**RECOMMENDATION REPORT**

**South of Embley Bauxite Mine and Port Development Project, Cape York, QLD**

**(EPBC 2010/5642)**

## 1. Recommendation

1.1. That the proposed action, to construct and operate a bauxite mine and port development, including associated shipping activities, near Weipa on the western side of Cape York, Queensland (EPBC 2010/5642) be approved under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) subject to the following conditions.

| **Conditions** |
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| **1.** Unless agreed to by the **department** in writing, the approval holder must submit a Temporary Barge Plan to the **Minister** to manage, avoid and mitigate negative **impacts** to **listed turtle species**, including their breeding and foraging habitat, from the **construction** and **operation** of the temporary barge facility near Pera Head. |
| **2.** The Temporary Barge Plan must include surveying to ascertain whether active, or potentially active, nests for the **listed turtle species** are present in the area to be **impacted** by the temporary barge facility. |
| **3.** The Temporary Barge Plan must include surveying to ascertain whether active, or potentially active, nests for the **listed turtle species** are present in the area to be **impacted** by the temporary barge facility. |
| **4.** The Temporary Barge Plan must be submitted to the **Minister** for approval**.** Commencement of the temporary barge facility must not occur until the **Minister** has approved the Temporary Barge Plan. The approved Temporary Barge Plan must be implemented**.** |
| **5.** The person taking the action must submit a Marine and Shipping Management Plan, covering all facets of the **construction** and **operation** of all marine related precincts for the South of Embley project (including, but not limited to, the Port development, shipping activities, barge and ferry terminals, recreational use of beaches and the marine environment, anchoring, and underwater noise) for the **Minister's** approval to effectively define, avoid, manage and mitigate against **impacts** to the following **matters of national environmental significance:**<br>**a.** Great Barrier Reef World Heritage Property;<br>**b.** Great Barrier Reef National Heritage Place;<br>**c.** Great Barrier Reef Marine Park;<br>**d. Listed turtle species;**<br>**e. Listed dolphin species;** and,<br>**f.** Dugong (*Dugong dugon)* and Bryde's Whale (*Balaenoptera edeni).* |
| **6.** The Marine and Shipping Management Plan must incorporate avoidance and mitigation mechanisms for the Great Barrier Reef World Heritage Property; Great Barrier Reef National Heritage Place: Great Barrier Reef Marine Park; **Listed turtle species; Listed dolphin species;** and, Dugong *(Dugong dugon)* and Bryde's Whale *(Balaenoptera edeni).* |

**a.** **impacts** to the marine environment that supports the above listed species traversing, foraging and/or breeding habitat including, seagrass, reefs and corals, **listed turtle species** nesting and/or foraging habitat;

**b.** **impacts** from changes to coastal processes, including beach and/or shore erosion from the port development, barge facilities and/or ferry facilities and ensure the action does not alter the beach gradients to such an extent that **listed turtle species** are prevented from and/or impeded in accessing the beach foreshore to nest or **listed turtle species** hatchlings are prevented and/or impeded from entering the marine environment;

**c.** artificial light related **impacts** on **listed turtle species** (including hatchlings) nesting beaches and adjacent marine environment including, but not limited, lighting from Port construction and operation, shipping, ferry and barge terminals, and anchored/moored vessels;

**d.** measures to ensure shipping activities are undertaken in accordance with the *Great Barrier Reef Marine Park Zoning Plan (2003)*, or its current version;

**e.** mechanisms to implement best practice measures for ship loading and unloading as well as all other aspects of shipping activities to minimise **impacts** on the marine environment (with bauxite and/or other contamination spills);

**f.** **impacts** from vessel strike to **listed turtle species, listed dolphin species** or Dugongs including, but not limited to, restricting vessel speed limits to 6 knots in water depths of equal to, or less than, 2.5 metres; and, implementation of a transit lane in the Hey River and Embley River that follows the greatest water depths;

**g.** **impacts** from underwater noise including, but not limited to, pile driving activities at Condition 11 and shipping;

**h.** measures that minimise the risk of introduced marine pest species over the life of the project, including ballast water management;

**i.** **impacts** associated with recreational use by project employees of **listed turtle species** nesting habitat (including, but not limited to, implementation of a permit access system for the employees);

**j.** **impacts** from the decommissioning of the temporary barge facility at Pera Head. If agreed by the **department** in writing, requirements of condition 1 to condition 4 may be incorporated into the Marine and Shipping Management Plan;

**k.** **impacts** identified in the Environmental Management Plan Outlines at Appendix 7-E (Threatened estuarine and Marine species); Appendix 9-A (Non-avian Migratory Species); Appendix 11-A (Great Barrier Reef Marine Park, World Heritage Area and National Heritage Place); and, Appendix 10- A (Commonwealth Marine Area) in the **Final Environmental Impact Statement;** and,

**l.** mechanisms to notify the **department** in writing within five (5) business days of any confirmed or suspected sighting/s and/or observation/s in the marine environment in and/or around the project area of the Dwarf Sawfish *(Pristis clavata*); Green Sawfish *(Pristis zijsron);* Freshwater Sawfish *(Pristis microdon);* or the Speartooth Shark *(Glyphis sp. A*).

**7.** The Marine and Shipping Management Plan must also include adaptive management strategies to benefit the Great Barrier Reef World Heritage Property; Great Barrier Reef National Heritage Place; Great Barrier Reef Marine Park; **listed turtle species, listed**

**dolphin species,** Dugong and Bryde's Whale. The Marine and Shipping Management Plan must include and address effective management strategies to mitigate each potential **impact**, desired outcomes, benchmarks, readily measureable performance indicators and goals, timeframes for reporting and implementation, corrective actions and contingency measures, and specify the persons/ roles with responsibility for implementing actions. The Marine and Shipping Management Plan must provide information detailing Traditional Owner employment in its implementation of this Plan (consistent with condition 37).

**8.** The Marine and Shipping Management Plan must include shipping related management and mitigation measures that have been developed in consultation with relevant Commonwealth agencies, including the Australian Maritime Safety Authority and the Great Barrier Reef Marine Park Authority, and state agencies, including Maritime Safety Queensland.

**9.** The Marine and Shipping Management Plan must be submitted to the **Minister** for approval. **Commencement of the action**, other than **Preliminary Works**, must not occur until the **Minister** has approved the Marine and Shipping Management Plan. The approved Marine and Shipping Management Plan must be implemented.

**10.** Within 60 days of the first anniversary of the **commencement of the action,** a reviewed Marine and Shipping Management Plan must be submitted to the **Minister** for approval. The Marine and Shipping Management Plan must be reviewed and submitted to the **Minister** for approval, annually for the first five (5) years, and every four (4) years thereafter. The approved Marine and Shipping Management Plans must be implemented.

**11.** The approval holder must ensure that the following measures related to any pile driving operations are implemented to minimise the **impacts** of underwater noise and disturbance on the following listed threatened species and/or listed migratory species:

**i.** **Listed turtle species;**

**ii.** **Listed dolphin species**; and

**iii.** Dugong *(Dugong dugon)* and Bryde's Whale *(Balaenoptera edeni).*

**a.** pile driving operations must not commence if the above listed species are observed within the **exclusion zone/s;**

**b.** observations for the above listed species must be undertaken by a suitably qualified person/s approved by the **Minister** in writing, for at least 30 minutes before the commencement of pile driving operations, and during pile driving operations;

**c.** the **exclusion zone** must be no less than 100 metres from the pile driving operations and be implemented so as to ensure that the above listed species are not exposed to sound exposure levels of greater than or equal to 183 dB re 1µ Pa2.s;

**d.** pile driving operations must implement **soft start procedures.** The **soft start procedures** must only commence if the species listed above have not been sighted in the **exclusion zone** during the pre-start-up visual observations;

**e.** pile driving operations must cease if the species listed above are observed within the **exclusion zone,** and action to cease all pile driving operations within the exclusion zone must be taken within two minutes of the observation, or as soon as possible, if it is unsafe to cease pile driving operations within two minutes. Every 30 days during periods when pile driving operations are occurring, the approval holder must report the number of incidents where pile driving operations did not cease within two minutes;

**f.** pile driving operations must not recommence until the species listed above observed within the **exclusion zone** are observed to leave the **exclusion zone** or are not observed for at least 30 minutes; and,

**g.** only pile driving operations which have commenced prior to sunset or prior to a **period of low visibility** can continue between the hours of sunset and sunrise, unless pile driving operations are suspended for more than 15 minutes.

**12.** The approval holder must undertake capital dredging activities for the South of Embley project in accordance with the Port Dredge Management Plan (Appendix 7-C) and the River Dredge Management Plan (Appendix 7-D) in the **Final Environmental Impact Statement** to avoid and mitigate **impacts** to:

**i.** Commonwealth Marine Area;

**ii.** **Listed turtle species**;

**iii.** **Listed dolphin species;** and,

**iv.** Dugong (*Dugong dugon*) and Bryde's Whale (*Balaenoptera edeni)*.

***13.*** The approval holder must prepare a Maintenance Dredging Management Plan/s for all maintenance dredging activities associated with the South of Embley Project. The Maintenance Dredging Management Plan/s must be prepared in accordance with the *Australian Government National Assessment Guidelines for Dredging (2009)* and the **department**'s *Long Term Monitoring and Management Plan Requirements for 10 year Permits to Dump Maintenance Dredge Material at Sea (July 2012),* or their most current versions.

**14.** The approval holder must comply with the requirements of any permit/s obtained under the *Environment Protection (Sea Dumping) Act 1981*, including any conditions attached to the permit/s.

**15.** The approval holder must not **clear vegetation** or remove more than 29,658 hectares of vegetation over the life of the project. The maximum **clearing of vegetation** that can occur in any 12 month period is 4,000 hectares.

**16.** To mitigate impacts on Red Goshawk (*Erythrotriorchis radiates*) and Masked Owl (*Tyto novaehollandiae kimberli)*, **listed flora species** and **listed migratory species** the approval holder must provide vegetation buffer zones (in addition, to buffer zones required under state regulations) for the Environmental Features (as defined in the Queensland Department of Natural Resources and Mines *Regional Vegetation Management Code for Western Bioregions* (version 2.1, 30 November 2012)) described in following table.

| **Environmental feature** | **vegetation buffer zones** |
|---|---|
| Stream order one or two | Minimum 100m to 200m** from edge of riparian vegetation |
| Stream order three or four | Minimum 100m to 200m** from edge of riparian vegetation |
| Stream order five and above | Minimum 200m from edge of riparian vegetation |
| Natural wetland | Minimum 200m from edge of wetland vegetation |
| Natural significant wetland | Minimum 200m from edge of wetland vegetation |

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| Tidal areas and marine plants*** | Minimum 200m from boundary of feature |
| Vine forest, coastal vegetation on sand, estuaries | Minimum 200m from edge of relevant vegetation type |

*** Set based on site specific factors following field survey.*
**** Category B Environmentally Sensitive area as defined by the Environmental Protection Regulation 2008 (Qld).*

**17.** Prior to any **clearing of vegetation** (including for **Preliminary Works**)**,** surveying must be undertaken to ascertain whether active, or potentially active, nests for the Red Goshawk (*Erythrotriorchis radiates*) and/or Masked Owl (*Tyto novaehollandiae kimberli)* are present in the area to be cleared. Surveying must be undertaken for the:

**a.** Red Goshawk – in areas located within one (1) kilometre of permanent water supporting riparian gallery forest or Paperback wetland; seasonally inundated coastal wetlands and seasonal water courses supporting riparian gallery forest, or an estuary; and,

**b.** Masked Owl – in areas within 200 metres of permanent water supporting riparian gallery forest of paperbark wetland, seasonally inundated Paperbark wetlands, seasonal watercourses supporting riparian gallery forest or an estuary.

**18.** The Pre-disturbance Program must include avoidance, mitigation or management measures if active, or potentially active, nests for the Red Goshawk or Masked Owl are found during surveying, including a 200 metre buffer zone around nest trees. The nest tree and buffer zone cannot be cleared or disturbed until the end of the breeding season (being until fledglings no longer use the nest for habitat).

**19.** Information obtained during the Pre-disturbance Program must be used to inform the Terrestrial Management Plan at condition 20.

**20.** The approval holder must submit a Terrestrial Management Plan covering all of the land based activities associated with the **construction** and **operation** of the project for the **Minister's** approval to effectively define, avoid, adaptively manage and mitigate negative impacts to the following **matters of national environmental significance**:

**i.** Red Goshawk*(Erythrotriorchis radiates*); Masked Owl (*Tyto novaehollandiae kimberli)*; and Bare-rumped Sheathtail Bat *(Saccolaimus saccolaimus nudicluniatus)*

**ii.** **listed migratory bird species**; and,

**iii.** **Listed flora species.**

**21.** The Terrestrial Management Plan must incorporate avoidance and mitigation measures on each **impact** associated with the project including, but not limited to:

**a.** measures for water related **impacts** including, but not limited to, erosion, construction and operation of the Dam; stormwater runoff, flood events, hydrocarbon spills, sewage, crude or process water, runoff from ore stockpiles, and downstream **impacts** on watercourses, streams and marine environment (including estuaries);

**b.** measures for pests and weed management, dust management, and fire management;

**c.** implementing the vegetation buffers zones at condition 16; and,

**d.** measures identified in the Environmental Management Plan Outlines at Appendix 5-A (Threatened Flora Species); Appendix 6-C (Threatened fauna species); Appendix 8-A (Avian Migratory Species); and, Appendix 16-B (Water Monitoring and

Management Conditions) in the **Final Environment Impact Statement.**

**22.** The Terrestrial Management Plan must also include adaptive management strategies to benefit the species listed at condition 20. The Terrestrial Management Plan must include and address effective management strategies to mitigate each potential **impact**, desired outcomes, benchmarks, readily measureable performance indicators and goals, timeframes for reporting and implementation, corrective actions and contingency measures, and, specify the persons/ roles with responsibility for implementing actions. The Terrestrial Management Plan must provide information detailing Traditional Owner employment in its implementation of this Plan (consistent with condition 37).

**23.** The Terrestrial Management Plan must be informed by the most current information available to avoid, manage or mitigate **impact** associated with the project (including, but not limited to *National Water Quality Management Strategy, Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZECC 2000) or most current version/s of these guidelines.

**24.** The Terrestrial Management Plan must be submitted to the **Minister** for approval within 18 months after the date of this approval. The approved Terrestrial Management Plan must be implemented**.**

**25.** Within 60 days of the first anniversary of the approval Terrestrial Management Plan at condition 20 a reviewed Terrestrial Management Plan must be submitted to the **Minister,** annually for the first 5 years, than every four (4) years thereafter. The approved Terrestrial Management Plans, as revised, must be implemented.

**26.** For the Bare-rumped Sheathtail Bat *(Saccolaimus saccolaimus nudicluniatus)* the approval holder must:

- **a.** Undertake a targeted Bare-rumped Sheathtail Bat survey in the project area, using broad spectrum acoustic monitoring prior to the **commencement of the action**;
- **b.** support a research program being conducted by the Australian Bat Society which will aim to acquire a quality reference call library for microbats of the Cape York region;
- **c.** utilise the reference calls acquired by the research program to analyse the targeted survey results for the Bare-rumped Sheathtail Bat (at minimum for those reference calls collected as part of the **Final Environmental Impact Survey**) and further define habitat preferences for the species; and,
- **d.** If the Bare-rumped Sheathtail Bat is identified, adaptive management measures to avoid and mitigate measures **impacts** from the project must be implemented in the Terrestrial Management Plan at condition 20 within six (6) months of the identification of the species.

***27.*** The approval holder must notify the **department** in writing within five (5) business days of any confirmed or suspected observation/s (including for condition 26) in the project area of Bare-rumped Sheathtail Bat.

**28.** The approval holder must submit an adaptive Rehabilitation Strategy, covering the **construction** and **operation** of the project to ensure the vegetation areas cleared for the project are returned to a land use equivalent to pre-disturbance habitat features for:

- **i.** Red Goshawk*(Erythrotriorchis radiates*);
- **ii.** Masked Owl (*Tyto novaehollandiae kimberli*)
- **iii.** **listed migratory bird species**; and
- **iv.** if identified at condition 26c or condition 27, the Bare-rumped Sheathtail Bat

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| *(Saccolaimus saccolaimus nudicluniatus).* |
| **29.** The land area to be progressively rehabilitated must be no less than 28,880 hectares. Unless otherwise specified in the approved Rehabilitation Strategy at condition 28, rehabilitation works must commence within two (2) years of vegetation clearing associated with the project. |
| **30.** The Rehabilitation Strategy must include adaptive management strategies to benefit the species listed at condition 28. The Rehabilitation Strategy must include and address effective management strategies to identify desired outcomes, benchmarks, readily measurable performance indicators and goals, timeframes for reporting and implementation, corrective actions and contingency measures, and, specify the persons/ roles with responsibility for implementing actions. The Rehabilitation Strategy must provide information detailing Traditional Owner employment in its implementation of this Strategy (consistent with condition 37). |
| **31.** The Rehabilitation Strategy must be submitted to the **Minister** for approval within 3 years of the **commencement of the action.** The approved Rehabilitation Strategy must be implemented. |
| **32.** Unless otherwise agreed to by the **department** in writing, every five (5) years from the first anniversary of the approval Rehabilitation Strategy at condition 28 a reviewed Rehabilitation Strategy must be submitted to the **Minister**. The approved Rehabilitation Strategy must be implemented. |
| **33.** If the rehabilitation objectives identified for species identified at condition 28 do not meet any of the success criteria for any of these species as described in the approved Rehabilitation Strategy at condition 28 after 10 years of vegetation clearance occurring, or as agreed in the approved Rehabilitation Management Plan (whichever is sooner), the approval holder must notify the **Minister** in writing within 20 business days of the area (hectares) over which the rehabilitation objectives and success criteria were not met. |
| **34.** Within two (2) months of notifying the **Minister** at Condition 33, the approval holder must provide an Offset Strategy outlining the offset to be provided for the **matters of national environmental significance** identified at condition 28). The related offset must be accordance with the *Environmental Protection and Biodiversity Conservation Act 1999 Environmental Offset Policy (October 2012*), or its most current version. |
| **35.** The Offset Strategy must be submitted to the **Minister** for approval within 6 months of notifying the **Minister** at condition 33]. The approved Offset Strategy must be implemented**.** |
| **36.** The approval holder must consult with Indigenous people or groups with rights, claims or interests in the area during preparation of management plans and strategies specified in this approval. |
| **37.** With the consent of Indigenous people or groups with rights, claims or interests in the area the approval holder must identify employment opportunities (e.g. an Indigenous Ranger Program or seed collection associated with rehabilitation activities) for Indigenous persons to facilitate the implementation the conditions specified in this approval. |
| ***38.*** The approval holder must implement a Feral Pig Management Offset Strategy to reduce the annual level of feral predation on **listed turtle species** nests for the period of this approval. |
| **39.** The Feral Pig Management Offset Strategy must be implemented at a minimum, in the project area**.** |
| **40.** The Feral Pig Management Offset Strategy must include surveying to develop significantly robust baseline data for **listed turtle species** nesting in the project area and desired |

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| outcomes, benchmarks, readily measureable performance indicators and goals, timeframes for reporting and implementation, corrective actions and contingency measures, and, specify the persons/ roles with responsibility for implementing actions. The Feral Pig Management Offset Strategy must provide information detailing Traditional Owner employment in its implementation of this Strategy (consistent with condition 37). |
| **41.** The Feral Pig Management Offset Strategy must adhere to the **department's** *Threat Abatement Plan For Predation, Habitat Degradation, Competition And Disease Transmission By Feral Pigs*, and the *Humane Pest Animal Control: Code Of Practice And Standard Operating Procedures*(currently being updated), or their most current versions. |
| **42.** The findings from the Feral Pig Management Offset Strategy must be used to inform the Marine and Shipping Management Plan at condition 5 on an ongoing basis. |
| **43.** The Feral Pig Management Offset Strategy must be submitted, within 12 months of the date of this approval, to the **Minister** for approval**.** The approved Feral Pig Management Offset Strategy must be implemented. |
| **44.** The approval holder must implement an Inshore Dolphin Offset Strategy to inform knowledge about the distribution and abundance of local and regional populations of **listed dolphin species** in the Western Cape York area, and identification of habitat utilised by **listed dolphin species.** |
| **45.** The Inshore Dolphin Offset Strategy must be implemented at a minimum, in the marine environment between latitude $12.60^0$S and latitude $13.35^0$S and must include provisions for action to be undertaken prior to, during and after construction of the Port and river facilities. |
| **46.** The Inshore Dolphin Offset Strategy must include significantly robust data for **listed dolphin species**, desired outcomes, benchmarks, readily measureable performance indicators and goals, timeframes for reporting and implementation, corrective actions and contingency measures, and, specify the persons/ roles with responsibility for implementing actions. The Feral Pig Management Offset Strategy must provide information detailing Traditional Owner employment in its implementation in this Strategy (consistent with condition 37). |
| **47.** The Inshore Dolphin Offset Strategy must be developed in consultation with the **department**. |
| **48.** The findings from the Inshore Dolphin Offset Strategy must be used to inform the Marine and Shipping Management Plan at condition 5 on an ongoing basis. |
| **49.** The Inshore Dolphin Offset Strategy must be submitted, within 12 months of the date of this approval, to the **Minister** for approval**.** The approved Inshore Dolphin Offset Strategy must be implemented. |
| **50.** All **survey data** collected for the project must be recorded so as to conform to data standards notified from time to time by the **department**. When requested by the **department**, the approval holder must provide to the **department** all species and ecological survey data and related survey information from ecological surveys undertaken for **matters of national environmental significance.** This survey data must be provided within 30 business days of request, or in a timeframe agreed to by the **department** in writing. The **department** may use the survey data for other purposes. |
| **51.** Every 12 months after the **commencement of the action**, unless otherwise agreed to in writing by the **Minister**, the approval holder must **publish** on their website, for the duration of the project including decommissioning, all the survey methodology and **survey data** collected and recorded for the program/s, plan/s, strategies or other conditions specified in |

this approval including for each individual **matter of national environmental significance**. The **department** must be notified within ten (10) business days of publication.

**52.** Within five (5) business days from this approval, the approval holder must publish the **Final Environmental Impact Statement** on their website for the duration of the project, including decommissioning.

**53.** Unless otherwise agreed to in writing by the **Minister**, the approval holder must publish, for the duration of the project including decommissioning, all programs/s, plan/s, review/s or strategies referred to in these conditions of approval on their website. Each/all program/s, plan/s or strategies (including revised versions) must be published on the approval holder's website within 1 month of being approved.

**54.** Unless otherwise agreed in writing by the **department,** each/all program/s, plan/s, or strategies specified in the conditions must be **independently peer reviewed** prior to submission to the **Minister** for approval. The approval holder must nominate an **Independent Peer Reviewer** to the **Minister**. The person/organisation/technical committee conducting the **independent peer review** must be approved by the **Minister**, prior to the commencement of the review. The **independent peer review** criteria must be agreed to by the **Minister** and any reviews undertaken must address the criteria to the satisfaction of the **Minister**.

**55.** The reviews undertaken for condition 54 must include an analysis of the effectiveness of the avoidance and mitigation measures in meeting the objectives, targets or management measures identified in the program/s, plan/s or strategies being reviewed.

**56.** Unless otherwise specified in these conditions or notified in writing by the **Minister**, the approval holder must provide to the **Minister**, a copy of all advice and recommendations made by the **Independent Peer Reviewer** for program/s, plan/s, or strategies, and an explanation of how the advice and recommendations will be implemented, or an explanation of why the approval holder does not propose to implement certain recommendations.

**57.** If the **Minister** is not satisfied that the final revised version of the plan/s, program/s or strategies specified in this approval adequately addresses the condition/s specified in the approval, the approval holder will be notified in writing by the **Minister** that they must update a plan/s, program/s or strategies to meet the condition/s that have not been adequately addressed.

**58.** For any plan, strategy or other condition specified in this approval that is to be approved by the **Minister**, the approval holder must ensure the **Minister** is provided at least 80 business days for review and consideration of the programs/s, plan/s, strategies or other condition specified in this approval, unless otherwise agreed in writing by the **Minister**. This does not apply to urgent changes required to protect the environment or repair or mitigate any damage that may or will be, or has been, caused by the action to any matter protected by Part 3 of the EPBC Act for which the approval has effect.

**59.** To avoid duplication, the approval holder may provide the **Minister** with any plan/s, program/s or strategies prepared for the State provided the plan/s, program/s or strategies meets the conditions specified in this approval. The plan/s, program/s or strategies must include a cross reference table that clearly identifies:

**a.** the condition specified in this approval for which the plan/s, strategy or program/s is being provided; and

**b.** the relevant folder, chapter, section number and page number in the plan/s,

program/s or strategies where the condition has been addressed.

**60.** Within ten (10) days after the commencement of **preliminary works** and **commencement of the action**, the approval holder must advise the **Minister** in writing of the actual date of commencement.

**61.** The approval holder must maintain accurate records substantiating all activities associated with or relevant to the conditions of approval, including measures taken to implement the plan/s or strategies as specified in these conditions and make them available upon request to the **department**. Such records may be subject to audit by the **department** or an independent auditor in accordance with section 458 of the EPBC Act, or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the **department**'s website. The results of audits may also be published through the general media.

**62.** Within three months of every 12 month anniversary of **commencement of the action**, the approval holder must **publish** a report on their website, for the duration of the project including decommissioning, addressing compliance with the conditions of this approval over the previous 12 months, including implementation of any management plan/s or strategies as specified in the conditions. Non-compliance with any of the conditions of this approval must be reported to the **department** at the same time as the compliance report is **published**. Within five (5) days after publication, the person taking the action must provide the **Minister** with a copy of the report/s.

**63.** Every three years from the date of this approval, the approval holder must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the **Minister**. The independent auditor must be approved by the **Minister** prior to the commencement of the audit. Audit criteria must be agreed to by the **Minister** and the audit report must address the criteria to the satisfaction of the **Minister**.

**64.** For the purposes of reporting at Condition 63, where material required under condition 36 and Condition 37 is culturally sensitive and cannot be disclosed at the explicit and written consent of the relevant Indigenous people with rights, claims or interests in the area, the approval holder must advise the **department** of the extent to which it cannot comply with condition 36 and Condition 37 or that reason.

**65.** Where the conditions require the approval holder to submit a program/s, plan/s or strategies for the **Minister's** approval, the approval holder must maintain a register recording:

- **a.** the date on which each plan was approved by the **Minister**;
- **b.** if a plan has not been approved, the date on which it was, or is expected to be, submitted to the **Minister**;
- **c.** the dates on which reports on the outcomes of reviews have been approved by the **Minister**; and,
- **d.** the **dates** on which the subsequent reviews are due.

The register must be submitted to the **department,** at the time the annual compliance report is **published**, but does not form part of the report.

**66.** If the approval holder wishes to carry out any activity otherwise than in accordance with a programs/s, plan/s or strategies as specified in the conditions**,** the approval holder must submit to the **department** for the **Minister's** written approval a revised version of that

programs/s, plan/s or strategies. The varied activity must not commence until the **Minister** has approved the varied programs/s, plan/s or strategies writing. The **Minister** will not approve a varied programs/s, plan/s or strategies unless the revised programs/s, plan/s or strategies would result in an equivalent or improved environmental outcome over time. If the **Minister** approves the revised programs/s, plan/s or strategies must be implemented in place of the plan/s or strategies originally approved.

**67.** If, at any time after the first 3 year anniversary of the date of this approval, the approval holder has not **commenced the action**, then the approval holder must not **commence the action** without the written agreement of the **Minister**.

**68.** The financial cost of adhering to the conditions specified in this approval will be borne by the approval holder.

**69.** If the **Minister** believes that it is necessary or convenient for the better protection of World Heritage properties (sections 12 & 15A), National Heritage Place (section 15B &15C), Listed threatened species and communities (sections 18 & 18A), Listed Migratory Species (section 20 & 20A), Commonwealth Marine Area (sections 23 & 24a) and Great Barrier Reef Marine Park (sections 24B and 24C) to do so, the **Minister** may request that the approval holder make specified revisions to the programs/s, plan/s or strategies specified in the conditions and submit the revised programs/s, plan/s or strategies for the **Minister**'s written approval. The approval holder must comply with any such request. The revised approved programs/s, plan/s or strategies must be implemented. Unless the **Minister** has approved the programs/s, plan/s or strategies then the approval holder must continue to implement the programs/s, plan/s or strategies originally approved, as specified in the conditions.

**70.** The approval holder must undertake the action in accordance with, and ensure all users of the South of Embley Bauxite Mine and Port Development project comply with, the approved plan/s, program/s or strategies to avoid, mitigate, manage and offset **impacts** to outstanding universal value of the World Heritage properties (sections 12 & 15A), National Heritage Place (section 15B &15C), Listed threatened species and communities (sections 18 & 18A), Listed Migratory Species (section 20 & 20A), Commonwealth Marine Area (sections 23 & 24a) and Great Barrier Reef Marine Park (sections 24B and 24C).

**Definitions**

a) **Capital Dredging** – as defined in the *Australian Government National Assessment Guidelines for Dredging (2009)* being 'dredging for navigation, to enlarge or deepen existing channel and port areas or to create new ones. Dredging for engineering purposes, to create trenches for pipes, cables, immersed tube tunnels, to remove material unsuitable for foundations and to remove overburden for aggregate extraction, etc'.

b) **Commencement of the action / commenced the action** – any works that are required to be undertaken for construction, except preliminary works.

c) **Clearing of vegetation/ clearing of vegetation** – the clearing or inundation by water of vegetation, pest and weed control, or construction of any infrastructure.

d) **Construction** – any works that are required to be undertaken for the project including the beneficiation plant (including tailings storage facility); port facility, and Hey and Embley River facilitates; dam construction; **clearing of vegetation**; and infrastructure facilities (including power station, roads, and fuels storage). Excludes **preliminary works**.

e) **Department** – the Australian Government department administering the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

*f)* **Exclusion zone** – a radius around pile driving operations of no less than 100 metres which must be visually observed at all times during pile driving operations.

*g)* **Final Environmental Impact Statement** – comprises the South of Embley Project Final Environmental Impact Statement (March 2013).

h) **Impacts/impacted** – as defined in section 527E of the EPBC Act.

i) **Independent/ly Peer reviewed/ Independent Peer Reviewer** – assessment of the assumptions, calculations, extrapolations, alternate interpretations, methodologies, performance goals and performance criteria, and conclusions pertaining to the management plans/strategies/programs by a person/organisation/technical committee, independent of the approval holder and/or employed in any subsidiary company of the approval holder. This person/organisation/technical committee must have demonstrated expertise in the **matter of national environmental significance** being reviewed and be approved by the **Minister** prior to commencement of the review.

j) **Listed dolphin species** – listed migratory species under the EPBC Act, specifically Australian Snubfin Dolphin (*Orcaella heinsohni)*; Indo-Pacific Humpback Dolphin (*Sousa chinensis).*

*k)* **Listed flora species** – listed vulnerable threatened species under the EPBC Act, specifically Cooktown Orchid *(Dendrobium bigibbum*); Chocolate Tea Tree Orchid (*Dendrobium johannis (Cepobaculum johannis*)); and Beach nightshade (*Solanum dunalianum).*

l) **Listed migratory birds species** – listed migratory species under the EPBC Act, specifically as identified in Annexure A.

m) **Listed turtle species** – listed threatened species and/or Listed migratory species under the EPBC Act, specifically Green Turtle (*Chelonia mydas),* Hawksbill Turtle (*Eretmochelys imbricate);* Flatback Turtle *(Natator depressus);* Loggerhead Turtle *(Caretta caretta);* Olive Ridley Turtle *(Lepidochelys olivacea);* Leatherback Turtle (*Dermochelys coriacea)*; and

n) **Maintenance Dredging** – as defined in the *Australian Government National Assessment Guidelines for Dredging (2009)* being 'dredging to ensure that channels, berths or other port areas are maintained at their designed dimensions'.

o) **Matter of national environmental significance** – those matters protected under the EPBC Act: World Heritage properties, National Heritage places, wetlands of international importance (Ramsar wetlands), listed threatened species and communities, listed migratory species, Commonwealth marine areas, Great Barrier Reef Marine Park, the environment where nuclear actions are involved (including uranium mines).

p) **Minister** – the Minister administering the *Environment Protection and Biodiversity Conservation Act 1999* and includes a delegate of the Minister.

q) **Observation Zone** – a radius around pile driving operations (as detailed in Annexure B and must be no less than the **exclusion zone**) which must be visually observed at all times during pile driving operations.

r) **Operation** – commencement of activities associated with bauxite mining and production, including shipping activities from the port and facilitates in the Hey and Embley Rivers. This does not include activities associated with construction.

s) **Period of low visibility** – where continuous visual observations to a distance of 1.5 kilometres from the **pile driving operations** for the port development or 600 metres from the **pile driving operations** for Humbug Terminal, Hornibrook ferry/tug terminal, Hey River terminal or for navigation aids, is not possible for a time period of greater than one hour.

t) **Preliminary Works** – includes the upgrade of Beagle Camp and Pera Head Access Roads; establishment of exploration drill and seismic lines; vegetation clearing and construction of the mine access road (between Hey River terminal and Boyd mine infrastructure area); Construction and operation of barge landing area located on Hey River; preparation of laydown areas at Humbug and Hornibrook terminals (existing disturbed areas); construction (including vegetation clearing of up to 30 hectares) and operation of a temporary accommodation camp (up to 200 persons) in the project area; installation and operation of ancillary infrastructure (including diesel fuelled power generation, laydown areas, package sewage treatment plants, waste storage and disposal facilities, fuel storage, offices and cribs, and access roads); construction and operation of an artesian bore; and installation of communications infrastructure.

u) **Publish/ed** – documentation available on the approval holder's website for the duration of the action (including decommissioning).

v) **Soft start procedures** – initiated at commencement of all marine piling activities by piling at low energy levels and then build up to full impact force. The first five impacts from the piling operation must be at no more than 50% of full hammer weight (e.g. a hammer with an adjustable stroke height of 1.2 metres should drop from a height of 0.6 metres at least 5 times during a 'soft start' procedure), to encourage animals to move away from subsequent blows.

w) **Survey Data -** information obtained from monitoring and survey activities associated with plan/s specified by these conditions and where relevant must include, but not be limited to, name of species (common and scientific), time and day of survey, GPS location, number of individuals located, age class, habitat type, and EPBC Act listing status.

## 2. The project

### *Description of the project*

2.1. The proposed action (also referred to as **the Project**) involves the construction and operation of a bauxite mine and associated processing and port facilities for shipping of bauxite to either Gladstone or international markets.

2.2. The proposed action involves the following elements:

- Bauxite mining – involving the clearing (approximately 29,645 hectares over the life of the project), salvage of topsoil, stripping of overburden, extraction of up to 50 million dry product tonnes per annum (Mdptpa) of bauxite, replacement of topsoil and revegetation;
- Bauxite processing – crude bauxite would be transported using a network of internal haul roads to one of two beneficiation plants (a beneficiation plant separates the bauxite and waste material through sizing, screening, washing and dewatering);
- Product bauxite stockpiles – beneficiated product stockpiles, built by a stacker for subsequent reclaiming, would be established adjacent to the proposed port facility;
- Ancillary infrastructure – involving the construction and operation of a diesel-fuelled power station, workshops, warehouse, administration facilities, package sewage treatment plant, temporary waste storage prior to disposal off-site, and diesel storage facilities;
- Barge, ferry and tug facilities – involving the construction and operation of a new ferry and tug terminal at Hornibrook Point, a roll on/roll off barge facility at Humbug Wharf, a new barge and ferry terminal on the western bank of the Hey River, and temporary barge and ferry access near the port and temporary berthing facilities at the Humbug and Hey River sites (for the initial construction phase only, to transport workforce, materials and equipment to the subject site). Approximately 111,000 $m^3$ of dredged material derived from the construction of the permanent facilities would be disposed at the existing Albatross Bay spoil ground;
- Temporary on-site camp for the construction phase – involving the construction of a facility with up to 2,000 beds. Additional accommodation may be constructed in Weipa if required. During the operations phase, employees would be housed in the existing Weipa community and commute to the site on a daily basis via a river crossing and a new mine access road;
- Water infrastructure – involving the construction of a water supply dam on a freshwater tributary of Norman Creek, plus pipelines, water treatment plants (for potable water) and artesian bores;
- Port and ship-loading facilities – involving the construction and operation of a new port, ship loading and tug mooring facilities between Boyd Point and Pera Head. Works would include a jetty, bulk carrier vessel wharf and berthing structures, tug and line boat moorings, ship-loader and dredging berth pockets and departure areas. Protected moorings for tugs to use during inclement weather may also be constructed in the Embley River. The initial construction phase of the port would result in the disposal of up to 2,600,000 $m^3$ of dredged material to a new spoil disposal ground; and

- Shipping activities – involving the transport of bauxite in bulk carriers from the proposed port to international locations as well as continuing bauxite shipping to the Port of Gladstone, and the transport of cargo and fuel for the proposed action from international and domestic locations. Bauxite ships leaving the proposed port would travel north past the existing Port of Weipa and through the Gulf of Carpentaria. Vessels supplying international markets would typically pass to the west of West Papua then east of the Philippines. Vessels supplying the Australian market would travel to Gladstone via the Torres Strait shipping route and the inner Great Barrier Reef Designated Shipping Area. Cargo and fuel would predominantly be delivered to the Port of Weipa via existing shipping routes from the international and domestic ports and transferred to the subject site.

***Location***

2.3. The subject site is located within the Weipa Plateau Subregion of the Cape York Peninsula Bioregion, approximately 40 km south-west of Weipa. The terrestrial part of the subject site is predominantly an elevated bauxite plateau.

2.4. The EIS states that lands within the subject site are relatively undisturbed by development, although exploration activities have taken place throughout the subject site and are continuing. While overall there has been very little direct disturbance, some areas have been affected by camping, recreational vehicle use and rubbish dumping, as well as areas that have been significantly affected by frequent fires and damage from feral pigs.

2.5. A map of the subject site is provided at Attachment E.

***Relationship to other projects***

2.6. The EIS states that the proposed action does not rely on any other project being implemented in order for it to proceed. There are several other existing or proposed projects in western Cape York that would use Gulf of Carpentaria waters for shipping that have formally commenced an environmental approvals process at either State/Territory and/or Commonwealth level.

2.7. In discussing cumulative impacts, the EIS states that the following relevant proposed projects and existing operations were identified:

- existing Rio Tinto Alcan operations north of the Embley River;
- Aurukun Bauxite Project (discontinued);
- Bauxite Hills Project;
- Pisolite Hills Project;
- Urquhart Point Mineral Sands Project;
- Roper Bar Iron Ore;
- Grey Boat Facility;
- Archer River Quarry;
- existing Port of Weipa operations;
- shipping in the Commonwealth marine area related to projects in the Gulf of Carpentaria; and
- shipping in the GBRWHA and the Commonwealth marine area related to projects on the east coast of Queensland.

2.8. The EIS states that the proposed action would only be related to the existing Rio Tinto Alcan operations north of the Embley River and the existing Port of Weipa operations as follows:

- the proposed action would replace bauxite supply to Gladstone as the reserves at the existing Rio Tinto Alcan operations north of the Embley River are depleted;
- shipping of bauxite from the existing Rio Tinto Alcan operations north of the Embley River from the Port of Weipa would continue during the initial stages of the proposed action. The volume of shipping using the Port of Weipa will over time decrease as the reserves north of Embley River are depleted and shipping from the proposed action would replace much of the demand;
- the workforce currently engaged in operations at East Weipa and at Andoom would transition to the proposed operations in stages as reserves at those operations are depleted; and
- fuel and cargo for the proposed action would predominantly be delivered to the Port of Weipa and then transferred to the subject site.

## 3. Background

### *Previous referral*

3.1. A referral for the proposed action was received by the then department of Environment, Water, Heritage and the Arts (the **department**) on 3 September 2008 (EPBC 2008/4435) and was determined a controlled action on 2 October 2008 as a result of likely significant impacts on listed threatened species and listed migratory species.

3.2. The proposed action commenced assessment under the *Agreement between the Commonwealth of Australia and the State of Queensland* (the **Bilateral Agreement**) using the Environment Impact Statement (**EIS**) process under Part 4 of the *State Development and Public Works Organisation Act 1971* (Qld).

3.3. Following substantial changes to the project design, including significant increases in dredging operations, EPBC 2008/4435 was withdrawn on 8 September 2010.

### *Current referral*

3.4. The proposed action which is the subject of this recommendation report was referred to the department on 13 September 2010 by Rio Tinto Aluminium Ltd (a company of the Rio Tinto Alcan group) (the **previous proponent**).

3.5. On 13 September 2010, the referral was published on the department's website for public comment, for a period of 10 business days. No public submissions were received on the referral.

3.6. By letter dated 14 September 2010, the Hon Martin Ferguson AM MP, then Minister for Resources and Energy was invited to provide comments on the referral. A delegated contact of the Minister responded on 24 September 2010 and noted that the proposed action will have the potential to substantially increase bauxite production in Australia and would serve as a viable ongoing source of bauxite for the Gladstone refinery, as well as being a major financial contributor and employer for the town of Weipa. They further stated that Geoscience Australia was unaware of any issues that would affect the development of the project.

3.7. By letter dated 14 September 2010, the Hon Stephen Smith MP, Minister for Defence was invited to provide comments on the referral. A delegated contact of the Minister responded on 21 September 2010 and stated that there would be no direct impact on Defence land or activities as a result of the proposed action. The delegate also noted that:

- The RAAF Base Scherger is located approximately 25 km east of Weipa. Scherger is an air base with no aircraft permanently based there. It is used infrequently as a transit and refuelling base and the base is activated a handful of times each year as part of coordinated military exercises. Defence also has a minor storage depot located within the Weipa township.
- Defence's assessment of the referral documentation is that there would be no direct impacts on Defence land or activities. The mining activities will occur well outside the protected airspace that surrounds the base. At its closest, the mining lease boundary is about 30 km from RAAF Base Scherger. The proposed port facilities would be approximately 50 km from the base.
- Indirect impacts that may occur include additional workforce moving into Weipa and their requirements for accommodation, services and infrastructure. It is unlikely there would be any adverse impact Defence land or activities. Participants in military exercises typically fly/drive in, accommodate themselves in tents on the base, and then fly/drive out. The economic growth for Weipa would generally enhance community services and infrastructure at Weipa, and this may improve the level of industry and supplies available in Weipa for Defence to draw on.
- Plans were starting to be developed to convert RAAF Base Scherger into an immigration detention facility.

3.8. By letter dated 14 September 2010, the Hon Chris Bowen MP, then Minister for Immigration and Citizenship was invited to provide comments on the referral. No comments were received in response to that invitation.

3.9. By letter dated 14 September 2010, the Hon Greg Combet MP, Minister for Climate Change and Energy Efficiency was invited to provide comments on the referral. No comments were received in response to that invitation.

3.10. By letter dated 14 September 2010, the Hon Jenny Macklin MP, Minister for Families, Housing, Community Services and Indigenous Affairs was invited to provide comments on the referral. No comments were received in response to that invitation.

3.11. By letter dated 14 September 2010, the Hon Kate Jones MP, then Queensland Minister for Climate Change and Sustainability was invited to provide comments on the referral. A delegated contact of the Minister responded on 1 October 2010 and stated that the Queensland Department of Infrastructure and Planning (DIP) had advised that the project was declared by the Coordinator-General on 21 November 2008 to be a significant project requiring an EIS. The delegate's letter also noted that:

- In accordance with clause 12.2 of the Bilateral Agreement, the proposed action would be assessed using the EIS process under Part 4 of the *State Development and Public Works Organisation Act 1971* (Qld) and Section 26 of the *State Development and Public Works Organisation Regulation 1999* (Qld). This assessment process falls within Class 2 of the Classes of Actions outlined in Schedule 1 of the Bilateral Agreement. Therefore, it was appropriate that the assessment be accredited under the Bilateral Agreement.

***Referral decision and assessment approach***

3.12. On 29 October 2010, your delegate determined that the proposed action is a controlled action and would require assessment and approval under the EPBC Act for potential significant impacts on listed threatened species and communities (Sections 18 and 18A of the EPBC Act), listed migratory species (Sections 20 and 20A of the EPBC Act) and Commonwealth marine areas (sections 22 and 24A of the EPBC Act).

3.13. As stipulated in Clause 7.3 of the Bilateral Agreement, the Bilateral Agreement does not apply to an action in a Commonwealth area. Because your delegate determined that 'Commonwealth marine areas' was a controlling provision, the Bilateral Agreement does not apply.

3.14. On 29 October 2010, your delegate decided under Section 87 of the EPBC Act that the relevant impacts of the action must be assessed by an EIS.

3.15. On 21 December 2010, your delegate issued the final 'Tailored Guidelines for a Draft Environmental Impact Statement' to the proponent.

**Environment Protection (Sea Dumping) Act 1981**

3.16. On 5 October 2010, the proponent submitted an application for a sea dumping permit under the *Environment Protection (Sea Dumping) Act 1981* (the Sea Dumping Act). In accordance with Section 163 of the EPBC Act, as part of the controlled action decision of 29 October 2010, the delegate decided that the sea dumping permit application triggered the requirement in Section 160 of the EPBC Act to provide advice on whether the proposal will, or is likely to have, a significant impact on the environment.

***Change of person proposing to take the action***

3.17. On 28 February 2011, Rio Tinto Aluminium Ltd changed the person proposing to take the action to RTA Weipa Pty Ltd (**the Proponent**), pursuant to Section 156F of the EPBC Act.

***First Draft EIS***

3.18. A draft EIS was published for public comment from 1 August 2011 until 12 September 2011. 24 submissions were received by the proponent, from government agencies, non-government organisations and members of the public.

***Reconsideration***

3.19. On 9 November 2011, you received a valid request under Section 78A of the EPBC Act to reconsider the controlled action decision of 29 October 2010, on the basis that there was substantial new information about shipping activities in the Great Barrier Reef Marine Park that warranted revoking and substituting that decision with one that includes the Great Barrier Reef Marine Park, World Heritage properties and National Heritage places as additional controlling provisions.

3.20. Following a consultation period, you decided on 15 March 2012 to revoke the previous decision in accordance with Section 78 (1) of the EPBC Act and to substitute a new decision.

3.21. On 15 March 2012, you decided that the proposed action is a controlled action and would require assessment and approval under the EPBC Act for potential significant impacts on World Heritage properties (sections 12 and 15A), National Heritage places (sections 15B and 15C), listed threatened species and communities (sections 18 and 18A), listed migratory species (sections 20 and 20A),

Commonwealth marine areas (sections 23 and 23A), and the Great Barrier Reef Marine Park (sections 24B and 24C).

3.22. On 15 March 2012, you decided under section 87 of the EPBC Act that the relevant impacts of the action must be assessed by an EIS.

3.23. As stipulated in Clause 7.3 of the Bilateral Agreement, the Bilateral Agreement does not apply to an action in a Commonwealth area. Because you determined that 'Commonwealth marine areas' was a controlling provision, the Bilateral Agreement does not apply.

3.24. Under the *Great Barrier Reef Marine Park Zoning Plan 2003*, commercial ships do not require a permit to transit through General Use Zones and Designated Shipping Areas. As such, the proposal has not been assessed by the Great Barrier Reef Marine Park Authority.

***Variation***

3.25. On 11 May 2012, your delegate accepted a variation to the proposed action, to expressly incorporate shipping activities associated with the proposal (including shipments of bauxite as part of the proposed port development).

***EIS timeline***

3.26. From 7 June 2012 until 21 June 2012, the draft 'Tailored Guidelines for a Draft Environmental Impact Statement' was published for public comment. No comments were received in response to that invitation.

3.27. On 9 July 2012, your delegate issued the final 'Tailored Guidelines for a Draft Environmental Impact Statement' to the proponent.

3.28. The draft EIS was submitted to the department in three parts for adequacy review; on 17 August 2012, 10 September 2012 and 19 October 2012. On 12 November 2012 you determined that the draft EIS had adequately met the requirements of the guidelines. Subsequently, the draft EIS was published for a public comment period from 22 November 2012 to 19 December 2012. Four submissions were received by the proponent during that period.

3.29. On 22 March 2013, the proponent submitted the Final EIS in accordance with section 104(3) of the EPBC Act. This document contained a table summarising and addressing the issues raised in the public submissions.

3.30. Submissions raised concerns about, but were not limited to, the following factors:

- access for commercial and recreational fishermen;
- economic impacts on commercial and recreational fishing businesses, as well as compensation;
- potential impacts on fisheries habitats;
- potential economic impacts of that may result from the eventual cessation of current operations, north of the Embley River;
- shipping through the Great Barrier Reef, including shipping numbers, cumulative impacts and spill modelling;
- assessment of potential underwater noise impacts;
- potential impacts on sea snakes in the Hey and Embley Rivers;
- clearing of Darwin Stringybark woodland;

- potential impacts associated with water use;
- rationale for the proposed environmental buffers; and
- potential impacts on the marine turtle nesting beach.

3.31. Submissions made on the draft EIS have been taken into account during the assessment of the proposed action. Issues raised during the comment period are addressed throughout this recommendation report, where relevant.

3.32. On 2 April 2013, the final EIS was published in accordance with section 104(4) of the EPBC Act.

3.33. The 40 business day period in which you must make your decision commenced on 25 March 2013, and a final approval decision is due by 22 May 2013.

## 4. State Assessment and Approvals

4.1. In addition to approval under the EPBC Act and a permit under the Sea Dumping Act, the following approvals are relevant to the proposed action:

- On 23 May 2012, the Queensland Coordinator-General released a report which evaluates the EIS prepared under the *State Development and Public Works Act 1971* (Qld) (**SDPWO Act**). This report set conditions and made recommendations that must be implemented in subsequent development approvals and licences issued by Queensland authorities.
- Environmental Authority (**EA**) under the *Environment Protection Act 1994* (Qld) (**EP Act**) – Covers mining and associated activities as per operational and environmental requirements of an environmental authority (mining activities).

4.2. The EIS states that the following development approvals (**DA**s) may be required. Applications for the DAs have not yet been submitted. However, under the SDPWO Act, the DA conditions must not be inconsistent with the Queensland Coordinator-General's report:

- for material change of use for an environmentally relevant activity under the *Sustainable Planning Act 2009* (Qld) (**SP Act**), EP Act, and the *Environment Protection Regulation 2008* (Qld) – Required for dredging;
- for removal of marine plants under the SP Act and the *Fisheries Act 1994* (Qld) (**Fisheries Act**) – Required if marine plants found to be present and required to be removed;
- for operational works for barge and ferry terminals under the SP Act and the *Coastal Protection and Management Act 1995* (Qld) – Required for operational work involving reclaiming land under tidal water and operational works in tidal areas;
- for operational works for waterway barrier/fish barrier under the SP Act and the Fisheries Act – May be required for a waterway crossing if it inhabits fish movement in areas outside the mining lease;
- for operational work to clear vegetation under the SP Act and the *Vegetation Management Act 1999* (Qld) – May be required if roads need to be realigned or widened in areas outside the mining lease; and
- for operational works for approach channel dredging – Required for operational works in tidal waters outside mining lease 7024.

## 5. Assessment

***Mandatory Considerations – section 136(1)(a) Part 3 – controlling provisions***

5.1. The proposed action, submitted on 13 September 2010, was determined a controlled action, following a reconsideration decision on 15 March 2012, under the following controlling provisions of the EPBC Act:

- World Heritage properties (sections 12 and 15A);
- National Heritage places (sections 15B and 15C);
- Listed threatened species and communities (sections 18 and 18A);
- Listed migratory species (sections 20 and 20A);
- Commonwealth marine areas (sections 23 and 24A); and
- Great Barrier Reef Marine Park (sections 24B and 24C).

5.2. All data on relevant flora and fauna species have been sourced from the departmental Species Profile and Threats (**SPRAT**), unless otherwise stated. The information represented in the SPRAT database takes into account conservation advice and recovery plans for species, as well as marine bioregional plans, where relevant.

## 6. Listed threatened species and communities (sections 18 and 18A)

6.1. The department's Environment Reporting Tool (ERT) identifies that a total of 27 EPBC Act listed threatened species may occur within a 20 km radius of the terrestrial footprint (report generated on 23 April 2013). No EPBC Act listed threatened ecological communities were identified. In accordance with section 158A of the EPBC Act, only species listed under the EPBC Act at the time of the controlled action decision (15 March 2012) have been considered in this recommendation report.

6.2. Based on the location of the action and likely habitat present in the area, coupled with the data presented in the EIS, the department considers potential impacts may occur on the following species and ecological communities:

**EPBC ACT LISTED THREATENED FLORA SPECIES**

6.3. Following extensive surveys presented in the EIS, the proponent asserts that the Cooktown Orchid (*Dendrobium bigibbum*) and the Chocolate Tea Tree Orchard (*Dendrobium johannis*) (also known as Johann's Orchid) are known to occur in the area, whilst the Beach Nightshade (*Solanum dunalianum*) is likely to occur.

***Cooktown Orchid (*Dendrobium bigibbum*)***

6.4. The vulnerable Cooktown Orchid is a perennial plant that occurs from northern-Cape York Peninsula to about the Archer River.

6.5. The EIS states that the Cooktown Orchid was recorded in a number of locations throughout the subject site in coastal and Weipa plateau vine forest, mangrove communities, and in areas of riparian rainforest and riparian gallery forest. The EIS states that the species is expected to be widespread in suitable habitat within the subject site and adjoining areas.

6.6. The EIS states that two occurrences of the Cooktown Orchid within rainforest pockets in the proposed footprint of Dam C would be inundated. The species was also found in the vicinity of the proposed infrastructure corridor crossings on Norman Creek and within the vicinity of road crossings at Norman Creek and Winda Winda Creek. These

individuals may be disturbed, depending on the final required alignment of this linear infrastructure.

6.7. In total, approximately 7.34ha of potential habitat for this species would be cleared. Clearing in these areas may also produce edge effects at the boundary of adjoining uncleared riparian habitat, however the extent of the edge effect on the species would be negligible as individuals of the species are regularly observed at the natural edge of riparian and vine forest vegetation.

6.8. The EIS states that construction of Dam C and infrastructure corridors would fragment habitat to a minor extent by creating a gap in the linear riparian gallery habitats occupied by the species. The EIS concludes that the gaps would not be of sufficient magnitude to adversely affect dispersal of the species or genetic continuity.

6.9. Construction activities could lead to the introduction (via machinery and light vehicles) and spread of weeds such as Gamba Grass, Guinea Grass and Rubber Vine which could adversely affect epiphytic orchids via promotion of hot frequent fire or the smothering of host trees. Establishment of these weeds could lead to moderate level, long term impacts on the Cooktown Orchid.

***Chocolate Tea Tree Orchid (*Dendrobium johannis*) (also known as Johann's Orchid)***

6.10. The vulnerable Chocolate Tea Tree Orchid is an epiphytic orchid on tree hosts.

6.11. The EIS states that the Chocolate Tea Tree Orchid was recorded within a small portion of the proposed construction disturbance area. The main impact on this species includes a minor reduction of the extent of wetland habitat supporting the species, due to the construction of linear infrastructure. In total, approximately 58.04ha of potential habitat of this species would be cleared.

6.12. Clearing in these areas may also produce edge effects at the boundary of adjoining uncleared wetland habitat, however the extent of the edge effect on the species would be negligible as individuals of the species are regularly observed at the natural edge of Melaleuca dominated wetland vegetation or in isolated trees in wetland areas.

6.13. Construction of the infrastructure corridors would fragment habitat to a small extent by creating a gap in the wetland habitats occupied by the species. The EIS argues that the Chocolate Tea Tree Orchid naturally occurs in both dense and open wetland habitats where gaps are common, and the gaps produced by clearing would not be of a sufficient magnitude to adversely affect dispersal of the species or genetic continuity.

6.14. Construction activities could lead to the introduction (via machinery and light vehicles) and spread of weeds such as Gamba Grass, Guinea Grass and Rubber Vine which could adversely affect epiphytic orchids via promotion of hot frequent fire or the smothering of host trees. Establishment of these weeds could lead to moderate level, long term impacts on the Chocolate Tea Tree Orchid.

***Beach Nightshade (*Solanum dunalianum*)***

6.15. The Beach Nightshade is a small tree or shrub growing to 2-4m in height. The EIS noted that the species was not found on the subject site; however, potential habitat is present.

Mitigation measures to minimise likely impacts on EPBC Act listed flora species

6.16. The proponent has proposed the following mitigation measures in the EIS to address identified impacts to the above mentioned flora species:

- an environmental buffer system is proposed to meet (exceed) the requirement of the Queensland Coordinator-General's approval conditions. This includes set-backs for mining from sensitive vegetation. The sensitive vegetation to be buffered would comprise the following vegetation types: riparian, wetland, estuarine, vine forest and coastal vegetation on sand. The EIS states that all potential habitat for the above mentioned flora species would be protected from mining by the buffer system.
  - the proposed buffer system would maintain a network of undisturbed habitats and would be enhanced through a proposed fire management program which would conserve fire sensitive flora and promote overall vegetation diversity.
  - the proposed buffer system would also be enhanced as a result of a proposed feral pig control program which would reduce pig damage to riparian and wetland areas;
- a weed management program will be developed and implemented prior to commencement of construction, and will include weed surveys annually (post wet season) targeting operational areas and site routes;
- dust abatement measures would minimise airborne dust and the potential effects of settled dust on individual plants;
- stormwater runoff will be managed by constructing and maintaining appropriately sized stormwater management structures;
- an erosion and sediment management plan will be developed prior to construction; and
- surface water monitoring will be conducted in accordance with the Queensland Coordinator General's approval conditions.

6.17. The department notes that the Queensland Coordinator-General's report recommends the proponent translocate and/or propagate 3.5 plants of Chocolate Tea Tree Orchid and Cooktown Orchid for each plant found within the footprint of disturbance and establish such plants within a 355.2 ha offset area comprising riparian habitat.

**Conclusion of assessment of impacts on EPBC Act listed threatened flora species**

6.18. It is recommended that a condition be placed on the approval of this project that restricts the clearing or removal of vegetation to no more than 28,880 ha over the life of the project. This will ensure that the extent of potential impacts remain consistent with those assessed in this recommendation report.

6.19. Because the proponent's proposed vegetation buffers (which are in addition to state requirements) are integral to reducing potential impacts to EPBC Act listed threatened flora species, it is recommended that conditions be placed on the approval of this project that require these buffers to be provided. This will ensure a greater level of certainty that the proponent's commitments will be adhered to.

6.20. It is also recommended that conditions be placed on the approval that requires the proponent to prepare and implement a Terrestrial Management Plan, to cover all of the land based activities associated with the construction and operation of the project. This would define, avoid, adaptively manage and mitigate negative impacts to the above discussed species.

6.21. Whilst acknowledging that a number of EPBC Act listed threatened flora species are likely to be impacted by the proposed action, the department is of the view that, provided the mitigation measures are implemented and conditions adhered to, long-term impacts to EPBC Act listed threatened flors species will not be unacceptable.

## EPBC ACT LISTED THREATENED TERRESTRIAL SPECIES

6.22. Following surveys presented in the EIS, the proponent asserts that the Red Goshawk (*Erythrotriorchis radiatus*), Masked Owl (*Tyto novaehollandiae kimberli*), Northern Quoll (*Dasyurus hallucatus*) and Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudicluniatus*) may possibly occur in the vicinity of the proposed action.

### *Red Goshawk (*Erythrotriorchis radiatus*)*

6.23. The Red Goshawk is a large, swift and powerful rufous-brown hawk endemic to Australia.

6.24. Suitable habitat for the species exists within the Project area - comprising predominantly habitat mosaics associated with the major drainage systems where nesting and main foraging is likely to occur, and the more extensive tracts of Darwin Stringybark dominated woodland that is likely to be used to a lesser extent by the species for foraging and movement between high and moderate suitability habitat areas.

6.25. An expert review of the potential presence of the species within the Project area (refer Appendix 6 of the Final EIS) confirmed the high suitability and likely preferential use of non-Darwin Stringybark woodland habitat associated with drainage lines, wetlands and coastal woodland, and the lower suitability of more extensive Darwin Stringybark woodland on the bauxite plateau.

6.26. Given the disposition for the species to nest in tall trees within 1km of a permanent water body, it is possible that nests of the species could be located within Darwin Stringybark open forest adjacent to permanent water or coastal habitats, or adjacent to seasonally inundated wetlands or perennial/semi perennial watercourses with near permanent water supporting riparian gallery forest within the Project area.

6.27. The EIS states that no individuals or nests of the Red Goshawk were located in the Project area during field surveys and there are no previous records of the species from within the Project area.

6.28. However, a 2010 report in the Weipa District confirmed the presence of the species in the Weipa Province of the Subregion. Further, in August 2012, a pair of birds was sighted perching on the boundary of the East Weipa mine. The species has been previously recorded in riparian gallery forest associated with the lower Wenlock River to the north of the Project area. It was also recorded in the open woodland of the Merluna Plain to the east of the Project area.

6.29. The potential population of Red Goshawk within the Project area, assuming a similar density to that estimated in the Subregion, could be a maximum of two breeding pairs.

6.30. The EIS concludes that given that the species was not observed during field surveys over five years, it is unlikely that the Red Goshawk is abundant within the Project area (it would be more readily detectable in this case). However, based on the survey results, it is also possible that the Project area is not occupied by breeding birds and may only be utilised intermittently by non-breeding adults or dispersing juveniles or alternatively, is not utilised by the species at all.

6.31. Further the EIS states that there is very little known about the Red Goshawk population in Northern and Western Cape York Peninsula. Under such data deficient circumstances, any sightings of the Red Goshawk in a newly explored area would constitute an "important population" under the meaning of the EPBC Act, since they would extend the known limit of the species distribution. Similarly, any confirmed sighting of the Red Goshawk within the Project area would be regarded as an important population.

Likely impacts on the Red Goshawk

6.32. The EIS states that the proposed action would disturb 961 ha of highly suitable habitat for the species, and 1,483 ha of moderately suitable habitat.

6.33. Construction activities are not anticipated to result in a barrier to movement or cause any impacts on accessibility to nearby habitat areas as the species is highly.

6.34. The EIS further states that approximately 23,276ha (37.9% of potential habitat available in the Project area and 2.7% of potential habitat available in the Subregion) of potential moderate suitability habitat would be progressively disturbed during operations over the life of the Project. The balance of the disturbance in the Project area (3,938ha) provides potential high suitability habitat which would be progressively disturbed during operations over the life of the Project. These areas contain potential nesting habitat for the species, specifically, areas of Darwin Stringybark woodland within 1km of permanent water. The majority of potential habitat to be disturbed during the operational phase of the Project is moderate suitability habitat for the Red Goshawk that is unlikely to be utilised for nesting and would generally be used for foraging opportunities.

Proposed mitigation measures to reduce impacts on the Red Goshawk

6.35. The proponent has proposed the following mitigation measures to address identified impacts on the Red Goshawk:

- pre-disturbance surveys for nests would be undertaken and if active nests are found, a 200 m buffer around the nesting tree would be excised from the mine plan and the nest monitored until completion of the breeding season, after which clearing would resume;
- a fire management program will be developed and implemented to conserve fire sensitive flora and vegetation communities and to promote overall vegetation diversity; and
- a weed management program will be developed and implemented.

6.36. The proponent has also committed to the sequential re-establishment of habitat which would facilitate the re-colonisation of prey fauna within the rehabilitated mine areas which would reinstate potential foraging habitat in these areas.

***Masked Owl (*Tyto novaehollandiae kimberli*)***

6.37. The vulnerable Masked Owl is sedentary, territorial and usually seen singly but occasionally in pairs or family groups.

6.38. The EIS states that on Cape York, the Masked Owl has been recorded in the Aurukun area in 2004 adjacent to the Project area, although the habitat within which it was recorded is unclear. These records indicate the existence of a northern-Cape York population but the current extent and status of this population is poorly known. The species occurs at very low densities outside the Wet Tropics, and is seldom encountered during surveys.

6.39. The availability of small mammal prey appears to be a significant determinant of habitat usage with the species observed to hunt native ground mammals in sugarcane paddocks and adjacent open grassy areas in North Queensland. Therefore, a critical factor supporting Masked Owl populations is the abundant presence of small mammals

6.40. The small mammal surveys within the Project area and similar surveys conducted recently in the Weipa area did not locate any habitat types where small mammals were abundant. Indeed, the EIS states that small mammals appear to be in very low densities or absent from extensive Darwin Stringybark dominated woodland areas in the Project area. A general decline of small mammal populations in tropical woodlands has been observed elsewhere in northern Australia and is attributed as the most probable cause of the decline and low density of the Masked Owl.

6.41. Given that no persistent abundant small mammal populations have been located within the Project area or Weipa area it was assumed that a similar lack of small mammal populations were likely to occur throughout the Subregion. Consequently no high suitability habitat was identified in the Subregion. The department notes that surveying was only undertaken in riparian areas and nor in Darwin Stringybark dominated woodlands.

6.42. The EIS concludes that overall the potential unmitigated impacts on the Masked Owl from clearing of habitat during construction are anticipated to be minor. The Masked Owl is a highly mobile species and would be able to utilise peripheral habitat around the Dam C impoundment to maintain connectivity upstream and downstream of the dam. Clearing of habitat within the Dam C area and infrastructure crossings of streams is not anticipated to cause any impacts on accessibility to nearby habitat areas by this mobile species.

Likely impacts on the Masked Owl

6.43. The EIS states that approximately 326ha of moderately suitable habitat (no high suitability habitat) would be disturbed during construction of the Project. The balance of the disturbance (both directly and indirectly) (29,332ha) is low/no suitability habitat. The moderate suitability disturbance area represents approximately 3.2% of the total area of moderate suitability habitat within the Project area and <0.1% of the moderate suitability habitat within the subregion and is therefore a minor component of the potential habitat available for the species.

6.44. Potential nesting habitat for the Masked Owl occurs within the Dam C footprint; however, the area is not regarded as significant for foraging or breeding by the species.

6.45. Construction of Dam C would disrupt the riparian corridor along the middle branch of Norman Creek and may force Masked Owls to make minor adjustments to movement patterns in this area; however, they are highly mobile species and would be able to utilise peripheral habitat around the Dam C impoundment to maintain connectivity upstream and downstream of the dam.

Proposed mitigation measures to minimise impacts on the Masked Owl

6.46. The proponent has proposed a number of mitigation measures to reduce potential impacts on the Masked Owl. These are the same as described for the Red Goshawk (detailed above).

***Northern Quoll (*Dasyurus hallucatus*)***

6.47. The endangered Northern Quoll is the smallest of the four Australian quoll species.

6.48. The EIS states that the Northern Quoll was not identified in the Project area during field surveys and there are no current population estimates for the Northern Quoll on Cape York Peninsula. There are no previous confirmed records of the species from the Project area and Traditional Owners did not indicate any sightings of the species in recent memory (20+ years). However there was a recent unconfirmed sighting at the Scherger Air Base (July 2012) approximately 24km east of Weipa.

6.49. The Darwin Stringybark dominated woodlands that occur across much of the Subregion are not regarded as high suitability habitat. Although it is possible for Darwin Stringybark woodlands to contain alternative denning habitat such as hollow logs, termite mounds and hollow trees, those features are not abundantly present in the local area due to the impacts on habitat quality from the current regime of extensive frequent fires.

Likely impacts on the Northern Quoll

6.50. The EIS states that the total area of disturbance during construction would include approximately 184ha of moderate suitability habitat.

6.51. Construction of Dam C would disrupt the riparian corridor along the middle branch of Norman Creek and may force the Northern Quoll to make minor adjustments to movement patterns in this area; however, they are mobile species and would be able to utilise peripheral habitat around the Dam C impoundment to maintain connectivity upstream and downstream of the dam.

Proposed mitigation measures to minimise impacts on the Northern Quoll

6.52. The proponent has proposed a number of mitigation measures to reduce potential impacts on the Northern Quoll. These are the same as described for the Red Goshawk and the Masked Owl (detailed above), but also includes the installation of dry culvert cells at the constructed access road crossings of Winda Winda Creek and the southern branch of Norman Creek (upstream of Dam C, the northern crossing on the Norman Creek Access Road) to maintain habitat continuity along the riparian corridor apart from during periodic high flow events that may be utilised by the Northern Quoll.

***Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudicluniatus*)***

6.53. The critically endangered Bare-rumped Sheathtail Bat is a large insectivorous bat.

6.54. The departmental SPRAT database states that the Bare-rumped Sheathtail Bat has been very poorly surveyed due to lack of described echolocation call making it difficult to reliably identify the species and difficulty in trapping this species. As such, the population size is poorly known. Anecdotal evidence suggests that the species occurs in low densities.

6.55. Only anecdotal information about habitat is available, and no information is available on foraging habitat shifts between the dry and wet seasons. The small number of confirmed roosts located in Australia have all been in tree hollows it has been suggested the species forage over habitat edges such as the edge of rainforest and in forest clearings.

6.56. The EIS states that a recent review of bats of Cape York observed a scarcity of records for the Bare-rumped Sheathtail Bat and an inability to practically capture the

species or identify it using existing echolocation call recognition techniques. Therefore, the current population within the Subregion cannot be estimated as there are no records for the species.

6.57. There are currently no records of the Bare-rumped Sheathtail Bat within the Weipa Plateau Subregion and the species has not been recorded from the wider western Cape York Peninsula area.

6.58. One specimen from Iron Range (eastern Cape York Peninsula) was found roosting in a Darwin Stringybark tree hollow adjacent to gallery forest on a narrow seasonal stream and within 1km of the extensive rainforests of the Claudie River flood plain.

6.59. Although there are similarities in the woodland communities occurring on the east coast and west coast of the Cape York Peninsula, there are substantial differences between them with respect to substrate, topography and climate which lead to differentiation between vegetation communities.

6.60. Limited but definitive reference echolocation calls of this species have only recently been recorded, and there have been some initial observations of characters that might allow it to be distinguished from other bats that make similar calls. However, substantial additional call data from all three Australian *Saccolaimus* species and development of analysis techniques is required to enable unambiguous identification based on acoustic recordings.

6.61. The EIS has not identified any potential impacts on the species from the proposed action because there is no evidence to suggest that the species is present on the subject site.

Proposed mitigation measures to minimise impacts on the Bare-rumped Sheathtail Bat

6.62. The proponent has not provided any specific avoidance or mitigation measures for the Bare-rumped Sheathtail Bat.

6.63. However, the EIS states that if the species is found within the Project area during surveys intended to be undertaken by the proponent in 2013, the proponent would first consider avoidance.

6.64. If that was not possible, the proponent would then assess the potential impact on the species and liaise with the department to develop an appropriate package of mitigation measures to manage any impacts on the species prior to clearing in the relevant area and document them in an environmental management plan.

**Conclusions of assessment of impacts on EPBC Act listed threatened terrestrial species**

6.65. Due to a lack of certainty associated with the quantification of likely impacts to species present on the subject site (arising through a lack of abundance data presented in the EIS), it is recommended that conditions be placed on the approval which require the proponent to prepare and implement a Pre-disturbance Survey Program, to further survey for nesting habitat of the Red Goshawk and Masked Owl prior to clearing vegetation, as well as for the development and implementation of appropriate avoidance, mitigation or management measures if the species are identified.

6.66. To ensure better protection of the Bare-rumped Sheathtail Bat, it is recommended that you condition the approval to require the proponent to undertake an additional targeted Bare-rumped Sheathtail Bay survey in the project area. To facilitate this survey, it is recommended that the proponent support a research program being conducted by the Australian Bat Society which will aim to acquire a

quality reference call library for microbats of the Cape York region (which can then be utilised to analyse the results of the targeted survey).

6.67. It is also recommended that conditions be placed on the approval which requires the proponent to prepare and implement a Terrestrial Management Plan, to cover all of the land based activities associated with the construction and operation of the project. This would define, avoid, adaptively manage and mitigate negative impacts to the Red Goshawk and Masked Owl (as well as the Bare-rumped Sheathtail Bat, if identified through the research program).

6.68. Because a number of impacts presented in the EIS are labelled as transient (and were therefore not assessed as being permanent), it is recommended that conditions be placed on the approval which requires the proponent to prepare and implement a Progressive Rehabilitation Strategy which will ensure that at the end of the life of each element of the proposed action, the proponent ensures vegetation areas cleared for the project provides habitat for the Red Goshawk and Masked Owl equivalent to pre-clearance habitat.

6.69. As a contingency it is recommended that a condition be placed on the approval which ensures that if the rehabilitation objectives for matters of national environmental significance identified in the Progressive Rehabilitation Strategy are not met, the proponent must submit for your approval an Offset Strategy in accordance with the *Environmental Protection and Biodiversity Conservation Act 1999 Environmental Offset Policy (October 2012*), or its most current version.

6.70. Whilst acknowledging that the proposed action may result in some impacts, the department is of the view that, provided the mitigation measures are implemented and conditions adhered to, long-term impacts to EPBC Act listed terrestrial species will not be unacceptable.

## EPBC ACT LISTED THREATENED TURTLE SPECIES

### *Leathery Turtle, Leatherback Turtle (*Dermochelys coriacea*)*

6.71. The endangered Leatherback Turtle is the largest of all sea turtles, and are known from waters all around Australia.

6.72. The EIS states that suitable foraging habitat for the Leatherback Turtle occurs in the project area, in particular at the proposed port site and the Albatross Bay and new spoil grounds. However, the departmental SPRAT database suggests that there is a strong likelihood that no Leatherback Turtles have nested in Queensland since 1996. Due to the low incidence of Leatherback Turtles nesting on Australian beaches, a number of threats faced by other marine turtles, such as coastal infrastructure and development, feral animal predation and indigenous harvest, are not significant threats to Leatherback Turtles in Australian waters.

### *Loggerhead Turtle (*Caretta caretta*)*

6.73. In Australia, the endangered Loggerhead Turtle occurs in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. While nesting is concentrated in southern Queensland and from Shark Bay to the North West Cape in Western Australia, foraging areas are more widely distributed.

6.74. The EIS states that the species is likely to be present in the project area (including the Great Barrier Reef and spoil grounds); however, nesting was not identified within the project area.

***Pacific Ridley, Olive Ridley (*Lepidochelys olivacea*)***

6.75. The endangered Olive Ridley Turtle is the smallest of the Australian sea turtles.

6.76. The EIS states that the species is known to occur at the proposed port site, are likely to occur at the Ferry and Barge terminals in Hey and Embley Rivers, and will possibly occur at the proposed Albatross Bay and new spoil grounds.

6.77. The EIS further confirms that Olive Ridley Turtle nesting has been recorded in the area surrounding the proposed port site, including False Pera Head to Boyd Bay (refer Table 1).

***Green Turtle (*Chelonia mydas*)***

6.78. Vulnerable Green Turtles nest, forage and migrate across tropical northern Australia.

6.79. The EIS states that the preferred habitat for the species in the Weipa /Cape York region is coastal waters - particularly seagrass beds; and that Wellesley Island in the southern corner of the Gulf of Carpentaria is a significant nesting site.

6.80. The EIS states that the species mates near-shore in vicinity of the nesting ground and nests on sandy beaches, but no nesting was identified in the project area.

6.81. The EIS states that the species is likely to forage in the proposed port site, ferry and Barge terminals in Hey and Embley rivers and within the project area as a whole. It is possible the species will forage in the proposed albatross Bay and new spoil grounds. The species is likely to traverse, forage and nest along the shipping routes, including the Great Barrier Reef.

***Hawksbill Turtle (*Eretmochelys imbricate*)***

6.82. Major nesting of the vulnerable Hawksbill Turtles in Australia occurs at Varanus Island and Rosemary Island in Western Australia, and in the northern GBR and Torres Strait, Queensland. The key nesting and inter-nesting areas (where females live between laying successive clutches in the same season) includes Western Cape York. Nesting occurs in the northern Great Barrier Reef and the Torres Strait between January and April.

6.83. The EIS states that the species is known to occur in the project area, and is likely to traverse the proposed port area at Boyd Point, Pera Head and between Pera Head and Thud point. Further, it is possible the species may utilise the proposed Albatross Bay and new spoil grounds, and the Ferry and Barge terminals in Hey and Embley rivers. The species is likely to traverse, forage and nest along the shipping routes, including the Great Barrier Reef. Further, nesting was identified in the project area (refer Table 1).

***Flatback Turtle (*Natador depressus*)***

6.84. The vulnerable Flatback Turtle is found only in the tropical waters of northern Australia, Papua New Guinea and Irian Jaya and is one of only two species of sea turtle without a global distribution.

6.85. The EIS states that the Flatback Turtle preferred foraging habitat in the Weipa and Cape York region is soft-bottom, coastal waters, including but not limited to shallow water habitat. Such suitable habitat is found within the project area

6.86. The EIS states that nesting has been regularly recorded within and surrounding the proposed port site (refer Table 1) and is best described as low density nesting (the area is not a major location for breeding aggregations of the species). The proposed port footprint would also be considered foraging habitat for this species.

6.87. The EIS states that the species is likely to forage and traverse the proposed Albatross Bay and new spoil grounds, the ferry and barge terminals in the Hey and Embley rivers, and the broader project area. The species is likely to traverse, forage and nest along the shipping routes, including the Great Barrier Reef.

Surveying for EPBC Act listed threatened turtle species

6.88. As discussed above, the EIS states that a number of turtle species were found to nest in the project area. Surveys were conducted on the following dates, and the results are presented in Table 1, below:

- August to September 2003 - along 38 km of beach from Boyd Point south of False Pera Head;
- May to July 2007 - a 10km stretch of foreshore between Boyd Point and Pera Head;
- 22 to 24 April 2008 - Daylight surveys were undertaken between Norman Creek to about 5km north of Boyd Points (encompassing 27 km of beach including the proposed Port site); and
- Incidental qualitative observations during boat-based marine ecology fieldwork. (which identified marine turtles (predominantly Flatback Turtles) frequently seen surfacing within the area surveyed. These observations did not reveal any apparent preference for one part of the study area over the other.

*Table 1– Summary of nesting activities recorded by the proponent on the project area, Western Cape York (Section 7 of the **Final Environment Impact Statement**)*

| | **Number of nesting activities recorded during surveys** | | |
|---|---|---|---|
| | **2003** | **2007/2008** | **TOTAL** |
| Olive Ridley *(Lepidochelys olivacea)* | 2 | 0-1 | **2-3** |
| *Flatback Turtle (Natador depressus)* | 41 | 9-10 | **50-51** |
| Hawksbill Turtle *(Eretmochelys imbricate)* | - | 1-3 | **1-3** |
| Unidentified nests | - | 28 | **28** |
| Unidentified tracks | - | 2 | **2** |

Known threats and likely impacts on EPBC Act listed threatened turtle species

6.89. The main threats to the EPBC Act listed threatened turtle species discussed above are: by catch from fisheries and shark control; indigenous harvest; animal/feral predation; coastal infrastructure and development (marine debris, light pollution, entanglement and ingestion of marine debris; chance disasters (e.g. oil spills); habitat destruction and degradation, and boat strike); seismic surveys; climate change, and extreme weather events.

6.90. The EIS states that two major threats to listed turtle species not associated with project activities along western Cape York are predation of nests by feral pigs, and entanglement in lost or discarded fishing nests (ghost nets).

6.91. The EIS states that the proposed action may have the following impacts on EPBC Act listed threatened turtle species:

*Disturbance to habitats (including benthic and intertidal)*

6.92. The proposed action may result in physical disturbance to benthic or intertidal habitats as a result of dredging and offshore spoil disposal, as well as the construction of marine and river facilities:

Dredging

- Benthic habitats in the dredge footprints of the proposed Port and river facilities would be completely removed until such time as they recolonise (although recolonisation would be affected by subsequent maintenance dredging).
- The EIS states that from all project areas, seagrass was only confirmed as present at Boyd Bay within the likely impact distance of the temporary jetty option.
- At Boyd Point, total hard coral cover is estimated at 2.1 hectare and total soft coral cover is estimated at 1.3 hectares. At Pera Head, total hard coral cover is estimated at 4.5ha and total soft coral cover is estimated at 4.5ha. Hard and soft coral is absent from the footprint of the proposed Port, although an estimated area of <0.2hectares of live soft coral-sponges would be impacted if Stage 2 of the wharf were constructed.
- Impacts from dredging and offshore spoil disposal would include turbidity plumes and the potential suspension of sediments that may reduce water quality. The chemical and physical characteristics of material that would be dredged from the proposed Port area and the barge/ferry terminals were assessed in the EIS. The assessment indicated that all dredge spoil is suitable for unconfined ocean disposal, and testing did not identify any constituents present at contaminant levels of environmental concern that would persist in the water column during dredging or offshore spoil disposal.
- The EIS argues that turbidity changes induced by dredging will only result in adverse environmental effects when the turbidity generated is significantly larger than the natural variation of turbidity and sedimentation rates in the area. The seagrass meadows in the Port of Weipa (including the Embley and Hey Rivers) are continually exposed to naturally high and variable turbidity.
- Turbidity plumes from dredging are predicted to reach sponge and coral habitats from Boyd Point to Pera Head, and further south towards Thud Point. Reefs in this area are predicted to be sediment tolerant, experiencing naturally high turbidity and sedimentation rates over extended periods of time.
- The proposed action may also result in changed to coastal processes (erosion and deposition). Changes to coastal processes and hydrodynamics may facilitate beach erosion and potentially reduce the availability of nesting habitat for marine turtles. However, results of modelling presented in the EIS indicated that negligible impact on coastal morphology from the dredge area is expected. Modelling results also indicated that wave heights are not expected to change by more than 4% as a result of the dredging works and therefore

minimal increase in beach and cliff erosion would be expected, even in extreme weather events (e.g. cyclones).

Spoil disposal

- Dredging in the Embley and Hey Rivers would involve placement of dredge spoil at the new and existing spoil grounds. Based on information from a previous study, the EIS states that changes in water quality in sensitive areas, such as seagrass meadows to the north-east, from the migration of material would be negligible because plumes are predicted to migrate south towards the South Channel.
- Disposal and spillage of dredge spoil may directly smother benthic habitat during disposal. Spoil may also be remobilised and re-deposited during extreme events such as cyclones.

Infrastructure

- The EIS states that the wharf for the port would require the installation of up to 274 piles mostly within intertidal/tidal areas. This includes six piles on the beach, resulting in direct disturbance to nesting habitat.
- A small area ($20m^2$) of very low density seagrass cover may also be impacted within Boyd Bay for the temporary passenger jetty.

*Physical harm and changes to lifecycle*

6.93. The proposed action may result in physical harm to EPBC Act listed threatened turtles species, in the event that they become entrained in the dredge:

- The EIS states that entrainment would only eventuate during dredging campaigns, and the potential unmitigated impact on marine turtle populations would be short term. Moreover, the risk of entrainment is reduced as the locations where dredging activities would occur are not considered to be important foraging habitat for marine turtles. However, in the event of entrainment, mortality of an individual would be likely. The potential unmitigated impact on marine turtles would be considered to be minor.

6.94. The proposed action may result in an altered light regime:

Construction and operation

- The EIS states that the provision of night-time lighting is required to enable safe construction and operation of the proposed Port and associated on-shore facilities. Alterations to natural light regimes will also occur from dredging operations.
- The EIS states that hatchlings may be attracted to light, and shore based lighting has the potential to prevent them finding the water immediately following emergence from the nest, increasing the risk of predation.
- The proposed Port area has a low density nesting population of Flatback Turtles, Olive Ridley and Hawksbill Turtles. These species may potentially be impacted by any alterations to the light regime from dredging and the construction and operation of the Port.
- The EIS concludes that altered light regimes from dredging operations would only eventuate during dredging campaigns, and so would be short term. Dredging operations would occur offshore, generally in excess of 500m from land, and would require a relatively low level of lighting.

Recreational use of beaches

- The EIS noted that the construction workforce based at the onsite temporary construction camp (2km north-east of the proposed Boyd infrastructure area) is anticipated to peak at 1,400 people. As a result, there is a potential for light impacts to arise from unauthorised worker-access of the beach at night. However, the proponent has committed that access to the beach at night for recreational purposes would not be permitted.

Bauxite spills

- The department notes that the proponent has not considered the potential impacts on listed marine turtles (or their habitat) specifically associated with bauxite 'ship loading spills' on turtle nesting beaches and/or the marine environment utilised by the listed turtle's species.
- In relation to bauxite spills the proponent has stated that:
  - bauxite is not classified as a dangerous good or marine pollutant;
  - any bauxite spilled into the sea would be expected to settle to the sea floor;
  - any bauxite spilled during ship loading or unloading, or as a result of hull damage caused by collision or grounding would not change water quality;
  - bauxite naturally occurs in the sediment of the proposed port and these naturally deposited bauxite materials do not appear to have had any impact on the marine environment; and
  - adverse environmental impacts could result from a bauxite spill if benthic organisms including coral, seagrasses or marine invertebrates are smothered.
- The department notes that the submission from Weipa Town Authority (which Weipa Town Authority requested be withdrawn from consideration) raised concerns about:
  - the 'significant' long term shoreline changes in the Embley River adjacent to the current (bauxite) ship loading facilities at Lorim Point facility,
  - the EIS does not refer to innovative or improved bauxite loading methods by significantly larger (Cape size vessels) and more regular shipments, leading the Weipa Town Authority to believe sedimentation of the beach and therefore degradation (including sedimentation changes) of marine turtle nesting sites would occur more rapidly over a much broader comparative area.
- The Weipa Town Authority submission also states that Rio Tinto needs to demonstrate a significant 'shift' from their current policy in relation to major bauxite spills during ship loading at the Lorim Point facility.

Increased shipping

- The EIS states that all vessels would be lit in accordance with the minimum requirements for navigational safety and safe operations at night.
- Additional to navigation lights, lighting directed onto the deck of bulk carriers, barges and ferries would be required to facilitate safe loading and unloading

of cargo and passengers, potentially resulting in some light spill onto the water surface.

- The EIS argues that lighting from ships that are moving or anchored are predominantly projected horizontally as sky glow, and direct light spill on the marine environment is limited. Operational vessels further offshore would generally be underway except when waiting at anchor outside Gladstone Harbour, making the impact of light transitory. The designated shipping routes are also offshore and not in close proximity to marine turtle nesting beaches so nesting marine turtles and any hatchlings are unlikely to be disturbed or disorientated.
- The EIS asserts that marine turtles may be unable to avoid vessels when they come to the surface to breathe and therefore can be vulnerable to vessel strike. Flatback Turtles were observed surfacing within the Project area during field investigations.
- The operation of the passenger vessel and barge may increase the risk of vessel strike on marine turtles in the Embley River estuary where seagrass beds are present. Transit lanes would be defined to reduce the overall area of disturbance from vessel activities, which would also follow the greatest water depths to further avoid significant meadows of seagrass beds, unless directed otherwise by the Regional Harbour Master.

6.95. The proposed action may result in underwater acoustic impacts:

Construction and operation

- The EIS states that underwater noise has the potential to impact all marine turtle species in the vicinity of dredging activities, including those feeding in the area, transiting through the area, or nesting.
- The EIS argues that marine turtles are unlikely to experience injury or hearing loss from dredging noise but may show behavioural responses and avoid the area (although there is a possibility that they become habituated to the noise and remain within the vicinity). Avoidance of underwater noise may impact on foraging or nesting behaviour of marine turtles in the immediate area.
- The EIS concludes that underwater acoustic impacts from dredging operations would only eventuate during dredging campaigns, and would be short term and only occur at close range to the dredge operations. Given the availability of preferred foraging habitat outside the dredging areas and low density of nesting in the vicinity of the Port dredge footprint, the potential unmitigated impacts of noise on all species of marine turtles from dredging activities would be negligible.
- The EIS further identifies impacts resulting from construction of marine and river facilities, primarily from pile driving activities.
- Behaviour impacts on marine turtles from underwater noise from piling activities may cause avoidance responses of animals attempting to use the beach for nesting or hatchlings migrating offshore. However, impact distances would only affect a small proportion of the adjacent beach and nesting marine turtles would be expected to avoid the noise source and access the beach outside of the impact distance.
- Based on behavioural disturbance limits modelled in the EIS, the EIS states that the foraging habitat of each marine turtle species may potentially be

impacted by underwater noise from piling operations. Alternative reef habitat for marine turtles similar to the area that may be affected occurs between Boyd Point and Thud Point, and at inshore reef areas south of Thud Point, and north of Boyd Point extending to Albatross Bay (refer to the location map at Attachment D). Alternative seagrass habitat for marine turtles similar to the area that may be affected occurs at multiple locations throughout the Hey and Embley River estuaries and south of Thud Point.

Increased shipping

- The EIS states that the effects of underwater shipping noise on marine turtles are difficult to quantify as few controlled experimental data exist.
- Operational vessels further offshore would generally be underway, except when waiting at anchor (at which time there would be no noise from propeller cavitation associated with propulsion), making any impact of underwater noise transitory.

6.96. There is also a risk that impacts may arise in the event of vessel discharges, oil spills, and vessel collisions. These potential impacts are discussed in Section 8 of this recommendation report.

Mitigation measures to reduce impacts to EPBC Act listed threatened turtle species

6.97. The proponent has proposed a number of mitigation measures to address the identified impacts on EPBC Act listed threatened turtles species associated with the following elements of the proposed action:

*Dredging and offshore spoil disposal*

6.98. The proponent states that no specific mitigation against physical disturbance to benthic or intertidal habitats from dredging is warranted. However, the proponent will implement a Dredge Management Plan for capital dredging which includes the following measures (which would be adaptive):

- measures to ensure dredging and disposal, as well as shipping, only occurs in approved areas;
- best-practice machinery will be used; and
- water quality and health of corals etc. will be monitored (with set trigger levels).

6.99. To protect against entrainment in the dredge:

- a Marine Fauna Observer will be on watch during daylight dredging operations, and a log will be maintained detailing all sightings; and
- dredging operations would not commence if marine turtles are observed within 300 m of the dredge – and for stationary dredge operations, would cease if marine turtles are observed within 50 m of the dredge head.

6.100. The proponent states that no specific mitigation against acoustic impacts is warranted. However, the Dredge Management Plan provides that all vessels would operate in accordance with appropriate industry and equipment noise and vibration standards.

6.101. The EIS states that all temporary seaborne access infrastructure will be removed when no longer required.

6.102. To mitigate impacts associated with the physical disturbance of beach habitats from piling and temporary beach access:

- nests may be translocated to outside the construction footprint (in consultation with the Queensland Department of Environment and Heritage Protection); and
- pathways and landing areas would be clearly delineated.

6.103. To mitigate impacts associated with alterations in light regimes, the proponent will work with the Queensland Department of Environment and Heritage Protection through an adaptive approach to minimise the impacts of changes to the light regime during both the construction and operation phases of the proposed Port on marine turtles, while still allowing a safe working environment.

6.104. Monitoring of marine turtle nesting and hatching success would be undertaken throughout the life of the proposed action. Monitoring would include monitoring emerging hatchlings moving up the beach towards land, the re-emergence of hatchlings from the water and any aggregation of hatchlings around a light source. If this behaviour is detected, within the limits set by the safe operation of the port, lighting modification or other solutions would be investigated and implemented if necessary.

6.105. To mitigate acoustic and vibration impacts:

- a soft-start approach would be used to disperse marine and migratory fauna prior to normal pile driving activities; and
- marine fauna observations will be undertaken, and appropriate actions (such as stopping works, or prohibiting works) implemented if marine turtles are observed.

6.106. Advice received from the department's North, West and Offshore Assessment Branch, as well as the South Australia and Permits Section suggests that the proposed mitigation measures are reasonable and appropriately precautious.

### *Project related shipping*

6.107. The EIS states that lighting on board vessels at sea and in port would be minimised to that necessary to comply with navigational safety regulations and provide for safe working while personnel are on deck; and all vessels would operate in accordance with appropriate industry and equipment noise and vibration standards.

6.108. Existing management regimes in place to protect against impacts from potential vessel discharges, oil spills, and vessel collisions are discussed in Section 8 of this recommendation report.

### Conclusions of assessment of impacts on EPBC Act listed threatened turtle species

6.109. Consistent with the assessment provided in the EIS, the department is of the view that impacts to EPBC Act listed threatened turtle species are likely to occur from:

- noise associated with pile driving activities associated with construction of the port and river facilities, and long-term impacts associated with maintenance dredging to maintain under keel clearance for ships;

- light regimes associated construction and operation of the Port (including shipping) that may prevent and/or hinder turtles nesting on the beaches in the vicinity of the proposed port, and adversely impact turtle hatchlings (including increased predation outside of, and within, marine environment in the vicinity of the port development). In particular, the department notes that no permanganate artificial light sources are currently occurring at the proposed port development site;
- capital and maintenance dredging program that will increase current turbidity levels (the department recognises that it is already a naturally turbid environment); increased physical disturbance and sediment deposition on benthic habitats, intertidal habitats, coral and reefs, and seagrass. In addition, listed turtle species could be entrained in Trailing Suction Hopper Dredger devices (suction pipes that trail from the dredger) ;
- vessel strikes resulting from the passenger ferry travelling to and from Weipa to the Hey terminal;
- direct impacts from port construction on turtle nests; and
- recreational use of the turtle nesting beaches by employees associated with the project, including disturbance of nesting activities, nests and hatchling movements, unless effectively prohibited by the proponent.

6.110. Although survey data presented in the EIS determined presence/absence of EPBC Act listed threatened turtle species in the project area, the surveys did not adequately detail abundance. Whilst the department is able to recommend that the proposed action will not result in unacceptable impacts to EPBC Act listed turtle species as a whole based on the data presented, further survey efforts are recommended to better inform management and mitigation of impacts from the action, for the life of the project.

6.111. The department notes that the marine environment for the proposed port development is undeveloped. Further the department considers that all of the impacts identified by the proponent for the proposed port development and river facilities, including the bauxite spills associated with ship loading, will lead to long term degradation of marine the environment and have significant residual impacts to listed turtle species foraging, nesting and traversing habitat.

6.112. To compensate for significant residual impacts to EPBC Act listed threatened turtle species, it is recommended that conditions be placed on the approval which require the proponent to prepare and implement a Feral Pig Management Offset Strategy to reduce current feral pig predation of turtle species' nests for the duration of the project. This was proposed as an offset measure in the EIS.

6.113. To manage marine and river impacts associated with the proposed action, it is recommended that a condition be placed on the approval requiring capital dredging activities to be conducted in accordance with the Port Dredge Management Plan and the River Dredge Management Plan at Appendix 7-C and Appendix 7-D of the EIS. Whilst this particular plan is sufficient to protect matters of national environmental significance, it is recommended that you condition the approval to require the proponent to develop and implement additional Maintenance Dredging Management Plans for all maintenance dredging activities associated with the proposed action.

6.114. To minimise impacts associated with pile driving, it is recommended that you condition the approval to outline a number of management processes that must be adhered to during the project's pile driving operations.

6.115. It is also recommended that you place a condition on the approval requiring the proponent to develop and implement a general Marine and Shipping Management Plan to cover all facets of the construction and operation of all marine related precincts, including but not limited to: the Port development; shipping activities in the Hey and Embley rivers; barge and ferry terminals; recreational uses of beaches; anchoring; and underwater noise.

6.116. The department is of the view that provided the mitigation measures are implemented and the recommended conditions are attached to the approval, long-term impacts to listed turtle species will not be unacceptable.

## EPBC ACT LISTED THREATENED ELASMOBRANCH SPECIES

### *Freshwater Sawfish (*Pristis microdon*)*

6.117. The vulnerable Freshwater Sawfish is a ray growing to 7 m in length.

6.118. The EIS states that the Freshwater Sawfish may occur in the lower reaches of rivers and coastal areas of the Project area. Suitable habitat is present in the brackish reaches of Norman Creek and the Ward River. The freshwater reaches of Norman Creek, including the middle tributary both upstream and downstream of where Dam C is proposed to be located, are not considered suitable habitat for sawfish species because these reaches are small, highly seasonal, lack large permanent pools and lack suitable schooling prey species.

6.119. While near-mature and mature animals may traverse the proposed new spoil ground and the Albatross Bay spoil ground, Freshwater Sawfish generally prefer inshore waters.

6.120. The EIS concludes that the lack of capture or observation of this species during targeted surveys supports the conclusion that the Freshwater Sawfish is rare in the vicinity of the Project area.

### *Dwarf Sawfish (*Pristis clavata*)*

6.121. The vulnerable Dwarf Sawfish is a small, robust, shark-like ray which is mostly greenish-brown on the dorsal surface and white underneath, with paler fins.

6.122. The EIS states the Dwarf Sawfish has not been recorded in surveys of the Project area but are considered likely to occur in shallow coastal areas and the estuarine and lower brackish reaches of the Project area's main drainage systems as suitable habitat is present at these sites. The species was previously recorded along the coastal shoreline within Albatross Bay.

6.123. The EIS concludes that the lack of capture or observation of this species during targeted surveys supports the conclusion that Dwarf Sawfish is rare in the vicinity of the Project area.

### *Green Sawfish (*Pristis zijsron*)*

6.124. The vulnerable Green Sawfish is a large ray with a shark-like body, a flattened head and an elongated snout or rostrum.

6.125. The EIS States the Green Sawfish has not been recorded in surveys of the Project area but it has been recorded from Albatross Bay (where the Hey and Embley Rivers discharge). The Project area, including the proposed Port and barge/ferry terminals in the Embley and Hey Rivers, contain suitable habitat for the species.

6.126. The distribution and population of Green Sawfish within the Gulf of Carpentaria is very patchy. Mortality in all populations in northern Australia needs to be reduced in

order to maintain genetic diversity within this region. Information on long term movements, as well as data on population genetic structure, is required to determine the status of the northern 'stock'.

6.127. The EIS concludes that the lack of capture or observation of this species during targeted surveys, supports the conclusion that the Green Sawfish is rare in the vicinity of the Project area. It is presumed that since it is a large species, and therefore capable of long distance movements along the coast, the species should form a continuous population. On that basis, the occurrence of Green Sawfish within the Project area would not be considered to represent an important population.

***Speartooth Shark (*Glyphis glyphis*)***

6.128. The critically endangered Speartooth Shark has only been captured in tidal rivers and estuaries within the Northern Territory and Queensland.

6.129. The EIS States that the Speartooth Shark has not been recorded in surveys of the Project area. It is considered that the Speartooth Shark may inhabit inshore marine coastal areas, such as adjacent to the entrance to the Hey River, although so far no specimens have been caught in a marine environment despite intensive sampling. The species has not been recorded in the Embley and Hey estuaries since 1985, despite extensive surveys over 20 years.

6.130. Given the locations and habitat in which the species has been previously documented as reported in the available secondary source information (including the Embley River), the EIS considers it unlikely that the species would occur within the vicinity of the proposed Port facilities, located approximately 35km southwest of the entrance to the Embley River.

6.131. The EIS concludes that the lack of capture or observation of this species during targeted surveys supports the conclusion that the Speartooth Shark is rare in the vicinity of the Project area.

<u>Known threats and likely impacts on EPBC Act listed threatened elasmobranch species</u>

6.132. The main threats to the above mentioned species are: gillnet fishing (including as bycatch); Indigenous harvest; shark finning (particularly the Green Sawfish which is targeted as a high value species); habitat modification/disturbance; and recreational 'trophy' fishing.

6.133. The Green Sawfish is also threatened by reproductive constraints. The low fecundity and late maturation of Green Sawfish render the species highly susceptible to anthropogenic mortality and limits the ability of the species to recover from other listed threats.

6.134. The EIS states that the proposed action may have the following impacts on EPBC Act listed threatened elasmobranch species:

***Dredging and offshore spoil disposal***

6.135. The EIS considers it unlikely that the Speartooth Shark would occur within the vicinity of the proposed Port facilities or offshore spoil disposal grounds, which are remote from the entrance to the Hey and Embley Rivers. The dredge footprint for the Port is also not located directly within any important habitats identified for the Dwarf Sawfish and the proposed dredge footprint for the Port is also small compared to the overall area of coastline and subtidal habitat available for these species.

6.136. The EIS asserts that proposed dredging activities within the Hey and Embley Rivers would result in negligible impacts to the viability of the adjacent mangrove

system, or to fisheries values or habitat essential to sawfish species and the Speartooth Shark.

6.137. The proposed new spoil ground would have a deposition area of approximately 1km radius from the centre of disposal. Both spoil grounds consist of soft sediment habitat, of which there is extensive similar habitat within and surrounding the Project area. Spoil disposal would be localised and would occur over a short time-frame over a small area in the proposed new spoil ground. These species are highly mobile and have the ability to move to similar habitats within or adjacent to the Project area.

***Marine and river facilities construction and operation***

6.138. In addition to the impacts identified in EPBC Act listed threatened turtle species of this recommendation report, a water supply dam (Dam C) would be constructed in a tributary of Norman Creek. This dam would reserve a sufficient amount of water to enable continued releases in the driest months of the year (August to October).

6.139. The EIS suggests that wet season freshwater flows are a cue for triggering sawfish pupping and that the alteration of flow could change the timing of reproduction and level of recruitment.

6.140. Once constructed, Dam C may also present a barrier to sawfish and the Speartooth Shark, were they to be present.

6.141. The EIS concludes the potential unmitigated impacts on sawfish species and the Speartooth Shark from potential restricted movement in riverine habitat associated with Dam C and changed downstream flow regime are considered negligible and to occur incrementally over a long period of time.

<u>Mitigation measures to reduce impacts to EPBC Act listed elasmobranch species</u>

6.142. As no significant potential impacts are anticipated, specific mitigation measures were not presented in the EIS. However, a number of mitigation measures proposed to be implemented for the protection of other marine and estuarine fauna and habitats would also reduce the risk of impacts on elasmobranch species (these are detailed in the EPBC Act listed threatened turtle species section of this recommendation report).

6.143. The department notes that the EIS does not identify or discuss potential impacts associated with surface water runoff into rivers and/or estuaries, such as increased sedimentation. However, the Environmental Management Plan for Sawfish Species and the Speartooth Shark (Appendix 7e of the final EIS) provides an outline for Surface Water Management as follows:

- Stormwater runoff shall be managed by constructing and maintaining appropriately sized stormwater management structures.
- An erosion and sediment management plan shall be developed prior to construction.

6.144. Surface water monitoring shall be conducted in accordance with the Queensland Coordinator-General's approval conditions:

- a network of at least 28 surface water monitoring locations shall be maintained. Locations shall be related to proximity to authorised surface water release points. The parameters to be monitored include pH, EC, turbidity, sulphate, suspended solids, aluminium, copper, lead, iron and zinc. Locations shall be monitored regularly to establish a statistical baseline (consistent with requirements of the Australian and New Zealand Conservation Council

[ANZECC] Guidelines for Fresh and Marine Water Quality [2000]) and also when any releases to surface water occur; and

- investigation trigger values for fresh and estuarine waters have been set based on the ANZECC Guidelines for Fresh and Marine Water Quality (2000) default values and site-specific contaminant limits for receiving waters are to be set based on the statistical baseline.

6.145. The department also notes that the proponent will be required to adhere to state legislative requirements as it relates to surface water quality management, including surface water runoff into waterways.

**Conclusion of assessment of impacts to EPBC Act listed elasmobranch species**

6.146. The department recommends that a condition be placed on the approval to require the proponent to develop and implement a Terrestrial Management Plan to cover all of the land based activities associated with the construction and operation of the project. This will include, but not be limited to, the management of potential stormwater and surface water related impacts.

6.147. The department is of the view that provided the mitigation measures are implemented and the recommended conditions are attached to the approval, long-term impacts to Freshwater Sawfish, Dwarf Sawfish, Green Sawfish and the Speartooth Shark will not be unacceptable.

**OTHER EPBC ACT LISTED THREATENED SPECIES AND COMMUNITIES**

6.148. Due to the nature of the habitat present within the vicinity of proposed action (and by cross-referencing with departmental databases [such as SPRAT]), it is unlikely that any other EPBC Act listed threatened species or communities would be impacted by the proposed action.

## 7. Listed migratory species (sections 20 and 20A)

7.1. The department's ERT identifies that a total of 40 EPBC Act listed migratory species may occur within a 20 km radius of the terrestrial footprint (report generated on 23 April 2013). In accordance with section 158A of the EPBC Act, only species listed under the EPBC Act at the time of the controlled action decision (15 March 2012) have been considered in this recommendation report.

7.2. Based on the location of the action and likely habitat present in the area, coupled with the data presented in the EIS, the department considers potential impacts may occur on the following migratory species:

**MIGRATORY MARINE SPECIES**

7.3. A number of migratory marine species relevant to proposed action are also listed threatened species and have been addressed in Section 6 of this recommendation report. The remaining species are addressed below.

***Indo-Pacific Humpback Dolphin (*Sousa chinesis*)***

7.4. The distribution of Indo-Pacific Humpback Dolphins in Australia is linked to the warm eastern boundary current. Known localities in Queensland include the Great Barrier Reef Marine Park; Moreton Bay; the lower reaches of the Brisbane River, and adjacent offshore waters. The total population size of the Indo-Pacific Humpback Dolphin in Australian waters is unknown. Indo-Pacific Humpback Dolphins inhabit shallow coastal, estuarine, and occasionally riverine habitats, in tropical and

subtropical regions. The species usually occurs close to the coast, generally in depths of less than 20 m, but they have been seen 55 km offshore in shallow water.

7.5. The EIS states that the Indo-Pacific Humpback Dolphin is known to occur at the proposed port site (4 individuals at Boyd Point), the Ferry/Barge terminals in Hey and Embley river (14 individuals), and along the shipping routes (including the GBR). The department notes that the species has also been sighted by a departmental officer during a site visit in 2011 and separately, by a state government officer in the Embley River. It is possible that the species occurs at the Albratross Bay and new spoil grounds. The proponent estimates an average of about 10 individuals may be present in the vicinity of the subject site.

***Australian Snubfin Dolphin (*Orcaella heinsohni*) (previously known as Irrawaddy Dolphin O. brevirostris)***

7.6. The Australian Snubfin Dolphin is an iconic, migratory species of the GBRWHA.

7.7. Records indicate that Australian Snubfin Dolphins occur only in waters off the northern half of Australia, on both coasts (from the Brisbane River on the eastern coast). All available data on the distribution and habitat preferences of Australian Snubfin Dolphins indicate that they mainly occur in one location: shallow coastal and estuarine waters of Queensland, Northern Territory and north Western Australia. There appears to be 'hotspots' of higher Australian Snubfin Dolphin densities along the Queensland coast and preliminary data suggest that they occur in small, localised populations.

7.8. The EIS states that the Australian Snubfin Dolphin is known to occur at the subject site (incidental sightings at the proposed port sight during surveying) and along shipping routes (including the GBR). The species is likely to occur in the Ferry/Barge terminals in Hey and Embley Rivers, and possibly occurs in the Albatross Bay and new spoil grounds. The Stranding Mortality Database Records identified an individual in south of the Gulf of Carpentaria. The proponent estimates an average of about 10 Australian Snubfin Dolphin may be present in the vicinity of the project area. The department notes that the Australian Snubfin Dolphin often co-exists with the Indo-Pacific Humpback Dolphin.

Known threats and likely impacts on migratory dolphins

7.9. The current threats to the Indo-Pacific Humpback and Australian Snubfin Dolphin include:

- habitat destruction and degradation - including noise pollution and harassment, particularly populations close to major cities. This threat is primarily a concern along the Queensland coast with existing high levels of construction, dredging, mining, land reclamation, resource extraction, agricultural development, commerce, tourism and recreational activities.
- pollution - The northern and north-western coastlines are relatively unpopulated compared to other areas within Indo-Pacific Humpback Dolphin's range. However, pollutants entering coastal and estuarine waters along Australia's northern coastline come from many different sources (e.g. industrial and sewage discharges, catchment runoff and groundwater infiltration) and include heavy metals, pesticides, herbicides, nutrients and sediments. The ecological significance of these contaminants on populations of Indo-Pacific Humpback and Australian Snubfin Dolphin species along the north coast are not known.

- vessel traffic - the frequencies of whistles (1.2-16 kHz) and broad band clicks (2-22 kHz) produced by Australian Indo-Pacific Humpback Dolphins overlap with the frequencies emanating from boat traffic, suggesting that noise pollution may be a problem for this species. The coastal near-shore distribution of Australian Snubfin Dolphins leads to the high probability of interactions with vessels. Boat traffic in densely populated areas of the Queensland coast has increased dramatically in the past decade, with predictions that this will increase even further in future years. Australian Snubfin Dolphins can be expected to exhibit vessel avoidance behaviour, potentially negatively affecting their extent of occupancy and life history, as per other nearshore dolphins. Additionally, the frequencies of whistles produced by Australian Snubfin Dolphins are likely to fall within the range often emanating from boat traffic, suggesting that noise pollution may a problem for this species.
- slow reproductive rate - the calving interval of this species is unknown, however, as per most *Delphinidae*, it is expected to be approximately one calf born per two to three years. This low reproductive rate could result in a slow population recovery from any threatening processes.

7.10. The EIS states that the impacts to the species may result from the following aspects of the proposed action:

- dredging and offshore spoil disposal – physical disturbance to benthic or intertidal habitats from dredging; creation of turbidity plume; deposition of dredged sediments on benthic habitat; and, entrainment in dredge activities;
- marine and river facilities – underwater acoustic impacts from pile driving and vessel movements; and
- shipping activities – underwater acoustic impacts from pile driving and vessel movements; marine oil spill; and vessel strike.

***Bryde's Whale (*Balaenoptera edeni*)***

7.11. Migratory Bryde's Whales are found year-round in waters between 40° S and 40° N, primarily in temperatures exceeding 16.3 °C. The coastal form of Bryde's Whale appears to be limited to the 200 m depth, moving along the coast in response to availability of suitable prey, whilst the offshore form is found in deeper water (500 m to 1000 m). This suggests that Bryde's Whales use the upper layers of the ocean, and can therefore be considered pelagic. Insufficient information exists as to how Australian Bryde's Whales use their habitat, as no specific feeding or breeding grounds have been discovered off Australia.

7.12. The EIS states that there have been no specific surveys of Bryde's Whales within Australian waters. There is no data within the literature that allows for an estimate of the Bryde's Whale population within the vicinity of the Project area or the greater Gulf of Carpentaria region.

7.13. The EIS further states that based on a combination of the secondary source information and the lack of any observation of this species in the area and limited suitable habitat, it is considered likely that abundance would be very low, if it occurs at all. Similarly there is a lack of information regarding the migratory habits of the species and habitat use as it may be applied to the Project.

7.14. However, anecdotal observations from local fishermen have identified the Bryde's Whale occurring within the Weipa Region, and as such, it is likely to occur in

all areas of the project site, except the ferry/barge terminals in the Hey and Embley Rivers.

Known threats and likely impacts on the Bryde's Whale

7.15. The known threats for Bryde's Whale are:

- Pollution, including increasing amounts of plastic debris at sea, oil spills and dumping of industrial wastes into waterways and the sea are leading to bio-accumulation of toxic substances in body tissues of marine mammals. The coastal form of Bryde's Whale may be particularly threatened by discarded plastic;
- Direct disturbance (such as seismic and/or defence operations);
- Collisions with large vessels;
- Entanglement in fishing gear; and
- Commercial fisheries, particularly species such as anchovy, may also affect these animals.

7.16. Likely impacts are the same as detailed in the EPBC Act listed threatened turtle species section of this Recommendation Report.

***Dugong (*Dugong dugon*)***

7.17. A significant proportion of the world's Dugongs are found in north Australian waters from Shark Bay, Western Australia, in the west, to Moreton Bay, Queensland, in the east. Considerable populations occur throughout this region, particularly in the Gulf of Carpentaria (Northern Territory and Queensland), the northern Queensland coast and the northern Western Australian coast. In the eastern Gulf of Carpentaria, survey results have indicated that this area supports Queensland's third largest population of Dugong (approximately 4000 animals), and is among the six most important Dugong habitats in Australia. The Torres Strait region is the most important Dugong habitat in the world, while the northern Great Barrier Reef region (from Hunter Point to Cape Bedford near Cooktown, Queensland) is the most important Dugong location within the Great Barrier Reef Marine Park and one of the most important locations Australia-wide. Together these regions contain the largest Dugong population in the world.

7.18. At least some individual Dugongs undertake long-distance movements. Survey details provided in the departmenral SPRAT database states that an adult female moved 600 km between two sites in the Gulf of Carpentaria over about five days. The reasons for such movements are unknown but may be associated with the tendency of their seagrass food to be emphemeral. Results of a time series of aerial surveys in Queensland and Western Australia also suggest large-scale movements of Dugongs between seagrass beds.

7.19. While Dugongs frequent coastal waters, they also use estuarine creeks and streams and have been tracked travelling within creeks upstream for several kilometres. Feeding aggregations tend to occur in wide, shallow protected bays; wide, shallow mangrove channels; and in the lee of large inshore islands. These areas are coincident with sizeable seagrass beds. Dugongs are also regularly observed in deeper water further offshore in areas where the continental shelf is wide, shallow and protected.

7.20. The EIS states that the Dugong is known to occur at the proposed Port site and ferry/barge terminals in the Hey and Embley rivers; is likely to occur along the

shipping routes (including the Great Barrier Reef); and may possibly occur at the Albatross Bay and new spoil grounds. Incidental surveying was undertaken for the species and no individuals were recording. However, anecdotal records from Traditional Owners report the species does migrate through Boyd Bay. In the lower Ward River Estuary, Dugong feeding rails were observed in seagrass beds, comprising two seagrass species *Halophila ovalis* and *Halodule pinifolio.*

7.21. The EIS states that the absence of sightings of the dugong in the project area (the department notes that only incidental surveying was undertaken for this species) supports previous studies that suggest the project area is likely to represent a low proportion of the Queensland Gulf of Carpentaria coast population.

7.22. The department notes that loss or damage to small, but isolated seagrass meadows may affect the ability of dugongs to move between their feeding grounds in the southern Gulf of Carpentaria. This is supported by Section 9, Figure 9.3, page 9-27 of the Final EIS that shows historical records of dugongs found along the eastern Gulf of Carpentaria (including the Aurukun/Weipa region).

Known threats and likely impacts on the Dugong

7.23. The current threats to the Dugong species are:

- incidental catch;
- habitat loss and degradation (particularly seagrass ecosystems);
- indigenous harvest;
- boat strike and boating activities;
- tourism (including Dugong watching and harassment);
- acoustic pollution (Dugongs are believed to have acute hearing within narrow sound thresholds and can caused by vessel traffic, low flying aircraft);
- chemical pollution (several environmental contaminants have the potential to cause harm to Dugongs including: oil from oil spills and the subsequent use of dispersants; heavy metals such as those associated with ports established to load metal ores; and pesticides. Polychlorinated dibenzodioxins seem to be the most significant ogranchlorine pesticide pollutant bioaccumulated in Dugongs;
- disease and parasites;
- capture stress;
- aquaculture; and
- tidal surges (tidal surges from tropical cyclones, for example, cause Dugongs to become stranded).

7.24. The EIS states that potential direct impacts associated with dredging and offshore spoil disposal on Dugong include: physical disturbance to benthic or intertidal habitats from dredging; creation of turbidity plume; deposition of dredged sediments on benthic habitat; and entrainment in dredge.

7.25. Construction activities have the potential to impact on Dugongs and their habitat. The potential impacts include physical disturbance to benthic or intertidal habitats from piling; and underwater acoustic impacts from pile driving.

7.26. Further, project-related shipping activities have the potential to impact on Dugongs and their habitat. The potential direct impacts include underwater acoustic impacts from vessel movement; marine oil spill; and vessel strike.

Mitigation measures to minimise likely impacts on migratory marine species

7.27. The proponent has proposed a number of mitigation measures to address identified impacts on migratory marine species. These are the same as detailed in the EPBC Act listed threatened species section of this Recommendation Report.

**Conclusion of assessment of impacts on migratory marine species**

7.28. The department's Marine Division advised on 3 April 2013 that the EIS does not provide sufficient information or analysis that allows for an assessment of the relative importance of habitat and populations of inshore dolphins found within the vicinity of the proposed action. Marine Division noted that information describing relative abundance, habitat use and fidelity, and movement patterns needs to be collected to assess potential impacts attributable to noise, vessel strike and habitat degradation to ensure better management of the species in the region.

7.29. The department notes that the marine environment for the proposed port development is undeveloped. Further the department considers that all of the impacts identified by the proponent for the proposed port development and river facilities, including the bauxite spills associated with ship loading, will lead to long term degradation of the marine environment and have significant residual impacts to listed marine species.

7.30. To compensate for significant residual impacts on the habitat (marine environment) for listed migratory marine species, including the Australian Snubfin and Indopacific Dolphin, it is recommended that you condition the approval to require the proponent to implement an Inshore Dolphin Offset Research Strategy. This strategy will require the proponent to identify and undertake research to inform better knowledge of local and regional populations of inshore dolphin species in the Western Cape York area, including but not limited to: distribution; presence/absence, and magnitude of abundance surveys; and identification of habitat utilised by the species.

7.31. Throughout this Recommendation Report, the department has proposed a number of additional conditions, including for the development and implementation of a Marine and Shipping Management Plan and Maintenance Dredging Management Plans, as well as prescriptive conditions to manage pile driving and boating activities (including speed limits etc.). These conditions will also ensure better protection of migratory marine species.

7.32. The department is of the view that provided the mitigation measures are implemented and the recommended conditions are attached to the approval, long-term impacts to migratory marine species will not be unacceptable.

**MIGRATORY BIRD SPECIES**

***International Migratory Shorebirds***

7.33. The EIS states that the following international migratory shorebirds were confirmed as being present within the subject site, during surveys:

- Lesser Sand Plover (*Charadrius mongolus*);
- Eastern Curlew (*Numenius madagascariensis*);
- Whimbrel (*Numenius phaeopus*);

- Common Greenshank (*Tringa nebularia*); and
- Marsh Sandpiper (*Tringa stagnatilis*).

7.34. The EIS states that the following international migratory shorebirds are likely to occur within or utilise the subject site:

- Common Sandpiper (*Actitis hypoleucos*);
- Green Knot (*Calidris tenuirostris*); and
- Latham's Snipe (*Gallinago hardwickii*).

7.35. The EIS states that the following international migratory shorebirds may possibly occur within or utilise the subject site:

- Sharp-tailed Sandpiper (*Calidris acuminate*);
- Red Know (*Calidris canutus*);
- Curlew Sandpiper (*Calidris ferruginea*);
- Red-necked Stint (*Calidris ruficollis*);
- Greater Sand Plover (*Charadrius leschenaultii*);
- Oriental Plover (*Charadrius veredus*);
- Grey-tailed Tattler (*Heteroscelus brevipes*);
- Asian Dowitcher (*Limnodromus semipalmatus*);
- Bar-tailed Godwit (*Limosa lapponica*);
- Black-tailed Godwit (*Limosa limosa*);
- Little Curlew, Little Whimbrel (*Numenius minutes*);
- Pacific Golden Plover (*Pluvialis fulva*);
- Grey Plover (*Pluvialis squatarola*); and
- Terek Sandpiper (*Xenus cinereus*).

7.36. Avian species considered 'shorebirds' may occur across a number of habitat types but are primarily associated with wetlands and coastal areas. Species considered international migratory shorebirds are those listed under the Birds Australia migratory shorebirds species list which undertake annual migration between the northern and southern hemisphere.

7.37. As part of this annual migration, international migratory shorebirds arrive in Australia each spring and disperse throughout the continent to feeding grounds amongst coastal and inland wetland habitats.

7.38. The EIS states that the subject site is situated within the East Asian-Australasian Flyway for transequatorial migratory waders, which is an area encompassing eastern Asia and Australasia tha hosts the primary movement pathways for the majority of migratory shorebirds visiting Australia. The Gulf of Carpentaria is regarded as one of the main access pathways for these species into Australia.

7.39. Within the Gulf of Carpentaria, the southeast Gulf is recognised as a key site for international migratory shorebirds with extensive wet season wetland habitats and tidal flats providing productive feeding grounds. It is anticipated that the majority of individuals that utilise the southeast Gulf areas access these areas directly, rather than work their way down the west coast of Cape York Peninsula (including the area

covered by the Project). The EIS argues that the Weipa Plateau sub-region is not regarded as a particularly significant feeding ground for these birds although small numbers can be observed along the coastline and within associated estuarine habitats.

7.40. The EIS notes that the number of birds utilising habitats within the sub-region is not known but based on reporting rates of species on Cape York Peninsula and in the Gulf of Carpentaria from annual surveys the sub-regional population is apparently a very small component of the overall number of individuals that have been recorded in the southeast Gulf sites and that utilise the East Asian-Australasian Flyway.

7.41. These birds are most commonly present in Australia from October to March and the return migration occurs from March to early June, although some non-breeding individuals may remain throughout the year.

***Waterbirds***

7.42. The EIS states that the following international migratory shorebirds were confirmed as being present within the subject site, during surveys:

- Clamorous Reed-Warbler (*Acrocephalus stentoreus*);
- Great Egret, White Egret (*Ardea alba*);
- Eastern Reef Egret (*Egretta sacra*); and
- Glossy Ibis (*Plegadis falcinellus*).

7.43. The EIS states that the Sarus Crane (G*rus antigone*) is also likely to occur within or utilise the subject site.

7.44. Bird species considered waterbirds are those which may inhabit a variety of wetland habitats across both terrestrial and coastal ecosystems. These species are not listed on the Birds Australia shorebirds species list.

7.45. The EIS states that all of the above mentioned waterbird species are commonly encountered within the Weipa Plateau sub-region, although the population of each species within the sub-region and wider Cape York area has not been determined. All five waterbird species are known to utilise a variety of natural and man-made habitats but primarily use the extensive estuarine and freshwater habitats that occur within the sub-region along the Western Cape York coastline.

7.46. The EIS noted that migratory patterns of waterbirds in the Cape York Peninsula bioregion are not well documented but in the primarily freshwater species comprising Clamorous Reed-Warbler, Great Egret, Sarus Crane and Glossy Ibis are most likely associated with the seasonal availability of wetland habitats. Specifically, as wetland habitats filled by wet season rains dry up, foraging opportunities diminish and birds move to alternative wetland habitat. It is likely that by the end of the dry season most of these species have moved to the most persistent wetland habitats that provide refugial foraging areas until wet season rains re-commence.

***Seabirds***

7.47. The EIS states that the following seabirds were confirmed as being present within the subject site, during surveys:

- Great Frigatebird (*Fregata minor*);
- Lesser Frigatebird (*Fregata ariel*); and
- Little Tern (*Sterna albifrons*).

7.48. The Streaked Shearwater (*Calonectris leucomelas*) was provisionally identified during a literature review; however, this species utilises open ocean habitat and is considered unlikely to occur within the area which would be impacted by the Project.

7.49. Seabirds are those birds which frequent the coastal waters and the open ocean. Seabirds are known to disperse long distances across the open ocean and breed in colonies on offshore islands.

***Woodland birds***

7.50. The EIS states that the following woodland birds were confirmed as being present within the subject site, during surveys:

- Rainbow Bee-eater (*Merops ornatus*);
- Satin Flycatcher (*Myiagra cyanoleuca*);
- Rufous Fantail (*Rhipidura rufifrons*).

7.51. The EIS states that the Oriental Cuckoo (*Cuculus saturatus*) is also likely to occur within or utilise the subject site.

7.52. The EIS states that the Black-faced Monarch (*Monarcha melanopsis*) may possibly occur within or utilise the subject site.

7.53. Woodland bird species are associated with a variety of terrestrial habitats including Eucalypt woodlands, vine thickets and riparian gallery communities. These species tend to seasonally migrate throughout the country or region, and/or are locally nomadic.

7.54. The EIS states that the Rainbow Bee-eater and the Oriental Cuckoo are both known to occur within the sub-region and may be found in a wide variety of habitat types. The Rainbow Bee-eater is particularly abundant in open habitats or along the edge of dense habitat types such as riparian gallery forest, and the complex of open and timbered habitats in coastal areas, including beaches. The Oriental Cuckoo is typically less numerous in occurrence but may be found in a variety of habitats including natural forests and woodlands and more open areas, including parks and gardens. Both species have the potential to occupy all habitats within the Project area. The Rainbow Bee-eater was observed during field surveys at numerous locations and in a variety of habitats. The species was most abundant in riparian, wetland and beach habitats but was also present in Darwin Stringybark woodland. The Rainbow Bee-eater is likely to occur in areas to be disturbed by construction and mining but is also widespread and common in areas that would not be disturbed. The Oriental Cuckoo was not observed during field surveys but it is considered likely to occur.

7.55. The Satin Flycatcher and the Rufous Fantail have been recorded from the sub-region and are commonly observed in the Weipa area. The Rufous Fantail was observed within the Project area during field surveys and the Satin Flycatcher is confirmed to occur in the Project area. Both species occupy forest and woodland habitats usually where there is deep shade and complex vegetation structure. Favoured habitats include riparian gallery forest, vine forest, Melaleuca forest and mangroves.

7.56. The EIS further notes that the Black-faced Monarch has been recorded from the Weipa area but is not recorded from the west coast of Cape York south of Weipa. The species could possibly occur in the Project area in association with relatively dense, moist habitats including riparian gallery forest, vine forest, Melaleuca forest and mangroves.

***Other migratory bird species***

7.57. The EIS states that the following migratory birds were confirmed as being present within the subject site, during surveys:

- White-bellied Sea-eagle (*Haliaeetus leucogaster*);
- Eastern Osprey (*Pandion cristatus*);
- Fork-tailed Swift (*Apus pacificus*); and
- White-throated Needletail (*Hirundapus caudacutus*).

7.58. The EIS states that the Barn Swallow (*Hirundo rustica*) may possibly occur within or utilise the subject site.

7.59. The EIS noted that the White-bellied Sea-eagle is considered a breeding resident throughout its range in Australia. Whilst breeding adult pairs are generally sedentary, juveniles and some adult birds would undertake long distance dispersal. Similarly, the Eastern Osprey is mostly resident or sedentary around breeding territories, but will forage widely and may disperse over large areas during non-breeding periods. The EIS argues that as clearly defined movement patterns (e.g. north-south breeding migration) are not known for these species, a figure depicting migratory patterns was unable to be produced.

7.60. The White-Throated Needletail and Fork-Tailed Swift were confirmed in the Project area during field surveys. Both species are non-breeding migrants to Australia and are exclusively aerial, spending day and night on the wing. These species fly above a wide range of habitats and are expected to use the airspace across the Project area. Both aerial species migrate to Australia from breeding grounds in Siberia, arriving around October and leaving again by mid- March.

7.61. The EIS states that the Barn Swallow was identified during literature reviews as a likely inhabitant of the sub-region but was not observed during field surveys of the Project area. The Barn Swallow is widespread in the northern hemisphere and non-breeding individuals may migrate south to northern Australia during the summer months (September to March) during which time it may be present within the Project area.

<u>Likely impacts on migratory bird species</u>

7.62. The EIS states that the only potential important habitat of a migratory avian species that occurs in proximity to the Project area are over-water foraging areas for the Lesser Frigatebird off the Project area and the roosts of the Lesser and Great Frigatebird located near the Weipa township. The limited disturbance in the foraging area mean there is unlikely to be an impact on the Lesser Frigatebird and the roost areas do not occur within the Project area and would not be impacted by the Project.

7.63. The EIS argues that the largest impacts to general habitat would be for species that use the Darwin Stringybark woodland (i.e. Rainbow Bee-eater/Oriental Cuckoo; Barn Swallow, and aerial species group). However, overall impact to these habitats would be minor as it would be progressively rehabilitated and there is a significant amount of similar general habitat in the Project area and subregion which would not be impacted.

7.64. The EIS notes that Migratory bird species may be affected in the short-term by noise and/or movement originating from operational activities, such as clearing and operating heavy vehicles. However, the EIS argues that bird species would

generally temporarily move away from the source to avoid these impacts and would return to the area when the disturbance ceases.

7.65. As with noise, disturbance from light may have a short-term effect on migratory avian species. However, the EIS again argues that birds would generally move away from any bright light to avoid being exposed. As much of the mine infrastructure and mining area is situated within timbered habitats, light emissions would generally be attenuated within a short distance upon entering vegetated areas and the affected area subsequently minimised.

Mitigation measures to minimise likely impacts on migratory bird species

7.66. The proponent states that species specific mitigation measures are not required. However, other avoidance and mitigation measures that would be implemented to protect listed threatened flora species and their habitat would also reduce the risk of impacts on migratory bird species. These measures are detailed in the EPBC Act listed threatened flora species section of this recommendation report.

Conclusion of assessment of likely impacts on migratory bird species

7.67. Throughout this Recommendation Report, the department has proposed a number of conditions, including for the development and implementation of a Progressive Rehabilitation Strategy, a Terrestrial Management Plan, and Port and River Dredge Management Plans, as well as the implementation of buffer zones. These conditions will also ensure better protection of migratory bird species.

7.68. The department is of the view that provided the mitigation measures are implemented and the recommended conditions are attached to the approval, long-term impacts to migratory bird species will not be unacceptable.

## OTHER MIGRATORY SPECIES

### *Estuarine Crocodile (*Crocodylus porosus*)*

7.69. The Estuarine Crocodile is found in Australian coastal waters, estuaries, freshwater sections of lakes, inland swamps and marshes, and its distribution ranges from Rockhampton in Queensland throughout coastal Northern Territory to King Sound (near Broome) in Western Australia. In Queensland the Estuarine Crocodile inhabits reef, coastal and inland waterways from Gladstone on the east coast, throughout the Cape York Peninsula and west to the Queensland-Northern Territory border. Population estimates for the species in Australia range between 100,000 to 200,000.

7.70. The EIS states that surveying for the Project relating to the distribution and abundance of Estuarine Crocodiles was collected opportunistically and to assess the potential impacts of Project activities on Estuarine Crocodile populations, a dedicated boat-based spotlight survey was undertaken over two nights in November and December 2008 lower Ward River, downstream of the Project area.

7.71. The Estuarine Crocodile was recorded in all freshwater and marine habitats across the Project area, including freshwater swamps and inland streams. Surveys recorded 55 individual sightings of the species within or downstream of the Project area, and indicate that the species occupies the freshwater reaches of Norman Creek, Winda Winda Creek and the Ward River during the wet season. Habitat utilisation appears to change seasonally, with more use made of inland freshwater habitats during the wet season, including the middle and upper reaches of groundwater-fed tributaries of Norman Creek and Coconut Creek. Overall, the species is widespread and numerous within the Project area.

7.72. Several nests and hatchling aggregations were located within the Project area on the middle reaches of Norman Creek and the lower reaches of the Ward River. An unused nest was located on the middle reaches of Winda Winda Creek. It appears that these locations may be favoured for nesting over downstream paperbark wetlands due to the inundation of these latter areas by freshwater flows during the wet season.

Known threats and likely impacts to the Estuarine Crocodile

7.73. In Australia, threats to the Estuarine Crocodile include incidental mortality from fishing nets and habitat destruction. In Arnhem Land, Northern Territory, feral animals such as buffalo destroy wetland habitat by increasing drainage and reducing vegetation.

7.74. The EIS states that potential unmitigated impacts on the Estuarine Crocodile during the construction and operational stages of the Project may result from dredging and offshore spoil disposal, construction and operation of the marine and river facilities, and the operation of Dam C.

7.75. The department notes that although the Table 9-3, page 9-13 of the EIS suggests that underwater acoustic impacts from pile driving is a direct impact, the EIS goes on to state that:

- underwater noise is not identified as a potential impact on Estuarine Crocodiles;
- the species is known to occur within the vicinity of the marine facilities within the Embley River, where similar construction and operational activities have been conducted; and
- the species would be expected to continuing utilising environments surrounding the Project marine facilities.

7.76. Field surveys found one nest located within the proposed footprint of Dam C. This location would be inundated by the dam. The potential freshwater nesting habitat of Estuarine Crocodiles totals 71.3km of stream reaches in Winda Winda Creek, Norman Creek, Ward River and their associated tributaries.

- It is unclear whether the Dam C would affect access of breeding females to potential freshwater habitat upstream and whether juveniles potentially hatched upstream of the Dam C would be exposed to increased mortality rates in traversing to lower reaches as stream flows recede in the dry season.

Mitigation measures to minimise likely impacts to the Estuarine Crocodile

7.77. The proponent states that species specific mitigation measures are not required. However, other avoidance and mitigation measures that would be implemented to protect listed turtle species and listed migratory marine species, as well as listed flora species and their habitats would also reduce the risk of impacts on the Estuarine Crocodile. These measures are detailed in the migratory marine species section of this Recommendation Report.

7.78. Throughout this Recommendation Report, the department has proposed a number of additional conditions, including for the development and implementation of buffer zones, a Marine and Shipping Management Plan, and Dredging Management Plans. These conditions will also ensure better protection of migratory marine species.

7.79. The department is of the view that provided the mitigation measures are implemented and the recommended conditions are attached to the approval, long-term impacts to the Estuarine Crocodile will not be unacceptable.

## 8. World Heritage Properties (sections 12 and 15A) and National Heritage places (sections 15B and 15C)

8.1. The proposed mine, port, and associated infrastructure areas are located approximately 370 km from the Great Barrier Reef World Heritage Area (**GBRWHA**) and National Heritage Place (by line of shipping route). However, the proposed action is expected to result in an increase in ship movements through the GBRWHA and National Heritage Place.

8.2. The GBRWHA was inscribed on the World Heritage List in 1981 for all four of the natural heritage criteria specified in the United Nations Educational, Scientific and Cultural Organisation's 2012 Operational Guidelines for the Implementation of the World Heritage Convention; criteria (vii), (viii), (ix) and (x).

8.3. The current natural heritage criteria for World Heritage properties are that they:

vii. contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance;

viii. be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features;

ix. be outstanding examples representing significant on-going ecological and biological processes in the evolution and development of terrestrial, fresh water, coastal and marine ecosystems and communities of plants and animals; and

x. contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of Outstanding Universal Value from the point of view of science or conservation.

8.4. The above criteria contribute to the outstanding universal value (OUV) of the property. Also encompassed in the OUV of the property is its integrity (i.e. the wholeness and intactness of the property and its ability to convey the values it holds), and the protection and management regime in place for the property.

8.5. The Great Barrier Reef was one of 15 World Heritage properties included in the National Heritage List in 2007. The National Heritage values of the Great Barrier Reef are the same as the World Heritage criteria:

a. the place has outstanding heritage value to the nation because of the place's importance in the course, or pattern, of Australia's natural or cultural history;

b. the place has outstanding heritage value to the nation because of the place's possession of uncommon, rare or endangered aspects of Australia's natural or cultural history;

c. the place has outstanding heritage value to the nation because of the place's potential to yield information that will contribute to an understanding of Australia's natural or cultural history;

d. the place has outstanding heritage value to the nation because of the place's importance in demonstrating the principal characteristics of:

i. a class of Australia's natural or cultural places; or

ii. a class of Australia's natural or cultural environments;

e. the place has outstanding heritage value to the nation because of the place's importance in exhibiting particular aesthetic characteristics valued by a community or cultural group.

8.6. The GBRWHA stretches more than 2,300 km along the northeast coast of Queensland, from the tip of Cape York to just north of Bundaberg. Its outer boundaries are defined by coordinates of latitude and longitude. Its width varies from around 90 km to around 300 km.

8.7. The Great Barrier Reef Marine Park Authority (**GBRMPA**) identified in its 2009 Outlook Report, over 40 emerging threats to the health of the Great Barrier Reef, and its ability to retain its OUV.

8.8. Of these threats, the following were identified by GBRMPA as 'very high risk', meaning that they are either likely to almost certain to occur, and may have major or catastrophic consequences reef-wide:

- climate change and the associated increase in sea level and sea temperature;
- rural and agricultural developments and catchment runoff;
- urban and industrial development and runoff; and
- resource extractions such as fishing.

8.9. The following emerging threats were identified by GBRMPA as 'medium risk' but are also highly relevant to this project:

- dredging and spoil dumping;
- boat strike; and
- clearing coastal habitats.

8.10. An assessment of impacts to matters of national environmental significance (including OUV) as a result of the proposed action is detailed below. Assessment has included the direct, indirect and cumulative impacts of the proposed action. Many issues are relevant to more than one criterion; however they are only described under one criterion to avoid repetition. For the purposes of consistency, all shipping data is provided in terms of 'ship movements', being one movement in one direction (either to or from a Port).

**Assessment under criterion (vii)**

8.11. **The criterion states:** *contain superlative natural phenomena or areas of exceptional natural beauty and aesthetic importance.*

8.12. The retrospective statement of outstanding universal value of the GBRWHA, adopted by the UNESCO World Heritage Committee in 2012, describes how the Great Barrier Reef meets this criterion as follows:

*The GBR is of superlative natural beauty above and below the water, and provides some of the most spectacular scenery on earth. It is one of a few living structures visible from space, appearing as a complex string of reefal structures along Australia's northeast coast.*

*From the air, the vast mosaic patterns of reefs, islands and coral cays produce an unparalleled aerial panorama of seascapes comprising diverse shapes and sizes. The Whitsunday Islands provide a magnificent vista of green vegetated islands and spectacular sandy beaches spread over azure waters. This contrasts with the vast mangrove forests in Hinchinbrook Channel, and the rugged vegetated mountains and lush rainforest gullies that are periodically cloud-covered on Hinchinbrook Island.*

*On many of the cays there are spectacular and globally important breeding colonies of seabirds and marine turtles, and Raine Island is the world's largest green turtle breeding area. On some continental islands, large aggregations of over-wintering butterflies periodically occur.*

*Beneath the ocean surface, there is an abundance and diversity of shapes, sizes and colours; for example, spectacular coral assemblages of hard and soft corals, and thousands of species of reef fish provide a myriad of brilliant colours, shapes and sizes. The internationally renowned Cod Hole near Lizard Island is one of many significant tourist attractions. Other superlative natural phenomena include the annual coral spawning, migrating whales, nesting turtles, and significant spawning aggregations of many fish species.*

8.13. Based on this statement, the department considers that the proposed action may impact on the OUV of the GBRWHA through impacts on visual amenity (above the ocean surface).

***Visual amenity within the shipping channel and surrounding areas (above the ocean surface)***

8.14. Visual amenity impacts occur from changes in the physical landscape, which may give rise to changes in its visual character and how it is experienced. This may in turn affect the perceived value of the visual landscape.

8.15. Due to the distance of the terrestrial and Port development from the GBRWHA (370 km), visual impacts are only anticipated to arise from an increase in ship movements, which may interfere with the natural beauty of the property when viewing it from the mainland or from adjacent islands.

Likely impacts

8.16. A summary of ship movements travelling from the area to ports within the GBRWHA (including Gladstone and Cairns) is presented at Table 2.

***Table 2*** *– A representation of ship movements from the Gulf of Carpentaria to the GBRWHA per annum.*

| **Ship Movements** | **Cargo** | **Fuel** | **Bauxite** | **Total** |
|---|---|---|---|---|
| Existing – before Project | 208 | 0 | 540 | 748 |
| Potential additional – at maximum Project production | 92 | 0 – 44* | 60 | 152 – 196* |
| **Total** | **300** | **0 – 44*** | **600** | **900 – 944*** |

Note: GBRMPA estimates cumulative shipping to equal 14,455 ship movements per annum through the GBRWHA by 2020.

* Fuel is currently proposed to be supplied from Darwin; however this may change to a supplier on the east coast of Australia during the life of the Project.

8.17. The EIS states that bauxite has been transported from the Port of Weipa along the same shipping route (known as the 'inner GBR Designated Shipping Area') to the Port of Gladstone for over 40 years. The EIS predicts that in 2015, prior to the commencement of shipments from the proposed Port, there will be approximately 540 bauxite ship movements per annum from the Port of Weipa to the Port of Gladstone, depending on international market demand and vessel size.

8.18. The EIS asserts that following commencement of the bauxite production associated with the proposed action, the ship movements through the GBRWHA would continue to be the ship movements required to meet the needs of the existing

aluminia refineries in Gladstone and would use the same inner GBR Designated Shipping Area as is used at present. At maximum production, an additional 60 ship movements may occur per annum (this number takes account of possible fluctuations in the future of ship movement numbers due to variation in bauxite grade quality and in aluminia production at the Gladstone refineries, within the scope of the existing approvals for the refineries).

8.19. The proposed action will also result in an increase in shipping within the GBRWHA associated with the supply of construction and operation cargo.

8.20. The EIS states that cargo deliveries required for construction will likely result in an annual average of 86 additional barge movements between Cairns and the Port of Weipa during the 30 to 36 month construction period. The Cairns to Weipa barge service traverses the GBRWHA from the Port of Cairns in the south to Cape York in the north and follows the inner GBR Designated Shipping Area. The barge service is owned and operated by a third party.

8.21. The EIS states that an additional 92 barge ship movements per annum are estimated to be required at maximum production, to provide for the predicted associated population increase (this would be in addition to the 208 barge ship movements per annum of existing deliveries).

8.22. The EIS notes that fuel supplies are likely to continue from the Port of Darwin and would not travel through the GBRWHA; however, the source may change in future to another port (possibly from the east coast of Australia) depending upon arrangements managed by the supplier.

8.23. The EIS states that the inner GBR Designated Shipping Area is aligned adjacent to and on the ocean side of both the Whitsunday Islands and Hinchinbrook Island. Shipping activities associated with the project will travel close to the Whitsunday Islands but will occur with a separation distance which excludes vessels from compulsory pilotage.

8.24. Recreational users of the GBRWHA will see these ships, together with existing ships in designated shipping routes. The inner route in particular passes between the outer reef and the mainland, and ships using this route are visible to recreational and tourism vessels which may be travelling from the mainland to the reef. Generally, views of ships are not seen as being particularly intrusive, with the majority of shipping channels located in excess of 10 km offshore. All ships are required to stay within the designated shipping areas.

<u>Cumulative shipping impacts</u>

8.25. The EIS notes that approximately 9,700 ship movements from major Great Barrier Reef ports were reported to utilise the Great Barrier Reef shipping channels (with some 65-75% of these ship movements utilising the inner GBR Designated Shipping Area) as at 2007.

8.26. Based on referrals currently under assessment by the department, including the various Abbot Point coal terminals, Hay Point, Gladstone and Townsville ports, the EIS estimates that 14,455 ship movements per annum would utilise the inner GBR Designated Shipping Area (this information is sourced from GBRMPA's 2012 *Ports and Shipping Information Sheet*).

8.27. The EIS states that predicted operational shipping movements associated with the proposed action would equate to 1 per cent (1%) of the estimated 14,455 ship movements in the inner GBR Designated Shipping Area. Adding cargo ship movements, the EIS estimated that the proposed action would account for 6.2 per

cent (6.2%) of the estimated 2020 ship movements through the inner GBR Designated Shipping Area.

***Visual amenity within the shipping channel and surrounding areas (below the ocean surface)***

8.28. Impacts to visual amenity associated with water quality are assessed in the EIS as being negligible, and as such, no specific safeguards, avoidance or mitigation measures are proposed. However, the EIS details a number of existing management practices that are relevant to the proposed action:

- all bauxite shipping will manage ballast water through a Ballast Water Management Plan which would comply with Australian mandatory requirements (the Australian Ballast Water Management Requirements, and the International Convention for the Control and Management of Ships Ballast Water and Sediments);
- the majority of ships travelling through Torres Strait and the GBRWHA to Gladstone/from Cairns would only travel on domestic routes, and would not be collecting ballast water outside Australia or being exposed to foreign species that may foul the ship hull;
- under amendments to the *Quarantine Act 1908* in 2001, ships are required to release 95% of ballast water outside the Australian territorial sea, as far as possible from land and in water exceeding 200m depth, where possible;
- discharge of ballast water (and sediment in ballast tanks) is prohibited by the Australian Quarantine and Inspection Service where it has been derived from ports or coastal waters outside Australian territorial waters;
- for the proponent owned bauxite ships, anti-fouling coating systems would be applied to exposed surfaces, biofouling resistant materials for piping and unpainted components and marine growth prevention systems for sea chests and internal seawater cooling systems;
- for the proponent owned bauxite ships, a relatively new shipping fleet would be maintained with hull inspections and surveys, hull cleaning and renewal of antifouling coating systems every 2.5 years as part of class requirements (all hull cleaning and dry-docking would be undertaken overseas);
- once a bauxite vessel is at berth it would be loaded/unloaded without delay except for unplanned events ; and
- the bauxite shipping schedule would be managed as best as possible to minimise queuing and delay at anchor.

***Seabirds and Marine Species***

8.29. Likely impacts associated with seabirds and marine species are discussed in Section 7 of this recommendation report. Avoidance and mitigation measures proposed for these species will ensure protection of species relevant to the OUV of the GBRWHA.

***Conclusion of assessment under criterion (vii)***

8.30. Based on the assessment presented in the EIS, the department is of the opinion that the proposed action will result in an increased risk of potential impacts on the GBRWHA.

8.31. On 15 April 2013, the department's Heritage Division advised that, while potential risks cannot be eliminated, they will be managed and mitigated to a large degree through a comprehensive array of existing regulation controlling shipping in the GBRWHA. As such, Heritage Division advised that the shipping associated with the project is unlikely to represent any greater risk to the OUV of the GBRWHA than the much larger volume of shipping traffic already utilising the GBRWHA.

8.32. Throughout this Recommendation Report, the department has proposed a number of conditions, including for the development and implementation of a Marine and Shipping Management Plan. These conditions will also ensure better protection of components of the OUV of the GBRWHA.

8.33. The department is of the view that provided the management measures are implemented and the recommended conditions are attached to the approval, long-term impacts to the GBRWHA will not be unacceptable.

**Assessment under criterion (viii)**

8.34. ***The criterion states:*** *be outstanding examples representing major stages of earth's history, including the record of life, significant on-going geological processes in the development of landforms, or significant geomorphic or physiographic features.*

8.35. The retrospective statement of outstanding universal value of the GBRWHA, adopted by the UNESCO World Heritage Committee in 2012, describes how the GBR meets this criterion as follows:

*The GBR, extending 2,000 kilometres along Queensland's coast, is a globally outstanding example of an ecosystem that has evolved over millennia. The area has been exposed and flooded by at least four glacial and interglacial cycles, and over the past 15,000 years reefs have grown on the continental shelf.*

*During glacial periods, sea levels dropped, exposing the reefs as flat-topped hills of eroded limestone. Large rivers meandered between these hills and the coastline extended further east. During interglacial periods, rising sea levels caused the formation of continental islands, coral cays and new phases of coral growth. This environmental history can be seen in cores of old massive corals.*

*Today the GBR forms the world's largest coral reef ecosystem, ranging from inshore fringing reefs to mid-shelf reefs, and exposed outer reefs, including examples of all stages of reef development. The processes of geological and geomorphological evolution are well represented, linking continental islands, coral cays and reefs. The varied seascapes and landscapes that occur today have been moulded by changing climates and sea levels, and the erosive power of wind and water, over long time periods.*

*One-third of the GBR lies beyond the seaward edge of the shallower reefs; this area comprises continental slope and deep oceanic waters and abyssal plains.*

8.36. Based on this statement, the department considers that the proposed action may impact on the OUV of the GBRWHA through the increased risk of ship groundings, and through direct impacts associated with anchor drop and chain drag.

***Increased risk of ship groundings***

Likely impacts

8.37. As detailed above, the proposed action will result in an increase in shipping through the GBRWHA. As such, there is an associated increased risk in ship groundings and collisions.

8.38. The EIS states that any grounding impacts associated with the proposed action are likely to be highly localised, however the severity of impacts would depend on the nature of the grounding. For example, more damage is likely if a vessel remains aground and is moved by waves and tidal action over an extended period.

8.39. Further damage to the substrate may result from activities required to free the vessel. Vessels may have to be dragged over benthic substrates, or blasting of the substrate may be required to clear a path for the vessel. Decisions on vessel recovery are made by the delegated regulatory authorities in conjunction with the appointed salvage experts. The priorities of any salvage action are protecting life and the environment, and minimising the risk of a marine oil spill.

8.40. Project-related bauxite shipping may also require anchoring while waiting to enter the port at either South of Embley or Gladstone. Anchors may drag along the seabed causing a small area of local disturbance. No anchoring would be expected while the ships are en route.

Existing management practices

8.41. Since the listing of the Great Barrier Reef on the World Heritage List, a number of management initiatives have been developed and implemented to manage shipping within the Great Barrier Reef. Examples include compulsory and recommended pilotage regimes, a ship reporting system (REEFREP) which was subsequently updated to a vessel traffic system (ReefVTS), establishment of Designated Shipping Areas and defined traffic routes, increased navigation aids and a differential GPS service, and the requirement for vessels to carry Automatic Identification Systems.

8.42. As noted in the EIS, currently, all vessels over 70m in length (or those transporting bulk oil, chemicals and liquefied gas cargoes) are required to carry a pilot when transiting through Torres Strait, the inner route of the Great Barrier Reef to the north of Cairns, Hydrographers Passage (off Mackay), and the waters around the Whitsunday Islands. Compulsory pilotage is estimated to reduce the risk of a shipping incident by a factor of 30.3. ReefVTS was implemented in 1996 to increase navigational safety within the area north of Gladstone to the Torres Strait. Under this system, all vessels over 50m in length, special product carriers, and certain vessels under tow, have systems requiring mandatory position reporting at specific points along the inner GBR Designated Shipping Area and automated position reporting via satellite. The reporting system is integrated with a system of navigation aids including VHF radio, radar monitoring and a network of differential global positioning systems and AIS stations situated throughout the Great Barrier Reef. Automated Position Reporting via Inmarsat C is now the primary means for ships to provide position reports.

8.43. The EIS observed that with the advent of these mandatory reporting systems and the extension of radar and satellite monitoring of shipping movements by the Australian Maritime Safety Authority (**AMSA**), groundings in the Great Barrier Reef have reduced from an average rate of 1.0 per year to 0.16 per year since 1996.

8.44. New offences under the *Navigation Act 1912* (Cth) for operating a vessel in a manner that causes pollution or damage have also been introduced, including increased penalties for failure to report an incident in the GBR.

Mitigation measures

8.45. The EIS states that all existing proponent controls to minimise the risk of a collision or grounding would apply to all proponent owned bauxite shipping

associated with the proposed action travelling through the Great Barrier Reef and include the following:

- all vessels will navigate within designated shipping areas and channels;
- all vessels travelling via the inner GBR Designated Shipping Area and through the compulsory pilotage areas within the Torres Strait will have an AMSA pilot on board. There pilots will have a very high degree of familiarity with the routes and the requirements for safe transit of the vessel;
- all vessels will have a Bridge Resource Management System, which will help to maximise cooperation and use of resources during critical passages and to minimise fatigue;
- the Vessel Operations Manual and the International Standards of Training, Certification and Watch keeping including guidelines for fatigue management for vessel crew will be complied with;
- all vessels will be monitored using the Automatic Identification System, which is integrated with the ReefVTS. ReefVTS compiles timely and accurate traffic imaging of shipping throughout the region and generates ship encounter predictions, which are disseminated to ships;
- relevant deck officers hold will hold certificates above the minimum qualifications required by the International Standards of Training, Certification and Watch keeping Convention;
- vessels will operate in accordance with a berth-to-berth passage plan, which will be audited in line with safety management systems;
- vessels will navigate using up-to-date electronic charts with paper chart backups;
- the proponent owned fleet consists of young ships in a good state of repair and subject to regular inspections, minimising the risk of a vessel being disabled;
- an AMSA Emergency Towage Vessel (ETV), the Pacific Responder, is stationed at Cairns and works principally within the northern part of the Great Barrier Reef and Eastern Torres Strait. The Pacific Responder has sufficient bollard pull capacity and resources to assist a disabled vessel that has lost power or steerage (a common cause of vessel grounding);
- in the restricted waters of the Port of Gladstone, vessels will be under pilotage and further controls and navigational requirements will be implemented by the Gladstone Ports Corporation to minimise the risk of collision, including the use of a Maritime Safety Queensland pilot and vessel separation protocols;
- both the ports of Weipa and Gladstone have tug facilities, and vessels will be attended at all times by two tugs during berthing operations;
- vessels will operate in strict accordance with the marine legislation and regulations at all times; and
- while awaiting port entry, all vessels will anchor only at the anchorage locations designated by the Regional Harbour Master at both South of Embley and Gladstone.

8.46. The EIS advises that vessels transporting cargo to Weipa through the Great Barrier Reef would be owned and operated by a third party and therefore some of

the mitigation measures for cargo shipping would be predominantly under the control of the owners and operators of those vessels. In such situations, the following, as a minimum, would be implemented under existing regulations:

- all vessels will navigate within Designated Shipping Areas and channels;
- all vessels travelling via the inner GBR Designated Shipping Area and through the compulsory pilotage areas within the Torres Strait will have an AMSA pilot onboard. As noted above, these pilots will have a very high degree of familiarity with the routes and the requirements for safe transit of the vessel;
- vessels will be attended at all times by two tugs during berthing operations at the Port of Weipa (this would also be the case for vessels transporting fuel from Darwin); and,
- the ETV Pacific Responder is stationed at Cairns and works principally within the northern part of the Great Barrier Reef and Eastern Torres Strait. The Pacific Responder has sufficient bollard pull capacity and resources to assist a disabled vessel that has lost power or steerage (a common cause of vessel grounding).

***Conclusion of assessment under criterion (viii)***

8.47. Based on the assessment presented in the EIS, the department is of the opinion that the proposed action will result in an increased risk of potential impacts on the GBRWHA.

8.48. Throughout this Recommendation Report, the department has proposed a number of conditions, including for the development and implementation of a Marine Management Plan. These conditions will also ensure better protection of components of the OUV of the GBRWHA.

8.49. The department is of the view that provided the management measures are implemented and the recommended conditions are attached to the approval, long-term impacts to the GBRWHA will not be unacceptable.

**Assessment under criterion (ix)**

8.50. **The criterion states:** *be outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial fresh water, coastal and marine ecosystems and communities of plants and animals*.

8.51. The retrospective statement of outstanding universal value of the GBRWHA, adopted by the UNESCO World Heritage Committee in 2012, describes how the GBR meets this criterion as follows:

*The globally significant diversity of reef and island morphologies reflects ongoing geomorphic, oceanographic and environmental processes. The complex cross-shelf, longshore and vertical connectivity is influenced by dynamic oceanic currents and ongoing ecological processes such as upwellings, larval dispersal and migration.*

*Ongoing erosion and accretion of coral reefs, sand banks and coral cays combine with similar processes along the coast and around continental islands. Extensive beds of Halimeda algae represent active calcification and accretion over thousands of years.*

*Biologically the unique diversity of the GBR reflects the maturity of an ecosystem that has evolved over millennia; evidence exists for the evolution of hard corals and*

*other fauna. Globally significant marine faunal groups include over 4,000 species of molluscs, over 1,500 species of fish, plus a great diversity of sponges, anemones, marine worms, crustaceans, and many others. The establishment of vegetation on the cays and continental islands exemplifies the important role of birds, such as the Pied Imperial Pigeon, in processes such as seed dispersal and plant colonisation.*

*Human interaction with the natural environment is illustrated by strong ongoing links between Aboriginal and Torres Strait Islanders and their sea-country, and includes numerous shell deposits (middens) and fish traps, plus the application of story places and marine totems.*

8.52. Based on this statement, the department considers that the proposed action may impact on the OUV of the GBRWHA through an increased risk of changes to ongoing ecological and biological processes as a result of ship collisions and groundings, releases of pollutants, and anchor drop and chain drag.

***Ongoing ecological and biological processes***

Likely impacts

8.53. The EIS states that in more than 40 years of Weipa bauxite and cargo shipping, there have been no reported incidents within the GBRWHA that have resulted in environmental harm.

8.54. The EIS states that ships and cargo barges associated with the proposed action would only travel through the GBRWHA via the inner GBR Designated Shipping Area and within the limits of the Port of Gladstone and Port of Cairns (by third parties). The EIS notes that the inner GBR Designated Shipping Area was developed under the Great Barrier Reef Zoning Plan 2003 to avoid the most sensitive areas of the Great Barrier Reef.

8.55. In assessing potential impacts, the EIS notes that:

- when in the Port of Gladstone, vessels would operate in accordance with the requirements of the Regional Harbour Master;
- Gladstone Ports Corporation operates under an Environmental Management System which is internationally recognised under joint Australian / New Zealand Standard AS/NZS14001:2004; and
- vessels would be escorted by two tugs at all times during berthing within the Port of Gladstone. Third party cargo vessels operating out of the Port of Cairns would operate under the conditions of a commercial permit from the GBRMPA.

8.56. The EIS contends that predicted ship movements associated with the proposed action would not impact on oceanic currents or upwellings. However, localised impacts on larval dispersal may potentially occur in the event of an oil spill during the coral spawning period, where coral gametes or larval stages are exposed to surface oil or elevated hydrocarbons in the water column.

*Oil spills*

8.57. The EIS notes that GBRMPA's 2009 *Outlook Report* identified the risk of large oil spills as a medium risk but unlikely to occur. Existing management arrangements and the use of the inner GBR Designated Shipping Area have resulted in very few incidents. Predicted ship movements associated with the proposed action would typically be in deep water, and even in the unlikely event of a spill, it is highly unlikely that hydrocarbon concentrations in the water column would be sufficient to

result in accumulation in marine sediments. In shallower areas of the GBRWHA from Cape York to Cairns, vessel movements would be under pilotage to prevent grounding. The EIS concludes that the small potential increase in bauxite ship and cargo barge movements at maximum production relative to existing shipping levels is not likely to increase the likelihood category of significant impact occurring upon coral reefs.

8.58. The EIS states that the annual probability of a spill due to the predicted increased in ship movements associated with the proposed action is estimated to be 0.0058 (or 0.58 per cent). The EIS asserts that this estimated increase is negligible.

8.59. The *Protection of the Sea (Prevention of Pollution from Ship) Act 1983* (Cth) includes provision for penalties for the discharge of oil or oil residues by ships in Australian waters.

8.60. The EIS concludes that the small potential increase in ship movements associated with the proposed action at maximum production is not likely to increase the risk category of incidents.

*Ship groundings and collisions*

8.61. The EIS states that during a vessel grounding there is also a possibility that antifouling paint would be scraped from the vessel's hull and cause localised contamination of the substrate. Antifouling paint historically contained the biocide tributyltin although this product is now banned in Australia and most parts of the world. However, even modern antifouling paints, by their nature, have a biocidal action and it is also possible that residual tributyltin paints may remain on the hull even where it has been recoated. Depending on local current regimes, antifouling paints can have localised toxic effects that radiate from the impact location. For instance, the grounding in December 2000 of the Bunga Teratai Satu on Sudbury Reef, 40km to south east of Cairns, caused injuries to hard and soft corals up to 250m from the grounding site (Marshall et al. 2002).

8.62. The EIS contends that although there have been a number of shipping incidents in the GBRWHA and Torres Strait, there have been no major pollution events affecting the region since the Oceanic Grandeur grounded in Torres Strait in 1970. A 2002 review of shipping safety in the Great Barrier Reef Marine Park and Torres Strait found that there were 40 major shipping incidents that had the potential for environmental harm in the Great Barrier Reef Marine Park and Torres Strait region, comprising 26 groundings and 14 collisions between 1985 and 2000. This equates to approximately 2.5 incidents per annum for the study period. Much of this period was prior to the implementation of navigation initiatives such as the ReefVTS. Since the introduction of ReefVTS in 1996, groundings in the GBRMP have reduced from an average rate of one per year to 0.16 per year.

*Mitigation measures*

8.63. The EIS states that all existing proponent controls to minimise the risk of a collision or grounding would apply to all proponent owned bauxite shipping associated with the proposed action travelling through the GBR. These measures are detailed under the assessment of criterion (vii), above.

***Conclusion of assessment under criterion (ix)***

8.64. Based on the assessment presented in the EIS, the department is of the opinion that the proposed action will result in an increased risk of potential impacts on the GBRWHA.

8.65. Throughout this Recommendation Report, the department has proposed a number of conditions, including for the development and implementation of a Marine and Shipping Management Plan. These conditions will also ensure better protection of components of the OUV of the GBRWHA.

8.66. The department is of the view that provided the management measures are implemented and the recommended conditions are attached to the approval, long-term impacts to the GBRWHA will not be unacceptable.

**Assessment under criterion (x)**

8.67. The criterion states: *contain the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science and conservation.*

8.68. The retrospective statement of outstanding universal value of the GBRWHA, adopted by the UNESCO World Heritage Committee in 2012, describes how the Great Barrier Reef meets this criterion as follows:

*The enormous size and diversity of the GBR means it is one of the richest and most complex natural ecosystems on earth, and one of the most significant for biodiversity conservation. The amazing diversity supports tens of thousands of marine and terrestrial species, many of which are of global conservation significance.*

*As the world's most complex expanse of coral reefs, the reefs contain some 400 species of corals in 60 genera. There are also large ecologically important inter-reefal areas. The shallower marine areas support half the world's diversity of mangroves and many seagrass species. The waters also provide major feeding grounds for one of the world's largest populations of the threatened dugong. At least 30 species of whales and dolphins occur here, and it is a significant area for humpback whale calving.*

*Six of the world's seven species of marine turtle occur in the GBR. As well as the world's largest green turtle breeding site at Raine Island, the GBR also includes many regionally important marine turtle rookeries.*

*Some 242 species of birds have been recorded in the GBR. Twenty-two seabird species breed on cays and some continental islands, and some of these breeding sites are globally significant; other seabird species also utilize the area. The continental islands support thousands of plant species, while the coral cays also have their own distinct flora and fauna.*

8.69. Based on this statement, the department considers that the proposed action may impact on the OUV of the GBRWHA through impacts on threatened species of outstanding universal value from the point of view of science and conservation.

***Threatened species of outstanding universal value from the point of view of science and conservation***

8.70. A discussion of likely impacts on threatened species of outstanding universal value from the point of view of science and conservation is provided at Section 6 of this Recommendation Report. Avoidance and mitigation measures proposed for these species will ensure protection of species relevant to the OUV of the GBRWHA.

***Conclusion of assessment under criterion (x)***

8.71. Based on the assessment presented in the EIS, the department is of the opinion that the proposed action will result in an increased risk of potential impacts on the GBRWHA.

8.72. Throughout this Recommendation Report, the department has proposed a number of conditions, including for the development and implementation of a Marine and Shipping Management Plan. These conditions will also ensure better protection of components of the OUV of the GBRWHA.

8.73. The department is of the view that provided the management measures are implemented and the recommended conditions are attached to the approval, long-term impacts to the GBRWHA will not be unacceptable.

**Integrity of the GBRWHA**

8.74. Integrity of the GBRWHA is summarised in the retrospective statement of OUV in the following manner:

*The ecological integrity of the GBR is enhanced by the unparalleled size and current good state of conservation across the area. At the time of inscription it was felt that to include virtually the entire Great Barrier Reef within the property was the only way to ensure the integrity of the coral reef ecosystems in all their diversity.*

*A number of natural pressures occur, including cyclones, crown-of-thorns starfish outbreaks, and sudden large influxes of freshwater from extreme weather events. As well there is a range of human uses such as tourism, shipping and coastal developments including ports. There are also some disturbances facing the GBR that are legacies of past actions prior to the inscription of the property on the World Heritage list.*

*At the scale of the GBR ecosystem, most habitats or species groups have the capacity to recover from disturbance or withstand ongoing pressures. The property is largely intact and includes the fullest possible representation of marine ecological, physical and chemical processes from the coast to the deep abyssal waters enabling the key interdependent elements to exist in their natural relationships.*

*Some of the key ecological, physical and chemical processes that are essential for the long-term conservation of the marine and island ecosystems and their associated biodiversity occur outside the boundaries of the property and thus effective conservation programs are essential across the adjoining catchments, marine and coastal zones.*

8.75. The Operational Guidelines for the Implementation of the World Heritage Convention published by UNESCO require that all properties nominated for inscription on the World Heritage List satisfy conditions of integrity, where integrity is defined as ‘a measure of the wholeness and intactness of the natural and/or cultural heritage and its attributes’.

8.76. Examining the conditions of integrity therefore requires assessing the extent to which a property:

- includes all elements necessary to express its outstanding universal value;
- is of adequate size to ensure the complete representation of the features and processes which convey the property’s significance; and
- suffers from adverse effects of development and/or neglect.

8.77. Factors that could impact on the GBRWHA as a whole (i.e. the integrity) as a result of the proposed development include:

- changes to water quality within the GBRWHA; and
- excessive visual impacts along a large extent of the GBRWHA.

8.78. The department considers that management measures coupled with the proposed conditions, as discussed throughout this recommendation report, will ensure that the GBRWHA as a whole is not substantially impacted.

**Property Management Arrangements**

8.79. The retrospective statement of OUV of the GBRWHA states:

> *The Federal* Environment Protection and Biodiversity Conservation Act 1999 *(EPBC Act) provides an overarching mechanism for protecting the World Heritage values from inappropriate development, including actions taken inside or outside which could impact on its heritage values. This requires any development proposals to undergo rigorous environmental impact assessment processes, often including public consultation, after which the Federal Minister may decide, to approve, reject or approve under conditions designed to mitigate any significant impacts. A recent amendment to the EPBC Act makes the GBR Marine Park an additional 'trigger' for a matter of National Environmental Significance which provides additional protection for the values within the GBR.*

8.80. The EPBC Act referral and assessment process has considered the potential impacts of the proposed action on the GBRWHA.

8.81. The proposed EPBC Act Approval will ensure that the OUV of the GBRWHA is not unacceptably impacted as a result of the proposed action.

8.82. The department is of the view that the proposed action will not result in a decrease in the protection and management mechanisms of the GBRWHA.

## 9. Great Barrier Reef Marine Park

9.1. Areas of the Great Barrier Reef have been progressively included in the Commonwealth Great Barrier Reef Marine Park (**GBRMP**) since the late 1970s. Today, almost the entire Great Barrier Reef ecosystem is included within the Marine Park, which extends over 2300 km along the coast of Queensland and covers approximately 344,400 $km^2$.

9.2. The Great Barrier Reef Marine Park is a multiple use marine park, supporting a wide range of uses, including: commercial marine tourism; fishing; ports and shipping; recreation; scientific research; and indigenous traditional use.

9.3. Threats and impacts to the Great Barrier Reef Marine Park as a result of the proposed action are identified and assessed throughout this recommendation report.

- An assessment of impacts on EPBC Act listed threatened marine species is provided in Section 6.
- An assessment of impacts on EPBC Act listed migratory species is provided in Section 7.
- An assessment of impacts on the Great Barrier Reef World Heritage Area and National Heritage place is provided in Section 8.

Advice from GBRMPA

9.4. Advice received from GBRMPA on 9 April 2013 stated that GBRMPA was of the opinion that the proponent has fully considered and addressed all potential risks associated with the Project-related increased shipping through the Great Barrier Reef Marine Park. GBRMPA stated that the proponent has outlined in the EIS adequate mitigation and management measures to address threats to Marine Park values, including for risks that have been identified as having a very low/negligible likelihood and consequence.

9.5. With regards to marine mammals and ship interactions, GBRMPA advised that it is important to note that ships have travelled to and from Weipa via the same route since 1963 and there have been no reported incidents of vessel strike in over 40 years of shipping.

9.6. GBRMPA advised that overall, the increase in shipping of both bauxite and cargo barge ships is unlikely to exacerbate any risks to the Great Barrier Reef Marine Park that result from existing shipping levels and activities.

9.7. GBRMPA noted that the proponent concluded from a cumulative risk assessment that the contribution from Project-related shipping to the cumulative impacts on matters of national environmental significance would not alter the existing risk profiles of any of the identified threats associated with shipping. There would be no changes to either the likelihood or consequence of the threats as a result of the small predicted increase in shipping generated by the Project. GBRMPA advised that this assessment was thorough and robust.

9.8. GBRMPA expressed concerns over the spill modelling presented in the EIS, primarily around the duration that the model was run for. GBRMPA noted that as fuel oil is highly persistent, a 5 day model (as was presented in the EIS) will not adequately establish the ultimate impact points of fuel oil and therefore oiled shorelines should be predicted considering 70 – 75 percent of spilled fuel oil will persist on the water surface after 5 days. Therefore, GBRMPA anticipates that the probability of fuel oil entering the GBRMP from a large fuel spill would be higher than the estimated 2 and 6 percent reported.

9.9. Overall, GBRMPA does not believe that the impacts associated with the proposed action are significant to the Great Barrier Reef Marine Park controlling provision due to existing Great Barrier Reef Marine Park shipping management arrangements, the proposed safeguards and the fact that the expected increased in shipping is relatively small compared to current shipping numbers.

Conclusion of assessment of impacts on the GBRMP

9.10. The department is of the opinion that the management measures couple with the proposed conditions, as discussed throughout this Recommendation Report will ensure that the Great Barrier Reef Marine Park is not substantially impacted.

**10. Commonwealth marine areas (sections 23 and 24A)**

10.1. The Commonwealth marine area is any part of the sea, including the waters, seabed and airspace within Australia's exclusive economic zone and/or over the continental shelf of Australia, that is not State or Northern Territory waters. The Commonwealth marine area stretches from 3 to 200 nautical miles from the coast.

Marine bioregional plan

10.2. Marine bioregional plans have been developed for the Commonwealth marine area to support the decision-making process for marine-based industries under the

EPBC Act. As part of this process, new Commonwealth marine reserves have been identified by the department for the conservation of marine ecosystems and biodiversity of Australia's oceans. These reserves are intended to meet Australia's commitments to establish a National Representative System of Marine Protected Areas.

10.3. Five marine regions have been identified as part of the bioregional planning process, including Southwest, North-west, North, East (Temperate East and Coral Sea) and South-east Marine Regions. As noted in the EIS, the North Marine Region is the only region relevant to the proposed action and is covered by the Marine Bioregional Plan for the North Marine Region.

10.4. The North Marine Region covers the Commonwealth marine area within the Gulf of Carpentaria, Arafura Sea and the Timor Sea as far west as the Northern Territory-Western Australian border. The Northern Marine Region has an area of approximately 625,000km2.

10.5. The Gulf of Carpentaria Basin and the Gulf of Carpentaria Coastal Zone identified as key ecological features in the Commonwealth Marine Environment Report Card: supporting the Marine Bioregional Plan for the North Marine Region are within areas where Project Related activities (predominantly shipping) would occur. Marine debris from land based activities, fishing boats, shipping and other vessels is identified as an "of concern" pressure for both these key ecological features. Changes in sea temperature and ocean acidification (both relating to climate change) are identified in as "of potential concern" pressures.

Likely impacts

10.6. The EIS states that the main activities that could potentially affect the Commonwealth marine area are associated with dredging and spoil disposal activities, and Project-related shipping activities.

10.7. The proposed new spoil ground, approximately nine nautical miles (approximately 17km) from the proposed Port, would be located within the Commonwealth marine area. The existing Albatross Bay spoil ground and the proposed Port dredging footprint are outside the Commonwealth marine area.

10.8. The EIS contends that there would be no direct disturbance from the Project of an important or substantial area of habitat such that an adverse impact on marine ecosystem functioning or integrity in the CMA would occur.

10.9. Hydrodynamic modelling predicted that any turbidity plume associated with dredging operations or spoil disposal for the Project would not significantly impact reef habitat in coastal waters and would not extend to the nearest potentially sensitive habitat in the Commonwealth marine area, Nine Mile Reef. Only small volumes of dredged material from river facilities dredging would be disposed at the Albatross Bay spoil ground located, over 12km outside of the Commonwealth marine area.

10.10. Due to the predicted minor impact of the turbidity plume associated with dredging operations or spoil disposal for the Project and the implementation of Dredge Management Plans, it was determined in the EIS that the Project is unlikely to significantly impact on any of the values of the Commonwealth marine area.

10.11. As previously discussed, the footprint of the proposed new spoil ground contains unvegetated soft sediment habitats. These habitats are consistent with the Gulf of Carpentaria basin described in Schedule 2.1.2 of the Bioregional Marine Plan for the North Marine Region. The EIS argues that these soft sediment habitats are common

throughout the Gulf of Carpentaria and are not considered to be sensitive marine habitats or areas of high importance.

10.12. The EIS notes that there is a possibility that marine pest species may be introduced to the Commonwealth marine area through the disposal of dredge material (both within the dredge, and from the ships), and through bauxite, cargo and fuel shipping activities such as the discharge of ballast water or hull fouling.

10.13. An assessment of impacts on threatened and migratory marine species is provided in section 7 of this Recommendation Report.

10.14. The EIS states that a total of 16 species of sea snaked have been recorded in the Weipa region. These include *Acalyptophis peronei, Aipysurus duboisii, Aipysurus laevis, Aipysurus eydouxii, Astrotia stokesii, Disteira kingie, Disteira major, Enhydrina schistosa, Hydrelaps darwiniensis, Hydrophis coggeri, Hydrophis elegans, Hydrophis inornatus, Hydrophis ornatus, Hydrophis pacificus, Lapemis curtus, Lapemis hardwickii* and *Acrochordus granulates*.

10.15. The EIS noted that most specimens captured of *Acrochordus granulatus* occurred along the edge of sea grass beds on the southern side of the Hey/Embley River estuary from opposite Lorim Point to near the mouth of the estuary, however no H*ydrophiidae* species were found in this area. *Acrochordus granulatus* was also frequently encountered in open water in the Hey and Embley Rivers. Adult specimens of *Enhydrina schistosa* were generally captured in depths of 8 to 8.5m of water, with juvenile specimens captured at approximately 6m depth. Only juveniles of *Enhydrina schistosa* were captured within 100m of the existing Lorim Point Wharf, with all being caught late at night.

10.16. The EIS further noted that the diversity of sea snakes in the Hey/Embley River was high and the high representation of juveniles of some species of sea snakes recorded in a 1997 study was suggested to mean that some estuarine environments act as breeding grounds and/or nurseries although the author did not suggest that the Hey/Embley River constituted an important breeding ground. This was further evidenced by the lack of juveniles collected in adjacent Gulf trawls and the high proportion of juveniles observed in other estuarine studies.

10.17. The North Marine Bioregional Plan identifies sea snakes as a conservation value and a priority for conservation in the North Marine Region (DSEWPaC 2012f). The Species Group Report Card – Marine Reptiles which supports the North Marine Bioregional Plan reports an analysis of pressures on 19 species of sea snakes in the North Marine Region. The results of the analysis identified pressures as "of concern" and "of potential concern" namely:

- of concern: by catch (commercial fishing); and
- of potential concern: climate change (change in sea temperature and ocean acidification) and physical habitat modification (dredging and/or dredge spoil).

10.18. The EIS notes that Sea snakes generally occur in shallow waters and are more likely to occur in coastal waters than in the Commonwealth marine environment. The proposed capital dredging program for the Project's river facilities would involve small volumes and short durations at each of three sites (maximum 11 weeks across the three sites) in the Embley and Hey Rivers. Whilst this may cause a very short-term and transient above average elevation of turbidity in the Embley and/or Hey Rivers, the EIS states that it is expected that these elevations would be within the long term background range for the area and short-lived when compared to the

frequent and naturally occurring elevated turbidity in the Embley and Hey Rivers and estuary.

10.19. The EIS concludes that it is unlikely that sea snakes that may inhabit the Embley and Hey Rivers and estuary would be impacted by Project-related activities.

10.20. The EIS notes that Albatross Bay is also known to be an important nursery area for the juvenile tiger and banana prawns that are the principal target species in the Northern Prawn Fishery area. Banana prawns migrate from estuarine areas into the Gulf of Carpentaria for spawning from September to November and March to May. At low tide, juvenile and sub-adult prawns are most abundant in small tidal creeks and gutters that drain from mangrove forests. However, Albatross Bay is located over 12km from the Commonwealth marine area at its closest point, and as such the EIS does not consider impacts to be likely.

10.21. During construction, dust emissions would result from the clearing of construction sites and the burning of cleared vegetation. In addition there would be heavy vehicle movements on unpaved roads. The EIS concludes that these emissions would generally be localised, of relatively short duration and would not impact on the airspace of the Commonwealth marine area.

10.22. A summary of ship movements travelling from the area through the Commonwealth marine area, including ships travelling to and from the GBRWHA, export markets, and Darwin is presented at Table 3.

***Table 3*** *– A representation of ship movements through the Commonwealth marine area, including ships travelling to and from the GBRWHA, international export markets, and Darwin.*

| **Ship Movements** | **Cargo** | **Fuel** | **Bauxite** | **Total** |
|---|---|---|---|---|
| Existing – before Project | Data not provided | Data not provided | 840 – 900 | 840 – 900 |
| Potential additional – at maximum Project production | 300 | 44 | 1400 | 1744 |
| Total | 300 | 44 | 2180 – 2240 | 2524 – 2584 |
| **Net Total*** | **300** | **44** | **1020 – 1460** | **1364 - 1804** |

* The EIS states that the volume of bauxite shipping from the Port of Weipa will decrease over time as reserves north of the Embley River are depleting, and Project-related bauxite shipping will replace much of this demand. Based on these assumptions, the EIS provides details of estimated 'net' increases.

10.23. Impacts on the CMA associated with shipping are the same as those identified in Section 8 of this Recommendation Report.

Proposed mitigation measures

10.24. The proponent states that species specific mitigation measures are not required. However, other avoidance and mitigation measures that would be implemented to protect other matters of national environmental would also reduce the risk of impacts on the Commonwealth marine area. These measures are detailed throughout this Recommendation Report.

Conclusion of assessment of impacts on the Commonwealth marine area

10.25. Throughout this Recommendation Report, the department has proposed a number of conditions, including for the development and implementation of a Marine Management Plan, Maintenance Dredging Management Plans, and an Inshore Dolphin Offset Strategy. These conditions will also ensure better protection of components of the Commonwealth marine area.

10.26. The department is of the view that provided the management measures are implemented and the recommended conditions are attached to the approval, long-term impacts to the Commonwealth marine area will not be unacceptable.

## 11. Considerations for Approval and Conditions

### *Mandatory considerations – section 136(1)(b) Economic and social matters*

11.1. The EIS states that the proposed action is forecast to provide the following economic benefits:

Construction Phase (22.5Mdptpa production capacity)

- Estimated direct employment of approximately 950 people;
- Indirect employment of approximately 632 people in the local area, 993 people in the Far North Queensland region, 1,712 people state-wide, and 2,286 people nationally;
- Direct financial contribution of $266 million locally, $527.9 million in the Far North Queensland region, $989.9 million in Queensland and $1,319.8 million nationally; and
- Indirect financial contribution of $167.6 million locally, $522 million in the Far North Queensland region, $1,633.5 million in Queensland and $2,977.4 million nationally.

Operations Phase (22.5Mdptpa production scenario)

- Direct employment (including contractors) of approximately 552 people in the local region;
- Indirect employment of approximately 615 people locally, 964 people in the Far North Queensland region, 2,008 people in Queensland and 3,104 people nationally;
- Direct annual financial contribution of $675 million across the local, regional, Queensland and national economies; and
- Indirect annual financial contribution of $194 million locally, $292 million in the Far North Queensland region, $584 million in Queensland and $920 million nationally.

Operations Phase (50Mdptpa production scenario)

- Direct employment (including contractors) of approximately 1,346 people in the local region;
- Indirect employment of approximately 1,409 people locally, 2,193 people in the Far North Queensland region, 4,532people in Queensland and 6,788 people nationally;
- Direct annual financial contribution of $1,500 million across the local, regional, Queensland and national economies; and
- Indirect annual financial contribution of $451 million locally, $673 million in the Far North Queensland region, $1,326 million in Queensland and $2,020 million nationally.

11.2. The EIS considers impacts to existing uses and activities in the Western Cape Region.

11.3. The EIS notes that during construction there would be an increase in heavy vehicle traffic along roads used by nearby cattle properties. Under state legislation,

the proponent will prepare a road use management plan (in consultation with the Queensland Department of Transport and Main Roads) for the relevant roads, for each phase of the proposed action. During periods of high traffic, the proponent will monitor conditions of the roads and repair any damage related to the proposed action. The proposed Humbug barge terminal has also been designed so that it would not interfere with adjacent existing live cattle export facilities.

11.4. The EIS notes that a number of bodies have expressed concern that disturbance due to the proposed Port development would lead to the displacement of fishing efforts and loss of income. The proponent has agreed to pay compensation (based on modelling undertaken by the Department of Agriculture, Fisheries and Forestry) to the Queensland Rural Adjustment Authority, to be administered to relevant fishers and to buyout an appropriate level of fishing effort.

11.5. The EIS noted that there is adequate suitable land for additional residential development to meet demand, if and when required. While this land is currently outside the Weipa town boundary, this boundary may be extended in consultation with Traditional Owners and the State Government. The ability to expand housing supply is expected to moderate upward pressure on housing and rental prices over time, however, shorter term spikes in demand do occur. An expanded housing stock and infrastructure are expected to be able to be provided such that the projected increase in population does not cause a significant shortfall in supply. Nor is the Project expected to change the social character of Weipa significantly.

11.6. The EIS estimates that 90 percent of tourists who visit Weipa do so primarily to fish. Weipa tourist accommodation is often at full capacity, particularly during the dry season. Government employees and contractors unable to find long-term accommodation utilise camping grounds and hotels, crowding out tourists. The introduction of about 200 Commonwealth staff and contractors in 2011 to support the operations of the detention centre at the Scherger RAAF base exacerbated this situation. To help minimise the crowding-out of tourist and other accommodation during construction, the proponent proposes to provide up to 200 beds for contractor accommodation near Nanum, if required, in addition to the South of Embley on-site construction camp. The proposed action is unlikely to result in a change in tourist visitation to the Western Cape.

Indigenous heritage

11.7. The EIS noted that the area south of the Embley River is formally recognised as the traditional lands of the Wik and Wik Way people. The subject site is covered by an Indigenous Land Use Agreement under the Commonwealth *Native Title Act 1993,* known as the Western Cape Communities Coexistence Agreement. The Agreement provides the process by which consultation with Traditional Owners. The EIS states that the proposal would bring development activities much closer to this community and for the first time would directly affect the traditional lands of the Wik and Wik Way people. Cultural heritage surveys of the subject site have found that shell middens and ethnographic sites are located outside of the areas for proposed facilities and future mining. The results of archaeological surveys suggest that scarred trees are the site type mostly likely to be impacted by the Project. Other site types are typically found in the riparian vegetation zone around watercourses, the coastline, and significant vegetation such as thickets of vine forest. Apart from Dam C and some haul road and access road crossings, disturbance as a result of the proposed action does not occur within the riparian vegetation zone.

11.8. Under the Agreement, the proponent is required to provide the relevant Agreement with six months minimum notification prior to undertaking commercial activities, including mining, that have the potential to damage places of cultural heritage value. Construction and operation of the Project would affect, from time to time, the ability of Traditional Owners to access certain parts of the Project area for cultural reasons, fishing, hunting and recreational purposes. The proponent will work collaboratively with the relevant Sub-committee established pursuant to the Agreement to develop a land access strategy aimed at causing as little disturbance as possible to Traditional Owner access.

11.9. During consultations, various stakeholders noted that improved access to the subject site, via the proposed Mine Access Road and barge/ferry terminals, may increase some recreational activities that are considered to have negative impacts on the subject site and adjacent coastal and beach areas (e.g. 4WD vehicle damage, bike activity on beaches). To minimise this risk, the Mine Access Road and barge and ferry terminals would be available for mine-related business use only. Signage at terminal and access tracks along the eastern boundary of the lease would provide information on controls on access and activities. To mitigate the impacts of recreational use of the subject site, the proponent will work with Traditional Owners in accordance with the Western Cape Communities Coexistence Agreement and other relevant stakeholders to develop an effective permit system to protect significant cultural heritage sites and environmental values and allow controlled access for recreational purposes.

11.10. As stated in the EIS, in response to the issues raised by Traditional Owners, the proponent recognises and supports the need for the joint development of a comprehensive Cultural Heritage Environment Management Plan for the subject site. The Cultural Heritage Environment Management Plan would provide the framework for the proponent and Traditional Owners to work together to manage the community, heritage and environmental values of the subject site in the context of the Western Cape Communities Coexistence Agreement.

11.11. In order to facilitate the implementation of the Cultural Heritage Environment Management Plan, the Project's Social Impact Management Plan contains a Land and Sea Management Programme designed to engage Traditional Owners directly in land and sea management activities in the construction and operational phases of the proposed action. The Programme aims to:

- implement land and sea management activities through direct employment of Traditional Owners in both permanent and casual roles with the proponent; and
- investigate and pursue opportunities to establish and promote career development pathways for Traditional Owners into areas such as environmental management, land management, cultural heritage management and/or community relations.

11.12. The EIS further states that the CHEMP development process has commenced and it, and the Land and Sea Management Programme, provides an opportunity for Traditional Owners to increase the level and frequency of direct involvement with land and seas in the subject site.

11.13. The department is of the view that given the adequate consultation that has occurred to date, coupled with the mature arrangements in place to facilitate continued consultation, there is a high level of certainty that indigenous values will not be diminished as a result of the proposed action. Conditions recommended by

the Queensland Coordinator-General will further ensure that Traditional Owners are engaged to facilitate the implementation of management strategies and conditions proposed as part of the current approval.

***Factors to be taken into account – section 136(2)(a) Principles of ecologically sustainable development***

11.14. The principles of ecologically sustainable development, as defined in Part 1, section 3A of the EPBC Act, are:

- decision making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations;
- if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation;
- the principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making; and
- improved valuation, pricing and incentive mechanisms should be promoted.

11.15. In formulating this recommendation, the department has taken into account the principles of ecologically sustainable development. In particular:

- This report and the assessment documentation provided contains information on the long-term and short-term economic, environmental, social and equitable considerations that are relevant to the decision and are presented for your consideration.
- Any lack of certainty related to the potential impacts of the projects is addressed by conditions that restrict environmental impacts, impose strict monitoring and adopt environmental standards which, if not achieved, require the application of response mechanisms in a timely manner to avoid adverse impacts.
- The proposed conditions will ensure protection of World Heritage properties, National Heritage places, listed threatened species, listed migratory species, Commonwealth marine areas and the Great Barrier Reef Marine Park. Those conditions allow for the project to be delivered and operated in a sustainable way to protect the environment for future generations and preserve matters of national environmental significance in perpetuity.
- The department has considered the importance of conserving biological diversity and ecological integrity in relation to all of the controlling provisions for this project, and the advice provided within this document reflects that consideration.
- The department's advice includes reference to and consideration of a range of information on the economic costs, benefits and impacts of the project.

***Factors to be taken into account – section 136(2)(ca) – environmental impact statement***

11.16. In accordance with section 136(2)(ca)(i) the finalised environmental impact statement relating to the action given to you under section 104 is at Attachment C.

11.17. In accordance with section 136(2)(ca)(ii) this document forms the recommendation report relating to the action given to you under section 105.

**Person's environmental history – section 136(4)**

11.18. The EIS states that the proposed action will be developed and operated by RTA Weipa Pty Ltd, which is a wholly owned subsidiary of Rio Tinto Aluminium Limited. Both companies are in the Rio Tinto Alcan product group. Rio Tinto Alcan is one of five product groups operated by the global mining group, Rio Tinto.

11.19. The EIS asserts that RTA Weipa Pty Ltd has a record of responsible environmental management during more than 40 years of mining bauxite in the Weipa region.

11.20. The EIS states that RTA Weipa Pty Ltd, Rio Tinto Aluminium Limited and their Executive Officers have not been the subject of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.

11.21. The EIS further states that in over 40 years of shipping from Weipa to Gladstone, there has been no reported collision or grounding incidents associated with RTA Weipa Pty Ltd shipping to or from Weipa that has resulted in environmental harm.

11.22. Advice from the department's Compliance Section stated that the department's compliance database shows there is no adverse environmental history for either RTA Weipa Pty Ltd or Rio Tinto Aluminium Limited.

**Considerations in deciding on condition – section 134**

11.23. In accordance with section 134(1), you may attach a condition to the approval of the action if you are satisfied that the condition is necessary or convenient for:

- protecting a matter protected by a provision of Part 3 for which the approval has effect (whether or not the protection is protection from the action); or
- repairing or mitigating damage to a matter protected by a provision of Part 3 for which the approval has effect (whether or not the damage has been, will be or is likely to be caused by the action).

11.24. As detailed in the Assessment section above, all recommended conditions attached to the proposed approval are necessary or convenient to protect, repair and/or mitigate impacts on a matter protected by provision of Part 3 for which this proposed approval has affect.

11.25. In accordance with section 134(4), in deciding whether to attach a condition to an approval the you must consider:

- any relevant conditions that have been imposed, or you consider are likely to be imposed, under a law of a State or self-governing Territory or another law of the Commonwealth on the taking of the action;
- information provided by the person proposing to take the action or by the designated proponent of the action; and

- the desirability of ensuring as far as practicable that the condition is a cost effective means for the Commonwealth and the person taking the action to achieve the object of the condition

11.26. Requirements for approvals under State legislation and conditions proposed by the Queensland Government have been discussed throughout this report.

11.27. The information provided by the person proposing to take the action has been considered. The proponent will be invited to comment on the proposed decision.

11.28. The department considers that the conditions proposed are a cost effective means of achieving their purpose. All conditions are consistent/compatible with those imposed under Queensland legislation where possible. This will ensure that the risk of superfluous costs is reduced.

## 12. Conclusion

12.1. The department considers the impacts on matters of national environmental significance will be acceptable provided the action is undertaken in accordance with the conditions recommended in this report. The proposed conditions are necessary to ensure that anticipated impacts on: listed threatened species and communities; listed migratory species, World Heritage properties; National Heritage places; the Great Barrier Reef Marine Park; and Commonwealth marine areas are managed to an acceptable level that maintains and/or enhances the protected matter in the vicinity of the proposed action. The recommended conditions are consistent with the objectives of the recovery plans for the relevant species assessed. The table at the beginning of this report outlines the department's recommendation in relation to the protection of Matters of National Environmental Significance.

12.2. Based on the information outlined in this report, the department recommends that the proposed action, to construct and operate a bauxite mine and port development, including associated shipping activities, near Weipa on the western side of Cape York, Queensland (EPBC 2010/5642) be approved under the EPBC Act subject to the conditions detailed at this start of this Recommendation Report.