black-throated finches in these locations. For the TNAIU Full Scope Project it is expected that the highway road reserve will be completely cleared of all vegetation as a dual-lane 100km/hr highway will replace the existing double lane highway. The property access side road and Bowden Road will be retained. Standard TMR clear-way vegetation management requirements will apply, including seeding of the batters and spoon drains of the highway lanes. The property access road will retain grassed areas seeded with suitable foraging species established as part of the TNAIU Interim Solution works.
Black-throated finch	Maintenance/enhancement of existing habitat factors	Area of perennial/annual grasses that provide opportunistic foraging resources within the road reserve are present in small mosaics. Maintenance of these patches and enhancement where these are not within the works footprint is possible through a program of site specific hydromulching that includes the seeds of grass species both as foraging resources and as stabilisation of exposed soil areas.

MNES Matter	Potential Risk Factor	Proposed Mitigation Measures
		The variety of native grass species will depend on availability and some introduced species e.g. Urochloa mosambicensis and Echinochloa colona may also be suitable in some areas. More general broad scale seed application (non-hydromulch) over disturbed areas provides opportunity for a wider range of grass seed species, including preferred black-throated finch dietary grass species, to be applied on batters and in spoon drain, and areas where weeds (e.g. bellyache bush) have been removed. The effectiveness of this approach may be limited by soil and climatic factors, availability of suitable seed, and particularly ant predation of exposed broadcast seed. Ant predation is the most significant source of failure of grass rehabilitation programs were broad scale applications are trialled, and this needs to be considered where broad scale grass seeding is attempted. Preferably a hybrid of hydromulching and broadcast seeding can be achieved. Revegetation of the Black River bridge excavation and overall project earthworks areas will include multiple approaches. Where practical, hydromulching with grass species that contribute to the diet of the black-throated finch can be utilised in areas that may be subject to more regular maintenance: e.g. about culverts, drainage areas, batters. Along the river banks where non-native grasses would be expected to recolonise in the absence of maintenance, revegetation with flood tolerant species of shrubs, small trees, and ground layer stoloniferous grasses and herbaceous species with soil binding root properties will provide some protection to transiting birds and generally reduce the erosion risk. The use of shotcrete concrete pads (of a final size to be determined by survey, but not less than 5m by 5m) as scour and bank protection will provide a series of low habitat "stepping stones". The pads will have the advantage of restricting guinea grass growth, and the rough surface of the shotcrete will naturally accumulate silts and organic debris that will enable the establishment of small herbaceous species, annual grasses and other fine rooted vegetation to become established, but preclude coarse rooted perennial grasses such as guinea grass from recruiting.
Black-throated finch	Substantial increases in traffic and human activity.	Current traffic carriageways comprise the Bruce Highway and intersections from six major side road intersections, and multiple property accesses directly from the Bruce Highway. The TNAIU Project will consolidate multiple property accesses west of Black River on the northern side of the highway to the one side road, thereby reducing the overall impact of multiple driveways. The TNAIU Project overall will not result in a net increase in traffic, and thereby will not increase risks related to interactions between traffic and animals. Consolidation of multiple property accesses to the one dedicated side road access will reduce the overall impacts of local property traffic. There is a high recreational use of the road reserve in some locations for motorcycle riding, ATV trail rides and general BMX tracks. This recreational activity does degrade local habitat values through erosion and spread of weed species, and increases the risk of accidental fires in the Project Area. The TNAIU Project overall will reduce opportunities for recreational activity as the area becomes a construction site and public access is limited. Furthermore, the TNAIU Full Scope Project ultimately will include a dual lane/100 km hr highway that will take up most of the road reserve and preclude these activities.
Black-throated finch	Predation of black-throated finches by feral animals	Predation by feral animals, primarily cats, is a recognised threatening process for many native species that forage or breed near the ground. While the black-throated finch nests are usually well clear of the ground, they are known to nest in lower branches of trees where other opportunities may be limited. The Project Area has a high population of cats (both domestic and probably feral) that was evidenced through nocturnal surveys. The TNAIU Project will reduce the opportunities for cats in the road reserve as construction results in the removal of vegetation sheltering feral cats. The Project may not result in successfully reducing cat numbers by a significant margin as a number of the cats observed were domestic, and probably roaming from

MNES Matter	Potential Risk Factor	Proposed Mitigation Measures
		adjoining properties. These cats will probably continue to roam after the project has been constructed.
Black-throated finch	Net loss/degradation of water sources, either perennial or ephemeral in the Project Area	Construction works in the Project Area will require the removal of riparian vegetation to enable drainage and culvert works to be undertaken. This will reduce ready access to water sources along the Project Area, however will not reduce the total amount of water available downstream. The water sources in the Project Area are ephemeral, comprising drainage lines that in most cases have been already modified to accommodate runoff from road side spoon drains as well as the natural flow of the drainage lines. These systems only flow for periods following rainfall, and offer only temporary and transitional water sources. Permanent water sources are represented by numerous constructed dams in the wider area, none of which will be directly impacted by this project. Water sources for black-throated finches can be enhanced through a number of measures including providing for detention features that will maximise the retention of incidental rainfall, road side table drains (for the property access side road) that retains a flat bottom and outlet controls to retain water for a short period of time following rainfall events, outlet controlled stormwater drainage lines to provide temporary water detention. Rehabilitation of riparian areas post culvert construction will have a focus on using grass species that are suitable as foraging for black-throated finch, with suitable local shrubs to provide shelter and perches within these areas. Weed control will be necessary to ensure species such as para-grass and hymenachne do not establish and degrade water detention features and riparian areas post construction. As noted, the riparian area of Black River will be subject to a specific revegetation/rehabilitation plan that will target the enhancement of habitat resource features for the black-throated finch in the bridge duplication area e.g. inclusion of shot-crete concrete pads.
Bare-rumped sheathtail bat	Removal of roost trees	Pre-clearance surveys of all potential habitat roost trees will be undertaken by a quality spotter-catcher prior to any works being undertaken to determine whether there are roost trees occupied by the bare-rumped sheathtail bat. Should the pre-clearance surveys identify the presence of roosting trees, then a Species Management Program (SMP) will be prepared under the provisions of the Qld Nature Conservation Act 1992. This SMP will include marking roosting trees for spotter catchers, avoid clearing fringing trees around the construction zone where possible, and using spotter catchers to remove bats. The SMP must be submitted to, and approved by the Qld Department of Environment and Heritage Protection prior to the commencement of any works. At a minimum the SMP would be expected to include: • Site plan that identifies stockpiles, laydown areas and other ancillary works areas relative to the location of identified roost trees. • A clearing plan that identifies timing for clearing, preferably outside the wet season November to April, so that juvenile bats are not keeping adults in roosting trees. The clearing plan will also include provision for staged works such that vegetation furthest from roost trees with young is removed first, and limit clearing to daylight hours only. • Identification of provisions to encourage bats to leave roosting sites (provided no young are present), including periodic impact noise, 'bumping' the tree, and other methods as may be recommended by DoE or EHP as appropriate. • An immunised spotter catcher will be on site for the entirety of operational works that involve the disturbance and/or removal of the roost tree.
Bare-rumped sheathtail bat	Clearing of foraging habitat	Clearing of foraging habitat will be staged according to the requirements of the TNAIU Project components, and of the SMP (where applicable). Foraging habitat represents only a small proportion of the available habitat in the wider surrounding area, and

MNES Matter	Potential Risk Factor	Proposed Mitigation Measures
		the low occurrence (as recorded by SongMeters) indicates that the Project Area is not well frequented by foraging bare-rumped sheathtail bats with between 1 to 3 occurrences per night over the monitoring period. Clearing for the TNAIU Interim Solution will be based on a vegetation clearing plan that considers: • Requirements of the SMP, where applicable to roost trees (if present); • Locations of vegetation to be retained; • Locating stockpiles, laydown areas and other ancillary works areas in areas already cleared to retain the highest degree of remnant vegetation practical; • Limits clearing in riparian areas to only that as necessary to enable culverts works, erosion and sediment control measures and any other drainage features incorporated into design plans; • A weed removal/control plan that identifies weed issues and is implemented to spot control declared weeds within the vegetation areas to be retained; • A rehabilitation plan that identifies requirements for restoration/enhancement of riparian areas and retained remnant vegetation; and • Be included in the contractors Construction EMP. For the TNAIU Project full scope component, the dual lane duplication of the Bruce Highway will inevitably result in the loss of all residual remnant vegetation within the road reserve owing to operational requirements for clearways and the revised highway footprint. However, some provisions to mitigate the loss of potential foraging habitat can be included as with the TNAIU Interim Solution components. This includes: • Retaining riparian vegetation where practical, and provide for restoration and enhancement of these drainage lines; • Continue to implement a weed control program for riparian areas, targeting paragrass and hymenachne in particular; Limits clearing in riparian areas to only that as necessary to enable culverts works, detention basins and any other drainage features incorporated into design plans.
Bare-rumped sheathtail bat	Vegetation change, timber collection and targeted tree removal	The TNAIU Project will ultimately require the removal of most vegetation within the road reserve to allow the safe construction and operation of a 60 km/hr service road and 100 km/hr dual lane national highway. This vegetation is approximately 8.8ha, including approximately 4.9ha of woodland that provides some potential for roosting and foraging for this species. Vegetation removal will be staged, according to the stages of the Project, and any trees identified as suitable roost trees (i.e. those with hollows, see below) will be investigated and bats encouraged to leave. Excepting for the removal of small areas of remnant vegetation, the Project will not have any impact on either local or regional vegetation communities, as it does not involve timber collection, promote vegetation changes through broadscale clearing/changes in fire regimes and does not target tree species for commercial removal.
Bare-rumped sheathtail bat	Competition for hollows	Competition for hollows is recognised as a potentially threatening process for bare-rumped sheathtail bats, however very little remains known about the roosting habits of this species. Hollow trees are present within the Project Area that may provide suitable resources. It is unknown whether these are utilised. A survey of suitable roost hollows will be undertaken when clearing plans and general Project surveys have been completed. As far as practicable, clearing of roost trees will be avoided between December and April (to avoid disturbing breeding activities). For any potential roost trees within the clearing footprint a fauna-spotter will undertake surveys of this potential roost trees. Bats, if present, will be encouraged to leave these roosts through either direct handling or the trees been subject to 'bumping' and noise effects and allowing the bats to leave on their own accord. Bare-rumped sheathtail bats are known to be seek out new roosts following any disturbance.

MNES Matter	Potential Risk Factor	Proposed Mitigation Measures
Bare-rumped sheathtail bat	Disease	There are no known diseases affected bare-rumped sheathtail bats that could be introduced as a result of this Project.
Bare-rumped sheathtail bat	Climate Change	Climate change, as affected by the release of carbon arising from vegetation clearing and vehicle/machinery and other use, will not be a significant factor on bare-rumped sheathtail bat habitat for this project. Vegetation clearing will be restricted to only that as necessary for the immediate safe construction and operation of the Projects. Revegetation as part of the Environment Management Plan provisions to provide shelter and foraging attributes for other species (e.g. black-throated finch) post construction may assist in offsetting the Projects contribution to climate change. The Project will not result in an increase in traffic and subsequent carbon emissions, and emissions from construction equipment will be temporary and of a very minor and non-quantifiable nature in terms of influencing bare-rumped sheathtail bat habitat. Emissions of construction vehicles on site will conform with manufacturers specifications and faulty vehicles will be stood down from construction until repaired.

6 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

6.1 Do you THINK your proposed action is a controlled action?

X	No, complete section 5.2
	Yes, complete section 5.3

6.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

The area of vegetated habitat available that will be cleared is less than 8.8 ha and represents less than 19% of the total Project Area. The habitat area is highly fragmented, comprising a mosaic of primarily regrowth vegetation dominated by Melaleuca viridiflora with an understorey and shrub layer dominated by introduced species. Ongoing impacts within these habitats include new weed incursions (e.g. Jatropha gossypifolia), recreational impacts from trail bikes, fire, and proximity to rural residential areas and a high roaming cat population.

Whilst there are small mosaics of grasslands (comprising a mix of introduced and native species) that may provide opportunistic foraging for black-throated finches, these comprise only approximately 4.9ha or less than 1.5% of available habitat as represented by the Qld Regulated Vegetation Management Mapping within 1km of the Project Area. Most of these foraging resources are heavily impacted by competition with non-native species. There are potential nesting resources within the Project Area, mostly restricted to a small portion of the Project Area between the Bowden Road and Black River Road intersections on the northern side of the road reserve west of Black River. This is the only location within 500m of permanent water. Further along the alignment westwards permanent water is represented by farm dams within 500m of the Project Area however in these locations nesting factors are suboptimal. No nests were observed during observations. While black-throated finches have been observed as occurring in the Project Area, this is on the basis of a single record and given that the essential habitat factors are only partially fulfilled, it is unlikely that this species occupies the Project Area other than on a transient and opportunistic basis for ephemeral water resources and foraging. More suitable essential habitat factors are represented extensively in localities south of the Bruce Highway (and away from the works area) and to the north-west of Black River.

The proposed duplication of the Black River bridge has potential to significantly impact on the black-throated finch in the absence of any mitigation measures. TMR have acknowledged this risk, and have committed to mitigation measures that have been proven to successfully reduce this risk. The primary measure has been the duplication of a parallel bridge, separated by a distance as far as reasonably practical from the existing structures. The separation of the bridges enables greater sunlight penetration of the areas below the bridges which will facilitate vegetation growth. Allied with this design feature, the extent of concrete abutments and pier footings will be limited where possible to provide a continuous band of vegetation beneath the bridges, and this will be enhanced through a program of weed removal and rehabilitation that is specific to black-throated finch habitat factors, i.e. sheltering shrubs and grass species that feature in their diet and creation of 'stepping stones' of low habitat based on shot-crete concrete pads restricting non-native grass recolonisation and allowing small rooted species to become established on the rough surface of the pads as silt accumulates.

Bare-rumped sheathtail bats have been recorded in a low frequency of occurrence in patterns suggesting that foraging is opportunistic and the Project Area may not have habitats critical or important to their foraging behaviour. Similarly, the pattern of echolocation calls does not suggest the presence of a high number of bat calls that would be associated with the presence of a roost tree. If a roost tree was present, it was assumed that echolocation call analysis would have identified numerous echolocation calls from multiple individuals in the locality. This was not the case, with only 1-3 calls being recorded each night, and as two SongMeters were deployed in proximity (within 100m) of each other, it is likely that the records from these meters (which were at the same time) recorded the same individual. Notwithstanding, it has been recommended that surveys for roost trees be undertaken.

The removal of the woodland areas within the Project Area within which the bare-rumped sheathtail bats were identified is similar to that of the black-throated finch habitat, i.e. approximately 1.5% of available habitat as represented by the Qld Regulated Vegetation Management Mapping within 1km of the Project Area. Given the high representation of woodland habitat that occurs to the south and north of the Project (which will not be impacted by the project), the loss of marginal foraging habitat is not considered to be a significant impact on this species.

6.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

	Matters likely to be impacted
	World Heritage values (sections 12 and 15A)
	National Heritage places (sections 15B and 15C)
	Wetlands of international importance (sections 16 and 17B)
	Listed threatened species and communities (sections 18 and 18A)
	Listed migratory species (sections 20 and 20A)
	Protection of the environment from nuclear actions (sections 21 and 22A)
	Commonwealth marine environment (sections 23 and 24A)
	Great Barrier Reef Marine Park (sections 24B and 24C)
	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

7 Environmental record of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

		Yes	No
7.1	Does the party taking the action have a satisfactory record of responsible environmental management? Provide details TMR North Queensland Region's (Townsville office) has been responsible for implementation of some of the largest regional transport projects in Qld in a responsible environmental manner. This record is reflected in the referral process of its major projects. TMR, Townsville office, has been responsible for the delivery of major Bruce Highway upgrade projects such as Ring Road Section 4 (Referral Number 2012/6562), Corduroy Creek to Tully High School (Referral Number: 2006/2967), Cardwell Range (Referral Number: 2008/4665) and Townsville Port Access Road (Referral Number: 2003/1011). Compliance to the EPBC Act and conditions within the approval notices indicates a record of responsible environmental management. TMR as a whole has recognised a need for environmental compliance as part of its core business, having an established an Environmental Management System, compliant to ISO 14001:2004. The Environment and Heritage Services team in the TMR Townsville office has a process of standard recording and documenting environmental aspects for each project, and providing best management practice advice and specifications for each project delivered in line with the Department's Environmental Services Unit.	X	
7.2	Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources? TMR, Townsville office, has never been subject to any proceedings under Commonwealth, State or local law for the protection of the environment or the conservation and sustainable use of natural resources. If yes, provide details		X
7.3	If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework? If yes, provide details of environmental policy and planning framework TMR as a whole operates under the guiding principles of its Environmental Policy 2008 – 2013. TMR currently operates under an Environmental Management System (EMS) recently developed to meet best management practice in environmental performance. The EMS is structured in line with the principles of ISO 14001:2004, although TMR is not currently seeking certification at this time. This system centralises State based environment and cultural heritage management processes to achieve a level of consistency and transferability in documentation, processes and management procedures. http://www.tmr.qld.gov.au/business-industry/Technical-standards-publications/Main-Roads-environmental-management-policy.aspx	X	
7.4	Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?	X	

Provide name of proposal and EPBC reference number (if known)

- Ring Road Section 4 (Referral Number 2012/6562),
- Corduroy Creek to Tully High School (Referral Number: 2006/2967),
- Cardwell Range (Referral Number: 2008/4665),
- Townsville Port Access Road (Referral Number: 2003/1011).

8 Information sources and attachments

(For the information provided above)

8.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

Atlas of Living Australia: online database: http://www.ala.org.au/

Black-throated Finch Recovery Team (BTF RT) 2004. Recovery plan for the Black-throated Finch Southern Subspecies *Poephila cincta cincta*. Department of Environment and Conservation (New South Wales), Hurstville, and Queensland Parks and Wildlife Service, Brisbane.

Black-throated Finch Recovery Team (BTF RT), Department of Environment and Conservation (NSW) and Queensland Parkes and Wildlife Service 2007. National recovery plan for the black-throated finch southern subspecies *Poephila cincta cincta*. Report to the Department of the Environment and Water Resources, Canberra. Department of Environment and Climate Change (NSW), Hurtsville and Queensland Parks and Wildlife Service, Brisbane.

Buosi P. (2011) Habitat management guidelines for the Black-throated finch (*Poephila cincta cincta*) in the Brigalow Belt North Bioregion.

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8.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

The technical assessment and field information provided in this Referral were prepared by suitably qualified and experienced environmental scientists. Field surveys to obtain information for this Referral were undertaken in February 2016. Other information was obtained from on-line databases and external sources as detailed in Section 8.1.

External databases identified the occurrence of the black-throated finch as occurring within the Project Area (one record), but the species was not observed in the field. Echo-location call analysis (via SongMeter) confirmed the occurrence of the bare-rumped sheathtail bat within the Project Area. Surveys for potential roost trees are yet to be undertaken.

8.3 Attachments

Indicate the documents you have attached. All attachments must be less than three megabytes (3mb) so they can be published on the Department's website. Attachments larger than three megabytes (3mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Attachment A: Overview of Project Area Attachment B: Preliminary Design TNAIU Project
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	Attachment C: MNES Important Areas and Recorded Locations
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)		
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)		
	copies of any flora and fauna investigations and surveys (section 3)	✓	Attachment D: Analysis of echo-location, and Attachment E: Significance of Impact Assessment
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)	✓	Attachment E: Significance of Impact Assessment
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		

9 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Project title:

9.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act[2], this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[3].

1. Name and Title:	Marissa Wise District Director (Northern District)
2. Organisation (if applicable):	Department of Transport and Main Roads
3. EPBC Referral Number (if known):	
4: ACN / ABN (if applicable):	ABN 39 407 690 291
5. Postal address	PO Box 1089, Townsville, Qld, 4810
6. Telephone:	(07) 4421 8848
7. Email:	
8. Name of proposed proponent (if not the same person at item 1 above and if applicable):	
9. ACN/ABN of proposed proponent (if not the same person named at item 1 above):	

[1] If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Gateway (1800 803 772) to obtain an alternative contacts, signatures and declarations page.

[2] If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A, EPBC Act*). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.*

COMPLETE THIS SECTION ONLY IF YOU QUALIFY FOR EXEMPTION FROM THE FEE(S) THAT WOULD OTHERWISE BE PAYABLE

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

□ an individual; OR

□ a small business entity (within the meaning given by section 328-110 (other than subsection 328-119(4)) of the *Income Tax Assessment Act 1997*); OR

□ not applicable.

If you are small business entity you must provide the Date/Income Year that you became a small business entity:

Note: You must advise the Department within 10 business days if you cease to be a small business entity. Failure to notify the Secretary of this is an offence punishable on conviction by a fine (regulation 5.23B(3) *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth)).

COMPLETE THIS SECTION ONLY IF YOU WOULD LIKE TO APPLY FOR A WAIVER

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

□ not applicable.

Declaration

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

Signature  Date 13.4.16

9.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name	Andrew Small
Title	Principal Scientist
Organisation	GHD Pty Ltd
ACN / ABN (if applicable)	ABN 39 008 488 373
Postal address	PO Box 819 Cairns, Qld, 4870
Telephone	61 7 4044 2206
Email	andrew.small@ghd.com

Declaration

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

Signature  Date 13/04/16

Attachment A