Rio Tinto Alcan

Section 1

Executive Summary

1 Executive Summary

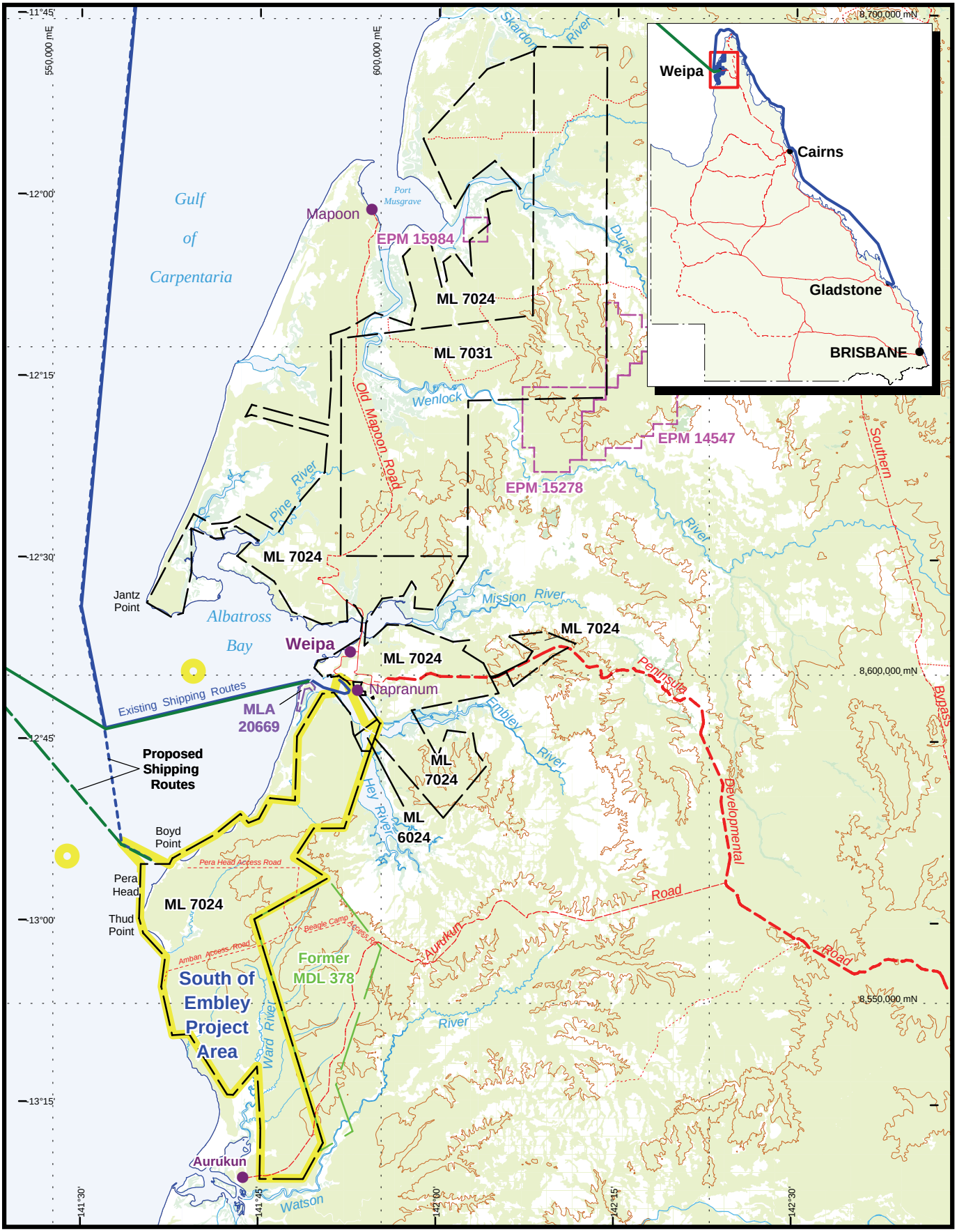
Project Overview

The proposed Project, referred to as the South of Embley (SoE) Project (or "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. The Project involves a staged increase in production up to 50 million dry product tonnes per annum (Mdptpa) of bauxite. The initial production is likely to be approximately 22.5Mdptpa. Actual production rates and the timing and size of capacity expansions would depend on market conditions. This document assesses the potential impact of several different levels of production, including 22.5Mdptpa and a maximum rate of 50Mdptpa. The anticipated mine life is approximately 40 years, depending on production rates.

The Project would be located near Boyd Point on the western side of Cape York Peninsula (refer **Figure 1-1**). Boyd Point is approximately 40km south-west of Weipa and 40km north of Aurukun, with the closest mining areas being 4km from Napranum, 15km from Aurukun, and 50km from the nearest cattle station homesteads. The Project area would be predominantly located on a portion of ML7024 south of the Embley River, on ML6024, on certain Strategic Port Land within the Port of Weipa, and offshore dredging and disposal areas (refer **Figure 1-2**).

The Project consists of the following components:

- **bauxite mining** – involving the clearing, salvage of topsoil, stripping of overburden, extraction of up to 50Mdptpa of bauxite, replacement of topsoil and revegetation. Mined areas would be progressively rehabilitated;
- **bauxite processing** – crude bauxite would be transported using a network of internal haul roads to one of two beneficiation plants (Boyd beneficiation plant, followed by a second plant near Norman Creek). A beneficiation plant separates the bauxite and waste materials through sizing, screening, washing and dewatering. Chemicals are not used in the process, only water. Fine waste materials would be discharged to tailings storage facilities;
- **product bauxite stockpiles** – beneficiated product stockpiles, built by a stacker for subsequent reclaiming, would be established adjacent to the proposed Port facilities;
- **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 for the initial construction phase, temporary barge and ferry access near the Port and temporary berthing facilities at the Humbug and Hey River sites. These would be used to transport workforce, materials and equipment between Weipa and the Project area. Approximately 111,000m^3 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 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 (Dam C), plus pipelines, water treatment plants (for potable water) and artesian bores;



RTA Mining Lease boundary
South of Embley Project Area
Oresome Australia Pty Ltd Mineral Sands Project
Former MDL 378
Cape Alumina Pty Ltd's Pisolite Hills Project
RTA Shipping route (domestic)
RTA Shipping route (international)
Locality
Drainage
Road/track
50m Topographic contour

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South of Embley Project

Fig. 1-1: Locality Map

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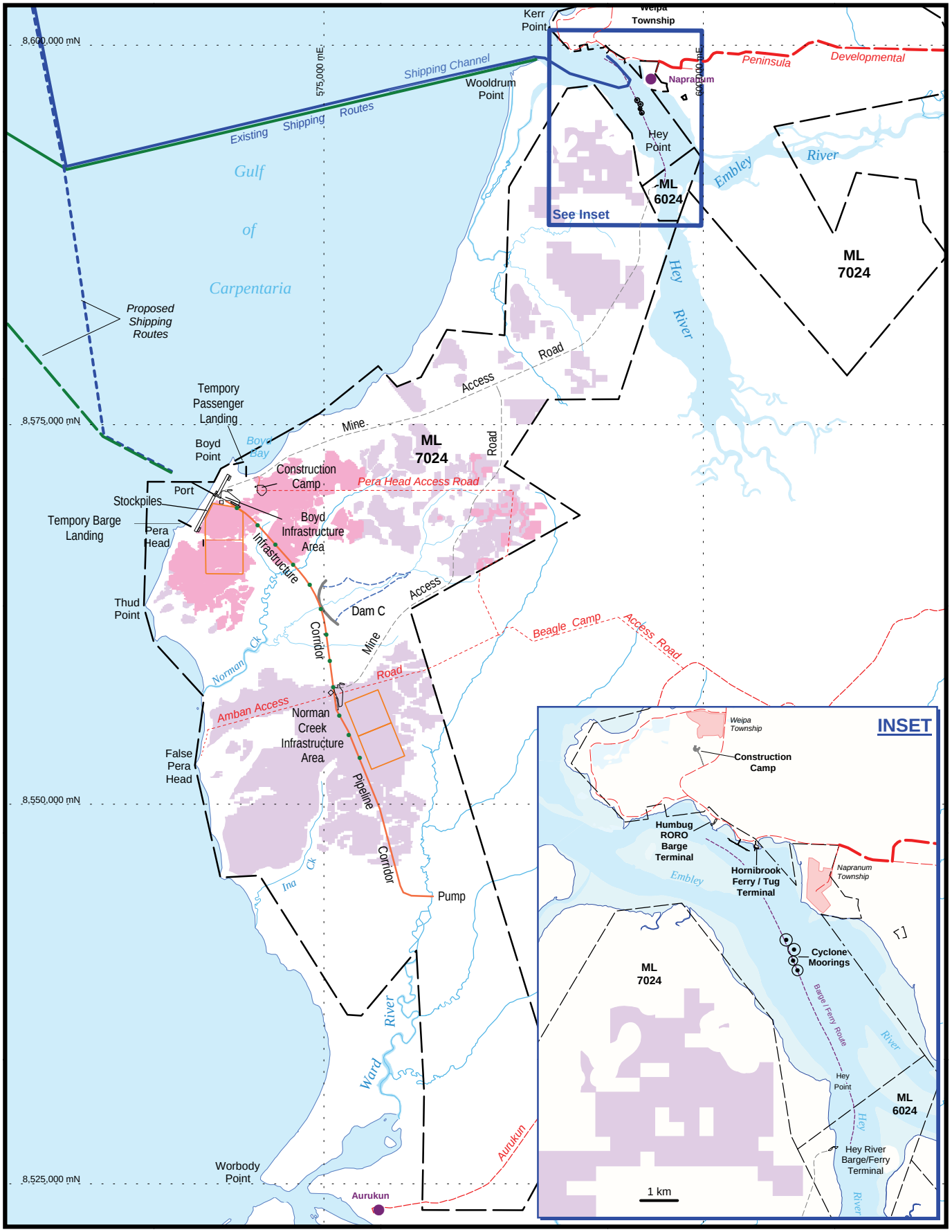
Datum/Projection: GDA94/MGA Zone 54 Date: 17/09/2012



Plans\SoE2013\EIS Figure 1\Fig 1-02 Infrastructure and Conceptual Mine Plan 40 years

RTA Mining Lease boundary
Locality
Road/track
Freshwater dam
Barge / Ferry route
Tailings storage facility
Mining Years 1 -13
Mining Years 14 - 40
Proposed Artesian Bore

South of Embley Project

Fig. 1-2: Infrastructure and Conceptual Mine Plan (up to 40 years)

N

5 0 5km

Datum/Projection: GDA94/MGA Zone 54 Date: 26/02/2013

- **Port and ship-loading facilities** – involving the construction and operation of a new Port, shiploading 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 of 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 approximately 2,600,000m^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 Project 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 export markets (e.g. China) 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 (GBR) Designated Shipping Area. Cargo and fuel would predominantly be delivered to the Port of Weipa via existing shipping routes from international and domestic ports and transferred to the Project area.

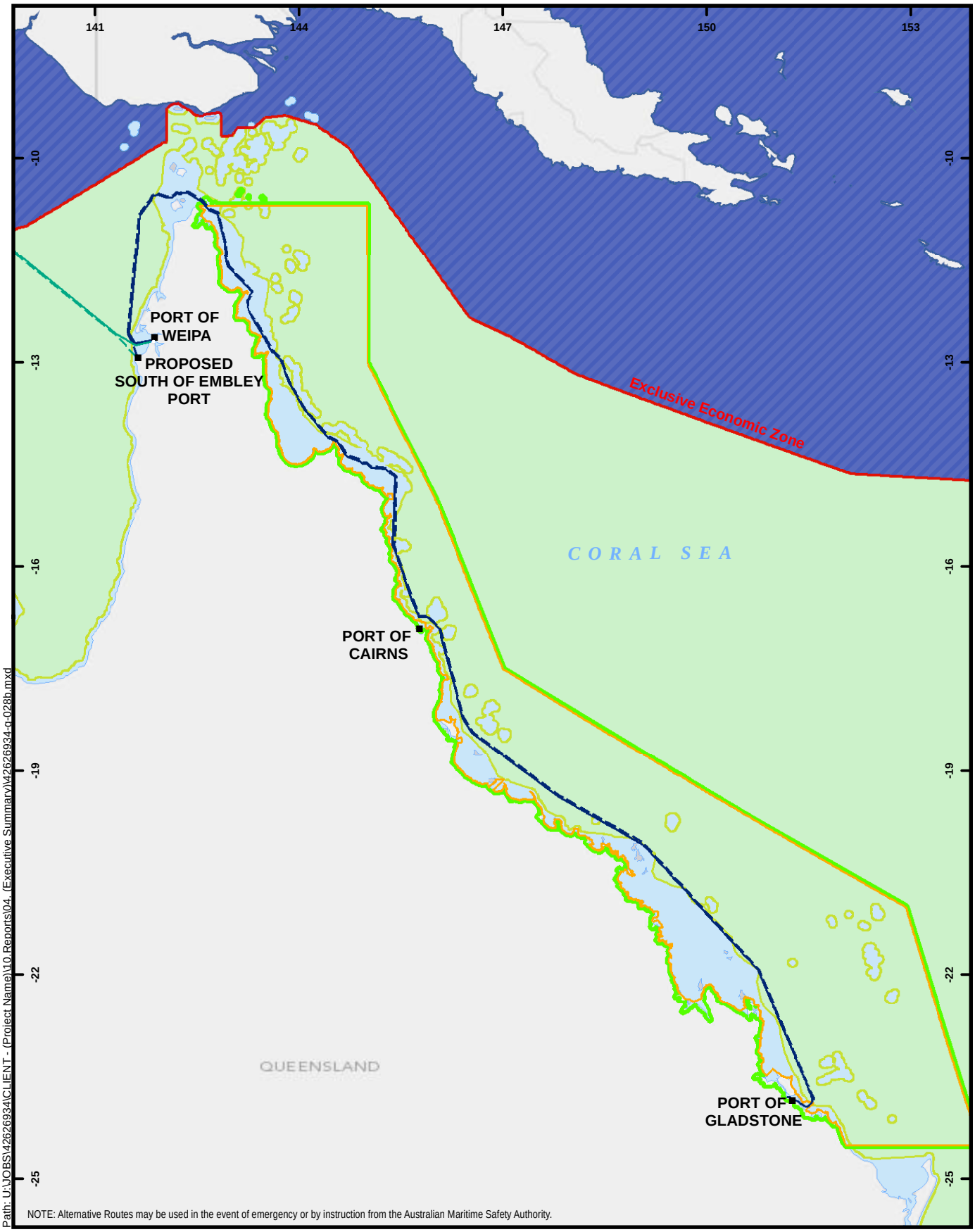
The main infrastructure components for the Project are illustrated in **Figure 1-2**. It is anticipated that construction would commence in or about 2013 subject to the grant of relevant environmental or other regulatory approvals and the determination of internal investment approvals for the Project by Rio Tinto. The initial construction phase is expected to take approximately 30 to 36 months, depending on the timing of the wet season in relation to Project approvals.

The proposed Port facility would be the port of loading and departure for shipping of processed bauxite to domestic and international destinations.

Bauxite ships leaving the Port would travel north past the existing Port of Weipa and through the Gulf of Carpentaria. Vessels supplying international export markets (e.g. China) would typically pass to the west of West Papua then east of the Philippines. Vessels supplying the domestic market would travel to Gladstone via the Torres Strait shipping route and the inner GBR Designated Shipping Area (refer **Figure 1-3**). In both cases, once vessels have passed the Port of Weipa they would travel via pre-existing shipping routes currently servicing bauxite mining operations to the north of the Embley River.

Project-related bauxite shipping would be expected to commence in or about 2016 (or approximately three years after the commencement of construction) subject to the grant of relevant environmental or other regulatory approvals, the determination or internal investment approvals for the Project by Rio Tinto and the construction schedule. As production from the Project increases there is anticipated to be a decrease in the bauxite shipments from the Port of Weipa as reserves at the existing Weipa operations deplete over time.

If the maximum production scenario (50Mdptpa) is reached, the potential increase in bauxite shipments (compared to bauxite shipping numbers prior to the commencement of the Project) would be an average of 60 bauxite ship movements per year through the Great Barrier Reef Marine Park (GBRMP). Movements of cargo barges for the Project through the GBR are predicted to increase by 92 movements per year at the maximum production scenario. It is predicted that all shipping in the inner GBR Designated Shipping Area would total 14,455 shipping movements in 2020. The small predicted increase in Project-related bauxite and cargo shipping, under a maximum production scenario, would represent a potential 1.0% increase in ship movements through the inner GBR Designated Shipping



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Rio Tinto Alcan

- Locality
- Exclusive Economic Zone
- RTA Proposed International Shipping Route
- RTA Existing International Shipping Route
- RTA Proposed Domestic Shipping Route
- RTA Existing Domestic Shipping Route
- Great Barrier Reef Marine Park (GBRMP)
- Great Barrier Reef World Heritage Area/National Heritage Place (GBRWHA/GBRNHP)
- Commonwealth Marine Area (CMA)
- International Waters
- Coastal Waters

South of Embley Project

Fig. 1-3: Shipping Routes and MNES

N

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Datum/Projection: GDA94

Date: 06/11/2012

Area. The Project's total predicted bauxite ship movements of 600 would represent 4.2% of the estimated 2020 ship movements through the inner GBR Designated Shipping Area. The Project's total predicted ship movements (bauxite and cargo) of 900 would represent 6.2% of the estimated 2020 ship movements through the inner GBR Designated Shipping Area.

The Port of Weipa would continue to receive deliveries of fuel, cargo, and equipment for the Project at the Humbug, Evans Landing, and Lorim Point wharves from domestic (mostly the Port of Cairns) and international ports. Materials would then be transferred either to vehicles or smaller barges as required for transport to the Project area. Some deliveries, such as construction materials and equipment modules, may be made directly to the new Port site or the barge/ferry terminal sites.

The Project would deliver significant economic benefits to the local, regional, Queensland and Australian economies, including direct and indirect employment opportunities and financial contributions.

This document has been prepared to meet the requirements outlined in the *Tailored Guidelines for a Draft Environmental Impact Statement South of Embley Bauxite Mine and Port Development Cape York Qld* (Tailored EIS Guidelines) prepared by the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) in July 2012 to address issues relevant to the controlling provisions under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The relevant controlling provisions for the Project are:

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

This document was advertised for public comment as a "draft EIS" between 22 November and 19 December 2012. The EIS has subsequently been updated and finalised, taking account of and summarising comments received within the submission period, and are published in this final EIS.

The Secretary of DSEWPaC will review the final EIS and give to the Minister a Recommendation Report relating to the action, which states whether the taking of the action should be approved, and if so, the conditions that should be attached to the approval.

The final approval decision of the Minister and associated conditions will be publicly notified by placing it on the DSEWPaC website.

Project Proponent and Environmental Record

The Project would be developed and operated by RTA Weipa Pty Ltd (RTA), 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.

Rio Tinto Alcan supplies bauxite, alumina and primary aluminium to Australia, New Zealand and export markets. Approximately 30% of Australia's total production of bauxite and 25% of its alumina is produced by Rio Tinto Alcan.

Rio Tinto Alcan's Australian head office for bauxite and alumina is based in Brisbane. Bauxite and alumina interests in Queensland include the existing Weipa operations and the Yarwun and

Queensland Alumina Limited (Rio Tinto Alcan holds an 80% interest in QAL) alumina refineries in Gladstone.

RTA has a record of responsible environmental management during more than 40 years of mining bauxite in the Weipa region. Whilst improvement of environmental performance and outcomes continues, due enquiry indicates that RTA, 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. In over 40 years of shipping from Weipa to Gladstone, there has been no reported collision or grounding incidents associated with RTA shipping to or from Weipa that has resulted in environmental harm.

RTA has a Health, Safety and Environment Policy that includes commitments to minimise environmental impact and continually monitor and improve the way the company works.

The primary contact for the Project is detailed below:

South of Embley Project
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Project Background and Rationale

RTA is currently mining the East Weipa and Andoom deposits located on ML7024 north of the Embley River. RTA is also mining from the adjacent Ely bauxite deposit (on ML7031) held by Alcan South Pacific Pty Ltd (acquired by Rio Tinto in 2007) under an agreement. Mined bauxite is trucked to one of two beneficiation plants located at Lorim Point and Andoom. Product bauxite is railed from Andoom to Lorim Point and conveyed to RTA's stockpiles prior to shipment from the Port of Weipa to either the Port of Gladstone or international ports.

The bauxite reserves north of the Embley River are gradually depleting, and with continuing demand for bauxite, RTA has undertaken extensive exploration programs. Significant bauxite reserves have been identified on the portion of ML7024 that lies south of the Embley River which could sustain a mining operation for about 40 years, depending on annual production rate.

RTA plans to develop a new bauxite mine south of the Embley River capable of producing up to 50Mdptpa along an incremental expansion pathway. The actual rates and the timing of production increases would be subject to market conditions.

The option of not proceeding with the Project is not financially feasible as the economic bauxite reserves will be depleted in RTA's current mining areas leading to the progressive closure of RTA's existing Weipa mining operations. Without an alternative source, the Gladstone alumina refineries would lose a viable, ongoing source of bauxite and the town of Weipa would lose its major financial contributor.

The Project requires assessment under both Commonwealth and Queensland environmental legislation. The Project is currently completing feasibility studies, having gained approval for the Project from the Queensland Coordinator General in May 2012 following exhibition of the Queensland EIS in 2011. This Commonwealth EIS has been prepared for the purposes of assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as well as the *Environment Protection (Sea Dumping) Act 1981*.

Project Objectives

The key objectives of the Project are to:

- extend the life of RTA's mining operations in Weipa beyond depletion of East Weipa and Andoom economic reserves;
- maintain continuity of bauxite supply to Gladstone refineries and third parties;
- enable increased bauxite production in the Weipa region in response to the rising global demand for this product and to enhance RTA's competitiveness as a bauxite producer;
- continue mining-related employment in the Western Cape region;
- maintain Weipa as the main residential and commercial support base for the Project;
- operate the Project in a manner that has an acceptable impact on surrounding communities and the environment;
- develop and operate the Project in compliance with all relevant statutory requirements; and,
- continue to maintain an open and honest relationship with stakeholders.

Alternatives

RTA has undertaken studies to optimise the Project design and minimise environmental impacts to the extent possible. A number of alternatives for different components of the Project have been considered including:

- location of the Port and stockpiles;
- construction of the Port jetty;
- Port capacity;
- location of anchorage area;
- locations of the barge and ferry terminals;
- location of the tug berths;
- disposal of dredged material;
- location of the temporary barge landing area;
- location of the temporary passenger jetty;
- construction workforce housing;
- shipping routes;
- water supply;
- beneficiation plant;
- tailings system;
- power supply; and,
- location of the beneficiation plants.

The alternatives were evaluated based on technical and operational feasibility as well as potential impact on matters of national environmental significance (matters of NES). Consultation with relevant stakeholders was also conducted where required as part of assessing the feasibility of Project alternatives.

Project Schedule

Construction of the Project would be anticipated to commence in or about 2013, subject to the grant of relevant environmental and other regulatory approvals and the determination of internal investment approvals for the Project by Rio Tinto. Construction would be expected to take 30 to 36 months depending on weather conditions and timing of approvals in relation to the dry season. Wherever practicable and required, construction activities would be undertaken 24-hours a day.

Production and shipping of the first bauxite from the Project area is expected to commence at the end of the initial construction phase, following commissioning.

The Project involves a staged increase in production up to 50Mdptpa from the likely initial production rate of approximately 22.5Mdptpa. The timing and size of capacity expansions would depend on market conditions. Similarly, the timing and extent of associated construction activities is subject to market conditions and approvals.

Overview of Existing Environment

The following section provides a summary overview of the existing regional and local environments including the physical, biological, social, cultural and economic environment.

Land

The proposed mine and infrastructure areas are located within the Weipa Plateau Subregion of the Cape York Peninsula Bioregion. The terrestrial part of the Project area (the portion of ML7024 south of the Embley River and ML6024) is predominantly an elevated bauxite plateau that is fringed on majority of its coastal margins by low cliffs and lateritic outcrops. The “Project area” incorporates areas that would be disturbed as a result of the Project as well as a significant proportion of the mining lease that would not be disturbed as a result of the Project.

Lands within the Project area are not used for agriculture and are relatively undisturbed by development. Exploration activities have taken place throughout the Project area and are continuing. While overall there has been very little direct disturbance and the terrestrial environment is generally in good condition, 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. The Project would have no direct impact on agricultural land uses or management practices of surrounding land. A significant proportion (70.4%) of the Project area would not be disturbed by the proposed action.

Terrestrial Flora and Fauna

Terrestrial flora and fauna surveys were completed within the Project area during July 2006, May 2007, December 2007, May 2008, December 2008, May 2009, July 2012 and October 2012, and were designed to target the range of habitat over the Project area, while focussing on those habitats where threatened species were most likely to occur. The terrestrial part of the Project area is relatively homogenous in vegetation and landform, and is characterised by large areas of *E. tetrodonta*, *Corymbia nesophila* tall woodland on deeply weathered plateaus, dissected by smaller areas of riparian vegetation, vine thicket patches and paperbark swamps. There are no protected areas within or near the Project area.

Darwin Stringybark woodland comprises 87% of the Project area and 99% of the disturbance area for the Project. Darwin Stringybark woodland is correlated with the bauxite-bearing Weipa plateau.

No EPBC Act listed “endangered ecological communities” are present in the Project area.

Two orchid species listed under the EPBC Act are known to occur in the Project area. The Cooktown Orchid (*Dendrobium bigibbum*) was found in two locations within the proposed footprint of Dam C, in the vicinity of the proposed infrastructure corridor crossing of Norman Creek, and in the vicinity of proposed road crossings of Norman and Winda Winda Creeks. The Chocolate Tea Tree Orchid

(*Dendrobium johannis* (*Cepobaculum johannis*)) was found within the proposed infrastructure corridor where it crosses Norman Creek but was not found within the footprint of Dam C.

The disturbance associated with Dam C and other infrastructure represents a minor proportion of the habitat for these two orchids.

Four other flora species listed under the EPBC Act were determined to be either likely to occur (Beach Nightshade) or possibly occurring (*Calophyllum bicolour*, Ant Plant and *Spathoglottis plicata*) within the Project area. None of these species were found during surveys.

The habitats of all the threatened flora species known, likely or possibly occurring within the Project area are in non-Darwin Stringybark vegetation communities which would not be directly affected by bauxite mining operations.

Three fauna species (Red Goshawk (*Erythrotriorchis radiatus*), Masked Owl (*Tyto novaehollandiae kimberli*), and Northern Quoll (*Dasyurus hallucatus*)) listed under the EPBC Act were identified as possibly occurring in the Project area. None of the species were found during the survey efforts undertaken for the Project. No high suitability habitat for either the Masked Owl or Northern Quoll was identified in the Project area. High suitability habitat for the Red Goshawk was identified in non-Darwin Stringybark vegetation communities associated with river systems and the adjacent Darwin Stringybark forests. The majority of this high suitability habitat would not be disturbed by the Project.

One fauna species (Bare-rumped Sheathtail Bat (*Saccolaimus saccolaimus nudicluniatus*)) listed under the EPBC Act was determined to be data deficient in the Project area. Targeted surveys have not located the species in the Project area. The habitat and general ecology of this species is poorly known. 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. Habitat modelling, undertaken for the *National recovery plan for the bare-rumped sheathtail bat Saccolaimus saccolaimus nudicluniatus*, did not identify the Western Cape York Peninsula area as potential habitat for the species.

Forty migratory avian species listed under the EPBC Act are known to occur, likely or possibly occurring in the Project area. The majority of these species utilise habitats that would be located within the proposed SoE environmental buffers and are not directly affected by the Project.

Relevant impacts, proposed mitigation measures and residual impacts on threatened flora and fauna and migratory avian species are summarised in the Relevant Impacts and Proposed Mitigation Measures section of this Executive Summary.

Aquatic Ecology

The proposed Project area sheds runoff from a centrally located topographic high to the west via Ina and Norman Creek; to the north via Triluck–Winda Winda Creek, Roberts and Leithen Creeks (the latter two primarily estuarine); to the east via unnamed tributary drainages of the Hey River estuary; and, to the south via the Ward River system. A number of smaller, less defined drainage depressions also flow independently to the Gulf of Carpentaria between these named drainage systems. Within the Project area there are also several swamps that occur in depressions within the bauxite plateau which are largely isolated from defined drainage networks.

Given the generally small size of these catchments and the highly seasonal rainfall of the region, many of the smaller streams and depressional swamps do not contain permanent aquatic habitats. However, shallow groundwater connectivity to surface water features is apparent in parts of the Project area

and semi-permanent groundwater discharge maintains stream flows in the lower reaches of larger streams (e.g. Norman Creek, Ward River) beyond the wet season.

Aquatic ecosystems within the Project area include swamps, lagoons, freshwater channels, and estuaries. The Norman Creek system includes perennial stream reaches and aquatic refugia and supports a host of aquatic habitat types. The systems are a mix of perennial and seasonal systems, some of which are interconnected with the groundwater system. The two main aquatic vegetation community types are riparian overstorey and aquatic macrophytes. Macrophytes are not common in the Project area due to shading by closed riparian forests, nutrient poor water and leaf litter dominated substrates, and high discharge rates.

The southern extremity of the Project area overlaps the Archer Bay Aggregation on the lower Ward River, which is a nationally significant wetland area listed in the Directory of Important Wetlands in Australia. These wetland systems provide areas of wetland habitat, productivity (carbon biomass), fish nursery, fisheries, nesting/feeding for migratory birds, aquatic refugia, habitat for threatened species and cultural significance.

No mining is proposed within the Archer Bay Aggregation. Archer Bay is fed by the Ward, Watson and Archer Rivers. Mining is only proposed within the Ward River catchment, which covers only 3.8% of the total contributing catchment of 17,358km^2. The Project would not affect the Watson or Archer Rivers. An assessment of impacts of mining on the Ward River catchment determined that the Project would reduce mean annual discharge to the Ward River estuary by 0.4%. The Project impact on the Archer Bay Aggregation, and any threatened, migratory and marine species which use these systems, would be negligible.

The Cape York Peninsula Land Use Strategy (CYPLUS) identifies two areas of conservation significance adjacent to the Project area: the estuary of the Embley River to the north and the Aurukun Wetlands to the south. There are two other relatively large wetland aggregations partly or wholly contained within the Project area; lower Winda Winda–Triluck Creeks and lower Norman Creek. These systems also provide wetland habitat, productivity (carbon biomass), fish nursery, fisheries, nesting/feeding areas for migratory birds, aquatic refugia, habitat for threatened species and areas of cultural significance. There are no Ramsar wetlands within or near the area affected by the Project.

Aquatic ecosystems in the Project area were surveyed and sampled in May 2008 and May 2009, with additional observations made during site visits in August–September 2007, November 2007, February 2008 and December 2008, February–March 2009, and August 2012.

Sampling of aquatic biota comprised two post wet season sampling periods in May 2008 and May 2009 as this presented the optimal site conditions for sampling. During the wet season, stream reaches could not be sampled due to the inaccessibility of sites due to wet season inundation of the landscape and the presence of debris laden high flows that prevented the safe and effective deployment of sampling equipment. While field observations were made at other times, the limited biological sampling cannot fully quantify seasonal and inter-annual variation in the Project area. However, when combined with information from surveys conducted by the same biologists elsewhere on the Weipa Plateau, the general composition of the aquatic biota can be suitably characterised.

No EPBC Act listed aquatic species were identified within the Project area.

Marine Environment and Estuarine and Marine Species

Benthic (sea floor) habitat surveys were completed within the Project area during October 2007, June 2008, November 2008, June 2009, July 2009, June 2010, and February 2012. A combination of towed video sled and drop camera video techniques and grab samples were adopted for these studies, allowing the survey of multiple sites in a short period, providing key information to describe the distribution and structure of benthic habitats.

Near shore fringing reef communities in the vicinity of the proposed Port occur approximately 2km to the north-east at Boyd Point and approximately 2.8km to the south-west at Pera Head. Fringing reef communities also occur between Pera Head and Thud Point in Queensland coastal waters. These communities comprise both hard corals and low profile reefs containing soft coral/sponge assemblages. The importance of these reef systems (Boyd Point to Thud Point) in a regional context is considered to be high as they support resources that are of conservation, cultural, commercial and recreational importance. Satellite imagery also indicates there may be numerous small reef outcrops present between Thud Point and Aurukun. Hard corals over the reef areas include species from the following genera: *Porites*, branching *Acropora*, *Turbinaria*, *Monitipora*, *Lobophyllia*, *Platygyra*, *Pavona* and *Favia*. Near shore sponge and soft coral reefs provide a food resource for a range of marine turtle species. The area known as the "Three Mile" (an area of scattered rubble substrate in Queensland coastal waters) is an important fishing area for charter operators and recreational anglers.

The development footprints for all marine infrastructure components of the Project (the Port, barge/ferry terminals, proposed new spoil ground, and temporary seaborne access areas) have been confirmed by field inspection. Most benthic habitats consist primarily of soft sediment habitats. The habitat closest to the Port contains extensive sub-tidal soft sediment habitats and small areas of soft coral-sponge habitat with <2% live cover. Some coral reef was observed at the Boyd Point temporary passenger jetty option and to the south of the temporary barge landing area near Pera Head.

Nine Mile Reef is located approximately 6km south south-west of the proposed new spoil ground in the Commonwealth marine area and is an important fishing location for local recreational fishermen and commercial line fishing.

The existing spoil ground at Albatross Bay is located in Queensland coastal waters and currently receives capital and maintenance dredging material from the Port of Weipa. The Albatross Bay spoil ground receives an average of about 1,000,000m^3 annually of spoil dredged from the inner harbour and entrance channel. The Albatross Bay spoil ground has been confirmed by field inspection as consisting primarily of soft sediment habitats that contain sparse epifauna typical of soft sediments. The Albatross Bay spoil ground does not contain, and is not close to any, reef communities, and also contains no seagrass beds, and is not shallow in nature.

The Queensland Department of Agriculture, Fisheries and Forestry conducts annual seagrass surveys in the Hey and Embley estuaries. Seagrass beds are typically present in the more sheltered areas of the Embley and Hey River estuaries and Boyd Bay. Seagrass habitats in the Albatross Bay area provide nursery habitat for fish and macroinvertebrates and species of conservation significance (e.g. Dugongs and Green Turtles). No seagrass was detected within the proposed Hornibrook terminal dredging footprint during surveys in 2012. Samples collected within 100m of the footprint recorded seagrass (*Enhalus acoroides*) leaves (no attached rhizomes) and additional samples collected to the east in an area known to have seagrass recorded seagrass (*E. acoroides*) leaves (no attached rhizomes) and seagrass with attached rhizomes (*E. acoroides*). No seagrass was detected within the proposed Humbug terminal dredging footprint area during the drop camera surveys in July 2009 and February 2012; however isolated patches of *E. acoroides* were observed within and adjacent to the

dredge footprint during visual inspection in May 2010. Seagrass with attached rhizomes (*Halophila ovalis*) was detected approximately 100m north north-west of this dredging footprint. No seagrass was detected within, or adjacent to, the proposed Hey River terminal dredging footprint. Samples collected in the bay to the north of this terminal, in an area known to have seagrass, recorded seagrass (*E. acoroides*) leaves (no attached rhizomes). No seagrass was observed in the survey of the temporary barge landing area near Pera Head. Seagrass was observed at the Boyd Bay temporary passenger jetty option.

The Project area is included in the area where the Northern Prawn Fishery (NPF), the Gulf of Carpentaria Commercial Inshore Finfish Fishery and the Gulf of Carpentaria Commercial Line Fishery operate. Recreational fishers and guided fishing tour operators also utilise the Project area.

Ambient water quality at the proposed Port, proposed new spoil ground, and ferry and barge facilities all exhibit significant natural fluctuations in suspended sediment and turbidity.

Listed Threatened Marine Species

Six species of marine turtles (also listed as migratory under the EPBC Act) transit the Project area and Project-related shipping routes. Three of these marine turtle species are listed as Endangered under the EPBC Act (Loggerhead Turtle, Leatherback Turtle and Olive Ridley Turtle) and three are listed as Vulnerable under the EPBC Act (Green Turtle, Hawksbill Turtle and Flatback Turtle). Green, Loggerhead, Hawksbill and Flatback Turtles have internationally significant populations in the GBRMP. Marine turtles are present in both coastal and pelagic marine waters of the GBRMP depending on their life history phase.

Previous studies of nesting activity in the vicinity of the Project area were undertaken in August to September 2003 and May to July 2007. In April 2008, field surveys were undertaken identify marine turtle tracks and nests from Norman Creek to north of Boyd Point, encompassing 27km of beach (including the proposed Port site).

Based on these studies, it was concluded that three species of marine turtles (Flatback Turtle, Olive Ridley Turtle and Hawksbill Turtle) nest on the beaches in low densities in the vicinity of the Project area, and feed in the surrounding waters. Marine turtle populations are currently significantly adversely impacted by feral pig predation of nests and entrapment in ghost nets.

Four elasmobranch species are likely to, or could possibly, occur within the Project area, including one species listed as Critically Endangered under the EPBC Act (Speartooth Shark) and three species listed as Vulnerable under the EPBC Act (Freshwater Sawfish, Dwarf Sawfish and Green Sawfish).

Sampling of Project area freshwater and estuarine stream reaches (including for elasmobranches) was undertaken during two post wet season sampling periods in May 2008 and May 2009, with additional observations made during site visits in August–September 2007, November 2007, February 2008 and December 2008, and February–March 2009.

Following a detailed assessment of potential habitat (specifically including the margins of shallow sand/mud bars and deeper main channels), targeted net surveys for threatened sawfish species and Speartooth Shark were conducted in August 2012 at both Boyd Point and Norman Creek estuary (over three days), and Embley/Hey River estuary (over four days).

The above surveys did not find any of the threatened sawfish species or the Speartooth Shark within the Project area.

Non Avian Migratory Species

The Estuarine Crocodile is commonly encountered in the Weipa area including the freshwater swamps and creek systems within the Weipa mining leases. The tributaries that collectively form the Port Musgrave system and the Albatross Bay system surrounding Weipa (including the Embley and Hey River estuaries adjacent to the Project area), have been identified as the two most significant Estuarine Crocodile habitats in Queensland. The species is widespread in the Project area.

Surveys for the Estuarine Crocodile were undertaken throughout the Project area in 2007, 2008, 2009 and 2012. Surveys included foot transect surveys for fauna (including for Estuarine Crocodiles) in riparian and wetland habitats covered substantial sections of the upper Ward River/Coconut Creek, Norman Creek, Ina Creek and Winda Winda Creek systems.

A dedicated boat-based spotlight survey was also undertaken over two nights in November and December 2008 in the lower Ward River, downstream of the Project area.

Opportunistic observations of the Estuarine Crocodile were also made during various other field surveys.

The Estuarine Crocodile was recorded in all freshwater and marine habitats across the Project area, including freshwater swamps and inland streams. 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. One Estuarine Crocodile nest was found within the proposed footprint of Dam C.

A comprehensive desk-top assessment of Dugongs in the Project area was undertaken and incidental observations for Dugongs were made during the various field investigations for the Project in 2007, 2008, 2009, 2010 and 2012. No Dugongs were sighted in the Project area during any field investigations.

Field investigations also verified the lack of suitable Dugong foraging habitat (seagrass beds) at the proposed Port site and the proposed new spoil ground. The seagrass species *E. acoroides*, which dominates the seagrass beds of the Embley and Hey Rivers, is not considered to be a preferred seagrass species in the Dugong diet.

Dugong feeding trails were observed in seagrass beds, comprising two seagrass species *Halophila ovalis* and *Halodule pinifolia*, in the lower Ward River estuary in December 2008. No feeding trails were observed in May 2009.

Based on field investigations and the comprehensive desk-top assessment it was determined that Dugongs occur in low densities in Albatross Bay and graze on the seagrass beds in the Embley estuary.

Two cetacean species listed as migratory under the EPBC Act (Indo-pacific Humpback Dolphin, Australian Snubfin Dolphin) are known to occur in the Project area and another (Bryde's Whale) could possibly occur within the Project area or the area that would be transited by Project-related shipping.

Field investigations were conducted in 2007, 2008, 2009, 2010 and 2012 to undertake benthic habitat mapping to determine the presence of suitable habitat for migratory cetaceans within the Project area. Incidental observations of cetaceans were also recorded during these field investigations. A desktop literature search for records of the species was also undertaken.

Comprehensive surveys for cetaceans were also conducted in August 2012. Nine days of survey were carried out (comprising both dedicated and incidental observations) in the Boyd Point area, Norman Creek estuary, Hey River and Embley River estuary.

Incidental observations at the proposed Port between 2007 and 2010 confirmed the presence of the Australian Snubfin Dolphin and Indo-Pacific Humpback Dolphin. Targeted cetacean surveys in August 2012 confirmed the presence of Indo-Pacific Humpback Dolphins within the Embley River estuary and at Boyd Point.

Relevant impacts, proposed mitigation measures and residual impacts on threatened marine and migratory marine species are summarised in the Relevant Impacts and Proposed Mitigation Measures section of this Executive Summary.

Commonwealth Marine Area

The Commonwealth marine area (CMA) consists of any waters of the sea inside the seaward boundary of the exclusive economic zone except waters which have been vested in a State or waters within the limits of a State (**Figure 1-3**). It generally equates to a region between approximately 5.6km to 370.4km from the low water line along the coastline and a line which encloses Albatross Bay. It includes the seabed and airspace of these waters.

The CMA in the Gulf of Carpentaria basin is comprised of extensive sub-tidal soft sediment habitats that contain epifauna typical of soft sediments, such as seapens and tube dwelling anemones, soft corals or sponges.

The proposed new spoil ground is located within the CMA. Suspended sediments associated with dredging the proposed Port and spoil disposal at the existing Albatross Bay spoil ground (located outside the CMA) have the potential to enter into the CMA. Project-related shipping routes traverse the CMA as illustrated by **Figure 1-3**.

Relevant impacts, proposed mitigation measures and residual impacts on the CMA are summarised in the Relevant Impacts and Proposed Mitigation Measures section of this Executive Summary.

Great Barrier Reef Marine Park

The GBR is the world's largest coral reef system, located on the east coast of Queensland, from Cape York in the north to past Lady Elliott Island in the south (refer **Figure 1-3**), covering some 34,870,000ha.

A Marine Park was declared over large parts of the GBR in 1975 under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). The Marine Park is referred to as the GBRMP under the GBRMP Act and covers an area of the GBR referred to as the Great Barrier Reef Region.

The GBRMP is slightly smaller (one per cent) than the Great Barrier Reef World Heritage Area (GBRWHA) as shown in **Figure 1-3**. The main difference in size is that the GBRMP does not include islands or waters of any bay, gulf, estuary, river, creek, port or harbour that are within the limits of Queensland in accordance with the *Seas and Submerged Lands Act 1973* (Cth). These features are included in the GBRWHA.

The GBRMP Act establishes zones to manage multiple uses in the GBRMP and protect its values. These zones are defined in the *Great Barrier Reef Marine Park Zoning Plan 2003* (Zoning Plan) and provide for a range of recreational, commercial and research opportunities and for the continuation of traditional activities. The zones establish rules for the activities, including shipping, and define those activities that are prohibited or require a permit.

The GBRMP Act and the EPBC Act were integrated through legislative changes that took effect on 25 November 2009. These changes established the GBRMP as a matter of NES under the EPBC Act and

aligned approval processes, such that Section 43 of the EPBC Act provides that where a permission is not required for undertaking shipping activities within designated zones under the GBRMP Act, an approval is not required under Part 9 of the EPBC Act to authorise those shipping activities. Under the Zoning Plan established pursuant to the GBRMP Act, commercial ships do not require a permit to transit through General Use Zones and Designated Shipping Areas.

Relevant impacts, proposed mitigation measures and residual impacts on the GBRMP is summarised in the Relevant Impacts and Proposed Mitigation Measures section of this Executive Summary.

Great Barrier Reef World Heritage Area (GBRWHA)

The Great Barrier Reef World Heritage Area (GBRWHA) was the first coral reef ecosystem in the world to be inscribed on the World Heritage List in 1981, due to its "Outstanding Universal Values" (OUV). A property included in the World Heritage List is a declared World Heritage Property under Section 13(1) of the EPBC Act. The GBRWHA covers an area of 348,000km^2 and extends across a contiguous latitudinal range of 14 degrees. Most of the property lies within the GBRMP: at 344,400km^2 the GBRMP comprises approximately 99% of the GBRWHA (Figure 1-3).

The GBRWHA was listed based on the following criteria (in DSEWPaC's order):

1. World Heritage Criteria VIII - Outstanding example representing the major stage of the earth's evolutionary history.
2. World Heritage Criteria IX - Outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment.
3. World Heritage Criteria VII - Contain unique, rare and superlative natural phenomena, formations and features and areas of exceptional natural beauty.
4. World Heritage Criteria X – Provide habitats where populations of rare or endangered species of plants and animals still survive.

Relevant impacts, proposed mitigation measures and residual impacts on the GBRWHA is summarised in the Relevant Impacts and Proposed Mitigation Measures section of this Executive Summary.

Great Barrier Reef National Heritage Place

The GBR was included on the National Heritage List on 21 May 2007 (GBRNHP). The determination states that, as a property on the World Heritage List, the GBR should also be included in the National Heritage List for those heritage values identified by the World Heritage Committee. Each National Heritage value has one or more corresponding World Heritage values.

The boundary of the GBRNHP is the same as the GBRWHA (**Figure 1-3**).

The GBRNHP is recognised for five of the National Heritage List criteria. These criteria are:

A. Processes - 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. Rarity - 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. Research - 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. Principal characteristics of a class of place - 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. Aesthetic characteristics - 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.

Relevant impacts, proposed mitigation measures and residual impacts on the GBRNHP is summarised in the Relevant Impacts and Proposed Mitigation Measures section of this Executive Summary.

Surface Water

The main catchments within the Project footprint are the Norman Creek, Ina Creek and Ward River catchments. The surface waters of the Project area are used by Traditional Owners and visitors for fishing, camping and recreation.

The Project's principal water requirements are for process water, haul road watering, vehicle wash-down, dust suppression and potable supplies. The Project's water demands range from 24.8GL/year at 22.5Mdptpa to 63.7GL/year at 50Mdptpa.

At 50Mdptpa, water would typically be drawn in order of preference from tailings recycle (22.1GL/year), recovery slots (1.6GL/year), and then a combination of surface water dam (Dam C) (25.4GL/year) and artesian bores (11.9GL/year).

After the construction of the Norman Creek plant, some supplementary surface water (2.5GL/year, up to 1% of mean annual flow) may be drawn directly from the Ward River to minimise the risk of inadequate supply from Dam C.

Catchment modelling indicates that Dam C would lead to an overall maximum annual decline in flow to the Norman Creek estuary of 15%, well within the range of normal year-to-year variation. Modelling shows Dam C would have a negligible impact on downstream wet season overbank flow to adjacent floodplains. There is typically little dry season flow at Dam C after July and when flow ceases, pools within the channel are no longer connected and some without groundwater inflow eventually dry up. An effect of Dam C would be to stop flow between pools earlier than would be the case under natural conditions. This is not expected to have an impact on matters of NES. Dam C would be fitted with a low level outlet pipe which would permit the controlled release of environmental flows when required. Sufficient water would be reserved for environmental flows to enable continued releases in the driest months (August to October) of a volume equivalent to 25% of dam inflows.

Groundwater

The groundwater resources in the Project area comprise shallow aquifer and artesian aquifer resources.

The bauxite layer (part of the Wyaaba beds) is highly permeable and is usually unsaturated. The bauxite overlies a kaolinite clay layer (part of the Bulimba Formation) which is generally of low permeability and typically contains macropores that allow preferential flow. The kaolinite layer is a transitional zone between the bauxite and the underlying sandstone Bulimba Formation. On the Weipa Peninsula north of the Embley River, the Bulimba Formation hosts a high yielding shallow aquifer which is used to supply existing RTA mining operations. However, the shallow aquifers in the Project area tend to be poorly developed and discontinuous.

Typically in the Project area, the water table is within the bauxite only at the height of the wet season, if at all. In the dry season the water table generally falls to 4 to 8m below the base of the bauxite. Streamflow during the dry season tends to be maintained by baseflow originating predominantly from kaolinitic strata. Water balance modelling shows the overall effect of mining on the baseflow and deep baseflow components is very small.

The artesian resources are hosted within the Gilbert River Formation and Garraway Beds. These are part of the Great Artesian Basin (GAB) aquifers, the main artesian groundwater resource in the region. RTA has an existing artesian Water Licence under the *Water Act 2000* (Qld) for 9GL per annum which allows abstraction from artesian bores located on ML7024. RTA has applied to increase the artesian allocation to cover the fluctuations in artesian demand. At maximum production, the overall Project demand averages 12GL per annum, with a peak abstraction of 15GL in any one year. Groundwater modelling indicates that up to 18GL per annum may be abstracted while still keeping within existing Water Licence conditions.

GAB discharge springs are absent from northern Cape York, as is the threatened ecological community *'The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin'*.

The Rolling Downs Group separates the shallow and artesian aquifers with a 500m thick confining layer of low hydraulic conductivity. Abstraction of artesian groundwater is not expected to have any impact on the shallow aquifer. The Queensland Government has a "spring factor" requirement whereby artesian abstraction should not cause the cumulative spring factor for registered recharge and watercourse springs to exceed 400mm head of water. Calculations show that abstraction at 12GL/year and 18GL/year meets the spring factor requirement in all cases. Groundwater modelling results also show that there would be negligible impact on flow in the Wenlock River (which is a watercourse spring).

Air Quality

The Project area is vegetated and does not currently contain significant particulate (dust) sources except for smoke from when bushfires occur. Potential sources of particulate emissions surrounding the Project area primarily comprise:

- unsealed roads;
- bushfires;
- existing RTA mines and processing plants at East Weipa and Andoom; and,
- cattle stations.

Given its remote location and the lack of significant particulate emission sources, the dust levels within the Project area are relatively low. The estimated average background level of dust deposition in the Western Cape region was 50mg/m^2/day over 30 days. The Queensland guideline for maximum dust deposition in residential areas is 120mg/m^2/day (30 days).

During construction of the Project, 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. These emissions would generally be localised and of relatively short duration.

During operations, the main sources of dust would be the progressive clearing of areas to be mined, topsoil stripping and rehabilitation, bauxite extraction and hauling by dump trucks. Bauxite has a high moisture content during beneficiation, conveying, stockpiling and shiploading so these processes are only a minor source of dust.

Minor amounts of particulates, SO_2 and NO_2 would be emitted by the diesel-fired power station and vehicles.

Air quality modelling of the Project shows no significant impacts on residential locations or on matters of NES.

Noise / Vibration

The residential areas along the Embley River, namely Napranum and the accommodation areas in Evans Landing, would be the nearest sensitive receptors to the Project area. The median current background ($L_{A90(1\ hour)}$) noise levels at the nearest sensitive receptors were found to be 41dB(A) during the day and 38dB(A) during the evening and night. The existing mining operations north of the Embley River currently contribute to the noise environment in Evans Landing and Napranum.

The proposed noise level criteria for the Project have been derived taking into consideration the acoustic quality objectives for health and wellbeing as well as the control of background creep, described in the *Environmental Protection (Noise) Policy 2008* (Qld).

Construction of the mine facilities and beneficiation plants would consist of a number of noise sources including earthworks, erection of buildings and structures, and installation of plant and equipment.

Bauxite and overburden are relatively easy to dig and would not require blasting.

The mine industrial area would include numerous noise sources including the beneficiation plant (including crushers), conveyors, power station, stacker/reclaimers and light vehicles.

Underwater noise levels from different sources are frequency dependent, as follows:

- seismic activity is in the first 10Hz;
- shipping and meteorological effects, including rain and wind, dominate the spectrum from 10 to 100Hz;
- wave action, rain and wind dominate the spectrum up to almost 100kHz; and,
- molecular thermal effects dominate the spectrum above 100kHz.

Underwater noise would occur as a result of construction of the proposed Port, barge/ferry terminals and navigation aids and temporary seaborne access infrastructure. Underwater noise during construction would be due to pile driving activities. Pile driving activities would closely follow the completion of capital dredging activities. Underwater noise during operations would arise from Project-related shipping activities and maintenance dredging.

Relevant noise impacts have been modelled and associated mitigation measures on matters of NES are summarised in the Relevant Impacts and Proposed Mitigation Measures section of this Executive Summary.

Social and Economic Context

The Project is located in the Western Cape region, which includes the Aurukun, Mapoon, Napranum and Weipa communities.

At the time of the 2011 Census, the total population of the four communities in the Western Cape region was 5,772 people, of which 50% were Indigenous. Weipa accounted for most of the region's population with 3,333 people (19% Indigenous), followed by Aurukun (1,294 people, 92% Indigenous), Napranum (857 people, 96% Indigenous) and Mapoon (288 people, 90% Indigenous). The projected population increase in Weipa due to the Project is in the range of 440 to 530, approximately. There are about 1163 dwellings in Weipa (2011 census).

RTA owns 237 of these dwellings, with the remainder owned privately and by Government agencies. The RTA workforce lives locally in predominantly privately owned homes and two single person villages located at Rocky Point (140) and Evans Landing (200). The economy and employment opportunities in the Western Cape region are dominated by the existing RTA mining operations north of the Embley River. The local economy and employment opportunities are also supported by businesses associated with the existing RTA mining operations, the cattle industry, commercial fishing and tourism. Recreational fishing is the major component of the tourism sector.

Private sector employment is relatively high in Weipa for both Indigenous and non-Indigenous people in comparison to that of the other communities, where government employment is dominant. Weipa's high proportion of Indigenous and non-Indigenous private sector employment is largely attributable to employees and contractors engaged with RTA's operations. Based on 2006 Census data, Mining and Mineral Product Manufacturing accounts for 43% of jobs in Weipa, followed by Education and Training (9%), Public Administration and Safety (9%), Healthcare and Social Assistance (6%) and Retail Trade (6%).

In 2011, 25% of RTA's employees were Indigenous, 17% from the local areas and 8% from outside the local area.

Lands within the Project area are not used for agriculture and are relatively undisturbed by development. The Project area is covered by a mining lease issued in 1958. Some cattle grazing and limited logging and sawmilling took place within the Project area in the early to mid 1900s but not since. There are no rural properties within the Project area.

Relevant Impacts and Proposed Mitigation Measures on Matters of NES

Threatened Flora

The distribution and habitat of threatened flora species known or likely to occur, or possibly occurring within the Project area is described in the Overview of Existing Environment section of this Executive Summary. The following relevant direct and indirect potential impacts of the Project have been considered for threatened flora species:

- clearing and loss of habitat;
- edge effects;
- fragmentation of habitat;
- effects on recruitment/movement of propagules;
- water quality;
- altered hydrological regime;
- air quality;
- introduction of weeds and pests; and,
- altered fire regime.

The primary potential impact on threatened terrestrial flora species would be the direct removal of habitat in the Dam C footprint.

The key avoidance measures that would be implemented to minimise relevant impacts from the Project on threatened flora species include the following:

- the proposed SoE environmental buffer system would exceed the requirement of the Queensland Coordinator General's approval conditions and comprise a methodology for determining set-back distances for mining from sensitive vegetation, instead of from the banks of watercourses and wetlands. This would protect areas that provide potential habitat for these species from mining;
- most infrastructure would be sited in areas with less sensitive vegetation; and,
- a dam on the Ward River has been removed from the proposal.

In addition, mitigation and enhancement measures would be implemented to further reduce impacts on these species. These include:

- for each Cooktown Orchid and Chocolate Tea Tree Orchid plant that is found within disturbance areas, 3.5 plants shall be translocated and/or propagated and established in suitable riparian habitat which is not to be disturbed; and,
- implementation of weed, fire management and feral pig control programs.

The assessment concludes that Project-related impacts on threatened flora species after mitigation measures are implemented would be negligible to minor.

Under the *EPBC Act Environmental Offsets Policy*, offsets are not required where the residual impact is not likely to be significant (when assessed against the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*).

The results of the impact assessment process conclude that with the implementation of the proposed mitigation measures, the residual impacts associated with the construction and operation of the Project on all terrestrial flora species would be negligible to minor and therefore not significant. As such, offsets relating to terrestrial flora species are not required under the Commonwealth offsets policy.

It is noted that the proposed orchid translocation and propagation does constitute an offset for threatened flora species under the *Queensland Biodiversity Offsets Policy* and the implementation of this offset is a recommendation of the Queensland Coordinator General's report for the Project.

Threatened Terrestrial Fauna

None of the threatened terrestrial fauna species considered as possibly occurring (the Red Goshawk, Masked Owl and Northern Quoll) in the Project area were located during the survey efforts and there are no previous records of the species within the Project area. Nevertheless, a detailed impact assessment was carried out to identify any high or moderate suitability habitat in the Project area for these species.

Habitat modelling for the Bare-rumped Sheathtail Bat did not identify the Western Cape York Peninsula area as potential habitat for the species, which has only been found in eastern Cape York on the Iron Range and Attack Creek (approximately 140km east of the Project area). The largest targeted survey effort for the species in Australia has been undertaken in the Project area (including 100 trap nights) and the species was not found.

The assessment concluded that direct impacts such as fragmentation of habitat and effects on movement, breeding and feeding patterns of these species, were they to be present, were negligible to minor. The primary reason for this would be that the proposed SoE environmental buffer systems and areas excluded from mining would protect contiguous ecological corridors that would allow individuals, should they occur, to access potential habitat within and outside of the Project area.

The primary potential impact on threatened terrestrial fauna species, were they to be present, would be the direct removal of habitat in the Dam C footprint.

Habitat removal impacts on both the Masked Owl and Northern Quoll, were they to be present, were assessed to be minor, as no high suitability habitat would be impacted by the Project and only a small amount of moderate suitability habitat would be impacted. The removal of moderate suitability habitat would represent a very small portion of the potential habitat for these species in the Project area (approximately 3% for the Masked Owl and 4% for Northern Quoll) and less than 0.1% of similar habitat within the Subregion.

Project-related impacts on high suitability habitat for the Red Goshawk would be approximately a quarter of one home range (one home range is approximately 20,000ha) for a breeding pair.

In total, the loss would represent only 13% of the potential high suitability habitat for this species in the Project area and 0.3% of the 1,421,675ha of similar habitat within the Subregion. A larger area of moderate suitability habitat for the Red Goshawk would be impacted during the operational phase of the Project. This habitat is less productive in terms of prey availability and may only be used intermittently and seasonally for foraging by the species, if present. The high and moderate suitability habitat for the Red Goshawk cleared during mining operations would be progressively rehabilitated. Progressive rehabilitation would minimise the area of habitat displaced at any one time and would facilitate reinstatement of foraging habitat (i.e. similar to the existing moderate suitability habitat). Given the relatively small amount of high suitability habitat displaced, the substantial areas of high suitability habitat that would remain available for nesting and foraging, the highly mobile and low density nature of this species, and the progressive rehabilitation of foraging habitat, the overall impact of habitat loss would be minor after progressive rehabilitation and other mitigation measures are implemented.

Potential indirect adverse impacts of the Project such as noise, air quality and changes to fire and water regimes were considered to be negligible to minor for all species based on the results of the studies undertaken.

The following key avoidance and mitigation/enhancement measures would be implemented for threatened terrestrial fauna species:

- removal of a dam on the Ward River from the proposal;
- pre-disturbance surveys for nesting Red Goshawk and nesting Masked Owl and avoidance of clearing until after breeding season;
- implementation of weed, fire management and feral pig control programs;
- siting facilities in areas with less sensitive habitat to avoid impacts;
- implementation of the proposed SoE environmental buffer system; and,
- progressive rehabilitation with local native species.

The proposed SoE environmental buffer system would exceed the requirements of the Queensland Coordinator General's approval conditions and comprise a methodology for determining set-back distances for mining from sensitive vegetation, instead of from the banks of watercourses and wetlands. The sensitive vegetation that would be buffered by Darwin Stringybark woodland would comprise the following vegetation types: riparian, wetland, estuarine, vine forest and coastal vegetation on sand. RTA would work with Traditional Owners and the relevant WCCCC Sub-committee on establishment of environmental buffers as part of the Communities Heritage and Environment Management Plan (CHEMP). The buffer system would maintain a network of undisturbed habitats and would be enhanced through the proposed fire management program which would conserve fire sensitive flora and promote overall vegetation diversity and the feral pig control program which would reduce pig damage to riparian and wetland areas. The area protected by the proposed SoE environmental buffer system (17,364ha) would be at least 8,356ha larger than that required by Queensland regulatory requirements.

Under the *EPBC Act Environmental Offsets Policy*, offsets are not required where the residual impact is not likely to be significant (when assessed against the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*).

The results of the impact assessment process conclude that with the implementation of the proposed avoidance, mitigation and enhancement measures, the residual impacts associated with the

construction and operation of the Project on all terrestrial fauna species would be negligible to minor and therefore not significant. As such, offsets relating to terrestrial fauna species are not required under the Commonwealth offsets policy.

Threatened Estuarine and Marine Fauna

Ten threatened estuarine and marine species listed under the EPBC Act were identified as possible, likely or known to occur in the Project area.

This included six marine turtle species and four elasmobranch (shark and sawfish) species. Potential direct and indirect impacts, such as creation of turbidity plumes from dredging activities, entrainment in dredge, underwater acoustic impacts from pile driving, and marine oil spills, on marine turtle species were determined to be minor prior to, and following, mitigation.

Marine turtle nesting surveys were conducted in the vicinity of the proposed Port site. These surveys determined that marine turtles nest on beaches between Thud Point and Boyd Point at low densities (mainly the Flatback Turtle, with minor numbers of Olive Ridley and Hawksbill Turtles). Surveys of marine turtle nests on the beach in the vicinity of the Port also demonstrates that nest predation by feral pigs is prevalent.

The largest potential impact on nesting marine turtles and their hatchlings as a result of the Project was considered to be altered light regime from onshore lighting at the Port. Altered light regime could prevent hatchlings finding the open water immediately following emergence from the nest and may increase the risk of predation. However, with the implementation of the proposed light management plan (including shielding, timers, movement sensors, low impact-wavelength lighting, and limited onshore lighting) the impact on nesting marine turtles and their hatchlings in the vicinity of the Port was determined to be minor both during the construction and operational phases of the Port.

Important foraging habitat for marine turtles is not present within the proposed dredge footprints, minimising the risk that marine turtles would be in the path of the dredge. With the implementation of fauna exclusion devices and an exclusion zone as detailed in the Dredge Management Plans (DMPs), the impact from entrainment in dredges would be negligible for marine turtles.

Potential impacts on elasmobranchs from marine construction, dredging, offshore spoil disposal or the construction of Dam C were all determined to be negligible as these activities are either not located within potential habitat or the nature of disturbance would not exclude continued habitat use by these species. The reasons for this conclusion are as follows:

- It is considered unlikely that the Speartooth Shark would occur within the vicinity of the proposed Port facilities or offshore spoil disposal grounds. The dredge footprint for the Port is not located within any important habitats identified for the Dwarf Sawfish. The Freshwater and Green Sawfish are widely distributed throughout northern Australia, and the Port location is well removed from estuaries that are the key habitat for these species.
- The 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 and the Speartooth Shark and would not exclude use of these areas by these species.
- The Project area is currently exposed to periodic but significant physical disturbance and elevated turbidity during extreme weather events. Sawfish and the Speartooth Shark typically inhabit turbid waters, are highly mobile, and can move away from any local areas that are temporarily affected by disturbance.
- Spoil disposal areas are not preferred habitat for sawfish and the Speartooth Shark. Both spoil grounds consist of soft sediment habitat, of which there is extensive similar habitat within and

surrounding the Project area. These species are highly mobile and have the ability to move to similar habitats within or adjacent to the Project area. The proposed Port is not located within any critical habitats for sawfish or the Speartooth Shark.

- The freshwater reaches of Norman Creek, including reaches upstream and downstream of Dam C are not considered to be suitable habitat for the Freshwater Sawfish and Speartooth Shark as they are small and highly seasonal habitats that lack large permanent pools, and lack suitable prey species. The freshwater reaches are not suitable habitat for Green or Dwarf Sawfish, which are considered to be restricted to marine and estuarine habitats and do not enter freshwater.

The following summarises the key mitigation and enhancement measures that would be implemented for threatened estuarine and marine fauna:

- Port and River DMPs which include marine fauna exclusion devices and exclusion zones;
- underwater noise mitigation measures for piling including 'soft start' and exclusion zones;
- lighting management plan to reduce impact on marine turtle hatchlings; and,
- feral pig control program to reduce predation on marine turtle nests.

Under the *EPBC Act Environmental Offsets Policy*, offsets are not required where the residual impact is not likely to be significant (when assessed against the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*).

The results of the impact assessment process conclude that, with the implementation of the proposed mitigation measures, the potential residual impacts associated with the construction and operation of the Project on all threatened estuarine and marine fauna species would be negligible to minor and therefore not significant. As such, offsets relating to threatened estuarine and marine fauna species are not required under the Commonwealth offsets policy.

It is noted that the feral pig control program does constitute an offset for marine turtle species under the *Queensland Biodiversity Offsets Policy* and the implementation of this offset is a recommendation of the Queensland Coordinator General's report for the Project.

Avian Migratory Species

Forty migratory avian species listed under the EPBC Act were identified as present, likely or possible to occur in the Project area.

The largest potential impact on avian migratory species would be habitat loss. 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. No 'important habitat' for migratory avian species would be substantially modified, destroyed or isolated by Project. The majority of these species predominantly utilise habitats that would be located within the proposed SoE environmental buffers and would not be directly affected by mining.

There would be some loss of general habitat as a result of the Project. The Rainbow Bee-eater and Barn Swallow occasionally forage in Darwin Stringybark woodland and species that spend day and night on the wing (aerial species) overfly Darwin Stringybark woodland. In addition, the Rainbow Bee-eater and Barn Swallow are more likely to concentrate activity within coastal and riparian habitats located outside of the mine footprint, where habitat characteristics provide conditions more favoured by these species for foraging. For the aerial species group, foraging habitat comprises the airspace

above terrestrial habitats and the availability of prey within this zone is not necessarily related to the terrestrial habitat located directly below it.

The overall impact on these migratory avian species from habitat loss in Darwin Stringybark woodland would be negligible as cleared areas 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.

The key avoidance measures that would be implemented to minimise impacts from the Project on migratory avian species include the following:

- the proposed SoE environmental buffer system would exceed the requirements of the Queensland Coordinator General's approval conditions and comprise a methodology for determining set-back distances for mining from sensitive vegetation, instead of from the banks of watercourses and wetlands. This would protect areas provide potential habitat for most avian migratory species from mining; and,
- beach, wetland and riparian habitats favoured by migratory species would have minimal disturbance from infrastructure.

In addition, the following mitigation and enhancement measures would be implemented to further reduce impacts on these species:

- progressive rehabilitation would limit the amount of general habitat impacted at any one time; and,
- implementation of weed, fire management and feral pig control programs.

Following mitigation, Project-related impacts on migratory avian species were determined to be negligible.

Under the *EPBC Act Environmental Offsets Policy*, offsets are not required where the residual impact is not likely to be significant (when assessed against the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*).

The results of the impact assessment process conclude that with the implementation of the proposed mitigation measures, the residual impacts associated with the construction and operation of the Project on all avian migratory species would be negligible and therefore not significant. As such, offsets relating to terrestrial flora species are not required under the Commonwealth offsets policy.

Non-Avian Migratory Species

The Estuarine Crocodile, Dugong, Australian Snubfin Dolphin and Indo-Pacific Humpback Dolphin are known to occur in the Project area. The Bryde's Whale possibly occurs in the Project area.

No 'important habitat' (as defined in the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*) for these species is present in the Project area. Project-related activities would not represent a barrier to migration for these species.

The Project area is not considered to represent a significant proportion of the population or an important habitat for the Australian Snubfin Dolphin, Indo-Pacific Humpback Dolphin or Bryde's Whale.

The disturbance area for the proposed infrastructure, dredging and offshore disposal grounds represents 0.8% and 0.7% of the potential foraging habitat within the Project area for the Australian Snubfin Dolphin and Indo-Pacific Humpback Dolphin respectively. The dredge footprint of the Project area is primarily characterised as flat, unvegetated soft sediments habitat, and are therefore unlikely to support high densities of prey species to be considered important foraging habitat for the Bryde's

Whale. Bryde's Whales are opportunistic feeders and, if present, are considered likely to be only transitory through the Project area.

The small reefs to the north and south of the proposed Port experience naturally high turbidity and sedimentation rates over extended periods of time and are tolerant of sediment. The impact of sediment plumes and sedimentation from capital dredging on cetaceans foraging habitat is expected to be minor to negligible and alternative foraging habitat for cetacean species occurs within the area. The creation of a turbidity plume would not represent a barrier to migration for the Bryde's Whale.

Dugong populations in the vicinity of the Project area are considered to represent a low proportion of the Gulf of Carpentaria population. There is a lack of seagrass beds and therefore suitable Dugong foraging habitat at the proposed Port site and the proposed new spoil ground. In addition, the seagrass species, *Enhalus acoroides*, which dominates the seagrass beds of the Embley and Hey Rivers, is not considered to be a preferred seagrass species for Dugong.

Potential impacts on Estuarine Crocodiles were determined to be negligible because:

- The species' has a widespread distribution and only a very minor proportion of habitat in the Project area that would be disturbed by the Project.
- The benthic habitats in the dredge footprint of the Port are not considered to be an important habitat for Estuarine Crocodiles and the proposed dredging activities within the Hey and Embley Rivers would result in a negligible impact on the viability of the adjacent mangrove system, or on fisheries values or habitat essential to the Estuarine Crocodile.
- Current breeding levels in the Project area found during EIS surveys, and indicated in previous research, suggest that the abundance of Estuarine Crocodiles in Norman Creek is probably more dependent on migration of juveniles from other breeding locations rather than breeding within the Norman Creek system.
- The length of potential nesting habitat that would be disturbed by the proposed Dam C footprint represents only approximately 9% of the total available freshwater nesting habitat within the Project area. This area of disturbance would be a small fraction of the available nesting habitat in the sub-region.
- The implementation of the proposed SoE environmental buffer system would ensure that the most suitable habitats of the Estuarine Crocodile are avoided.

The potential unmitigated impact of marine oil spills on Dugongs and cetacean species was determined to be minor prior to, and following, mitigation.

Pile driving activities have the potential to temporarily alienate cetaceans, cause physical damage to the auditory system or cause temporary changes in behavioural patterns. Based on underwater noise modelling, the potential unmitigated impacts on cetaceans from underwater noise associated with pile driving activities were assessed as minor. With the implementation of proposed noise mitigation measures, including a soft-start pile driving and exclusion zones, the impact of underwater noise associated with pile driving activities was determined to be negligible for cetaceans.

The potential unmitigated impact from entrainment in dredges for Dugongs was determined to be minor. Important foraging habitat for Dugongs is not present within the proposed dredge footprints, minimising the risk that Dugongs would be in the path of the dredge. With the implementation of the proposed mitigation measures outlined in the DMPs, the impact on Dugongs from entrainment in dredges would be negligible.

The key measures that would be implemented to mitigate unavoidable relevant impacts from the Project on non-avian migratory avian species include the following:

- Port and River DMPs including marine fauna exclusion devices and exclusion zones; and,
- underwater noise mitigation measures for piling including 'soft start' and exclusion zones.

The potential unmitigated impact on Dugong as a result of vessel strike associated with Project-related shipping (including the operation of the barge and passenger vessel in the Hey/Embley Rivers) was assessed as negligible. However, the passenger vessel would use a transit lane which follows the greatest water depths and would be restricted to a speed of 6 knots in depths of less than 2m when approaching berth. These mitigation measures would further reduce the potential for vessel strike on Dugong.

Under the *EPBC Act Environmental Offsets Policy*, offsets are not required where the residual impact is not likely to be significant (when assessed against the *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*).

The results of the impact assessment process conclude that, with the implementation of the proposed mitigation measures, the potential residual impacts associated with the construction and operation of the Project on all non-avian migratory species would be negligible to minor and therefore not significant. As such, offsets relating to non-avian migratory species are not required under the Commonwealth offsets policy.

The feral pig control program would have consequential positive effects on Estuarine Crocodiles as it would reduce threats associated with nest predation.

Commonwealth Marine Area

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

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

Impacts associated with the disposal of dredged material from the Port at the proposed new spoil ground were determined to be negligible.

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. 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 CMA, 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 CMA. The key mitigation measures to minimise impacts of dredging and spoil disposal are outlined in the DMPs prepared for both the Port and river facilities. Due to the predicted minor impact of the turbidity plume associated with dredging operations or spoil disposal for the Project and the implementation of DMP's, it was determined that the Project is unlikely to significantly impact on any of the values of the CMA.

Under the maximum production scenario (50Mdptpa), up to 700 bauxite ships per annum would be loaded at the proposed Port and travel through the CMA. Approximately 400 of these would be bound for export markets, and travel through the Gulf of Carpentaria but not pass through the GBR. The balance of a predicted average of 300 bauxite shipments per year (600 ship movements) are required to supply bauxite to two existing alumina refineries in Gladstone and would travel through the GBR. Bauxite shipping from the Port of Weipa to export markets and Gladstone, prior to commencement of bauxite shipping from the proposed Boyd Port, is predicted to range between 420 and 450 ships per

annum (depending on the size of the ships). The volume of bauxite shipping using the Port of Weipa will decrease over time as reserves north of the Embley River are depleting and Project-related bauxite shipping replaces much of this demand. Therefore, the potential net average annual increase in bauxite shipping from RTA at maximum production would range between 90 and 280 ships (depending on the size of ship used for export and market conditions) in the Gulf of Carpentaria, including a potential average of 30 loaded ships (60 ship movements) which would travel through the GBR to the Port of Gladstone.

Up to 150 deliveries of cargo and 22 deliveries of fuel per annum (344 ship movements) through the CMA are predicted to be required to supply the Project and the town of Weipa under the maximum production scenario (50Mdptpa). All of these shipments would travel through the Gulf of Carpentaria, but not all cargo shipments would travel through the GBR and no fuel deliveries would travel through the GBR.

Existing shipping routes would continue to be used by Project-related bauxite, cargo and fuel shipping. Potential impacts on the CMA from Project-related bauxite, cargo and fuel shipping activities associated with collision/groundings, spills and releases, marine pest introduction would continue to be managed in accordance with standard industry management practices, and Commonwealth and international marine regulations and policies. Impacts on marine species from Project-related bauxite, cargo and fuel shipping activities such as acoustical impacts and vessel strikes were determined to be minor. Based on the outcomes of this assessment, coupled with the relatively small increase in shipping activities and the fact that, in over 40 years, there have not been any shipping incidents causing environmental harm in the CMA associated with RTA owned or contracted vessels, the impacts of Project-related shipping on the CMA were determined to be negligible.

Several shipwrecks are known to occur in the general vicinity of, but not within, the shipping route. Any shipping hazards are recorded on navigation charts. Therefore impacts on Heritage Values of shipwrecks associated with Project-related shipping activities were determined to be negligible.

Great Barrier Reef Marine Park

The mine, Port and associated infrastructure areas are located approximately 370km from the Great Barrier Reef Marine Park (GBRMP) (by length of shipping route). Due to this distance, the only potential impacts on the GBRMP from the Project are considered to be those associated with domestic shipping activities.

Some 9,700 ship movements (a movement of an individual ship from one port to another either loaded or unloaded) from major GBR ports were reported to use GBR shipping channels in 2007, with approximately 65-75% of these ships utilising the inner GBR Designated Shipping Area. This equates to approximately 6,305 to 7,275 movements per annum in the inner GBR Designated Shipping Area. Based on EPBC Act referral applications to DSEWPaC for the Abbot Point, Hay Point, Gladstone and Townsville ports (Multiple Cargo Facility excluded), the Ports and Shipping Information Sheet published by GBRMPA estimates that predicted shipping through the inner GBR Designated Shipping Area in 2020 would equate to 14,455 shipping movements per annum (based on 65% of shipments using the inner GBR Designated Shipping Area).

Projected ship movements through the GBRMP would include the small potential increase in bauxite shipping at maximum production, plus the extra deliveries of cargo (predominantly from the Port of Cairns or other east coast domestic ports) that would be required to support the operation and the town of Weipa. A summary of the predicted annual average shipping movements through the GBRMP during the operational phase of the Project is provided in **Table 1-1**.

Table 1-1 Summary of Annual Predicted Average Shipping Movements through GBRMP – Operations

Ship Movements	Cargo Barge	Fuel*	Bauxite	Total
Existing – before Project	208	0	540	748
Potential Additional – Project Maximum Production	92	0	60	152
Total	300	0	600	900

* Fuel supplies are likely to continue being sourced from Darwin, but it is recognised that this could vary in the future at the discretion of the fuel supply company.

Note: Actual shipping movements would depend on market conditions and size of ships.

The potential additional operational Project-related shipping activities at maximum production (152 movements per annum) equates to approximately 2.4% of 2007 shipping levels through the inner GBR Designated Shipping Area. The potential additional bauxite shipping at maximum production (60 movements per annum) equates to approximately 1% of 2007 shipping levels through the inner GBR Designated Shipping Area.

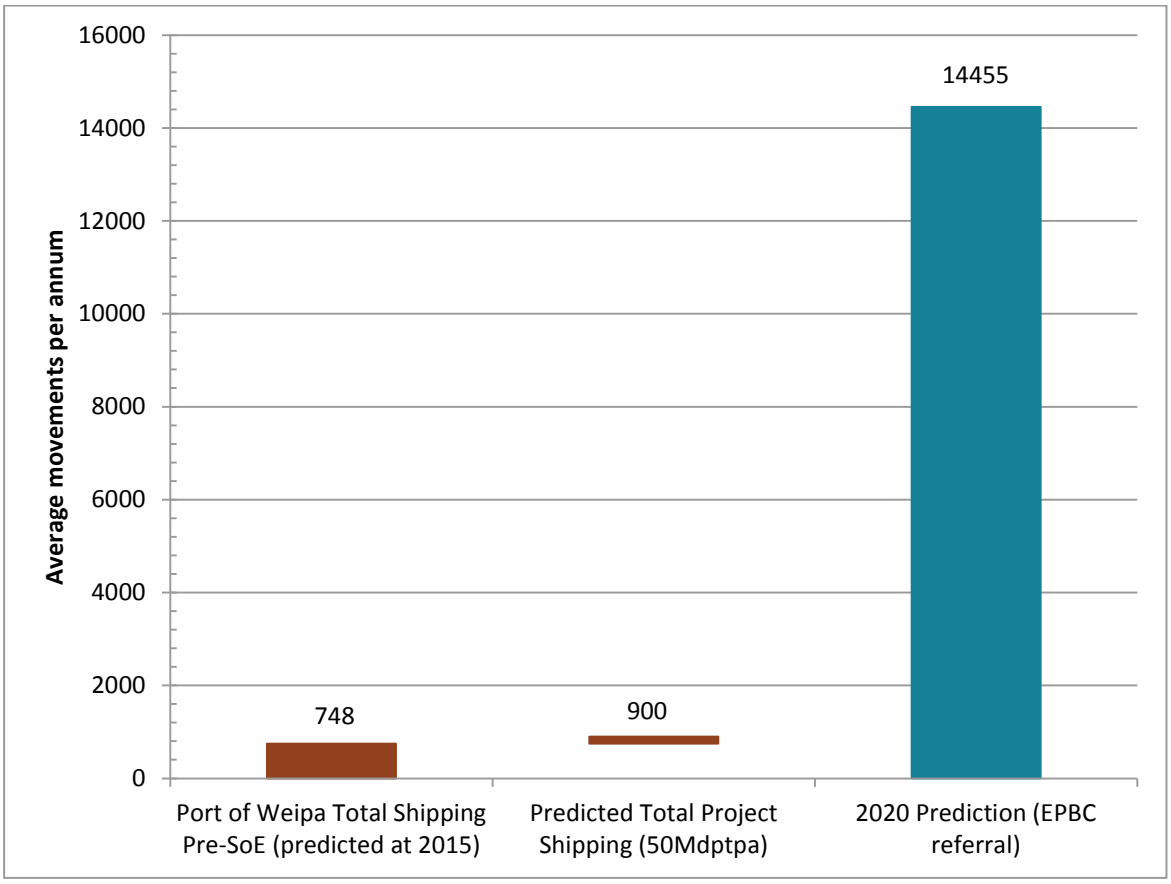
Potential Project-related shipping movements during the operational phase of the Project compared to predicted levels at 2020 through the inner GBR Designated Shipping Area is illustrated in **Figure 1-4**. The additional potential operational Project-related shipping activities (152 movements per annum) equate to approximately 1% of predicted shipping through the inner GBR Designated Shipping Area. The potential additional bauxite shipping at maximum production (60 movements per annum) would represent approximately 0.4% of the predicted shipping movements through the inner GBR Designated Shipping Area in 2020. The Project's total predicted bauxite ship movements of 600 would represent 4.2% of the estimated 2020 ship movements through the inner GBR Designated Shipping Area. The Project's total predicted ship movements (bauxite and cargo) of 900 would represent 6.2% of the estimated 2020 ship movements through the inner GBR Designated Shipping Area.

The potential increase of an annual average of 30 bauxite ships (60 ship movements) through the GBR at maximum production (compared to shipments occurring prior to commencement of the Project) includes possible fluctuations in future shipments due to variation in bauxite grade quality and in alumina production at the Gladstone refineries (within the scope of existing approvals for the refineries).

An assessment was made of potential Project-related shipping impacts on the GBRMP from marine pest introduction, degradation of ecosystem function and integrity, vessel strike, underwater noise, artificial lighting, changes to air quality, changes to water quality, oil spill and cargo spill.

Stochastic spill modelling of a 25.25m^3 spill in Gladstone Harbour suggested that there would be up to 2% and up to 6% possibility of 0.01mm or thicker water-surface slicks entering the GBRMP from a spill at Fisherman's Landing and South Trees Wharf respectively if such a spill occurred. For the modelled cells within the GBRMP that have a possibility for oil on water, there is a maximum probability of 2% and 6% for a slick to occur from a spill at Fisherman's Landing and South Trees Wharf respectively. The model results for a 5m^3 spill at both Fisherman's Landing and South Trees Wharf would not result in any water-surface oil slicks of 0.01mm or thicker being transported into the GBRMP. The *Final Report – Assessment of the risk of pollution from marine oil spills in Australian ports and waters* carried out for the Australian Maritime Safety Authority estimated the annual probability of a spill (>10t) in the GBRMP as being 0.0511.

Figure 1-4 Total Operational Shipping Movements Compared to Long Term Forecast



The probability of an oil spill greater than 10t from a Project-related vessel (bauxite or cargo) traversing the GBR is 0.0174 (1.74%). The increase in the annual probability of a spill due to the projected increase in Project-related shipping is estimated to be 0.0058 (or 0.58%). Given a similar increase in spill probability in the Port of Gladstone, the small potential increase in Project-related shipping at maximum production would only increase the risk of an oil or fuel spill entering the GBRMP to a negligible extent. All potential impacts on the GBRMP associated with Project-related bauxite and cargo shipping were determined to be negligible as Project-related shipping would continue to be managed in accordance with standard industry management practices and Commonwealth and international marine regulations and policies.

The following measures that are used for existing Weipa bauxite and cargo shipping activities would continue to be used for Project-related shipping:

- using the existing shipping route which traverses the inner Designated Shipping Area of the GBR;
- for vessels over 70m in length, use of a pilot when transiting through the inner route of the GBRMP to the north of Cairns and the compulsory pilotage areas of the Torres Strait. All ships would have a minimum of one local pilot on board through the Port of Gladstone, with pilotage commencing at the Fairway Buoy (compulsory pilotage is estimated to reduce the risk of a shipping incident by a factor of 30);
- fatigue management guidelines to ensure the crew remains alert (bauxite shipping);
- using a real-time global positioning system referred to as the Automatic Identification System (AIS) for vessels over 50m, which is integrated with the ReefVTS. The ReefVTS compiles timely

and accurate traffic imaging of shipping throughout the region and generates ship encounter predictions, which are disseminated to ships;
- maintaining a modern fleet of bauxite ships in a good state of repair and subject to regular inspections to minimise the risk of a ship being disabled; and,
- the use of two tugs at all times during berthing operations.

It is noted that 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.

Section 43 of the EPBC Act provides that where permission is not required for undertaking shipping activities within designated zones under the GBRMP Act, an approval is not required under Part 9 of the EPBC Act to authorise those shipping activities. Under the Zoning Plan established pursuant to the GBRMP Act, commercial ships do not require a permit to transit the inner GBR Designated Shipping Area through which Project-related shipping would transit.

Great Barrier Reef World Heritage Area

The Great Barrier Reef World Heritage Area (GBRWHA) overlaps and is slightly larger (1%) than the GBRMP. The GBRWHA was listed based on the following criteria:

1. World Heritage Criteria VIII - Outstanding example representing the major stage of the earth's evolutionary history.
2. World Heritage Criteria IX - Outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment.
3. World Heritage Criteria VII - Contain unique, rare and superlative natural phenomena, formations and features and areas of exceptional natural beauty.
4. World Heritage Criteria X – Provide habitats where populations of rare or endangered species of plants and animals still survive.

As for the GBRMP, an assessment of potential Project-related bauxite and cargo shipping impacts on the values of the GBRWHA was made and these were also assessed as negligible.

Great Barrier Reef National Heritage Place

The Great Barrier Reef National Heritage Place (GBRNHP) shares identical boundaries with the GBRWHA. The GBRNHP is recognised for five of the National Heritage List criteria and these five National Heritage criteria each correspond to one or more of the four World Heritage List criteria associated with the GBRWHA.

As for the GBRWHA, an assessment of potential Project-related bauxite and cargo shipping impacts on the values of the GBRNHP was made and these were also assessed as negligible.

Social and Cultural Impact

Economic Modelling

The likely economic impacts arising from the construction and operation of the Project have been estimated using an input-output model. The model estimates the total economic contribution to the local, Far North Queensland (FNQ), Queensland and Australian economies would be significant. The results of the modelling for the various phases of the Project are:

- Construction Phase (22.5Mdptpa production capacity)
  - Estimated direct employment averages approximately 950 people;

  - Indirect employment of approximately 632 people in the local area, 993 people in the Far North Queensland (FNQ) region, 1,712 people state-wide and 2,286 people nationally;
  - Direct financial contribution of $264 million locally, $527.9 million in the FNQ region, $989.9 million in Queensland and $1,319.8 million nationally;
  - Indirect financial contribution of $167.6 million locally, $522.0 million in the FNQ 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 local region;
  - Indirect employment of approximately 615 people locally, 964 people in the FNQ region, 2,008 people state-wide and 3,104 people nationally;
  - Direct annual financial contribution of $675 million across the local, regional, Queensland and national economies;
  - Indirect annual financial contribution of $194 million locally, $292 million in the FNQ region, $584 million in Queensland and $920 million nationally.
- Operations Phase – 50Mdptpa production scenario
  - Direct employment (including contractors) of approximately 1,346 people in local region;
  - Indirect employment of approximately 1,409 people locally, 2,193 people in the FNQ region, 4,532 people state-wide and 6,788 people nationally;
  - Direct annual financial contribution of $1,500 million across the local, regional, Queensland and national economies;
  - Indirect annual financial contribution of $451 million locally, $673 million in the FNQ region, $1,326 million in Queensland and $2,020 million nationally.

In addition, the Social Impact Management Plan (SIMP) contains a Local and Indigenous Sourcing Action Plan designed to best maximise opportunities for local Indigenous and non-Indigenous businesses to develop and to participate in the Project.

Impacts on Existing Uses and Activities

The following summarises potential impacts and proposed mitigation measures (where relevant) of the Project on the existing uses and activities in the Western Cape region.

Cattle Industry

During construction there would be an increase in heavy vehicle traffic carrying aggregate along the Peninsula Development Road (PDR) and Aurukun Road (the roads used by the nearest cattle properties).

The Queensland Coordinator General requires RTA to prepare a road use management plan for the PDR and Aurukun Road for each phase of the Project in consultation with the Queensland Department of Transport and Main Roads (Queensland Government 2012). During periods of significant traffic, RTA must monitor condition of the roads and repair any Project-related damage. The proposed Humbug barge terminal has been designed so that it would not interfere with adjacent existing live cattle export facility. The Project is not expected to result in a change to the cattle industry on the Western Cape.

Commercial and Recreational Fishing

Areas adjacent to the proposed Port site between Pera Head and Boyd Point and the proposed new spoil ground location are important areas for catching banana prawns. The area of the proposed new spoil ground (approximately 3km^2) represents about 0.02% of the Northern Prawn Fishery (NPF). Any reduction of catch due to disturbance to trawl habitat, were it to occur, would be of the order of

0.02% (1.3 tonnes) of the average annual NPF catch of 6,383 tonnes. Therefore, the Project would have a negligible impact on the NPF and a negligible impact on licensed operators.

During the Queensland EIS consultation process, the Gulf of Carpentaria Commercial Fishermen's Association and the Queensland Seafood Industry Association expressed concern that disturbance due to the proposed Port development would lead to displacement of fishing effort and loss of income. A compensation model for commercial fishing operations has been developed by the Department of Agriculture, Fisheries and Forestry (DAFF) to determine the level of compensation which might apply to fishing operators affected by projects in Queensland's marine environment. With regard to the Project, modelling undertaken by DAFF indicated that a total compensation amount of approximately $242,000 would be reasonable in the case of commercial fishery impacts arising from the Project. RTA has subsequently agreed to pay this amount and for the Queensland Rural Adjustment Authority to administer compensation to relevant fishers and to buyout an appropriate level of fishing effort. The Queensland Coordinator General has supported this approach to determining a settlement and accepted that "the compensation model developed by DAFF for commercial fishing impacts provides a fair, reasonable, scientific and defendable basis for determining a compensation amount of $242,000".

During the Queensland EIS consultation process, private recreational and sport fishing charter operators expressed concern that disturbance due to the proposed Port development would:

- adversely affect important fishing charter spots such as the "Three Mile" and the Nine Mile reef;
- restrict access to preferred fishing spots; and,
- lead to economic loss for charter operators.

Some submissions requested that measures be taken to offset impacts by monetary compensation and measures such as the establishment of artificial reefs. RTA shall implement the following measures to minimise potential impacts on charter operators and recreational fishers:

- re-align the jetty and main access channel by two degrees south to avoid most of the "Three Mile" fishing area;
- designate a safe passage underneath the proposed jetty or boats that can safely navigate under the jetty in order to avoid the need to travel around the wharf (subject to Maritime Safety Queensland requirements);
- support the establishment of a local recreational fishing reference group to provide a forum to develop and help implement the establishment of a community fisheries project (which may take the form of new or upgraded infrastructure or studies or management measure). The reference group would comprise representatives from charter operators and the Weipa Sportsfishing Club and would operate by consensus; and,
- provide funding and/or works up to the value of $242,000 for the above agreed communities fisheries project.

Housing and Infrastructure

The construction phase would take 30 to 36 months depending on weather conditions and timing of approvals in relation to the dry season and construction workforce numbers would vary over that period, averaging approximately 950 full-time equivalents. The Project construction workforce would be a "single status" workforce, housed predominately in a temporary on-site camp near the Boyd infrastructure area. When not on roster, the construction workers would return to their point of hire. In addition to the SoE on-site camp, RTA proposes to provide up to 200 beds for contractor accommodation near Nanum, if required, to help alleviate short term accommodation pressures during construction.

The average projected operational workforce (employees and contractors) would be 1,380 at 22.5Mdptpa and 1,346 at 50Mdptpa (the reduced workforce number at 50Mdptpa is a result there

being no mining workforce north of the Embley River). This amounts to an increase from the workforce at the existing Weipa operations of 173 and 139 personnel respectively. As a result, the projected population increase in Weipa due to the Project is in the range of 440 to 530, approximately. 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.

Tourism

It is estimated that 90% 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, RTA proposes to provide up to 200 beds for contractor accommodation near Nanum, if required, in addition to the SoE on-site construction camp. The Project is unlikely to result in a change in tourist visitation to the Western Cape.

Traditional Use Activities (including cultural heritage)

The area south of the Embley River is formally recognised as the traditional lands of the Wik and Wik Way people. The Project area is covered by an Indigenous Land Use Agreement under the Commonwealth *Native Title Act 1993,* known as the Western Cape Communities Coexistence Agreement (WCCCA). The WCCCA provides the process by which consultation with Traditional Owners is to occur in relation to mining activities such as the SoE Project. RTA's existing operations are relatively remote from the Project area and from Aurukun, the nearest community. The Project 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 Project area 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, Project disturbance does not occur within the riparian vegetation zone.

Under the WCCCA, RTA is required to provide the relevant WCCCA parties 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. RTA will work collaboratively with the relevant SoE Project Sub-committee established pursuant to the WCCCA to develop a land access strategy aimed at causing as little disturbance as possible to Traditional Owner access.

During consultations, various stakeholders noted that improved access to the Project area, via the proposed Mine Access Road and barge/ferry terminals, may increase some recreational activities that are considered to have negative impacts on the Project area 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 Project area, RTA will work with Traditional Owners in accordance with the WCCCA 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.

In response to the issues raised by Traditional Owners, RTA recognises and supports the need for the joint development of a comprehensive CHEMP for Project area. The CHEMP would provide the framework for RTA and Traditional Owners to work together to manage the community, heritage and environmental values of the Project area in the context of the WCCCA.

In order to facilitate the implementation of the CHEMP, 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 Project. The Programme aims to:

- implement land and sea management activities through direct employment of Traditional Owners in both permanent and casual roles with RTA; 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.

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 Project area.

Existing Use Activities – Shipping Routes

The potential impact of the Project on the following uses and activities in the shipping routes has been assessed:

- commercial and recreational fishing;
  - Project-related shipping is not expected to affect the use of the Torres Strait by commercial or recreational fishers; and,
  - Project-related shipping is not expected to affect the use of the GBR by commercial or recreational fishers.
- tourism;
  - Project-related shipping is not expected to change visitation patterns or the use of the GBR by tourists.
- scientific use; and,
  - Project-related shipping is not expected to change scientific use activities.
- traditional use activities;
  - Project-related shipping is not expected to change traditional use activities or Indigenous cultural heritage values.

Cumulative and Consequential Impacts

Cumulative impacts are defined in the Tailored EIS Guidelines as the incremental impacts of the action when combined with other past, present and reasonably foreseeable future actions.

Consequential impacts have been assumed to be impacts that result from reasonably foreseeable further actions by parties other than the proponent, and which are made possible by the proposed Project.

To enable the cumulative and consequential impacts of the Project to be assessed, the following relevant projects and existing operations were considered:

- existing RTA operations north of the Embley River;
- Aurukun Bauxite Project (discontinued, although the Queensland Government recently sought expressions of interest for the Aurukun bauxite deposit);
- Bauxite Hills Project;
- Pisolite Hills Project;
- Urquhart Point Mineral Sands Project;
- Roper Bar Iron Ore Project;
- Grey Boat Facility;
- Archer River Quarry;
- existing Port of Weipa operations;
- shipping in the CMA related to projects in the Gulf of Carpentaria; and,
- shipping in the GBR and the CMA related to projects on the east coast of Queensland.

The largest potential cumulative impact on terrestrial ecosystems would be clearing of Darwin Stringybark woodland. Based on the information currently available, if all the projects identified above were to proceed, 89.9% of remnant Darwin Stringybark woodland (as mapped in 2006) in the Bioregion would remain undisturbed.

A detailed assessment of the significance any potential cumulative impact on terrestrial flora, fauna and avian migratory species requires detailed information from the other possible projects on (a) the results of field surveys to confirm the presence/absence of threatened species, and (b) the clearing extent of high and moderate suitability habitat. This level of detail is largely unavailable for the other possible projects. However, based on available information, clearing of potential habitat for following species is considered to be unlikely to result in a significant cumulative impact:

- Cooktown Orchid and Chocolate Tea Tree Orchid;
- Red Goshawk, Northern Quoll and Masked Owl; and,
- avian migratory species.

Potential impacts on threatened estuarine and marine species and non-avian migratory species assessed as part of the Project are anticipated to be either negligible or minor. Most of the other projects that may require marine construction works would be far removed from the SoE Project. There are not anticipated to be significant cumulative impacts on threatened estuarine and marine species and non-avian migratory species.

There are potential lighting impacts on nesting marine turtles associated with the SoE Project, however these impacts would be mitigated through the use the proposed lighting control measures. Other projects, such as the Bauxite Hills Project and the Urquhart Point Mineral Sands Project, propose activities in the vicinity of beaches that provide suitable nesting habitat some marine turtles. These proposed projects would not impact on the same nesting beaches as the SoE Project and would be likely to adopt similar lighting mitigation measures to reduce potential impacts on nesting marine

turtles. It is therefore unlikely that these projects would have a significant cumulative impact on marine turtles.

Shipping is the other activity that could potentially impact threatened marine species and other matters of NES, including the CMA, GBRMP, GBRWHA and GBRNHP. A cumulative risk assessment of the impacts of shipping (including Project-related shipping) was undertaken. The cumulative risk assessment considered oil spills, grounding of large vessels, the introduction of exotic species, vessel strikes, vessel discharges, as well as impacts on the Outstanding Universal Value (OUV) of the GBRWHA.

A summary of the likelihood and consequence of existing risks on matters of NES (including the OUV of the GBRWHA) based on the shipping threats identified by GBRMPA in the *Great Barrier Reef Outlook Report 2009* compared the likelihood and consequence of the combined or cumulative risks of the Project and other projects is provided in **Table 1-2**.

The risk assessment concluded that the contribution from Project-related shipping to the cumulative impacts on matters of NES would not alter the existing risk profiles of any of the identified shipping threats.

Table 1-2 Cumulative Risk Assessment from Shipping

Threat	GBRMPA ASSESSMENT			INCLUDING PROJECT-RELATED SHIPPING			Cumulative Risk Comparison
	Likelihood	Consequence	Risk	Likelihood	Consequence	Risk	
Grounding of large vessels	Possible	Moderate	Medium	Possible	Moderate	Medium	No change
Oil spills	Unlikely	Major	Medium	Unlikely	Major	Medium	No change
Vessel Strike	Likely	Minor	Medium	Likely	Minor	Medium	No change
Exotic species – hull fouling and ballast water	Possible	Moderate	Medium	Possible	Moderate	Medium	No change
Vessel discharges	Almost certain	Minor	Medium	Almost certain	Minor	Medium	No change

Stakeholder Consultation

RTA's interaction with external stakeholders is guided by Rio Tinto's global code of business conduct, *The way we work*. The Rio Tinto Communities policy and Standards provide the framework, specific requirements and guidance in areas such as baseline communities assessment, consultation, social impact assessment, communities plans, partnerships and agreements.

Weipa has a long history as a mining town which is operated by RTA through the Weipa Town Authority (WTA), as there is a unique relationship between RTA's existing mining operations and its activities imbedded in the Weipa community. The mining leases where RTA currently operates are situated on Aboriginal land and neighbour the communities of Aurukun, Napranum, Mapoon and Weipa. RTA has strong relationships with surrounding Indigenous communities strengthened by the formal agreements that exist between the Traditional Owners and RTA that guide consultation and program development.

RTA has a dedicated Community Relations team that carry out regular consultation. A number of roles within this team oversee consultation with communities and social impact related work for the Project. These roles would continue upon confirmation of Project approvals.

SoE Consultation Approach

RTA has a long history of participation, communication and consultation on the Western Cape, with government and the broader community. Consistent with this, an extensive program of community consultation was undertaken for the Project and would continue to be an important part of the approval process and throughout the life of the Project.

The following lists the objectives of the community consultation process for the Project:

- to identify stakeholders who have an interest in the Project;
- facilitate two-way engagement with stakeholders, providing accurate, timely and relevant information on the Project;
- identify any concerns or potential issues stakeholders may have with the Project;
- explore areas of the Project with the potential to have a positive impact on communities;
- develop appropriate strategies to mitigate any concerns; and,
- address stakeholder issues and concerns during the approvals process.

Stakeholders

A scoping study was undertaken in 2008 to define the key stakeholders who would be potentially directly and/or indirectly affected by the Project or have a particular interest in an aspect of the Project. This list has been reviewed and expanded throughout the approval process and will continue to be reviewed throughout the life of the Project.

The range of stakeholder categories provided with the opportunity to participate in the consultation process to-date in the Project are listed below:

- government;
- non-government organisations and local community groups;
- Traditional Owners and Aboriginal groups;
- industry, local business and service providers;
- general public and residents;
- regional landholders; and,
- employees and contractors.

The following summarises the results of the consultation efforts to date.

Western Cape Communities Coordinating Committee (WCCCC)

RTA worked closely with the WCCCC throughout the consultation phases. In June 2009, RTA and the WCCCC agreed on a process whereby Traditional Owners would obtain independent advice regarding the content of draft EIS chapters. This process involved RTA submitting draft chapters of the Queensland EIS, WCCCC having these independently reviewed and providing recommendations back to RTA for response. In late 2011, RTA compiled the responses and recommendations from this process into action plans contained in the draft Social Impact Management Plan (SIMP) that was released as part of the Queensland Supplementary EIS in February 2012. Since this time, RTA has continued to collaborate with the SoE Sub-Committee and WCCCC on refinement of the action plans in the SIMP, and on implementation of some of the key actions contained therein.

Phase 1 - Initial Consultation

Extensive consultation was undertaken by RTA during the preparation of the Queensland EIS to identify the issues and discussion topics that informed and shaped the development of mitigation measures for the Project.

Initial consultation, referred to as Phase 1, extended from 2008 to April 2012 and included a period of public comment period from August to mid-September 2011 for the Queensland EIS. Initial consultation included the identification of stakeholder issues, development of a SIMP, consultation with regulators and the receipt and review of submissions resulting from the Queensland EIS public comment period. Key activities during Phase 1 of the stakeholder engagement program included the following.

- meetings, briefings and face to face consultation;
- workforce presentations;
- community forums;
- Project site visits;
- workshops;
- distribution of the Queensland EIS at 12 locations for viewing as well as the distribution of soft copies;
- distribution of newsletters,
- public information sessions;
- government agency briefings; and,
- maintenance of the Project website and 1800 free call number.

Issues

The issues and opportunities of greatest significance identified and discussed with stakeholders during Phase 1 of consultation were:

- traffic/transport on the proposed new access road to the Project infrastructure;
- land and sea management;
- community consultation and engagement;
- employment, training and educational opportunities;
- breakdown in community cohesion associated with increases in alcohol and substance abuse, and escalating law and order problems;
- water supply dam construction, operational and closure impacts;
- opportunities for business development; and,
- workforce arrangements.

In addition, there were a number of other issues of importance raised by State and Commonwealth government departments and agencies in relation to the Project. These issues included:

- demographic changes;
- economic impacts on the local economy;
- housing and property values; and,
- cumulative impacts.

Stakeholder Submissions

During the Queensland EIS public comment period, 24 submissions were received from stakeholders.

Issues and opportunities of high impact and interest raised by stakeholders during Phase 1- Initial Consultation were grouped into Action Plans to enable a focused and holistic approach to

implementation. The Action Plans detail the impacts, performance goals, responsible parties, actions and performance indicators and implementation timeframes. The Action Plans are part of the SIMP which would be further refined from feedback received from Phase 2 – Current Consultation. Many of the programmes would be implemented via collaborative efforts with key stakeholders and utilise existing engagement groups and partnerships.

Phase 2 - Recent Consultation

The stages of Phase 2 – Recent Consultation are listed below:

- pre draft Commonwealth EIS Public Comment Period;
- draft Commonwealth EIS Public Comment; and,
- post draft Commonwealth EIS Public Comment Period.

Issues

The focus of Phase 2 consultation was to provide updates on the process and progress discussions on key issues and interest areas. The key issues raised in Phase 2 are summarised as follows:

- status of the Project and associated approvals;
- implications of shipping through the Great Barrier Reef;
- Cultural Heritage Protection and Management;
- Cultural Awareness Training;
- Aurukun office;
- employment;
- additional field survey work;
- fishing engagement and compensation;
- socio-economic study; and,
- SIMP status.

Commonwealth EIS Public Comment Period

During the Commonwealth draft EIS public comment period, RTA undertook a targeted consultation programme and invited written submissions. This also provided an opportunity for any new stakeholders to become involved in the process. Four public submissions were received during the Commonwealth draft EIS public comment period. The key issues raised in these submissions are as follows:

- 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 closure;
- shipping through the GBR, 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 SoE environmental buffers; and,
- potential impacts on the marine turtle nesting beach.

The feedback received via consultation and public submissions has been considered, where appropriate, to finalise the EIS.

On-going Stakeholder Engagement Strategy

To ensure a high level of awareness, input, collaboration, participation and monitoring RTA has implemented a comprehensive Stakeholder Engagement Schedule for the Project that would:

- include a range of communication mechanisms used throughout the Project to ensure accessibility of information and involvement to a wide audience;
- continue to utilise existing engagement forums to ensure a coordinated approach to programme development; and,
- leverage key engagement mechanisms to support implementation and monitoring of mitigation measures and management plans.

Some of the key external engagement mechanisms specific to the Project include the establishment of an Aurukun Office, the existing WCCCA processes, a local recreational fishing reference group and the SIMP Steering Committee.

Conclusion

The results of the impact assessment process concluded that with the implementation of the proposed avoidance and mitigation measures, the residual impacts associated with the construction and operation of the Project on all listed threatened species, non-avian and avian migratory species that are known to occur, likely or possibly occur within the Project area would not be significant. Residual Project-related impacts on the CMA were also determined not to be significant. In relation to impacts associated with shipping, it was determined that Project-related shipping activities at maximum production would result in no significant impacts on the CMA, GBRMP, GBRWHA and GBRNHP. It is also noted that in over 40 years of shipping, RTA has not had any shipping incidents that have resulted in environmental harm.

The Project would provide an average of 950 direct jobs for the construction of the initial 22.5Mdptpa capacity operation, and approximately 550 and 1,350 direct local area jobs at the 22.5Mdptpa and 50Mdptpa production rates, respectively. It is considered that the Project is environmentally, socially and economically acceptable and complies with the principles of ecologically sustainable development.