



GREAT BARRIER REEF MARINE PARK AUTHORITY

GBRMPA Application. Ref. No: G34897.1 Date of Receipt: 31 January 2012

SUMMARY APPLICATION DETAILS

Applicant name: North Queensland Bulk Ports Corporation Limited
Assessment Type: Commonwealth Marine Park Only
Operation Type: Carry out works being: the dumping of dredge spoil
Proposed Use: Disposal of up to 3,000,000m³ of dredge material into the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,00m³ in any one year.
Period of Permit: Application seeks permission for the disposal of dredge material from 2014 to 2020.
Zones and Locations: General Use Zone, offshore from the Port of Abbot Point – in accordance EPBC 2011/6213 referral and subsequent variations that was deemed a Great Barrier Reef Marine Park permit application.

SUMMARY ASSESSMENT DETAILS

Fees: A Permit Assessment Application Fee (PAAF) of \$37,710 has been paid in full.
Marine Park Assessment: All mandatory and relevant discretionary assessment criteria have been considered fulfilling the requirements under the *Great Barrier Reef Marine Park Regulations 1983* for the consideration of a Marine Park permit
Sea Dumping Assessment: A separate assessment has been conducted for the requirements under the *Environment Protection (Sea Dumping) Act 1981* for the consideration of a sea dumping permit.



OPTIONS AVAILABLE TO THE DELEGATE

- 1 Refuse to grant a Marine Park permit** – for the proposed disposal of up to 3 million cubic metres of dredge material offshore Abbot Point after considering the evidence contained with the Public Environment Report, Supplementary Report to the PER; including this assessment report undertaken under the *Great Barrier Reef Marine Park Act 1975* and any other material considered by the Delegate.

- 2 Grant a Marine Park permit with conditions** – for the proposed disposal of up to 3 million cubic metres of dredge material offshore Abbot Point within the current Dredge Material Relocation Area (DMRA) and (if needed) in a yet to be determined site within the Investigation Area.

- 3 Grant a Marine Park permit with conditions** – for the proposed disposal of up to 3 million cubic metres of dredge material offshore Abbot Point within the current Dredge Material Relocation Area (DMRA) only.

- 4 Grant a Marine Park permit with conditions** – for the proposed disposal of up to 3 million cubic metres of dredge material offshore Abbot Point to a yet to be determined site within the Investigation Area only.

ASSESSMENT OFFICER

Date:

Rean Gilbert, Manager, Ports and Shipping

(This assessment was conducted by a team of assessment officers including Nicholas Baker, Kevin Edison, Katrina Goudkamp and Rean Gilbert)



DIRECTOR (ENVIRONMENTAL ASSESSMENT AND MANAGEMENT) NOTES:

The assessment was based on the statutory process of EIA for applications in the GBRMP and is a technical assessment of the action against six mandatory (88Qa-f) and eleven discretionary criteria (88Ra-k) in the GBRMP Regulations.

The information used to complete this assessment was based on information supplied by the proponent (NQBP) through a PER process and GBRMPA, DoE facts, scientific data and general literature. This assessment was also peer reviewed through an internal process and has identified significant knowledge gaps and uncertainty with the proposal, impact and potential future management of the action.

An in-depth risk assessment based on the GBRMPA (2009) EAM Risk Management Framework concluded that there are general and specific environment ecosystem level and environment perception risks associated with this action.

General risks

- Activity – Disposal of 3 m cu m of dredge spoil in the GBRMPWHA
- Hazard – Damage to water quality, benthic communities, coral, heritage, community values and tourism/fishing industry
- Initial risk – Ecosystem- (moderate x likely) = HIGH (Table 1)
Perception - (catastrophic x almost certain) = EXTREME (Table 2)
- Proposed management (by EPBC and GBRMPA)
EPBC- Possible alternative disposal site, 3 month dredge window, Development of plans for dredging, monitoring, management and 150% offset for water quality
GBRMPA – permit, ESS, MRG, bond
- As low as reasonably practical?
No as there is significant uncertainty and management actions need to be reliable

Specific risks

Hazard	Initial Risk
Decline in water quality in and around the DMRA by increased TSS and turbidity	Med-High
Decline in water quality via increased nutrients within 250 km2 from DMRA (or greater)	High
Direct burial of benthic flora and fauna over 400 ha at the DMRA and change in benthic communities	High
Re-suspension of fine sediments causes sub lethal impacts on seagrass or seagrass habitat through increased light attenuation, due to increased TSS and turbidity and smothering due to sedimentation.	High
Coral communities at Holbourne Island and Nares Rock will experience sub lethal impacts through increased light attenuation, and sedimentation due to increased TSS and Turbidity.	High
Coral communities at Holbourne Island and Nares Rock will experience lethal impacts through increased light attenuation, and sedimentation due to increased TSS and Turbidity.	High
The activity has an adverse effect on one or more of the GBR's World Heritage Values causing a degradation in environmental, social or cultural values	High
WWII Catalina plane wreck will be impacted by sedimentation	High
Loss of income and employment of local commercial fisheries and local seafood businesses by degrading fishery resources and restricting or displacing fishers	High
Negative impact on regional reputation of seafood quality	High
Damaged regional reputation of tourism and recreation for tourists and residents (including recreational fishing and coastal and island camping)	High
The approval of dredging has an adverse social perception effect	Extreme

Although the submission contains sufficient information to make a decision(s) to dispose 3 million cu m at a location 24 km north east of Abbot Point in water depths of -39 metres to -44 metres LAT (the



PER site), it did not contain sufficient information to make a robust decision(s) to dispose 3 million cu m in the proposed investigation area.

The PER site is within 3km of the Catalina seaplane WWII heritage site and 5-7km of sensitive coral environments and fishing grounds. The predicted sediment plume will have spatial dimensions of up to 280 sq km . The assessment of the PER site suggests there are four mandatory criteria where the application is potentially unacceptable (a, b, e and f) and there are two mandatory criteria where there is uncertainty as there are sub-components that are acceptable and sub-components that are not acceptable (c and d). There are no mandatory criteria that are acceptable.

The assessment of the PER site suggests there are six discretionary criteria where the application is potentially unacceptable (a, b, c, d, g, k) and there are one discretionary criteria (e) where there is uncertainty as there are sub-components that are acceptable and sub-components that are not acceptable. There is one discretionary criteria that is potentially acceptable (j).

The draft assessment and possible options for the delegate were discussed at 3 meetings with GBRMP Directors and key staff during the week of 13-17 January 2014. These meetings were valuable to share information, discuss issues, provide feedback and evaluate the options (minutes in Appendix). The table below compares the four options with the elements of the APS REFLECT model for comparison purposes.

OPTIONS	Consequences and risk	Processes	Public scrutiny	Reasons (GBRMP assessment criteria)
1. Refuse	Low environment Low social Low heritage	consistent with assessment	Yes- consistent with assessment	Unacceptable Criteria 88Q a,b,e,f 88R a, b, c, d, g, k
2. Approve PER and Investigation site	Med environment High social	consistent with EPBC permit	No – uncertainty as to what is approved	This option not fully assessed
3. Approve PER	Med environment High social High heritage	consistent with application	N0- inconsistent with assessment	Acceptable 88R j
4. Approve investigation site	Likely low environment Low social		Yes- consistent with EPBC and stakeholder	This option not fully assessed

Option 1 has low risks and is consistent with GBRMP processes. The decision is straight forward and consistent with public scrutiny and consistent with a majority of unacceptable assessment criteria.

Option 2 has med-high risks and is consistent with EPBC but not GBRMPA processes.

Option 3 has med-high risks and is consistent with GBRMP application and consistent with one assessment criteria but inconsistent with the majority of considerations.

Option 4 is a subset of option 2 and has not been fully assessed. It may result in a low risk and is deemed to be consistent with the objectives of the EPBC decision, the stakeholder constraints map and the objective of NQBP and GBRMPA to ensure the best possible environmental, social and heritage outcome.



As a regulator the GBRMPA has the options to avoid, mitigate and offset impacts. If the option to approve the PER site for dredge material disposal, the delegate will have been deemed to have accepted the above risks and may choose to impose conditions to mitigate and offset impacts. The drivers for impacts from dredge spoil disposal are changes in water quality (turbidity and sedimentation). It is also noted that EPBC conditions include water quality offsets (150%) which will require to be resourced and managed appropriately. There is uncertainty about the quantum, economic costs and practicality of the proposed offset in the timeframes of the EPBC approval (2020).

_____ Date:
Dr Adam Smith, Director Environmental Assessment and Management



DELEGATE NOTES:

DELEGATE DECISION

- (Option 1) Refuse to grant a Marine Park permit
- (Option 2) Grant a permit with conditions for the proposed DMRA and Investigation Area
- (Option 3) Grant a permit with conditions for the proposed DMRA only
- (Option 4) Grant a permit with conditions for a site within Investigation Area only

Date:

Bruce Elliot, General Manager, Biodiversity, Conservation and Sustainable Use



EXECUTIVE SUMMARY

The Great Barrier Reef Marine Park (Marine Park) is a multi-use protected area that stretches 2300km along the Queensland Coast and covers 344,000km². It is the largest coral reef ecosystem in the world and supports an outstanding array of plants and animals. The Marine Park supports a variety of uses, particularly tourism, fishing, recreation and shipping. It is an integral part of the lifestyles and livelihood of communities along the Great Barrier Reef Coast.

The Port of Abbot Point (the Port) is an existing operational coal port located within port limits approximately 25 kilometres North West of Bowen on the central Queensland Coast. North Queensland Bulk Ports Corporation Limited (NQBP), as operators of the Port, have made application under the Great Barrier Reef Marine Regulations for a permit to conduct works in the Marine Park, specifically the disposal of up to 3,000,000m³ of capital dredge material to the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,000 m³ of dredge material to be disposed in any one year.

Disposal of dredge material is a result of capital dredging works associated with a proposed expansion of the Port of Abbot Point. A proposed 400 hectare Dredge Material Relocation Area (DMRA) is located approximately 25 km east/north east of the Port. A proposed further Investigation Area (approximately 800 square kilometres in size) for potential dredge disposal is located directly offshore from the Port of Abbot Point (Figure 1).

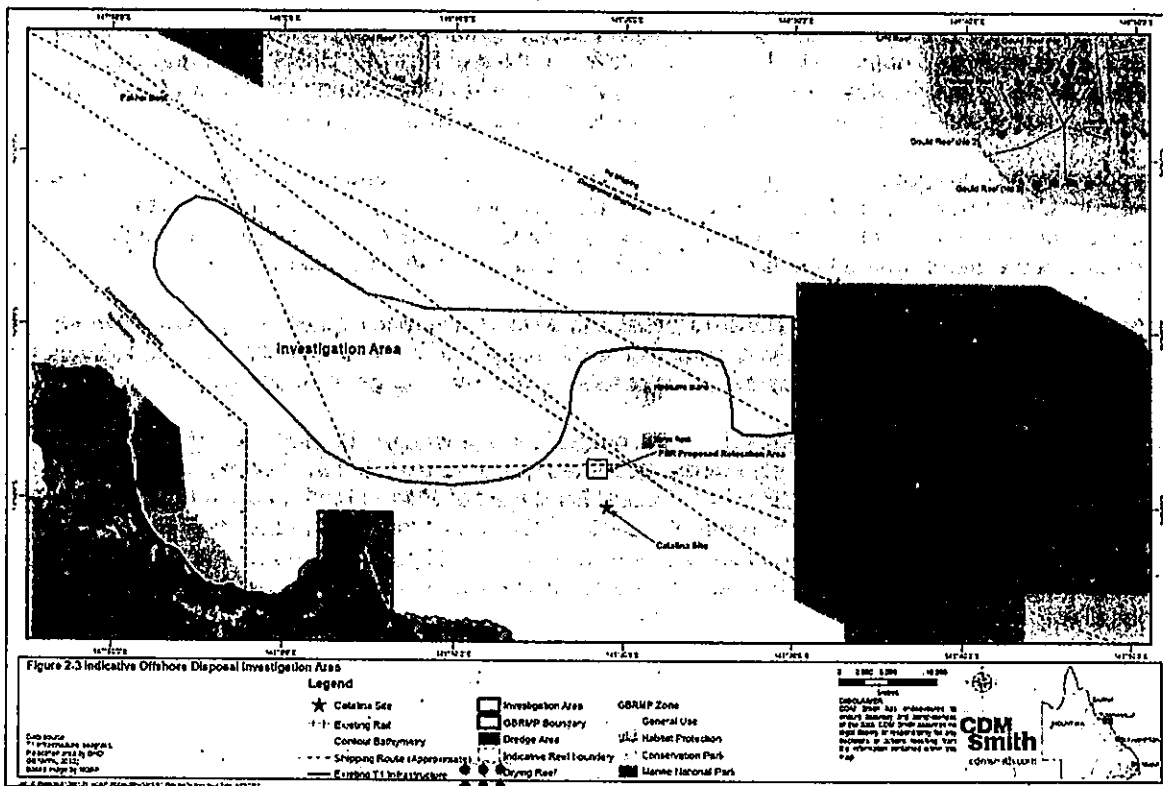


Figure 1: Map showing proposed Investigation Area for a potential dredge material disposal and the initial proposed Dredge Material Relocation Area.

The proponent submitted a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 5 December 2011 and, subsequently, the Department of the Environment declared the referral to be a controlled action to be assessed by Public Environment Report (PER). The application was deemed a Marine Park application under section 37AB of the *Great Barrier Reef Marine Park Act 1975* as elements of the proposed activity were located within the Marine Park.



This assessment predominantly considers those impacts that may be associated with the action of dredge material disposal and use and entry to the Marine Park.

The proposed activity of dredging is located entirely outside the Marine Park, criteria 88R(c) does however allow for the consideration of "...the context of other conduct in the relevant area or nearby areas, or in the Marine Park." The associated activities of dredging and related potential impacts are limited to discussion within this criterion.

The proximity of Abbot Point to deep water makes Abbot Point a preferred location for a port development.

There are well documented environmental and social risks associated with the impacts from dredge material disposal to the marine environment.

A risk based approach was used to assess potential impacts associated with the proposed action. A risk assessment of the proposed disposal activity was undertaken using the EAM Risk Management Framework (2009) (Attachment A).

The risk assessment identified several risks associated with the proposal for the disposal of up to 3 million cubic metres of dredge material to the Marine Park, particularly in relation to a decline in water quality surrounding the DMRA.

The risk assessment (Attachment A) has identified eleven (11) unmitigated "HIGH" risks and one (1) unmitigated "EXTREME" risk. Some of the identified risks can be managed and mitigated by imposing a set of conditions. Once mitigation and management measures are applied the disposal of 3 million cubic metres of dredge material to the proposed DMRA still has four (4) "HIGH" risks and one (1) "EXTREME" risk. The residual high risks relate to water quality, Outstanding Universal Value and perception risk whilst the extreme risk relates to social perception and negative media attention.

The proposal has the potential to impact on water quality in the surrounding area during each disposal campaign and for a period of time thereafter. A decline in water quality due to dredge material disposal offshore from Abbot Point may be due to an increase in the concentration of suspended sediments in the water, and a possible release of nutrients from the dredged material.

Water quality is a value of the Great Barrier Reef and a decline in water quality may also have flow-on impacts on other environmental values including coral, seagrass, benthic (bottom) habitat, species of conservation concern as well as social values of fishing, tourism and general amenity.

The dredge plume modelling undertaken by the proponent has limitations (these are discussed in detail in criteria 88Q (a)) and possibly underestimates the plume extent. The model predicts an approximate "worst case" area of 280 km² of Great Barrier Reef Marine Park to be affected by a decline in water quality from dredge material disposal. The temporal scale of potential impacts may be compounded by ongoing re-suspension and movement of dredge material with the prevailing conditions and potentially impacting on water quality and sensitive receptors further afield from the disposal site.

A reduction in water quality can be minimised (through the use of conditions) but not avoided during dredge material disposal. Options are available to manage the flow-on impacts on sensitive receptors through the use of management arrangements (such as the use of trigger values to control water quality at further afield sensitive receptor sites). Mitigation strategies would need to be sufficiently robust to prevent and minimise any irreversible impacts on Great Barrier Reef values.

The assessment report considers information contained in the original Public Environment Report (PER), the supplementary PER, public comments, published scientific literature and any other environmental, economic, social and strategic issues relating the Marine Park.

This assessment focusses on the proposed activity; being the disposal of dredge material to the proposed site (the Dredge Material Relocation Area) as outlined in the PER and supplementary report to the PER. Another additional consideration is the use of a site within the 'Investigation Area'. However, little information on the potential impacts from using a site within the Investigation Area has



been provided by the proponent to undertake a thorough assessment of this option. A preliminary review only of the Investigation Area has been undertaken.

CURRENT ENVIRONMENT OF THE PROJECT AREA

The DMRA is located on the mid shelf and in the Non-reef mid shelf lagoon (NB7) bioregion. The PER states that no marine flora was observed within the proposed DMRA. Areas adjacent to and within the DMRA are made up of patches of macroinvertebrates comprised mostly of mud scallops, with occasional hermit crabs, gastropods, polychaetes and crinoids¹. The PER also reports that no corals have been located at the DMRA².

Water quality at the DMRA is slightly above GBRMPA water quality guidelines for most parameters. There is no water quality data provided in the proponents PER.

Holbourne Island, approximately 7 km NE of the proposed DMRA has fringing reefs and is a National Park with no camping allowed. The GBRMPA zoning plan has afforded its values a level of protection by designating it a Conservation Park Zone. Nares Rock, located approximately 5 km ENE from the proposed DMRA is important to the commercial fishing industry and has been designated a Habitat Protection Zone. The WWII Catalina aircraft wreck is located approximately 3 km south of the proposed DMRA and has significant heritage value.

Other users of the Marine Park offshore from Abbot Point include but are not limited to commercial fishing operators, recreational fishers, tourists (for example scuba divers diving the nearby Catalina dive wreck (WWII aircraft)) and Traditional Owners.

Although there is limited information provided to the Managing Agency regarding the habitat of the Investigation Area. Preliminary investigation reveals that parts of the Investigation Area may contain patchy seagrass, Halimeda and other algae habitat. There is likely to be small coral gardens (hard corals, sea whips and gorgonian gardens) and sponge habitat. Much of the Investigation Area will be represented by muddy fine sediments with increased calcium carbonate content towards the mid and outer shelves.

LIKELY IMPACTS

Potential impacts are associated with the disposal of up to 3 million cubic metres over a period of approximately 5 - 6 years, with no more than 1,300,00m³ in any one year to the proposed DMRA.

Water quality around the proposed disposal site is expected to decline due to increased turbidity and suspended sediments from the direct action of dredge material disposal and through subsequent re-suspension of dredge material. The worst case sediment plume predicted to occur from the activity (from the PER) is a predominantly NW/SE plume extending out 20 km to the NW and approximately 8 km to the SE. The information provided by the proponent may potentially underestimate the footprint of water quality declines and the extent of potential impacts.

Scientific information suggests that with the inclusion of large-scale currents in models the dredge spoil has the potential to move larger distances than previously modelled (i.e. further than the modelling in the PER)³. The assessment concludes that impacts on water quality will be difficult to mitigate, manage or offset.

¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Executive Summary, page xxiv)

² GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)

³ SKM 2013, Improved dredge material management for the Great Barrier Reef Region, Great Barrier Reef Marine Park Authority, Townsville.



No seagrass has been identified within the DMRA. The distance between the DMRA and the location of the nearest seagrass communities within Abbot Bay could be around 10 to 15 km but this figure is confounded by the confined geographical area in which seagrasses were studied for the PER.

Seagrass species within nearby Abbot Bay (approximately 25 km away) are of high value as they have been identified as those which are preferred by Dugong as food⁴.

Due to the potential distance between the proposed activity (disposal) and the nearest seagrasses (potentially 10-15 km directly south, Abbot Bay 25 km SW) there is potential for suspended sediments to travel towards and impact upon seagrasses. However, there are many uncertainties associated with the extent of the plume and the duration and severity of any impact. The assessment concludes that potential impacts to seagrasses from disposal alone are manageable by imposing appropriate water quality conditions and triggers.

Dredge plume modelling provided in the PER did not predict any visible plume associated with the disposal activity near Holbourne Island. The uncertainties associated with the modelling predictions are discussed in criteria 88Q(a).

The risk assessment, conducted pursuant to the EAM Risk Management Framework (2009) indicated that potential likelihood of impacts on coral reef communities at Holbourne Island (7 km away) and Nares Rock (5 km away) was 'Possible'. This likelihood was based predominantly on the proximity of the proposed DMRA to fringing reefs at Holbourne Island (7 km) and Nares Rock (5 km). Furthermore, the proponent's modelling indicates that up to 25mg/L Total Suspended Sediments (TSS) could impact on Nares Rock reefs. There is uncertainty as to what impacts this would have on these reefs, the severity of the impacts or the reversibility of the impacts.

The assessment concludes that the potential impacts to corals could be managed through conditions of permission with a preference for avoiding plume dispersal in the direction of the coral reef sites.

The proposed DMRA is located approximately 3 km from a WWII Catalina aircraft wreck. The proposed action may cause sedimentation issues at the wreck site which will have heritage issues and flow on effects for those that dive the wreck site. Due to the proximity of the proposed activity to the WWII heritage site implementing management and mitigating conditions may not appropriately protect the site. Any potential impacts associated with dredge material disposal on the WWII Catalina aircraft wreck should be avoided to maintain the preservation of this heritage site. The proposal in its current form poses unacceptable risks to the heritage values⁵ of the Great Barrier Reef Marine Park that are not manageable other than to relocate the DMRA further away from the heritage site.

Other potential indirect impacts include a possible temporary reduction in target species or catch for fishers associated with turbidity and sedimentation at preferred fishing sites near Holbourne Island and Nares Rock, and on the areas amenity for tourism and recreational users.

A social impact assessment has been conducted (Attachment D). The assessment provides further details on the potential social impacts and perception issues that are associated with this proposal. Over 14,000 emails and 2,000 phone calls have been received by GBRMPA from members of the public (both nationally and internationally) expressing the view that the disposal of dredge material to the Marine Park should be unacceptable or not permitted. The proposed activity has the potential to impact on the social values of the Great Barrier Reef Region by creating a negative perception around the health and state of the Great Barrier Reef as a desirable destination and well-managed marine protected area, thus impacting on social values and potentially reducing GBR tourism. The action to dispose of 3 million cubic metres of dredged material in the Great Barrier Reef Marine Park may also impact on the World Heritage status of the Great Barrier Reef. It may also negatively affect support for reef related stewardship activities.

⁴ Rasheed, M.A., Thomas, R. and McKenna, S.A. 2005. Port of Abbot Point seagrass, algae and benthic macro-invertebrate community survey - March 2005. DPI&F Information Series Q105044 (DPI&F, Cairns), 27 pp

⁵ Heritage is all the things that make up Australia's identity - our spirit and ingenuity, our historic buildings, and our unique, living landscapes. Our heritage is a legacy from our past, a living, integral part of life today, and the stories and places we pass on to future generations. <http://www.environment.gov.au/topics/heritage>



Potential impacts associated with social perception could be managed through media campaigns, fact sheets, communication plans in order to increase public awareness around dredge material disposal to the Marine Park.

The proponent has explored alternative options which are intended to minimise or avoid the need for dredging and disposal. These have included the use of trestles and land-based dredge disposal. These options have all been eliminated by the proponent for technical, schedule or budgetary reasons. In general, the proponent maintains that the options will be significantly more expensive than the option to dredge and dispose in the World Heritage Area and may have additional environmental impacts.

CONCLUSION

In deciding whether to grant a permission under the *Great Barrier Reef Marine Park Act 1975* the delegate must consider a range of criteria as stipulated in the *Great Barrier Reef Marine Park Regulations 1983* mandatory (reg 88Q) and discretionary considerations (reg 88R). These considerations are the fundamental elements of an assessment decision and are considered in this assessment report.

It is a requirement of the *Great Barrier Reef Marine Park Act 1975* (s 3AB) that, in managing the Marine Park and performing its other functions, the Authority has regard to and seeks to act in a way that is consistent with the principles of ecologically sustainable use. These principles are defined in the Act. The Authority is bound by the requirements of the Act which includes under subsections 3AB (a) and (b):

- a) Decision-making processes should effectively integrate both long-term and short-term environmental, economic, social and equitable considerations; and
- b) The precautionary principle – means the principle that lack of full scientific certainty should not be used as a reason for postponing a measure to prevent degradation of the environment where there are threats or serious or irreversible environmental damage.

Limited detailed information has been provided by the proponent to enable a thorough evaluation of the potential impacts of a new dredge material relocation area from within the Investigation Area.

The current proposed DMRA as identified in PER does not represent the best environmental outcome for offshore disposal to the Marine Park. The potential impacts on sensitive areas such as Holbourne Island, Nares Rock and the WWII Catalina could be avoided by identifying a disposal site further away from these known sensitive receptors.

Potential impacts to sensitive receptors (at Holbourne Island, Nares Rock) resulting from disposal of dredge material to the DMRA could potentially be managed through conditions of a permission. Potential impacts to the WWII Catalina wreck resulting from disposal of dredge material to the DMRA are unlikely to be manageable through conditions of permission.

Mitigating and management measure that reduce the likelihood of negative impact whilst still being in line with the original proposal as approved under the EPBC Act is to investigate an alternative site within the Investigation Area that is further away from identified sensitive receptors at Holbourne Island, Nares Rock and the WWII Catalina wreck.

The proponent has also indicated that a superior DMRA further away from sensitive receptors is likely from within the Investigation Area and as such has varied their original application to include the Investigation Area. In fact, in a letter to the Department of the Environment (dated 7 November 2013) the proponent states that they intend to prepare a Site Synthesis Report "which will identify the final dredge relocation site within the defined offshore investigation zone". It is unclear whether the proponent has any intention of still using the proposed DMRA.

A thorough assessment of the environmental impacts of a disposal site within the Investigations Area cannot be undertaken until detailed information is provided by the proponent. An initial investigation by the Authority is that it is likely that a superior dredge disposal site can be found within the Investigation Area that is further away from sensitive receptors.



The proponent has agreed to undertake further work in close consultation with stakeholders to find an acceptable solution for offshore disposal, recognising that the initially proposed location (the DMRA) does not provide for the best environmental outcome for the environment and other users of the Marine Park.

The best environmental and socially outcome associated with this proposal is for a new DMRA to be identified within the Investigation Area and for a separate assessment to be conducted once additional information is provided around:

- the exact location of a new dredge material relocation area;
- a detailed report of the environmental, social and heritage values of the new DMRA;
- 3D hydrodynamic plume modelling of the placement of up to 3 million cubic metres of dredge material at the new DMRA, consistent with the Great Barrier Reef Marine Park Authority guidelines for *The use of Hydrodynamic Numerical Modelling for Dredging Projects in the Great Barrier Reef Marine Park* and the inclusion of inter-annual variation.



ASSESSMENT

The *Great Barrier Reef Marine Park Regulations 1983* outline the matters the GBRMPA, as the responsible agency, must have regard to in considering applications for permissions.

- Under the *Great Barrier Reef Marine Park Regulations 1983* these matters are specified in Regulation 88Q (Mandatory considerations). If relevant, the GBRMPA delegate may also consider other matters specified under Regulation 88R (Discretionary considerations). With the discretionary criteria, only those criteria which add value to the consideration by the Delegate are to be included in the assessment.

BACKGROUND

The proponent for this application is the Port Authority, North Queensland Bulk Ports Corporation Limited (NQBPC). NQBPC also manage four other ports throughout Queensland.

The Port of Abbot Point (the Port) is an operational coal port located within port limits approximately 25 kilometres North West of Bowen on the central Queensland Coast. The port commenced operations in 1984 and underwent a major expansion (which was completed in) 2011 of the existing terminal (Terminal 1(T1)) to increase the capacity to 50 million tonnes per annum from the original capacity of approximately 17 million tonnes per annum⁶. Currently the terminal is operating at approximately 34% of the 50 Mtpa capacity, similar to their 2008/2009 throughput⁷.

Since the establishment of the Port, maintenance dredging at the port has only been required twice, once in 1986 (26,000 m³) and again in 2008 (20,000 m³) along with 275,000 m³ of capital dredging associated with the expansion of T1⁸. The dredge material from the 2008 campaign was disposed of at the previously permitted Dredge Material Relocation Area (DMRA) located 7 km offshore in the Great Barrier Reef Marine Park (GBRMP)⁹ under Marine Parks permit (G08/25493.1).

The proponent submitted a referral under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 5 December 2011. GBRMPA provided initial advice to the Department of the Environment (then the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC)) on the referral, recommending that the project be declared a controlled action, requiring assessment through an Environmental Impact Statement (EIS).

On 6 January 2012, the Department of the Environment declared the referral to be a controlled action to be assessed by Public Environment Report (PER). The application was deemed a Marine Parks application under section 37AB of the *Great Barrier Reef Marine Park Act 1975* as elements of the proposed activity were located within the Marine Park.

Guidelines were issued for the PER on 26 June 2012 with input from GBRMPA and a draft PER was provided to regulators for review on 21 September 2012.

On 15 October 2012 and again on 29 November 2012 GBRMPA provided advice to the Department of the Environment and the proponent that the draft PER did not fully address all of the requirements of the guidelines (there were 33 specific comments – see Attachment E).

On 13 December 2012 NQBPC requested a variation to the proposal on the following matters:

- Limit dredging to a maximum of 3 million cubic metres of sediment;

⁶ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane. (Chapter 1 Introduction)

⁷ Abbot Point Monthly Actual Throughput. 2013. Retrieved 19 June, 2013, from North Queensland Bulk Ports Web site: <http://www.nqbp.com.au/abbot-point>

⁸ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane. (Chapter 1 Introduction)

⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane. (Chapter 1 Introduction)



- Identify the dredge material disposal site approximately 24 km from the dredge site;
- Increase the dredge footprint by 10 ha (up to 185 ha), due to a change in the alignment for safety reasons; and
- Increase the dredge depth of certain berth pockets

The Department of the Environment notified GBRMPA on 21 December 2012 that a decision had been made to publish the draft PER for public comment. The draft PER was made available for public comment between 4 January 2013 and 15 February 2013. A total of 103 public submissions were received (34 percent were from the Abbot Point Action Group- a community group of fishers, residents and families in Bowen who are campaigning against Abbot Point Coal Terminal expansion for community and fishing reasons).

Some of the views expressed within the public submissions included the validity of the assessment and dredge plume modelling in the PER, and noted the potential impacts of dredging and the offshore disposal of dredge material in relation to:

- Recreational and commercial fisheries in the Bowen area
- The recently discovered Catalina World War 2 plane wreck and associated heritage and tourism values
- Water quality and biodiversity
- The local tourism industry
- The Outstanding Universal Value of the Great Barrier Reef World Heritage Area.

Following the public consultation period for the PER, GBRMPA, Department of the Environment and the proponents for the port expansion held three workshops in February 2013 and March 2013, which discussed the feasibility of alternatives to the proposed dredging and disposal project, modelling methodologies and alternate options for dredge material disposal.

NQBP, through the release of their Supplementary Public Environment Report, on 13 May 2013, proposed a new, yet to be determined, dredge material disposal site area to be located within a large Investigation Area of approximately 800 km².

The offshore Investigation Area was confirmed formally as an option through a variation of their EPBC referral on 7 November 2013.

After multiple extensions of the time to make a decision in late 2013, the Minister for the Environment granted an approval with conditions on 10 December 2013.

A detailed chronology of the project is attached as Attachment C.



Consideration of Assessment Criteria - Mandatory Considerations



the potential impacts of the conduct proposed to be permitted by the permission (this proposal conduct) on the environmental and on the social, cultural and heritage values of the Marine Park or a part of the Marine Park.

ASSESSMENT SUMMARY

The proposed conduct is the disposal of up to 3 million cubic metres to the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,00m³ in any one year. The key environmental factors considered in this assessment include impacts on water quality, coral, benthos, seagrasses and mega fauna. Furthermore, potential impacts on social values, cultural and heritage values are also considered.

Based on the attached risk assessment (Attachment A) and consequence event tree analysis (Attachment B) the proposal to dispose 3 million cubic metres of dredge material at the site proposed in the proponent's PER represents an overall high risk to the environmental, social and cultural/heritage values of the Marine Park.

The disposal of dredge material at the proposed Dredge Material Relocation Area (DMRA) is likely to impact on the environmental, social and heritage values of the Marine Park through:

- the resulting increases in total suspended solids of at least 10-25mg/l above background levels at Nares Rock and possibly Holbourne Island (potentially impacting on corals);
- the subsequent plume has the potential under certain oceanographic conditions, to impact on the heritage values associated with the WWII wreck of the Catalina; and
- ongoing re-suspension of dredge material will disturb the benthic habitats that support commercial and recreational catch species within and adjacent to the proposed DMRA.

There is a high level of uncertainty associated with the predicted impacts from disposal at the proposed DMRA due to significant limitations associated with the predictive modelling.

The limitations of the model relate to limited weather scenarios, incomplete element forcing (i.e. wind, waves, ocean currents) and assessment of a single proposed DMRA. There are difficulties in assessing potential impacts on the marine environment, and their likelihood as modelling is the principal predictive tool with which to identify spatial and temporal extent and predicted impacts on sensitive receptors. The limitations of the modelling provided in the PER are discussed in detail in criterion 88Q(a).

The following uncertainties have been identified for the consideration of a new disposal site within the larger Investigation Area:

- the exact location of an alternative disposal site within the Investigation Area;
- potential impacts to the marine environment from disposal at the proposed DMRA;
- lack of detailed information about the existing environment, its values, within and immediately adjacent to the Investigation Area;
- no benthic surveys and no sediment analysis of a new site to ensure 'like for like' (sediment composition); and
- no predictive modelling of dredge material disposal within the Investigation Area.

Without a comprehensive impact assessment; including modelling of alternative sites within the Investigation Area; it is not possible to conduct a thorough assessment that includes the relative benefits of different disposal area locations within the broader area of interest, or identify regions that are likely to be impacted by dredge disposal activities.

A preliminary review of the Investigation Area identifies that it may prove to have better environmental outcomes based on distance from nearest sensitive receptor. This would need to be further substantiated with predictive modelling, benthic surveys and sediment analysis.

A Social Impact Analysis has been included in Attachment D. The analysis summarises the social reactions that were predicted in the risk assessment and the subsequent events that have occurred since the Minister's EPBC approval.



PROPOSED CONDUCT

North Queensland Bulk Ports is seeking a permission for disposal of up to 3 million cubic metres of dredge material derived from the T0, T2 and T3 capital dredging program at the Port of Abbot Point, to a location offshore of Abbot Point within the Marine Park.

The proposed conduct for which a Marine Park permission is required does not include the activity of dredging. Dredging is to occur outside of the Marine Park, adjacent to existing port facilities and within the Great Barrier Reef World Heritage Area.

The proponent through the EPBC referral (2011/6213), that was subsequently deemed an application under *Great Barrier Reef Marine Park Act 1975*, proposed to dispose the dredge material to "the existing offshore dredge disposal area or to a suitable onshore area if one can be found. All disposal options, including the use of the material as fill for the development of the proposed terminals will be assessed as part of a detailed multi criteria assessment".

On 13 December 2012 the proponent requested a variation to the proposal on the following matters:

- limit dredging to a maximum of 3 million cubic metres of sediment;
- identify the dredge material disposal site approximately 24 km from the dredge site;
- increase the dredge footprint by 10 ha (up to 185 ha), due to a change in the alignment for safety reasons; and
- increase the dredge depth of certain berth pockets.

The delegate of the Minister and the GBRMPA agreed to the request.

The Public Environment Report, which was released for public comment between 4 January 2013 to 15 February 2013, identified a preferred offshore dredge location area, within a General Use Zone of the Marine Park, of approximately 400 ha (~2km by 2km), 24 km north east of Abbot Point in water depths of -39 metres to -44 metres LAT¹⁰.

Table 1: Coordinates of proposed Dredge Material Relocation Area

Location Point	Latitude	Longitude
A	19°47'31.1"S	148°17'48.2"E
B	19°47'30.6"S	148°18'57.7"E
C	19°48'35.5"S	148°18'58.2"E
D	19°48'35.7"S	148°17'48.6"E

The PER states that this area was selected as it represents a natural depression when compared to surrounding areas and is characterised by muddy sediment which supports very little marine flora and epibenthic biota¹¹. This site, as identified within the PER, was based on a Multi Criteria Analysis (MCA) that was attended by the proponent, port customers, government regulators, scientists and engineers and subsequent additional technical and investigative studies conducted by the proponent.

Previous dredge material disposal works at the Port of Abbot Point used a disposal ground further inshore identified in Figure 2.

A total of 201,000 cubic metres of dredge material was last disposed of at the inshore site in 2008 and was related predominantly to the X50 expansion project for an additional berth facility at the port. No regular maintenance dredging occurs at the Port of Abbot Point.

¹⁰ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1) pg 2-29.

¹¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1).pg 2-23

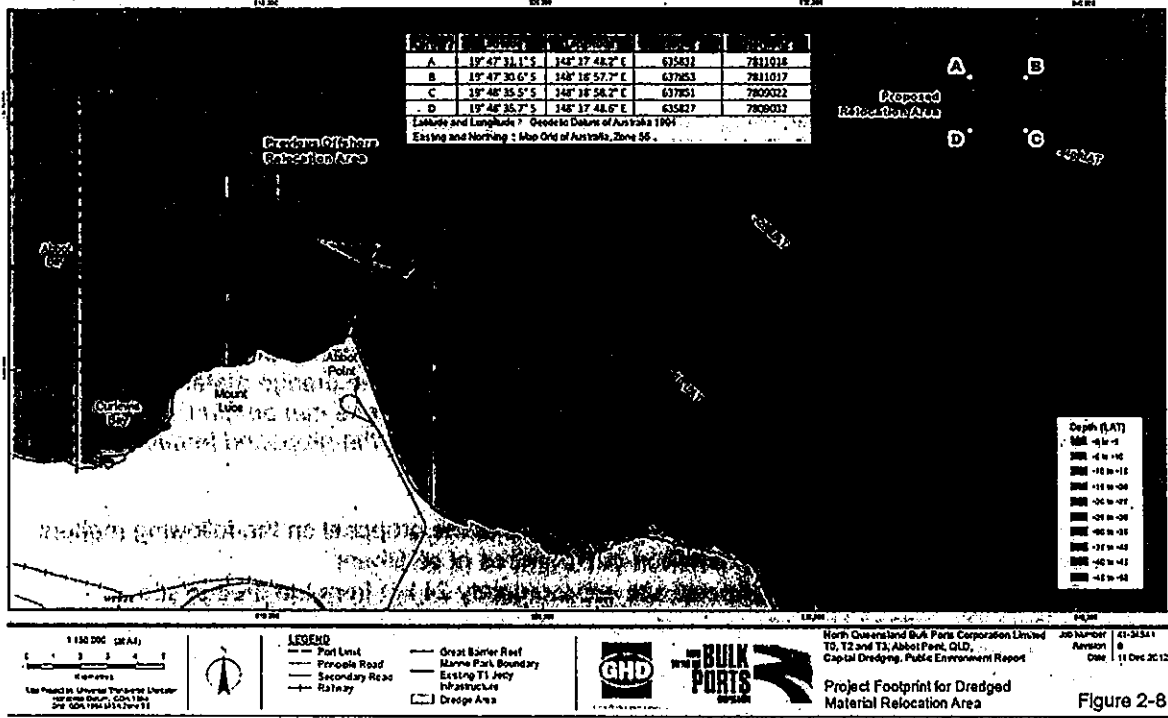


Figure 2: Location of the previously used dredge disposal site at Abbot Point located within the Great Barrier Reef Marine Park and the proposed DMRA

Public comment received on the draft PER highlighted concerns around potential impacts to commercial fishing grounds, proximity to sensitive marine environments at Holbourne Island and Nares Rocks including the discovery of a World War II plane wreck (the Catalina) to the south of the proposed DMRA.

The proponent, through the submission of a Supplementary PER in May 2013 identified the need to investigate other potential offshore disposal locations¹² and outlined a larger area (approximately 140 times the original proposal) for further investigation (Figure 3)¹³. The investigation area is within a General Use Zone of the Marine Park but adjacent to a Marine National Park Zone.

The proponent has indicated they will not be nominating a specific offshore disposal location until after a decision is made (GBRMPA and EPBC decision). The proponent indicates that the work will take approximately 4-6 months to complete and stated that they may require up to 12 months. The proponent noted that the work will be undertaken in consultation with the Department of the Environment¹⁴.

¹² CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane pg 2-10
¹³ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane. Pg 2-12
¹⁴ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane pg 2-13

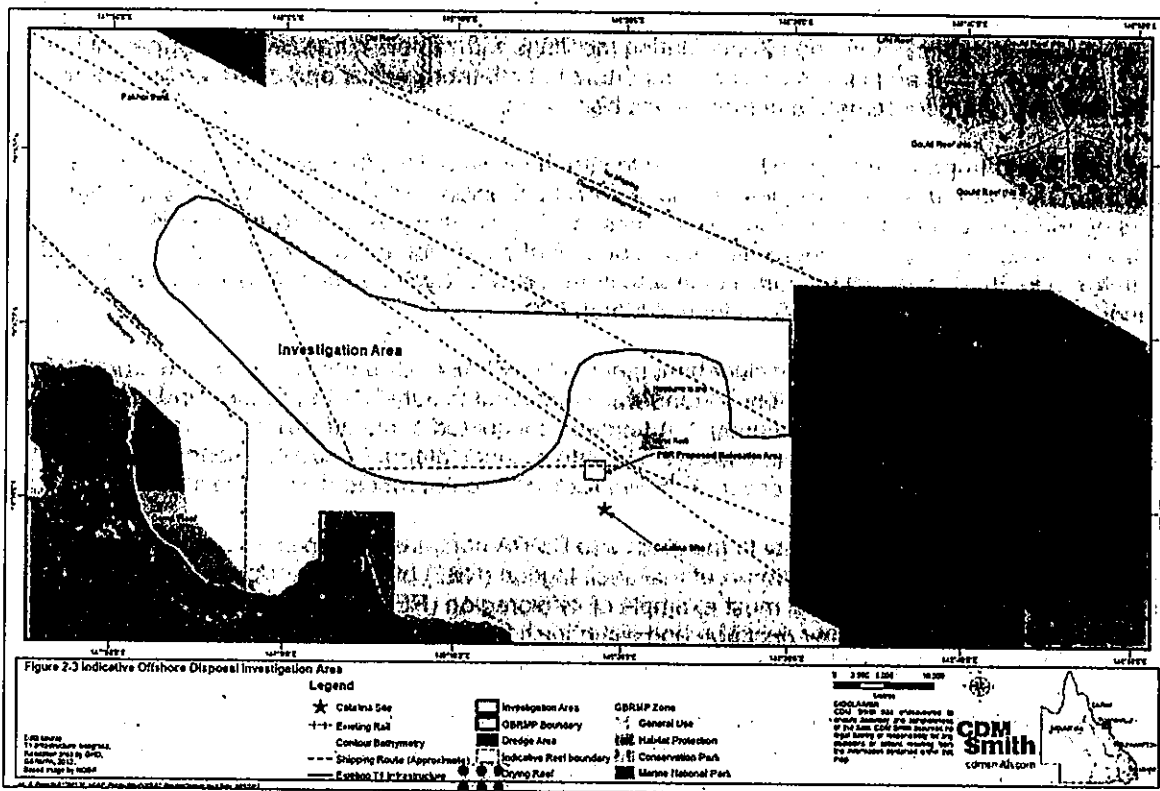


Figure 3: Map showing proposed investigation area for a Dredge Material Disposal and the initial proposed dredge disposal site

EXISTING ENVIRONMENT

The proposed Dredge Material Relocation Area (DMRA) is located adjacent to the inshore area surrounding Abbot Point at a depth of between -39 m and -44 m Lowest Astronomical Tide (LAT)¹⁵ while the proposed Investigation Area covers an area approximately 140 times larger than the proposed DMRA (Figure 3).

The proposed conduct is to be located entirely within a General Use Zone of the Great Barrier Reef Marine Park and is located within the Great Barrier Reef World Heritage Area.

The PER states that no marine flora was observed within the proposed DMRA and areas adjacent to and within the DMRA are made up of patches of macroinvertebrates comprised mostly of mud scallops, with occasional hermit crabs, gastropods, polychaetes and crinoids¹⁶. The PER also reports that no corals have been located at the DMRA¹⁷.

The closest coral reefs to the proposed DMRA are fringing reefs at Holbourne Island and Nares Rock (5-7 km NE) and Camp Island (40km W).

Holbourne Island is a National Park with no camping allowed, and the GBRMPA has afforded the waters adjacent to the Island a level of protection by designating it a Conservation Park Zone. It is considered to be the northern most island of the Whitsundays Island Group.

¹⁵ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Executive Summary, page xxii)

¹⁶ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Executive Summary, page xxiv)

¹⁷ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)



There is very little information available on the coral communities at Nares Rock, the location is designated as a Habitat Protection Zone. During meetings with fishers it has become apparent that both Holbourne Island and Nares Rock are important to both recreational and commercial fishers and particularly important for targeting demersal and pelagic fish.

Reef Health and Impact Surveys (RHIS) (used to inform the Reef Health Incident Response System) have been undertaken at both Holbourne Island and Camp Island Reefs. Surveys at Camp Island reef found up to 45% live coral cover in some locations in 2012, while surveys at Holbourne Island found 0% live coral cover¹⁸. Surveys identified large amounts of coral rubble (up to 74%) and live coral rock (up to 40%) in 2010. The lack of coral could also correlate with Cyclone Hamish which passed through the region as a Category 5 cyclone in March 2009.

A combined site inspection which included members of GBRMPA, Department of the Environment, local stakeholders and port proponent (Adani) was conducted in July 2013 to further understand the environment around the proposed conduct. Attendees conducted some informal (i.e. not structured or repeatable) reef surveys of Holbourne Island. The surveys indicated a relatively healthy coral cover with mean cover of 21% live coral cover, 17% live rock, 41% coral rubble and 21% sand.

The environment at and in proximity to the proposed DMRA contains examples of both Strong Tidal Inner Mid Shelf Reefs (RE4) and Non-reef mid shelf lagoon (NB7) bioregions. Camp Island (within nearby Abbot Bay) is the northern most example of its bioregion (RE4 Coastal Southern Reefs). Bioregions are important as they describe and distinguish the biological and physical diversity of the GBR. Bioregions also helped to inform the zoning of the Marine Park.

The PER and the Supplementary Report to the PER assesses the environmental values at Abbot Point and the proposed disposal site including a desktop assessment of relevant literature and field based studies between 2008 and 2012. Survey techniques included video transects, macroinvertebrate grabs, megafauna observation transects and benthic sled and free diver visual surveys¹⁹. Sample locations were in most cases limited to port limits although some benthic grabs and video transects were taken over a larger area (Figure 4 samples within port limits, Figure 5 samples over large area).

¹⁸ The lack of coral found at Holbourne Island more than likely represents the locations surveyed rather than the health of the reef, as surveys were taken on the non-reef side of the Island.

¹⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (page 3-83 to 3-91)

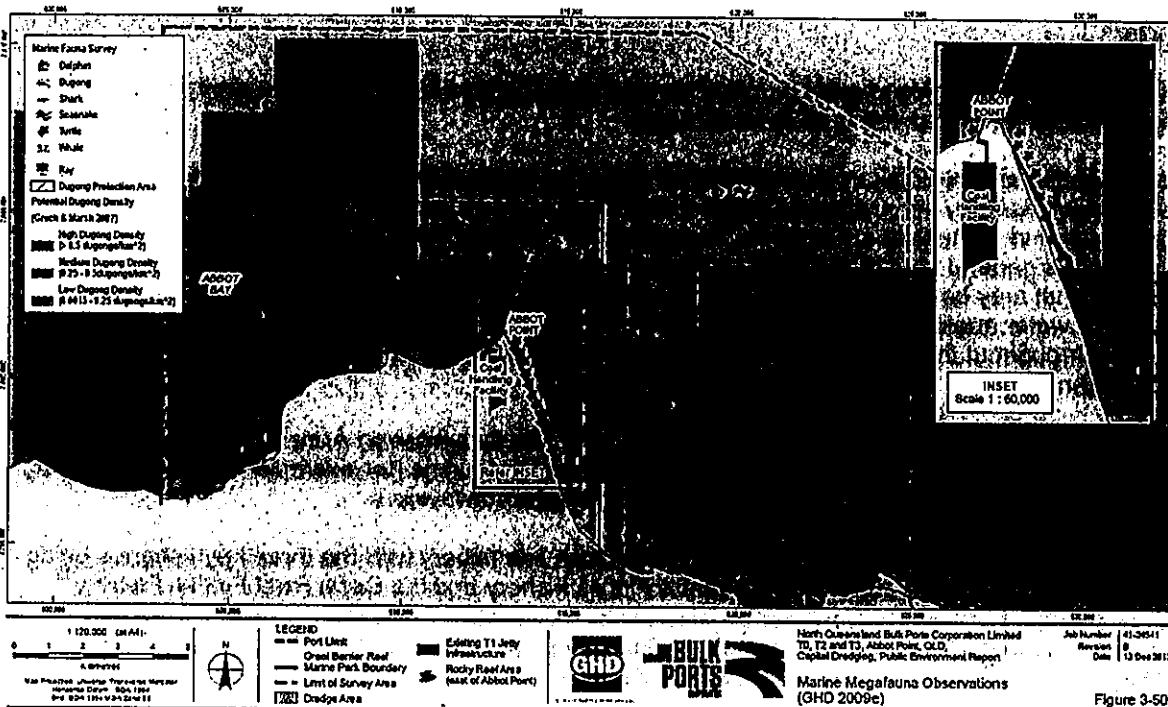


Figure 4: Marine Megafauna Observations

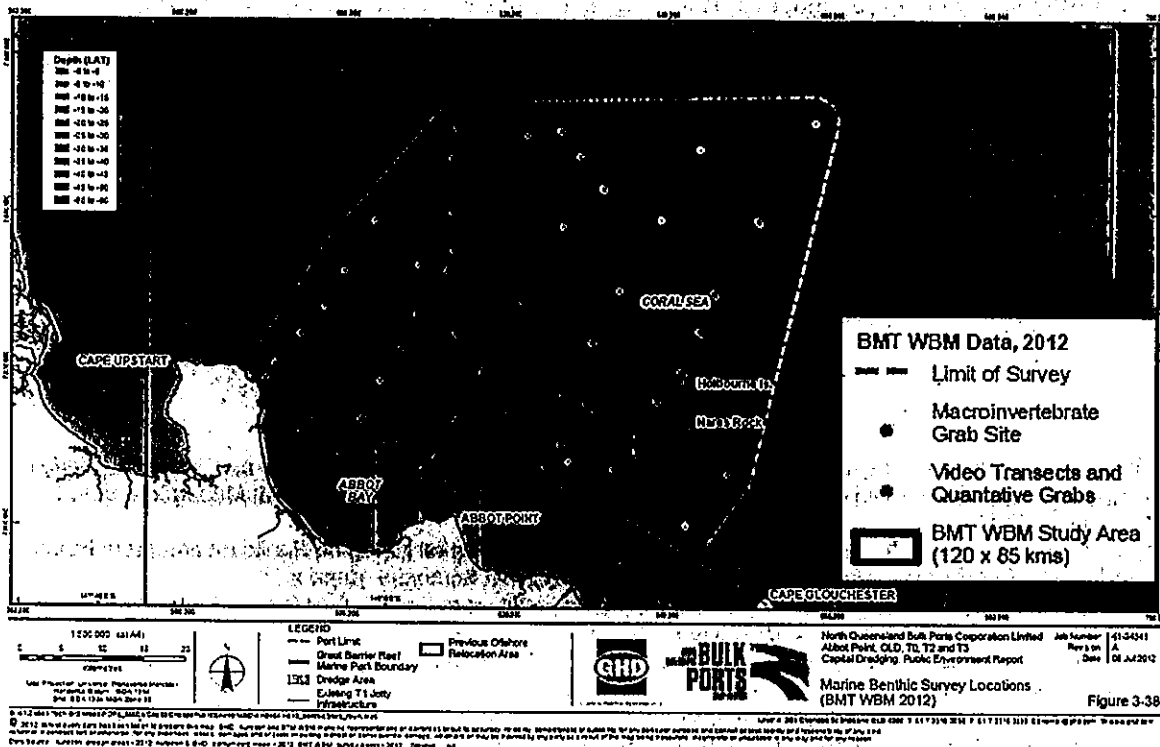


Figure 5: Benthos Survey Locations

The proponent describes the environment at and nearby the proposed DMRA as not containing natural heritage attributes at a scale or value of consequence to the World Heritage Area (WHA) as a



whole²⁰.

The PER notes that the sediment found at the DMRA is slightly different than the dredge area and has finer sediments than the area to be dredged²¹.

No monitoring or investigation of water quality has been undertaken at the DMRA or within the Investigation Area by the proponent (most of the water quality monitoring was focussed around the dredge site and immediate surrounds). There is some historical data available for mid shelf water quality in the general area of the DMRA. This data has been used in this assessment as a high level guide to what may be expected at the DMRA. On average TSS annual means are slightly above GBRMPA water quality guidelines. Nutrient parameters are also above guidelines. Water quality is variable throughout the year with the highest turbidity and nutrient concentrations occurring during the wet season.

Users of the Marine Park in and around the DMRA and the Investigation Area include but are not limited to commercial fishing operators, recreational fishers, tourists (for example scuba divers diving the nearby Catalina dive wreck (WWII aircraft)) and Traditional Owners.

Commercial fishers in the area participate in more than one fishery with the three key fisheries being East Coast Trawl Fishery, East Coast Inshore Finfish Fishery and the Coral Reef Finfish Fishery²². The peak period of activity for the commercial line fishery is September to November, while for the net fishery it is June through September²³. The net fishery slightly overlaps with the dredge window permitted by the EPBC conditions (1 March to 30 June).

Nares Rock and Holbourne Island are important for both recreational and commercial fishers, and in particular the importance of the location for targeting demersal and pelagic fish²⁴. This is one of the suggested reasons by the proponent and their fisheries consultant that an alternate DMRA be investigated within the Investigation Area^{25,26}. Increased turbidity can affect coral reef fish²⁷. Increased turbidity has been shown to impair habitat choice and foraging success²⁸. Other evidence of impacts due to increased sedimentation and turbidity shows that there can be an impact to predator-prey interactions.

²⁰ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane. (Section 3 Key Issues, Environmental Management and Enhancement for MNES)

²¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897-1). GHD Brisbane (Executive Summary, page xxiii)

²² CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (Appendix E, Page 5-6)

²³ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (Appendix E, Page 5-6)

²⁴ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (Appendix E, Page 28)

²⁵ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (2-10)

²⁶ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (Appendix E, Page 28)

²⁷ Amelia S. Wenger, Mark I. McCormick, Determining trigger values of suspended sediment for behavioral changes in a coral reef fish, Marine Pollution Bulletin, Volume 70, Issues 1-2, 15 May 2013, Pages 73-80

²⁸ Amelia S. Wenger, Mark I. McCormick, Determining trigger values of suspended sediment for behavioral changes in a coral reef fish, Marine Pollution Bulletin, Volume 70, Issues 1-2, 15 May 2013, Pages 73-80



Consideration

- Coral cover in the broader Great Barrier Reef has declined significantly over the last 25 to 30 years and evidence suggests that fish stocks are currently under stress²⁹. Inshore mega fauna such as dolphin and dugong populations are substantially smaller than 50 years ago and recent extreme weather events have exacerbated this and other risks to their population status³⁰.
- The majority of information characterising the existing environment in the proponent's PER is derived from studies within close proximity to the Port of Abbot Point, in areas adjacent to the proposed DMRA. There is limited detailed information on the existing environments within the Investigation Area, increasing the uncertainty surrounding the potential impacts of the proposed activity.
- Sediment characteristics at the proposed DMRA should be largely the same as the material to be dredged. In this case the material to be dredged is coarser in composition to the area where the material will be disposed. Changes to sediment composition could result in changed benthic communities at the DMRA post disposal (i.e. coarse sediments would result in colonisation by different organisms when compared to the colonisation of fine silts).
- Water quality data is lacking for the DMRA and further monitoring and data analysis is needed to accurately determine the existing state of water quality in the area. Historical data for the region indicates that the water quality is on average better than the nearby inshore areas.
- Commercial fishers in the area participate in more than one fishery with the three predominant fisheries being, East Coast Trawl Fishery, East Coast Inshore Finfish Fishery and the Coral Reef Finfish Fishery.
- Nares Rock and Holbourne Island are important for both recreational and commercial fishers, and in particular the importance of the location for targeting demersal and pelagic fish.
- The WWII plane wreck (the Catalina) is approximately 3 kilometres to the south of the proposed DMRA³¹.
- The commercial fishing industry and the dependent industries (i.e. seafood retailers) are the industry most likely to be impacted by the disposal of dredge material at the DMRA. The proponent acknowledges that the fishery is locally important³².
- Additional water quality sampling and analysis is required before any commencement of the activity. Use of inshore data (as per the PER) could lead to over-estimation of water quality parameters which could mask any water quality impacts caused by the action during monitoring activities.
- The larger Investigation Area has been characterised using low resolution field studies and desktop studies. Further studies are needed in order to accurately understand the existing physical and biological environment in this area before an assessment of potential impacts can be undertaken.

POTENTIAL IMPACTS

One of the tools used in Environmental Impact Assessment to predict the extent and risk to sensitive areas and receptors from a dredge material disposal activity is the use of hydrodynamic/sediment plume modelling. The outputs of the model are entirely dependent on the quality and accuracy of the inputs. If inputs are inaccurate or incomplete, there will be considerable uncertainty associated with

²⁹ De'ath, G., Fabricius, K.E., Sweatman, H. and M. Puotinen. 2012. The 27-year decline of coral cover on the Great Barrier Reef and its causes. *Proceedings of the National Academy of Sciences*. 109(44): 17995-17999.

³⁰ Brodie, J., McCulloch, M., Coles, R., Mumby, P., Fernandes, L., Pandolfi, J., Hoegh-Guldberg, O., Possingham, H., Marsh, H. and Richmond, B. 2013. Declaration by concerned scientists on industrial development of the Great Barrier Reef coast.

³¹ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane. Pg 2-5

³² CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (2-10)



the outputs.

Predictive modelling used by the proponents for the PER, contains uncertainties regarding the quality and outputs of the model. Therefore the likelihood and consequences of predicted impacts are difficult to assess and there is considerable uncertainty.

There is uncertainty relating to the results of the hydrodynamic and sediment models, due to limitations and flaws in the applications of the models. In particular the modelling to support the proponent's conclusion that the disposal of dredge material will not impact other GBRMPA zones is deficient and shows that the spatial extent of the impact will be larger than the model domain, but the total extent of impacts is undefined.

The proposed conduct at the DMRA (as proposed in the PER) has the potential to impact on the environment and on the social, cultural and heritage values of the Marine Park. The risk assessment (Attachment A) has identified eleven HIGH unmitigated risks and one EXTREME risk. With mitigation measures in place this is potentially reduced to four HIGH risks and one EXTREME risk. The residual mitigated remaining HIGH risks include water quality, OUV and two social impacts. The residual mitigated remaining EXTREME risk is a social perception risk to the Great Barrier Reef Marine Park Authority.

Potential impacts include:

- A decline in water quality including, suspended sediments concentration, sedimentation rates and release of nutrients as a result of the disposal and re-suspension of up to 3 million cubic metres of dredge material.
- El Niño and La Niña occur on average every 3 to 5 years. La Niña typically brings wetter conditions for Australia with cooler days, warmer nights and increased tropical cyclone activity. The 2010-11 La Niña broke rainfall records, resulted in flooding and cyclones to the GBR (BOM website). It is possible that within the period of proposed works, another La Niña event may eventuate, adding to the cumulative water quality stressors at the DMRA potentially contributing to the water quality stressors associated with dredge material disposal.
- Direct and indirect impacts on benthic habitats (including corals) as a result of dredge material disposal and ongoing re-suspension of dredged material potentially to areas further afield.
- Direct and indirect impacts on mobile marine fauna from the placement of dredge material and subsequent ongoing re-suspension of that material from the DMRA.
- Interactions with mega-fauna as a result of carrying out works from the transportation of dredge material to the disposal site by the dredging and associated work vessels.
- Impacts to the social values of local communities whose livelihood and reef dependant activities such as commercial fishing may be affected from the disposal of dredge material at the DMRA
- Impacts to cultural and heritage values of the Great Barrier Reef World Heritage Values including indigenous and non-indigenous values.

These potential impacts are discussed in detail below.

WATER QUALITY

Suspended Solids

The proponent's water quality monitoring was focussed on the dredge site and immediate surrounds. There is therefore no water quality information provided for the mid-shelf area around the DMRA. Total suspended solids concentrations are not known with any certainty, however historical data can be used to assume, for the purposes of this assessment, that the TSS and turbidity at the DMRA is better than that at the inshore dredge area.

Mid shelf TSS in the region ranges between 0 and 30mg/l and records a mean of 2.2mg/l which is only slightly above GBRMPA water quality guideline value of 2mg/l.

The PER states that the sediment proposed to be disposed is generally made up of a mixture of



terrigenous sandy clay, clayey sand or silty clay³³. Analysis of the physio-chemical properties of the sediment showed that no noteworthy contamination exists and on the basis of 95% Upper Confidence Limits (UCL) for the analysed contaminants, all passed their respective National Assessment Guidelines for Dredging 2009 (NAGD) screening levels³⁴.

The sediment to be dredged and disposed was found to be Potential Acid Sulphate Soil (PASS), although because the acid neutralising capacity of the sediment is greater than the acid generating potential, no impacts from acid sulphate soils are expected to occur if the dredged material is disposed onshore or offshore³⁵.

The particle size distribution associated with the dredge material proposed for disposal within the Marine Park is shown in

³³ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). pg 3-37

³⁴ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)

³⁵ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)



Table 2. It is assumed that on average approximately 39 per cent of the dredged sediment (i.e. the silt and clay fraction less than 60 microns) contains fine sediments. On average the material proposed to be dredged contains 54 per cent sand. Clay content generally increased with depth and from overall visual observations natural residual geological material is present at depths of 0.5 to 1m below the sea floor.³⁶

Predictive modelling of the increases in total sediment concentrations as a result of dredging and disposal was undertaken by the proponent in order to predict potential impacts. The modelling system used was a three dimensional model and a range of hydrodynamic, wave and sediment transport modules. The resulting models interact dynamically to represent the combined effects of tide wind and waves of the transport of sediments. Model outputs are represented as both 50th (average) and 95th (worst-case) percentile plumes modelled under prevailing conditions. The model was initially run for 6 weeks between July and August 2007 for an expected 10 week proposed dredge and disposal campaign. In addition the months of September to November 2003 were simulated in an alternative wave and climate scenario³⁷. The modellers chose to run the model under 2007 conditions which they acknowledge are conservatively mild conditions³⁸. The proponent considers the outputs modelled during 2007 (95th percentile outputs) to represent a worst case plume scenario. However, modelling under more energetic conditions (such as 2011) could potentially generate larger plumes that move greater distances.

³⁶ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane pg 3-37

³⁷ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). Appendix H1, pg xvi -xvii

³⁸ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)



Table 2: Statistical Summary of Sediment Particle Size Distribution Results³⁹

Table 3-5 Statistical Summary of Sediment Particle Size Distribution Results for Dredge Area

Particle Size		PSD (%) Dredge Area	PSD (%) using Seawater Dredge Area	PSD (%) Relocation Area
Cobbles (>6 cm)	Minimum	0	0	0
	Maximum	0	0	0
	Average	0	0	0
	Standard Deviation	0	0	0
Gravel (>2 mm)	Minimum	1	2	0
	Maximum	35	21	5
	Average	7.7	5.2	0.5
	Standard Deviation	5.4	4.2	1.4
Sand (0.06 mm - 2.00 mm)	Minimum	25	31	7
	Maximum	83	83	26
	Average	54	52	12.6
	Standard Deviation	11	10	5.4
Silt (2.00 µm - 60 µm)	Minimum	2	15	34
	Maximum	47	66	59
	Average	19	43	50.5
	Standard Deviation	8.2	9.6	6.5
Clay (<2 µm)	Minimum	7	<1	29
	Maximum	41	<1	40
	Average	20	<1	36.5
	Standard Deviation	5.4	0	2.9

³⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary, Page 3-39 to 3-40)



Figure 6 shows the 95th percentile model outputs for total sediment concentrations as "above background" for the proposed DMRA modelled under July to August 2007⁴⁰ conditions.

The modelling indicates no visible plume at Holbourne Island. Nares Rock, which is not shown on the map, is predicted to be impacted by increased TSS (up to 25mg/l) (and therefore sediment). This may lead to stress and impacts on corals such as production of mucus and tissue necrosis, as well as algal symbionts being affected by increased light attenuation⁴¹.

Water quality around the proposed action is expected to experience increased turbidity and suspended sediments from the direct action of dredge material disposal and through subsequent re-suspension of dredge material. The worst case plume provided in the PER (Figure 6) predicts the plume to move predominantly in a NW/SE direction extending out 20 km to the NW and approximately 8 km to the SE. The information provided by the proponent may potentially underestimate the footprint of water quality declines and the extent of potential impacts due to the parameters used within the model.

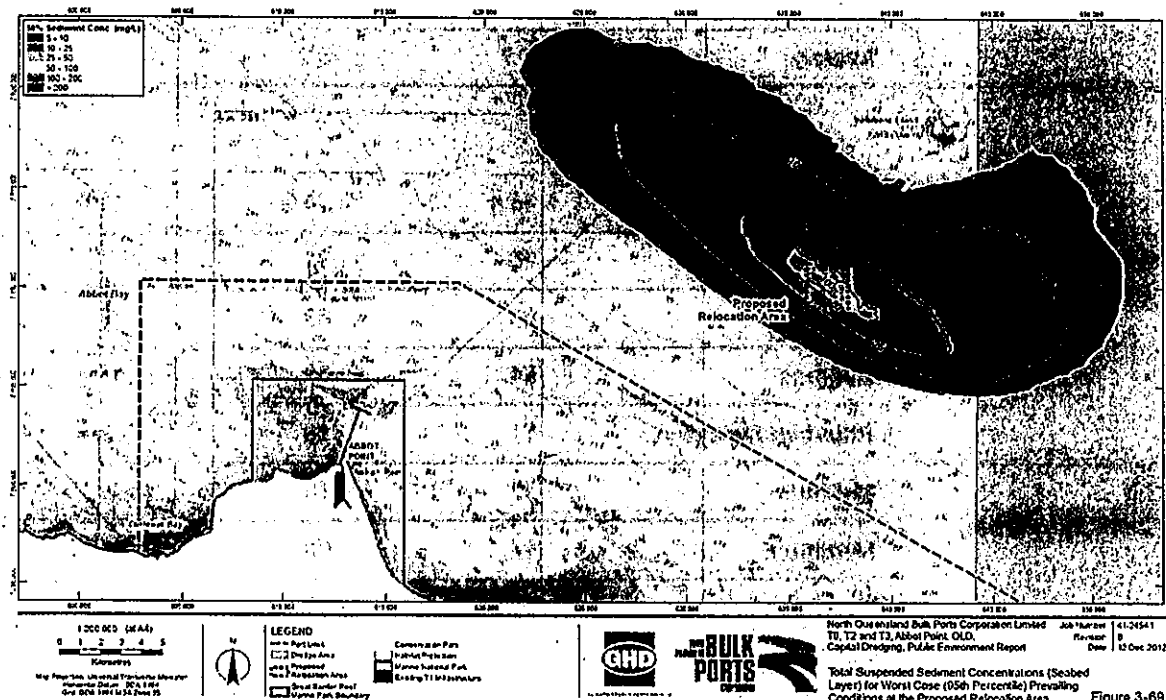


Figure 6: Total Suspended Sediment Concentrations (Seabed Layer) for Worst Case (95th Percentile) Prevailing Conditions at the Proposed Relocation Area

No comparative alternate weather scenarios (95th percentile) have been provided in the PER or supplementary PER for the proposed DMRA.

The proponent has considered migration of non-cohesive sediment (i.e. sand and gravel) from the proposed DMRA once it has been deposited over a 5 month period starting 15 June 2004 to 16 November 2004⁴². Figure 7, shows the depth and pattern of sedimentation as of 18 October 2004,

⁴⁰ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane pg 3-145

⁴¹ Erfemeijer, P. L. A., Riegl, B., Hoeksema, B. W. & Todd, P. A. (2012). Environmental impacts of dredging and other sediment disturbances on corals: A review. *Marine Pollution Bulletin*, 64, 1737-1765. doi:10.1016/j.marpolbul.2012.05.008

⁴² GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane Appendix H1, pg 87



three months after the start of the simulation⁴³. No further long term outputs are presented in the PER documentation. This output assumes that the cohesive material (i.e. silts and clays) will eventually be fully exhausted (i.e. dispersed). No long-term modelling of the cohesive fraction of the sediment (roughly 39%) has been provided for the proposed DMRA.

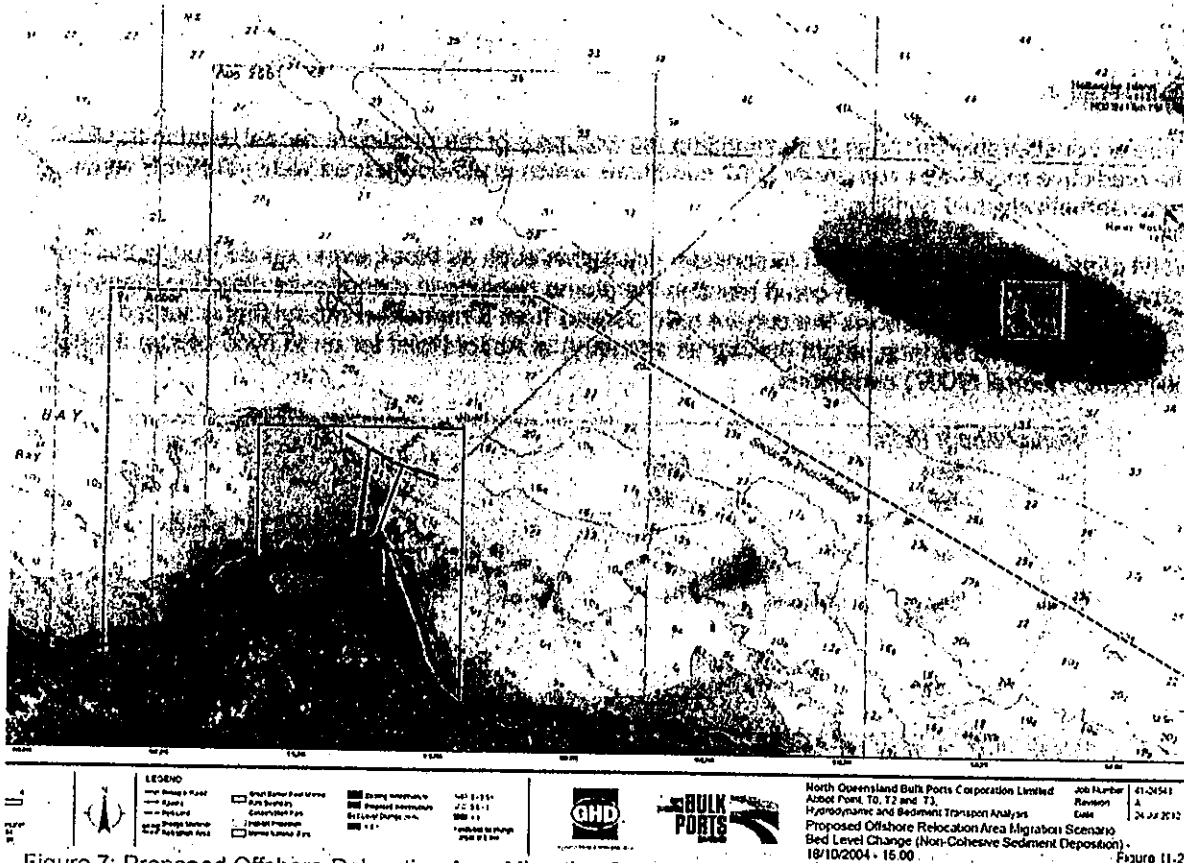


Figure 7: Proposed Offshore Relocation Area Migration Scenario Bed Level Change (Non-Cohesive Sediment Deposition) after three months

Studies commissioned by the Department of the Environment on improved dredge material management for the Great Barrier Reef region⁴⁴ report that:

- the inclusion of large-scale oceanic currents into hydrodynamic models may result in larger plume extents and further migration of suspended sediment than previously modelled;
- a portion of dredge material disposed offshore within the GBRWHA will resuspend and be transported by wind, waves and oceanic currents; and
- when sediment transport and migration is modelled over longer periods (i.e. 12 months) the re-suspension and deposition area is increased.

It is noted that findings of the SKM (2013) study have yet to be fully validated and have not been undertaken with significant resolution and accuracy that is required or expected of a detailed impact assessment process. The inclusion of the large-scale oceanic current forcing, especially in deeper offshore waters would capture the expected current movement that would not otherwise be considered within a model that is driven by only by winds and tidal elevations. As a result, there is the potential that the modelling provided may not correctly resolve the rate and extent of longshore transport driven by larger scale ocean circulation processes operating within the Great Barrier Reef.

⁴³ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane Appendix H1 pg 88

⁴⁴ SKM 2013, Improved dredge material management for the Great Barrier Reef Region, Great Barrier Reef Marine Park Authority, Townsville.

Consideration of larger scale oceanic currents in dredge plume modelling is a current requirement of GBRMPAs hydrodynamic modelling guidelines. It must be noted that the GBRMPA guidelines were released in mid-2012, this was subsequent to the issuing of the Terms of Reference for the Abbot Point capital dredging PER. Any, further hydrodynamic modelling undertaken for the proposed activity must consider these guidelines.

Consideration

There is considerable uncertainty surrounding the accuracy of the predictive model used in the PER. The predictive model was run under 2007 conditions which is acknowledged within the PER report to be conservatively mild conditions⁴⁵.

Worst case scenario's would need to consider conditions such as those experienced during 2011 or perhaps those from 2004 which could result in the plume heading in an opposite direction than what was expected. Figure 8, shows the current rose derived from a numerical model that is forced by observations of sea surface height (known as altimetry) at Abbot Point for an El Niño (2004), La Niña (2011) and neutral (2007) conditions.

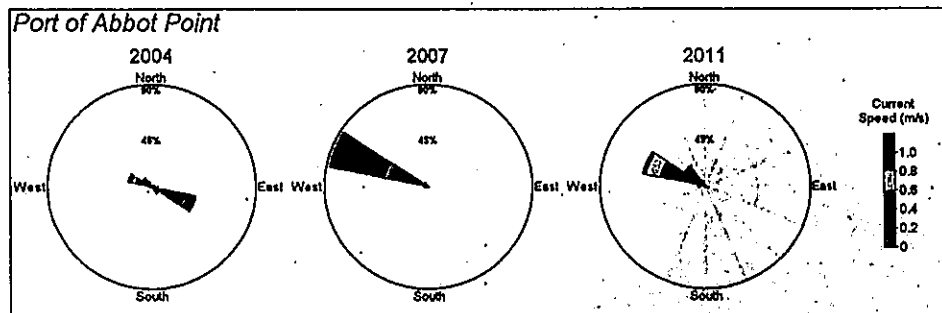


Figure 8: Surface large scale current rose diagrams for an El Niño (2004), La Niña (2011) and neutral (2007) conditions. The diagrams were generated using data closest to the existing material placement site at the Port of Abbot Point⁴⁶

The modelling undertaken for the PER shows predicted plumes exiting the modelling domain which should have constituted grounds for the modeller's to re-assess the area under consideration and increase the size of the modelling domain to fully capture the likely spatial extent of the plume. The total extent of plume footprint is thus, undefined.

Modelling outputs are therefore likely to:

- under estimate the geographic extent of TSS increases associated with dredge material disposal and potential remobilisation; and
- not provide an accurate representation of extent of TSS increases associated with dredge disposal. They are a 6 week snapshot in time and only reflect a small sub-set of the different weather scenarios that are likely to occur at the site.

Longer predictive modelling outputs (greater than the 3 months presented) are required to understand and assess the long-term fate of resuspended dredge particles and their ecological relevance.

It is therefore likely that the proponent has not identified all possible potential impacts associated with the disposal campaign for the proposed DMRA.

⁴⁵ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)

⁴⁶ SKM 2013, Improved dredge material management for the Great Barrier Reef Region, Great Barrier Reef Marine Park Authority, Townsville.



Conclusion:

- *The material proposed to be dredged and disposed within the Marine Park is considered suitable, chemically, for ocean disposal as per the National Assessment Guidelines for Dredging 2009.*
- *Acid sulphate soil generation is not expected as a result of the proposed conduct.*
- *The main predictive tool used to ascertain the sediment plume associated with the proposed activity has limitations associated with predicting potential impacts of the proposed conduct within and adjacent to the DMRA.*
- *No modelling of the dredge plume has been undertaken within the Investigation Area.*
- *No conclusions are made in regards to suspended sediment associated with a dredge disposal plume in the Investigation Area*

Nutrients and Chlorophyll a

The historical data available regarding nutrient water quality parameters at the proposed DMRA finds that some values are above GBRMPA water quality guidelines⁴⁷. In general, nutrient concentrations in the mid shelf region are less than those further inshore.

The PER notes low levels of nutrients in the sediments to be dredged, however no estimates or further information regarding the subsequent release of nutrients from the dredged sediments is provided.

The mechanical action of dredging releases water held within the sediments; this is called pore water. This pore water typically contains higher levels of nutrients than in the surrounding water column. The ecological influence of these additional nutrients depends on background concentrations in the water column as well as on the amount of nutrient that are released during the dredging.⁴⁸

As there are no specified screening levels for nutrients in sediments under the NAGD, there is no requirement for further testing such as elutriate or pore water analysis. Elutriate tests can show a release of soluble nitrogen and phosphorus from sediments into the surrounding water⁴⁹.

Increased nutrient levels are associated with eutrophication. Epiphytic growth and changes in benthic communities such as increased macro algae biomass are likely if the nutrients are at increased levels. Algal blooms reduce light and decreased dissolved oxygen.

The ReefPlan 2010 aims to reduce the annual average inputs of nitrogen and phosphorus from riverine sources into the Great Barrier Reef catchment area. As these nutrients are of concern to the state of the GBR water quality. The nutrients detailed in the PER, around reported total N and total P levels in the proposed dredged sediments at Abbot Point are in line with values reported elsewhere in the literature.

This assessment attempted to identify the probability and impacts associated with increased nutrients being released into the water column due to the dredging and disposal action and consequent re-suspension events. Wind driven re-suspension of sediments is likely to only affect the top few mm of sediment. However nutrients released can affect nutrient and related phytoplankton standing crop levels in coastal areas.

⁴⁷ *Data extrapolated from De'ath and Fabricius (2008) Water Quality of the Great Barrier Reef: Distributions, Effects on Reef Biota and Trigger Values for the protection of ecosystem health. Research Publication No. 89*

⁴⁸ *EPA Victoria Guidelines for Dredging, Appendix 4: Estimated nutrient release by dredging*

⁴⁹ *Jones, R. A., and Lee, G. F., "The Significance of Dredging and Dredged Material Disposal as a Source of Nitrogen and Phosphorus for Estuarine Waters," IN: Estuaries and Nutrients, Humana Press, Clifton, NJ, pp 517-530 (1981)*



For comparative purposes, the largest re-suspension events are those associated with tropical cyclones where surface sediments over large areas (between 1,000 km² and 10,000 km² of the GBR can be resuspended to depths of 1-10 cm). The water quality issues associated with these cyclonic re-suspension events include changes to water turbidity and may trigger massive phytoplankton blooms over large areas (10,000 km²).

Although the differences in spatial scales between a disposal event and cyclonic conditions are acknowledged the disturbance of the seabed and the subsequent release of nutrients from the sediments is possible and currently an unknown impact. It would be expected that the dredging plume and post-spoil disposal plumes from the proposed dredging activities would produce conditions analogous to those occurring after a cyclonic re-suspension event for a short period (days to a few weeks) and over smaller spatial scales (~ 100 km²).

It is difficult with all the uncertainties and assumptions whether these nutrient values can be compared to the reduction in nutrients through ReefPlan. The evidence does suggest that the action of dredging and disposal will cause the release of nutrients into the water column.

Chlorophyll *a* is used to determine the likely amount or density of algal biomass in water. High levels are usually associated with eutrophication of a system and can be harmful for aquatic ecosystems⁵⁰.

Historical data used to ascertain the likely levels of chlorophyll *a* at the disposal site shows that chlorophyll *a* levels to be slightly above GBRMPA water quality guidelines (i.e. 0.61 µg/L)⁵¹.

It is reported that in the nearby Abbot Bay chlorophyll *a* levels show some seasonal variability and are above both the ANZECC upper limit of 1.4 µg/L and the GBRMP/QWQ guideline value of 0.45 µg/L during the wet season. The levels at the DMRA would likely be less but also experience that seasonal variability.

Chlorophyll *a* concentrations often have an inverse relationship with nutrient concentrations from river plumes or other nutrient sources and the same would be true for dredge and dredge material disposal plumes⁵² (i.e. as the nutrients are used up, it would be expected that the increase in algal biomass would result in increased chlorophyll *a* levels). Chlorophyll *a* levels increase with distance or time away from the plume, as heavier sediments settle out allowing increased light for photosynthesis and as nutrients are used up during growth as such it would be expected that large dredge plumes could result in increased algal blooms.

Consideration

There is limited information contained within the PER and Supplementary PER report around the release of nutrients as a result of the placement and re-suspension of dredge material at the proposed dredge material relocation area.

It is likely that nutrients will be released from the disposed sediments into the surrounding waters. The resulting impacts are likely to be experienced as a short term impact such as increased turbidity due to increases in algae biomass.

Eutrophication and algal blooms are usually a secondary impact as TSS levels drop and nutrients are used by primary producers. Planktonic blooms can migrate further than the originating sediment plume creating further turbidity related impacts such as increased light attenuation and decreased dissolved oxygen or other localised changes in water quality.

It is possible that disposal of the dredged material may result in an increase in Chlorophyll *a* levels due to resuspension, that would potentially remain above the relevant guideline values.

⁵⁰ GHD. (2012) Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final: GHD: Brisbane

⁵¹ Data extrapolated from De'ath and Fabricius (2008) Water Quality of the Great Barrier Reef: Distributions, Effects on Reef Biota and Trigger Values for the protection of ecosystem health. Research Publication No. 89

⁵² GBRMPA, (2001) Research Publication No. 68, Flood plumes in the Great Barrier Reef: Spatial and Temporal Patterns in Composition and Distribution. GBRMPA: Townsville



There is the potential for effects of increased algal blooms and eutrophication being experienced beyond the modelled plume, meaning that affects such as reduced light and/or increased epiphytic growth may be widespread and result in sub lethal impacts to seagrasses or corals.

Conclusion:

- *The proponent has followed the National Assessment Guidelines for Dredging 2009 in regards to testing for nutrients in the sediment, it is however unclear how much of the nutrients in the sediment will become available in the water column due to the physical disturbance associated with the proposed activity in the Marine Park.*
- *The proposed activity may increase the levels of nutrients in the surrounding area to the DMRA. The exact impacts are unknown but in general elevated levels of nutrients can lead to eutrophication and algal blooms. Algal blooms can migrate creating further turbidity in other areas.*

Summary of water quality impacts

The PER contains limited information relating to existing water quality parameters at the proposed DMRA or the Investigation Area. The focus on water quality monitoring within the PER is within the immediate area surrounding the Port of Abbot Point.

There is potential for water quality at the proposed DMRA, and adjacent areas, to be reduced by dredge material disposal.

The risk assessment (Attachment A) identifies that the risk of a deterioration of water quality due to the proposed activity can be considered a residual "HIGH - MEDIUM" risk. This is to say that the likelihood that deterioration will occur is 'almost certain' but the exact consequences are unknown. Due to the 5-6 year time frame the consequence rating of 'Moderate' was applied, making the overall risk 'HIGH -MEDIUM' (a range was accepted here representing the uncertainties of the project).

Impacts as a result of changes to water quality (in particular TSS and release of nutrients) are likely to influence marine communities in and adjacent to the proposed DMRA; including flow on impacts to corals and seagrasses.

The proposed activity is likely to have unmitigated "HIGH - MEDIUM" risks on water quality as identified within the Risk Assessment at the proposed DMRA and immediate areas surrounding the DMRA due to the high proportion of fine silts in the material to be disposed. Consecutive disposal campaigns over an extended period of up to six years may reduce water quality for an extended timeframe.

There are standard mitigating measures such as the development of adaptive trigger thresholds, management plans, mechanical conditions and environmental site supervision that can be conditioned to reduce the risk of impacts to water quality at sensitive receptor sites.

Turbidity plumes and subsequent re-suspension will be difficult to mitigate, manage once material is placed as sea.

IMPACTS TO BENTHOS

A minimum of 400ha (the footprint of the DMRA) of Marine Park benthic area will be directly impacted by the proposed dredge disposal action.

The benthic communities identified in the PER are consistent with the description in the GBRMPA non-reef bioregion NB7 Mid Shelf Lagoon⁵³. The PER states that there are no seagrass communities

⁵³ GBRMPA. 2002. Non-reef bioregion: NB7 Mid Shelf Lagoon. GBRMPA Townsville



present at the DMRA and no other marine flora is observed within the proposed DMRA. The PER also documents that the DMRA is made up of patches of macroinvertebrates comprised mostly of mud scallops, with occasional hermit crabs, gastropods, polychaetes and crinoids, no corals have been observed at the DMRA^{54,55}.

These non reefal areas are generally dominated by macro invertebrates in low densities such as echinoderms, solitary corals, sponges, holothurians (sea cucumbers) and various anemones⁵⁶.

The benthic communities located at the DMRA will be impacted by burial, or indirect impacts from water quality degradation. The benthic communities located in the 400 ha proposed DMRA will be subject to burial in up to 800 mm of dredged material over the duration of the dredging campaign and those surrounding will be subjected to varying degrees of smothering⁵⁷.

Benthic surveys found low density cover of between 1% and 10% and no communities of significant concern⁵⁸. However, the proponent notes in the PER that sediment characteristics differ at the proposed DMRA when compared to the dredge area⁵⁹. This may result in the benthic community being altered following recovery.

The PER concludes that the benthic assemblages are resilient to large scale and targeted benthic disturbances such as dredging or extreme weather events⁶⁰. It is known that dredging can change the physical habitat and biological structure of ecosystems⁶¹. It is highly likely that this also applies to the disposal of large amounts of dredged material, as this action will modify the benthos at the proposed DMRA and possibly further afield due to ongoing re-suspension.

Consideration

Human modification to the marine environment (either directly or indirectly) will compromise the ability of that ecosystem to recover from other stressors such as cyclones, floods, eutrophication and climate change. There is potential to change the species composition and functioning of an existing ecosystem, a shift in community composition has the potential to alter other organism's use of an area and potentially result in the displacement of those animals and a change in species diversity or biomass.

Summary of impacts to benthos

It can be expected that benthic communities at the DMRA, and adjacent areas, will be directly or indirectly impacted by dredge material disposal, either by direct burial or increased turbidity and resuspension of material.

⁵⁴ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Executive Summary, page xxiv)

⁵⁵ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)

⁵⁶ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)

⁵⁷ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Executive Summary)

⁵⁸ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)

⁵⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)

⁶⁰ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation 3-100)

⁶¹ National Research Council, *Effects of Trawling and Dredging on Seafloor Habitat*. Washington, DC: The National Academies Press, 2002.



A minimum of 400ha (the footprint of the DMRA) of Marine Park benthic habitat will be impacted by the proposed action. Repeated (up to three separate campaigns) dredge disposal actions over a 5-6 year period of up to 1.3million cubic metres each is likely to directly impact the benthic habitats within the DMRA. This impact is unlikely to show full recovery until a period of time (years) following the final disposal campaign.

Partial recovery may take place following each campaign with re-establishment of pioneering communities that are known to re-establish the impacted area after disposal activities have ceased.

The risk assessment identifies that the proposed activity has unmitigated "HIGH" risk to benthic communities at the DMRA and adjoining areas.

SEAGRASS

The PER states that no seagrass communities were observed at the proposed DMRA^{62,63}. This is most likely due to the depth of the proposed DMRA (>35m). Nearby, in Abbot Bay, seagrass communities are the dominant benthic community.

The PER states that seagrass communities surrounding Abbot Point are in low diversity⁶⁴. However, Abbot Bay seagrass species diversity in the deeper offshore meadows is known to be higher than that found in other tropical and sub-tropical Queensland locations⁶⁵ and seven seagrass species have been identified within the Abbot Point region between 2008 and 2012⁶⁶. These offshore seagrass species within Abbot Bay are of high value as they have been identified as those which are preferred by Dugong as food⁶⁷.

There is a possibility that the potential resuspension of dredge sediments from the DMRA, has the potential to cause impacts on deepwater offshore seagrass communities. The extent of impacts on seagrasses is unknown as there is uncertainty surrounding the plume predictions (previously discussed) and the lack of long term sediment migration modelling, only non-cohesive material, sand and gravel was modelled for a period three months following a single disposal event. The extent of offshore deepwater seagrass mapping is limited within the areas surrounding the DMRA and Investigation Area. Mapping has been previously concentrated around inshore coastal areas surrounding the Port of Abbot Point (Figure 9).

The improved dredge material management in the Great Barrier Reef study found that dredge material disposed offshore will resuspend and be transported by wind, waves and oceanic currents up to approximately 100 km further than previously modelled⁶⁸. When sediment transport and migration is modelled over longer periods (i.e. 12 months) the resulting deposition area is increased and the likely impact on previously unconsidered sensitive sites is possible.

⁶² GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)

⁶³ SKM 2013, Improved dredge material management for the Great Barrier Reef Region, Great Barrier Reef Marine Park Authority, Townsville.

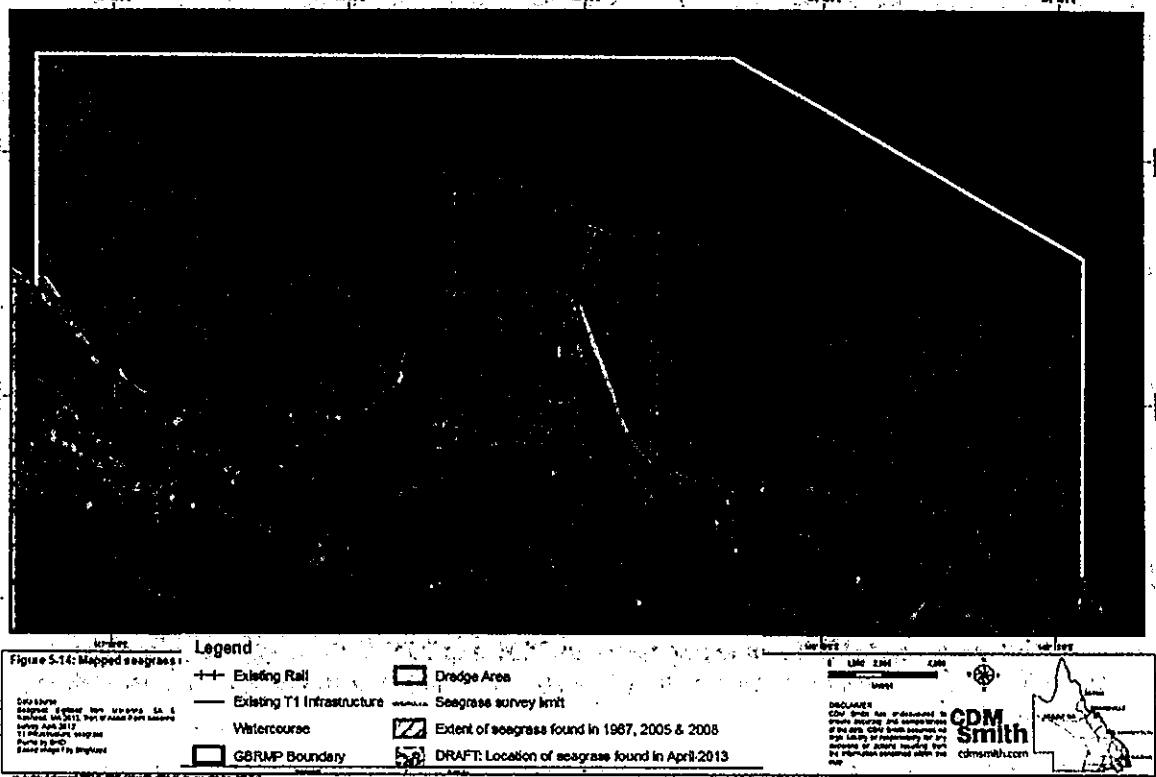
⁶⁴ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Executive summary, Page xxiii)

⁶⁵ Rasheed, M.A., Thomas, R. and McKenna, S.A. (2005). Port of Abbot Point seagrass, algae and benthic macro-invertebrate community survey - March 2005. DPI&F Information Series Q105044 (DPI&F, Cairns), 27 pp.

⁶⁶ McKenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.

⁶⁷ Rasheed, M.A., Thomas, R. and McKenna, S.A. (2005). Port of Abbot Point seagrass, algae and benthic macro-invertebrate community survey - March 2005. DPI&F Information Series Q105044 (DPI&F, Cairns), 27 pp.

⁶⁸ SKM 2013, Improved dredge material management for the Great Barrier Reef Region, Great Barrier Reef Marine Park Authority, Townsville.



Consideration

- The PER does not predict any direct or indirect impacts to seagrass from dredge material disposal, yet the full extent of potential seagrass habitat has not been mapped within the immediate area of the proposed activity. There is a possibility that resuspension of dredged material from the DMRA may impact on seagrass meadows further away in the region.
- Seagrass communities surrounding the Port of Abbot Point, are the dominant benthic community. Dredge disposal activities may put additional pressure on seagrass meadows with threats to water quality, and in particular light availability.

Summary of seagrass impacts

The PER does not predict any direct or indirect impacts to seagrass from dredge material disposal. This is because seagrass is unlikely to occur at the proposed offshore DMRA due to its depth. Mapping of seagrass habitats outside the immediate area surrounding the Port of Abbot Point is limited especially within the Investigation Area. It is possible that potential impacts to seagrasses may occur. The exact severity and possible recovery times are unclear.

The proponent proposes to dredge in the dry season (April – October)⁶⁹ (this has subsequently been refined to March to July), some of which may encompass the seagrass growing season (July to January)⁷⁰.

⁶⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Page 3-171)

⁷⁰ Mckenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.



There are large areas surrounding the proposed activity that have not been surveyed for seagrasses.

Recovery of some offshore seagrasses has started in Abbot Bay and any subsequent stressors may delay the recovery.

Dredge material disposal at the proposed DMRA or alternate site within the Investigation Area is likely to result in continual re-suspension of unconsolidated sediments and decreased water quality for an unpredictable amount of time.

No seagrass habitat has been observed within the proposed DMRA.

There are large areas surrounding the proposed activity especially within the Investigation Area that have not been surveyed for seagrasses.

Seagrass communities nearby surrounding the Port of Abbot Point, are the dominant benthic community.

It is possible that potential impacts to seagrasses may occur.

Mitigation measures that may reduce this risk is to implement an adaptive water quality monitoring program with clear triggers, implement baseline seagrass surveys in areas that are currently not surveyed.

With mitigating measures in place risk assessment identifies that the residual risk to seagrass from the proposed activity is "MEDIUM".

CORALS

The PER reports that no coral reefs are located at the proposed DMRA and as such no impacts to corals are expected to occur⁷¹. Therefore the proponent has not recommended any mitigating or management measures.

The closest coral reefs to the proposed DMRA are Nares Rock and Holbourne Island (located approximately 5-7 km north-east).

Reef Health and Impact Surveys (RHIS) (used to inform the Reef Health Incident Response System) have been undertaken at both Holbourne Island and Camp Island Reefs. Surveys at Camp Island reef found up to 45% live coral cover in some locations in 2012, while surveys at Holbourne Island found 0% live coral cover⁷².

The Australian Institute of Marine Science has historical data for Holbourne Island Reef and confirms the presence of coral at Holbourne at between 2.5% and 12% coral cover⁷³.

It is well known and acknowledged that dredge material disposal activities can cause impacts on corals associated with increased turbidity and sedimentation. The risk and severity of the impact will primarily depend on the intensity, duration and frequency of the exposure to increased turbidity and

⁷¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)

⁷² The lack of coral found at Holbourne Island more than likely represents the locations surveyed rather than the health of the reef, as surveys were taken on the no reef side of the Island. The surveys did identify large amounts of coral rubble (up to 74%) and live coral rock (up to 40%) in 2010.

⁷³ Australian Institute of Marine Science. (2013). Holbourne Island Reef Surveys, Retrieved 16 January 2014 from <http://data.aims.gov.au/reefpage2/reefpage.jsp?fullReefID=19103S>



sedimentation⁷⁴. Some potential impacts include⁷⁵:

- reduced light availability;
- abrasion of coral tissue;
- reduced larval survival;
- reduced coral polyp activity;
- reduced reproductive rates;
- smothering of coral polyps;
- hindered attachment of coral larvae; and
- increased susceptibility to coral pathogens⁷⁶.

Changes to water quality including the reduction of dissolved oxygen and the release of nutrients and contaminants⁷⁷ caused by dredging can also cause impacts to corals.

The modelling provided as part of the PER indicated that Nares Rock and its surrounding reefal habitat may be impacted by increased TSS by the proposed action at the DMRA, while Holbourne Island is shown to be approximately 2km away from the plume extent. The 95th percentile, above background levels of TSS at Nares Rock are expected to reach between 10-25 mg/L⁷⁸ under prevailing conditions, no similar comparison has been provided for the alternate weather scenario where expected increases in TSS may be larger.

The PIANC report 108 (2010) 'Dredging and port construction around coral reefs' identifies that 25mg/l TSS for less than 5% of the time (as predicted to occur at Nares Rock) equates to a Minor to Moderate impact based on thresholds for impact severity for suspended sediment impact in Singapore on corals⁷⁹. It must be noted that tolerance limits are site specific and the Singapore example is reflective of the relatively high background turbidity and sedimentation rates, the shallow nature of the coral reefs and the prevailing strong currents found in Singapore.

Different coral species will have different levels of tolerance to TSS and sedimentation. For example; Erfteimeijer *et al.* 2012 found that tolerance limits of coral reef systems for chronic suspended-sediment concentrations range from <10 mg/l in pristine offshore reef areas to >100 mg/L in marginal nearshore reefs⁸⁰. This keystone review on the impacts of dredging and other sediment disturbances on corals also found that some coral species could show mortality after exposure of weeks to concentrations as low as 30 mg/L. They also found that fine sediments tend to have greater effects on corals with regards to smothering than coarse sediments⁸¹.

Studies indicate that corals can tolerate changes in turbidity and increases in sedimentation⁸², especially those corals found in naturally high and variable background conditions of turbidity and sedimentation. As sediments move and remobilise (particularly fine sediment) there is a risk that the sediment will move into areas that are not naturally turbid.

Consideration

⁷⁴ Erfteimeijer, P., Riegl, B., Hoeksema, B and Todd, P. Environmental impacts of dredging and other sediment disturbances on corals: A review. Marine Pollution Bulletin 64: 1737-1765

⁷⁵ PIANC 2010. Report no. 108, *Dredging and port construction around coral reefs*

⁷⁶ PIANC 2010. Report no. 108, *Dredging and port construction around coral reefs*

⁷⁷ PIANC 2010. Report no. 108, *Dredging and port construction around coral reefs*

⁷⁸ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Figure 3-69)

⁷⁹ PIANC 2010. Report no. 108, *Dredging and port construction around coral reefs*

⁸⁰ Erfteimeijer, P., Riegl, B., Hoeksema, B and Todd, P. Environmental impacts of dredging and other sediment disturbances on corals: A review. Marine Pollution Bulletin 64: 1737-1765

⁸¹ Erfteimeijer, P., Riegl, B., Hoeksema, B and Todd, P. Environmental impacts of dredging and other sediment disturbances on corals: A review. Marine Pollution Bulletin 64: 1737-1765

⁸² Erfteimeijer, P., Riegl, B., Hoeksema, B and Todd, P. Environmental impacts of dredging and other sediment disturbances on corals: A review. Marine Pollution Bulletin 64: 1737-1765



- It is considered that the severity of the impacts, and the relevance or acceptance of these impacts, is related to the severity and spatial extent of the sediment plume and the temporal nature and finality of the dredged sediment migration due to re-suspension. Modelling indicates that most dredge disposal plumes will head in a north-westerly direction away from Holbourne Island but almost certainly impact on Nares Rock with TSS levels of 5-25 mg/l⁸³.
- There is limited documented information about the coral communities at Nares Rock to assess or predict likely impacts from the disposal of dredge material at the DMRA.
- Uncertainties with predictive modelling and limited information provided in the PER report in regards to a comparative alternate weather scenarios for this location indicate a high potential for increases in TSS over and above that reported. The potential impact of the proposed activity on corals is therefore difficult to ascertain.
- Corals and reef biodiversity are currently in decline, due to stressors such as climate change, poor water quality and Crown of Thorns Starfish⁸⁴.
- Response of corals to impacts associated with dredge material disposal and the recovery of those corals to pre impact health depends on a number of factors including the ecological state of the coral reef prior to the impact and during recovery.
- The recovery time of coral varies greatly and depends on the species of coral affected, the severity of the impact and the length of the impact. "Provided that environmental conditions return to the pre-impact situations and that these conditions are not hampering recovery, time-scales for natural recovery of coral reefs are in the order of a few years to several decades"⁸⁵.
- Repetitive stress events (i.e. disposal over an extended timeframe) may result in impacts on corals if the corals have not been given sufficient time to recover between consecutive disturbances⁸⁶.
- Turbidity, sedimentation and nutrient enrichment gives a competitive advantage to macroalgae over corals leading to trophic dominance by assemblages of macroalgae once productivity exceeds grazing rates⁸⁷.

Summary of impacts on coral

The modelling provided as part of the PER indicated that Nares Rock and its surrounding reefal habitat may be impacted by increased TSS by the proposed action at the DMRA. The 95th percentile, above background levels of TSS at Nares Rock are expected to reach between 10-25 mg/L⁸⁸ under prevailing conditions, no similar comparison has been provided for the alternate weather scenario where expected increases in TSS may be larger.

⁸³ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Figure 3-69)

⁸⁴ Great Barrier Reef Marine Park Authority. 2013 Great Barrier Reef Region Strategic Assessment Program Report, Draft for public comment. GBRMPA, Townsville

⁸⁵ Erftemeijer, P., Riegl, B., Hoeksema, B and Todd, P. Environmental impacts of dredging and other sediment disturbances on corals: A review. Marine Pollution Bulletin 64: 1737-1765

⁸⁶ Erftemeijer, P., Riegl, B., Hoeksema, B and Todd, P. Environmental impacts of dredging and other sediment disturbances on corals: A review. Marine Pollution Bulletin 64: 1737-1765

⁸⁷ Cooper, T.F., Uthicke, S., Humphrey, C. and Fabricius, K.E. 2007. Gradients in water column nutrients, sediment parameters, irradiance and coral reef development in the Whitsunday Region, central Great Barrier Reef, Estuarine, coastal and Shelf Science 74, 458-470.

⁸⁸ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Figure 3-69)



Changes to the reef benthic assemblages such as increased biomass of macro algae and epiphytes are possible due to the decline of water quality and recovery of coral communities may be compromised in the long term and take several years to decades. Recruitment of juvenile corals may be affected as coral larvae require a solid substrate to attach to. If sediment is covering the substrate recruitment may be compromised. Juvenile corals are more susceptible to poor water quality than mature colonies.

Reef environments surrounding Nares Rock will likely experience periods of increased turbidity due to the proposed action. Reef environments around Holbourne Island may be impacted but this is uncertain due to the limitations in the PER plume modelling such as no alternate weather scenario modelling.

The risk assessment identifies that the proposed activity has unmitigated "HIGH" risks to cause impacts on surrounding reef environments associated with dredge disposal to the DMRA.

Mitigating measure that may reduce or avoid this risk are to investigate an alternate disposal site within the Investigation Area that is further away from sensitive reef habitats, implement 'live' validated oceanographic plume modelling and ensure no disposal activities occur during the coral spawning season and develop appropriate scientifically robust adaptive management trigger levels.

Other mitigation measure to increase certainty around potential impacts may include redoing the plume modelling using oceanic currents and inter-annual variability to determine appropriate spatial extent and intensity of dredge disposal plumes.

With these mitigating measures in place this assessment concludes that the residual risk to corals from the proposed activity is "MEDIUM"

IMPACTS ON MOBILE MARINE FAUNA

Fish

The PER reports state that beam trawls and video transects were used to assess fisheries in the wider project area and the DMRA, and recorded three fish taxa (fusiliers, lizard fish and flatheads) within the DMRA⁸⁹. Mud scallops were recorded as the most abundant species within both the wider survey area and the DMRA⁹⁰.

Mud scallops are collected as by-catch from prawn trawlers and represent a minor contribution to the Queensland scallop fishery.

The PER did not provide any information on the expected impact of the proposed disposal activity on these fish species even though this was required as part of the Guidelines for preparation of the PER. In addition, beam trawl and video transects would not have targeted the pelagic fisheries in this area which include Mackerel. These species also prefer and relies upon clear water for feeding.

Commercial catch data provided in the PER, although limited, identified areas near Queens Bay, the inner reef, Cape Bowling Green and around the Nares Rock and Holbourne Island as areas with the highest catch⁹¹.

Studies have shown that increased turbidity can affect coral reef fish⁹². Inshore and generally more

⁸⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC-2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Page 3-105)

⁹⁰ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Page 3-105)

⁹¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Page 3-105)



highly impacted sites (with regards to suspended sediment) have shown a decreased fish abundance and biodiversity when compared to offshore low impacted sites. Increased turbidity has been shown to impair habitat choice and foraging success⁹³

Other evidence of impacts due to increased sedimentation and turbidity shows that there can be an impact to predator-prey interactions. Slightly increased turbidity favours predators whereas large increases in turbidity decreases predation rates⁹⁴. This impact on predator-prey interactions has the potential to change to the essential trophic process which regulates fish assemblages.

Consideration

Distinguishing between direct and indirect impacts to fish, is difficult as the direct impacts may compound the indirect impacts such as changes to population dynamics and habitat loss⁹². It is unlikely that the survey methods (i.e. beam trawls and video transects) used to assess the fish communities in the DMRA would accurately reflect the fish communities in the area.

Conclusion

- *There is limited information available to accurately predict the potential impacts on fish from the proposed activity and therefore impacts are uncertain.*
- *The survey methods used by the proponent are unlikely to be representative of the fish assemblages around the DMRA.*
- *Scientific evidence reports changes to fish behaviour caused by increased turbidity.*

Megafauna

The PER identified six listed threatened species known to occur within the wider project area, these are humpback whale, loggerhead turtle, green turtle, hawksbill turtle, olive ridley turtle and flatback turtle. In addition, potential habitat for the leatherback turtle is available in the project area, although the species has not previously been recorded there. The PER also noted the seasonal presence of Humpback whales, *Megaptera novaeangliae* within the project area. Other marine megafauna observed included shark and ray species.

The survey area for megafauna did not include the DMRA (Figure 10).

⁹² Amelia S. Wenger, Mark I. McCormick, Determining trigger values of suspended sediment for behavioral changes in a coral reef fish, Marine Pollution Bulletin, Volume 70, Issues 1-2, 15 May 2013, Pages 73-80

⁹³ Amelia S. Wenger, Mark I. McCormick, Determining trigger values of suspended sediment for behavioral changes in a coral reef fish, Marine Pollution Bulletin, Volume 70, Issues 1-2, 15 May 2013, Pages 73-80

⁹⁴ Wenger, A.S., McCormick, M.I., McLeod, I.M., and Jones, G.P. Suspended sediment alters predator-prey interactions between two coral reef fishes. Coral Reefs, Online First Article . pp. 1-6. (In Press)

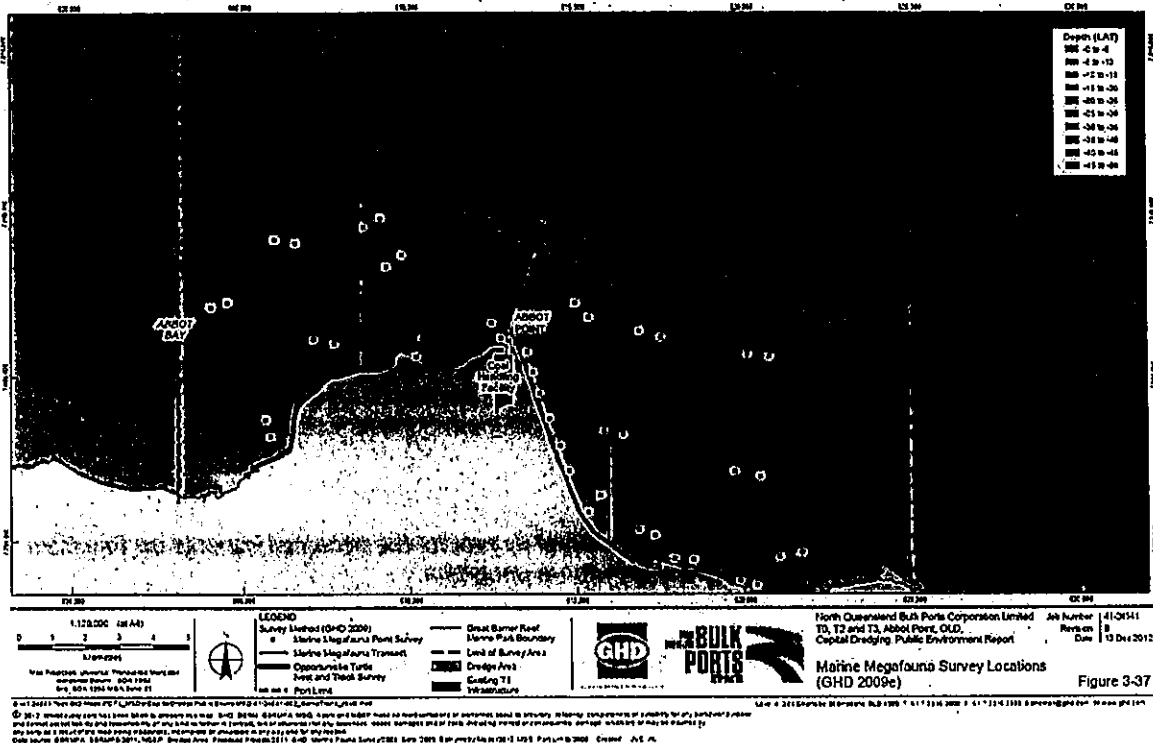


Figure 10: Survey locations for megafauna

The proponent notes that Abbot Point provides foraging habitat for marine turtles with the green turtle being identified as the most frequent marine turtle within the port limits⁹⁵.

In addition to the threatened species mentioned above, which are also listed as migratory species, the PER states that four other migratory marine species are known to occur within the project area. Those other species are the dugong, Australian snubfin dolphin, Indo-Pacific humpback dolphin and estuarine crocodile.

Dugongs were reported to migrate long distances between dugong protection areas north and south of Abbot Point and potentially grazing on seagrasses in Abbot Bay on route. The PER reports that the Abbot Point dugong population is not an important population⁹⁶.

Consideration

Potential impacts to these megafauna are both direct and indirect. Indirect impacts from the burial of benthic habitat could result in the displacement of feeding grounds for dugong resulting in an increase in pressure on adjacent habitats by the displaced animals.

Green Turtles (the primary species which may be impacted) have a high fidelity to their foraging grounds and are unlikely to move to new feeding areas⁹⁷. Therefore the impacts to turtles is likely to be the gradual decline in condition of the animals and the increase in disease and strandings as seen following the 2011 extreme weather events.

⁹⁵ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA.G34897.1). GHD Brisbane (Chapter 4 Matters of National Environmental Significance, Page 4-17)

⁹⁶ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA.G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation)

⁹⁷ Broderick, A.C., Coyne, M.S., Glen, F., Fuller, W.J. and Godley, B.J. 2007. Fidelity and over-wintering of sea turtles. Proc. R. Soc. B (2007) 274, 1533-1538



Vessel strike due to increased vessel operation in the area is a risk, however the level of risk is low given the mobility of the animals in question and the relatively slow speeds of the vessels used for the works.

Conclusion

- *Direct impacts to megafauna are not expected but indirect impacts associated with potential loss of seagrass may cause some impacts.*
- *The risk assessment identifies that the risks to megafauna from the proposed disposal at the DMRA as being "MEDIUM-LOW" and are manageable by implementing an appropriate vessel management programs and site supervision.*

SOCIAL VALUES

A social, cultural and heritage impact analysis report was undertaken to assist the assessment of the proposed activity under the *Great Barrier Reef Marine Park Act 1975* (Attachment D):

Social values are those things that an individual considers to be of value in their social existence. For the proposed DMRA those values are likely to include:

- Contribution that the area makes to the economic fabric of the community, e.g. commercial fishing;
- Contribution that the area makes for recreational activity, e.g. recreational fishing; and
- Contribution the area makes to the public's perception that it forms an integral part of the GBRWHA

Marine Park stakeholders and community groups that could be impacted (positively and negatively) by the proposed activity in the Marine Park include:

- (a) Commercial fishing operators (direct negative impacts on opportunity)
- (b) Recreational fishers (direct negative impacts on opportunity)
- (c) Visitors to the Marine Park- for example scuba divers diving the nearby Catalina dive wreck (WWII aircraft) (direct negative impacts on opportunity)
- (d) Local seafood suppliers (indirect impacts on opportunity)
- (e) Traditional Owners
- (f) Local residents (employment, amenity, appreciation)
- (g) Port proponent (economic)

The proponent states that the area's fishery value is low and that there will be no significant impact from the proposed activity⁹⁸. Commercial fishers have indicated that they will be forced to fish elsewhere if offshore disposal to the DMRA is approved, as turbid plumes and changed benthic habitat will result in decreased and displaced fishing effort. Scallop and prawn fisheries will most likely be impacted by changes in benthic habitat, while mackerel and shark fisheries will most likely be adversely affected by prolonged turbid plumes⁹⁹.

The PER states broadly (on a whole of project level) that there will be little to no socio-economic impacts as a result of the project and that none of these social activities take place within the port limits¹⁰⁰.

Consideration

⁹⁸ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary, Page 3-163)

⁹⁹ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (Appendix E, Page 25-27)

¹⁰⁰ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary, Page 3-7)



Impacts could include a loss of income and employment for dive operators and other marine tourism operators, and suppliers for recreational activities (e.g. boats, fishing and camping equipment). There could be an impact on regional reputation of tourism and recreational activities (including recreational fishing and coastal and island camping), resulting in a prolonged recovery time for these industries.

People employed in reef-dependent industries may be forced to leave the area, if water quality declines, and if marine life is adversely affected by the disposal activity and other activities related to the port expansion. This in turn may cause disruption to social cohesion and social networking in the local community. Other possible social impacts associated with the proposed activity include:

- disruption to personal and cultural levels of attachment to the area;
- diminished visual (scenic) amenity above and below water;
- compromised dive experiences.

There is currently a high level of concern from tourism operators in the Whitsundays (south of the proposed disposal activity). They are concerned about dredge plumes potentially migrating in a southerly direction from the disposal activity and thus impacting on their livelihoods. The probability of a southerly movement of the dredge plume is not clear as all the modelling was based on 2007 conditions when the predominant flow was towards the north. There are however, years in which the predominant ocean flow is towards the south but it is not clear how far the sediment from the disposal activity could migrate.

Summary

The disposal of dredge material at the DMRA has the potential to impact on local social values particularly through impacts on opportunities for reasonable use by other Marine Park stakeholders (Marine Park users) especially those who depend on a healthy Reef for their livelihood, for example, commercial fishers, tour operators and those who supply recreational users, tour operators and commercial fishers who operate in the Marine Park.

It is considered there is also a risk to commercial fishers associated with dredge material disposal activities potentially displacing fishers and influencing catches due to poor water quality and direct and indirect impact to fisheries habitat.

A perception has been set in Gladstone, where dredging and disposal has been allegedly correlated to major impacts on the commercial fishing industry.

The proposed activity in the Marine Park may negatively affect the public perception of the Great Barrier Reef Marine Park Authority as an effective management agency and upholding the objectives of the Act. This may also affect the World Heritage Status of the Great Barrier Reef by UNESCO. This risk is rated as EXTREME as any approval of dredge material disposal in the Marine Park at this time may lead to negative perception issues for the GBRMPA.

Conclusion

- *There are significant social impacts associated with the proposed activity, some of which are based on perception and other that are based on economics.*
- *Most of the social risk is difficult to quantify and to mitigate due to the level of tension existing between stakeholders (fishers, tourism and the proponent).*
- *The most probable risk mitigation strategy would involve using an alternate DMRA that is selected with considerable input from relevant stakeholders.*
- *In order to reduce the risks to tourism operators an adequate dredge plume model is needed which considers inter-annual variability and increases certainty around plume location.*
- *Water quality monitoring based on the above mentioned plume model would increase the*



likelihood that dredging and disposal operations could be adaptively managed if the plume is observed to be travelling towards tourism values.

- The proposal in its current form will have unacceptable social impacts (in particular the impact on commercial fishers). The mitigating measure that could reduce the social impact risk would be to select an alternate DMRA, however, the perception risk surrounding dredge material disposal in a World Heritage Area would still remain.
- Perception risk may be managed by implementing education and communication strategies.

CULTURAL HERITAGE VALUES

Indigenous Cultural Heritage is one of the many elements comprising the Outstanding Universal Values of the Great Barrier Reef World Heritage Area. GBRMPA recognises and respects the cultural values of GBR Traditional Owners.

The PER states that the DMRA does not support any cultural heritage values¹⁰¹ although sites have been identified in the broader Abbot Point region¹⁰². No significant impacts on cultural heritage values are anticipated as a result of the project¹⁰³. The Strategic assessment has categorised Indigenous heritage values into four broad categories:

1. Cultural practices, observances, customs and lore
2. Sacred sites, sites of particular significance places for important for cultural tradition
3. Stories, songlines, totems, and languages
4. Indigenous structures, technology, tools and archaeology.

There may be other indigenous values that have not been assessed in the PER which may be impacted¹⁰⁴.

The PER notes that through meetings with the Juru (Traditional Owners of Abbot Point) and the proponent, Juru were provided with a briefing of the project and the initial feedback obtained was that Juru did not support land based disposal of the dredged material¹⁰⁵. However there is no discussion on whether or not Juru supported ocean disposal.

There is an Indigenous Land Use Agreement (ILUA) in place for the port area which the proponent says has been the source of ongoing dialogue between the proponent and the Juru Traditional Owners of Abbot Point¹⁰⁶.

There is no Traditional Use of Marine Resources Agreement (TUMRA) in the area however Juru Traditional Owners are party to a Turtle and Dugong MOU agreed between the Gudjuda Reference Group and the then Queensland Environmental Protection Agency¹⁰⁷. Turtle and Dugong are strong

¹⁰¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary, Page 3-178)

¹⁰² GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary, Page 3-178)

¹⁰³ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary, Page 3-7)

¹⁰⁴ Great Barrier Reef Marine Park Authority. (2013). *Great Barrier Reef Region Strategic Assessment Program Report: Draft for public comment*. Townsville: Great Barrier Reef Marine Park Authority.

¹⁰⁵ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane (2.2.5)

¹⁰⁶ National Native Title Tribunal. 2012. Extract from Register of Indigenous Land Use Agreements, Port of Abbot Point and Abbot Point State Development Area. NNTT, QLD

¹⁰⁷ ATNS. 2007. Juru, Gia and Ngaru Turtle and Dugong Memorandum of Understanding, <http://www.atns.net.au/agreement.asp?EntityID=3722>. Agreements, treaties and negotiated settlements project. (Accessed on 19 June, 2013)



elements of overall Indigenous Cultural Heritage. The MOU was agreed in June 2005 and the GBRMPA has not received any advice that the Agreement is no longer current.

Juru Traditional Owners continue to access their sea country for many reasons associated with their strong connection to country and their strong interests in maintaining their Indigenous Cultural Heritage values.

Consideration

- There is little evidence in the PER to substantiate the conclusion that no impacts to cultural heritage values are expected.
- Discussions between the proponent and the Juru Traditional Owners were not attended by GBRMPA staff but the rationale of not supporting disposal of dredge material on land is unclear.
- The risk to the ecosystem from increased sedimentation will impact negatively on the overall Indigenous Cultural Heritage values held in the area. Further, the plume models for the dredging show that the effect of sedimentation will extend across Abbot Bay to affect the eastern side of Cape Upstart. Juru Traditional Owners have recently been granted Native Title to Cape Upstart indicating that that specific area is of significant cultural importance to Juru Traditional Owners¹⁰⁸.

Conclusion:

- *There is insufficient information relating to the cultural values of the disposal site and no thorough assessment has been undertaken.*
- *Limited information exists on the proponent's engagement with Traditional Owners regarding their view on the offshore disposal of dredge material.*

HERITAGE (OTHER) VALUES

The PER states that the project will not notably alter, modify, obscure, diminish, degrade or damage the national heritage values of the Great Barrier Reef National Heritage Place (NHP)¹⁰⁹

WWII Catalina Aircraft Wreck

During the preliminary development of the PER, the proponent, GBRMPA and Department of the Environment were unaware of the location of the WWII Catalina aircraft wreck which was identified by local community divers offshore Abbot Point near the proposed DMRA. Local divers believe the plane wreck will be impacted by sedimentation due to dredging and disposal activity, and could possibly be buried under silt. According to the locals, the wreck which crashed 17 August 1943, lay undiscovered until two years ago, and could be listed as a future site of special significance, as there were 12 people lost in the accident while two others survived. The bodies were never recovered and are presumed to be entombed within the wreckage¹¹⁰.

Anecdotal evidence indicates that only part of the wreck has been discovered. The proponent has identified that there is unlikely to be any impact from the dredging and disposal activity under modelled conditions.

¹⁰⁸ National Native Title Tribunal. 2011. Native title recognition for the Juru People, <http://www.nntt.gov.au/news-and-communications/media-releases/pages/nativetitle-recognition-for-the-juru-people.aspx>. (accessed on 19 June, 2013)

¹⁰⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 4 Matters of National Environmental Significance, Page 4-1)

¹¹⁰ Australian Broadcasting Corporation Broadcast; The 7.30 Report, 25/02/2013 Reporter: Peter McCutcheon. <http://www.abc.net.au/7.30/content/2013/s3698078.htm> (accessed on 18th June, 2013)

Other Historic Wrecks

There are over 21 listed historic shipwrecks listed on the Australian National Shipwreck Database between Cape Bowling Green and the Bowen Region. Many of the locations of these wrecks remain unknown and some wrecks are protected.

The proponent has not identified any wrecks within the DMRA or the Investigation Area. It is possible that a wreck may exist within the Investigation Area based on the large size of the Investigation Area.

Consideration

- Impacts to the Catalina wreck and the values it holds for the families and the military could occur if the DMRA is used as a dumping ground and should be avoided.
- Further exploration of the area may be required to determine if other parts of the wreckage can be located and protected.
- It is important to consider the possibility of other historic shipwrecks being impacted by the disposal of dredge material.

Summary

The avoidance of any potential impacts on the WWII wreck is important for the preservation of this heritage site. The main concern is the uncertainty associated with the modelling and the possibility of un-modelled conditions arising and the plume still impacting on the wreck: Preference is to avoid any works in near proximity to the wreck and as such, alternatives which do not pose a risk to the heritage values of the GBR need to be considered. Any impact on the WWII heritage Catalina site are unacceptable.

The uncertainties associated the plume modelling and the proximity of the WWII aircraft wreck to the proposed DMRA, the proposal in it's current form would pose a risk to heritage values of the Marine Park. The only mitigating measure that would minimise the risk to heritage values, with certainty, is the selection of an alternate disposal site that avoids the possibility of a dredge disposal plume encountering the Catalina wreck.



88Q(b)

options for monitoring, managing and mitigating the potential impacts of the proposed conduct.

ASSESSMENT SUMMARY

There are several uncertainties associated with the proposed activity within the Marine Park, mainly:

- potential impacts to the marine environment from the proposed DMRA;
- the proximity of the proposed DMRA to Holbourne Island and Nares Rock and the probability of impacts to fishing grounds and coral reef systems; and
- the proximity of the DMRA to the site of the WWII Catalina aircraft wreck and the probability of impacts.

In light of these unknowns, a range of management and mitigation measures would need to be implemented as a precautionary measure.

The supplementary report to the PER documents a number of alternatives that are likely to produce a better and more manageable environmental and social outcome than the proposed activity by:

- avoiding impacts by eliminating the need to place dredge material in the Marine Park; or
- mitigating potential impacts by identifying an alternate DMRA that would provide an improved environmental and social outcome and reduce the risk to the habitats, species and heritage values of the area.

POTENTIAL IMPACTS

The disposal of 3 million cubic metres of capital dredge material to the proposed Dredge Material Relocation Area (DMRA) is likely to impact on the environmental, social and heritage values of the Marine Park (Criteria 88QA). Potential impacts include:

- Decline in water quality in and around the DMRA by increased TSS and turbidity.
- Decline in water quality via increased nutrients within the greater plume area from DMRA.
- Direct burial of benthic flora and fauna in the DMRA footprint.
- Coral communities at Holbourne Island and Nares Rock will experience impacts through increased light attenuation, and sedimentation due to increased TSS and Turbidity.
- Decline in water quality due to the introduction of wastes or contaminants derived from works and vessel spills.
- Direct and indirect impacts on marine turtles, dugongs and other marine mega fauna.
- WWII Catalina plane wreck may be impacted by sedimentation.

The significance and risks of these impacts are discussed in detail in criterion 88Q(a) and in the risk assessment at Attachment A.

AVOIDANCE OF POTENTIAL IMPACTS

Public comment received on the draft PER highlights concerns around potential impacts to commercial fishing grounds, proximity to sensitive marine environments at Holbourne Island and Nares Rocks including the discovery of a World War Two plane wreck (the Catalina) to the south of the proposed DMRA.

The proponent, through the submission of a Supplementary PER in May 2013 identified the need to investigate other potential offshore disposal locations¹¹¹ and outlined an area approximately 800km²

¹¹¹ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane pg 2-10



for further investigation¹¹².

No other avoidance measures for water quality impacts, impacts from plumes or impacts from sedimentation have been proposed.

The Supplementary report to the PER identifies multiple alternatives to unconfined offshore disposal that either reduce the required amount of dredge disposal or completely remove the need to dispose of dredge material offshore and in the Marine Park.¹¹³ (Table 3)

Table 3: Summary of trestle extension options presented for the Port of Abbot Point

Options	NQBP Proposed Option: Figure 1	Option 3: Trestle Extension with NO Dredging	Proponents Option 5: Trestle Extension with dredging of berth pockets and land disposal. (Figure 2 & Figure 3 or 4)
Dredge Amount Required	3,000,000 m ³	0 m ³	500,000 m ³
Disposal Site Location	Sea Disposal	Not required	Sea/Land Disposal
Maximum Trestle Length Required (km)	3.9	3.9	5.2
Overall extension to proponent preferred option (km)	0	5	1.3
Approximate Cost ¹¹⁴	\$30,000,000	\$1.35 billion	\$430,000,000

¹¹² CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane. Pg 2-12

¹¹³ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane, (Section 3.2.2 Trestle Design and Onshore Disposal Options, Page 3-3).

¹¹⁴ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane, (Table 5-3 Trestle Option Review, Page 5-27).



The proponent's preferred option for this project is the sea disposal of 3 million cubic metres of dredge material and trestles that are 3.9 km long (Figure 11).

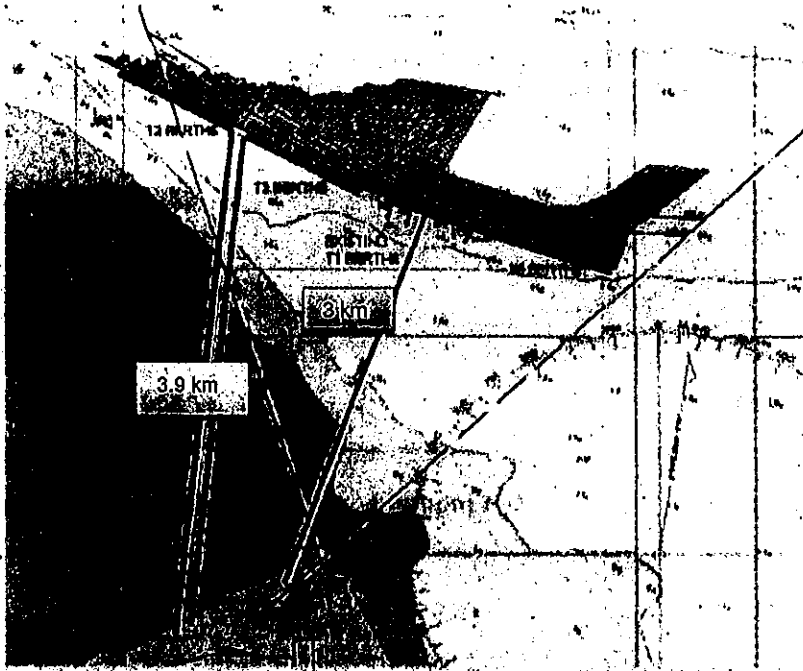


Figure 11: North Queensland Bulk Ports proposed option



Proponents Option 5

This option requires the extension of trestles 1.3 km further than the proponents proposed option. Dredging would only be required for Terminal berth pockets and a maximum volume of 500,000 cubic metres (Figure 12).

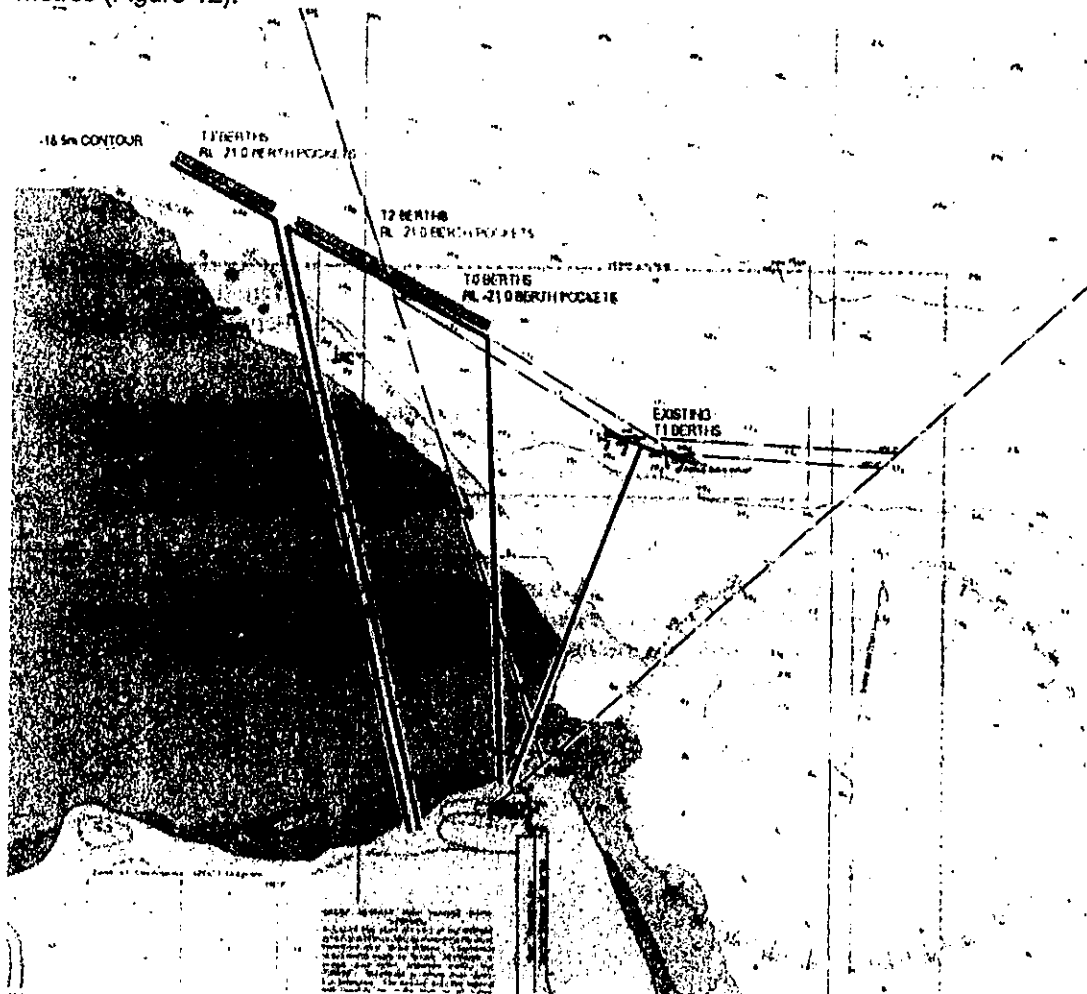


Figure 12: Proponents Option 5

The proponent estimates that option 5 would incur a delay of around 1 - 2 years and cost \$430 million more than the proposed option of sea disposal of 3 million cubic metres (which is costed at \$30 million)¹¹⁵.

A detailed breakdown of costs was not been provided. These costs are broad estimates providing an indication of the cost differences.

The proponent has identified the constraints with option 5. They include:

- Port infrastructure located in GBRMP, until boundary could be re-aligned.
- Operational Port Limits would need to be modified so that the port could operate safely.
- Adverse public response and reputational impacts associated with locating coal loading infrastructure within the GBRMP.
- No tenure held and would be required prior to projects proceeding.
- Additional approvals required.

¹¹⁵ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane, (Table 5-3 Trestle Option Review, Page 5-27 to 5-30).



- Additional Native Title requirements.
- Still requires dredging.

The length of trestles proposed under the proponents Option 5 is similar in length to existing jetties at Lucinda jetty (5.8km long) and preliminary drawings for the proposed Dudgeon Point Coal Terminal (5 to 6 km). In both instances trestle length is a function of available water depth to allow for effective port operations.

Land Disposal Options

A series of land based disposal options were presented in the Supplementary report to the PER¹¹⁶.

Beneficial reuse of the dredged material as land for development is possible if left for a period of 5 or more years¹¹⁷. Clean fill is a valuable resource and as an example, the Abbot Point terminal proponents expect to bring in up to \$144 million worth of clean fill for the construction of their terminal areas¹¹⁸.

Management of a land disposal site is well established practice. A process of self-grading settlement ponds resulting in the ultimate release of managed tail water is standard practice. The proposed dredge material is chemically clean and although potentially acid sulphate soil (PASS), the acid neutralising capacity is higher than the acid generating capacity¹¹⁹. Monitoring of PASS may be required and can be treated if detected.

Bunding and lining of settlement and containment ponds is practical and provides adequate management of dredge material and seawater (see Figure 15: Wiggins Island). The placement of saturated dredge material is unlikely to increase the risk of ground water salination or enter surrounding wetlands if managed properly.

¹¹⁶ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane, (Section 3.2.2.2 Onshore and Reclamation Options, Page 3-4).

¹¹⁷ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane, (Section 5.2.1.4 Onshore and Reclamation Disposal Options).

¹¹⁸ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC.2011/6213/GBRMPA G34897.1). GHD Brisbane (Appendix E, Dredged Material Relocation and Reuse Options Assessment, Page 42)

¹¹⁹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Executive Summary, Page xxii)

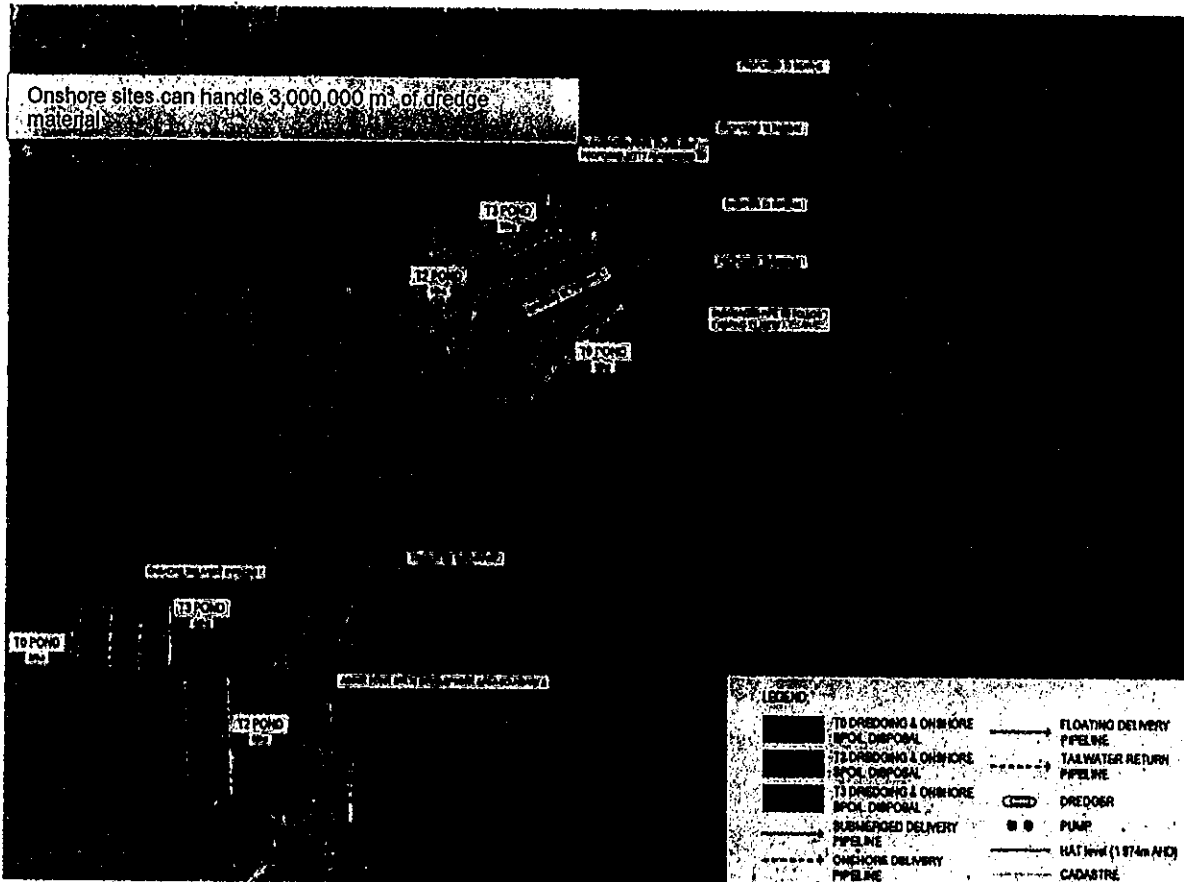


Figure 13: Land disposal site capable of handling the full 3 million cubic metres of dredge material

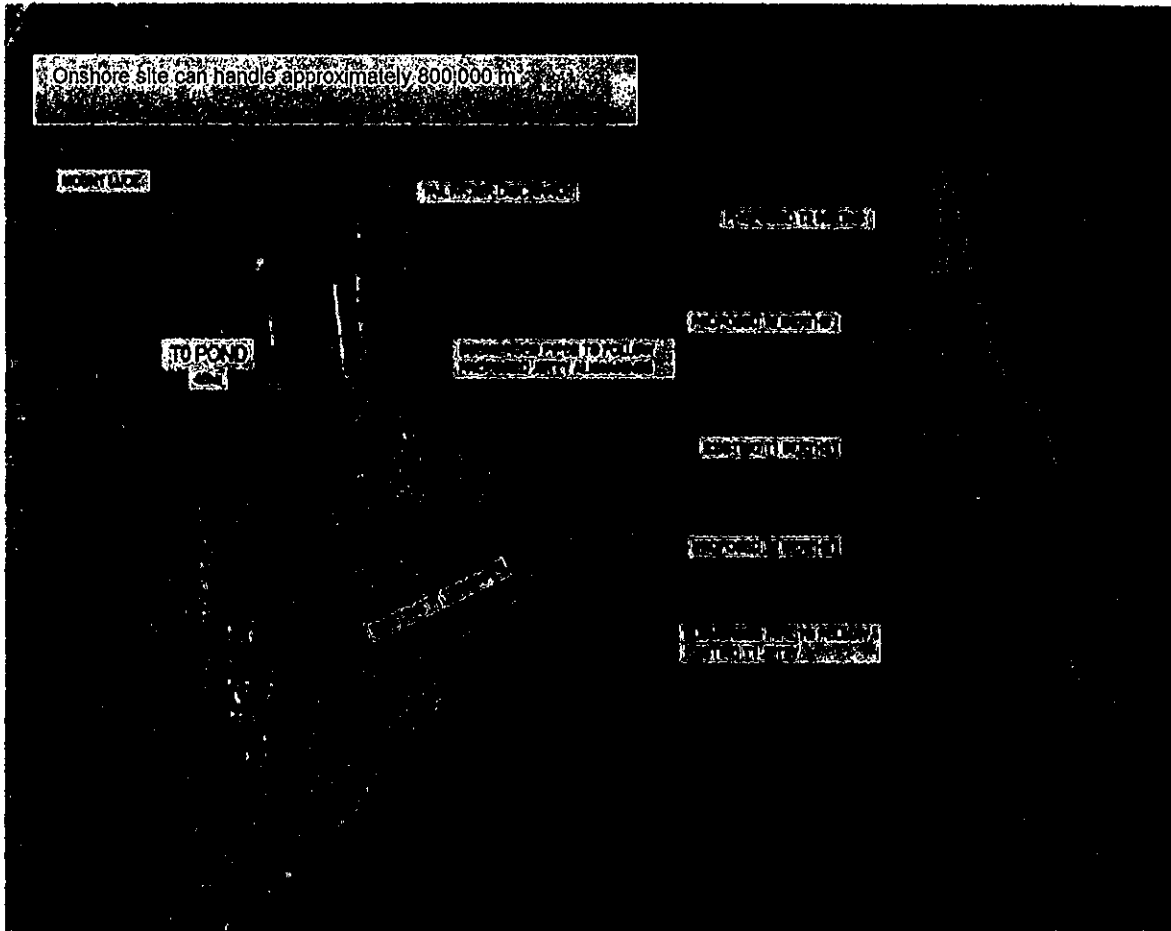


Figure 14: Land disposal site capable of handling approximately 800,000 cubic metres of dredge material

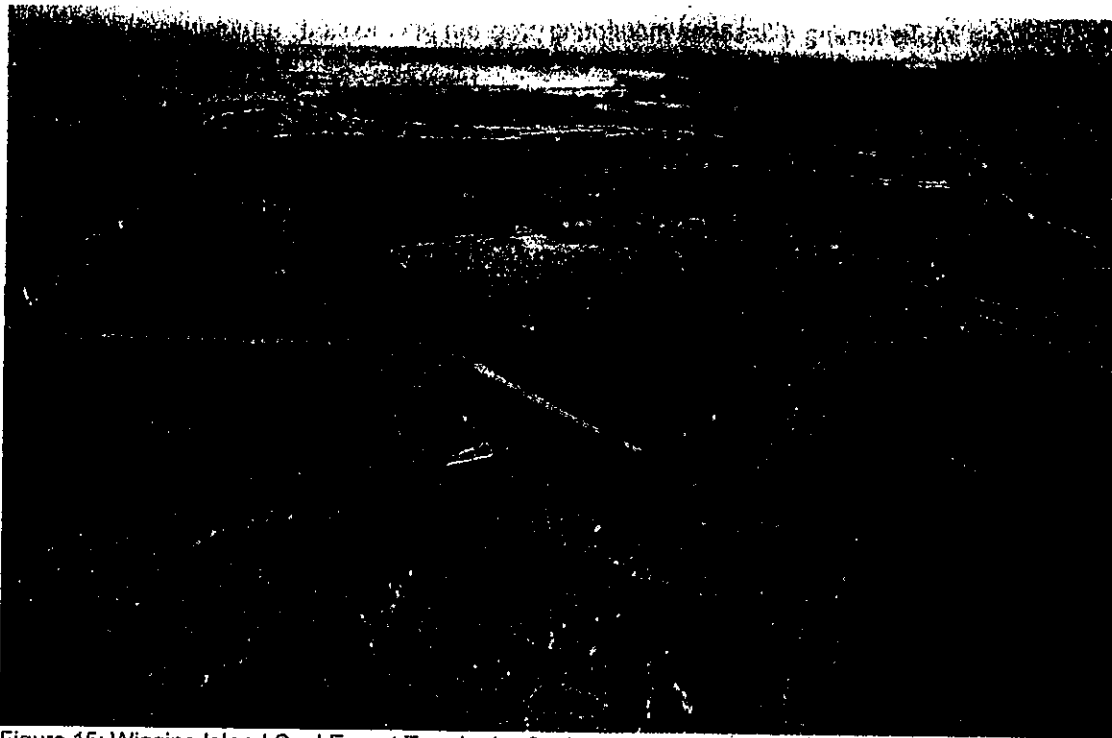


Figure 15: Wiggins Island Coal Export Terminal – Onshore dredge material relocation facility

The Supplementary report to the PER concludes that:¹²⁰

- All trestle extension options are an order of magnitude more expensive than offshore disposal (\$30 million compared to a minimum of \$400 million). Accordingly these costs are considered to be disproportionate considering the low environmental impact of offshore disposal"
- Most of the onshore disposal options were technically feasible. However the proponents were of the view that there were other environmental risks and the options would cause project delays and significant extra costs.
- Offshore disposal was still considered the preferred and most feasible (from an environment and cost perspective) option by the proponents".

MONITORING AND MANAGING POTENTIAL IMPACTS

The proponent has placed a strong focus on monitoring measures to determine if reactive management is required. The PER provides a draft Dredging Environmental Management Plan¹²¹ (DEMP) that outlines a framework for proposed monitoring and management measures during dredging and disposal activities. The DEMP summarises environmental monitoring programs for:

- water quality;
- flora and fauna;
- noise;
- air quality;
- waste management;
- hazardous substances; and
- community consultation.

¹²⁰ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane, (Section 3, Page 3-4 to 3- 5).

¹²¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Appendix L)



Monitoring includes implementing a baseline monitoring program prior to work commencing, and conducting monitoring during works to enable adaptive and reactive dredge management intervention to minimise impacts¹²².

These reactive management measures include relocating the dredger if any one sensitive habitat was demonstrating stress, halting dredging works or increasing dredge cycle time to decrease site specific impacts, and completing the dredging as fast as possible to minimise duration of degraded water quality conditions¹²³.

A final monitoring program (yet to be provided) will include a hierarchy for responding to trigger criteria exceedance. Responses may include increasing monitoring efforts; reviewing dredging and operation of the dredge vessel to identify ways to reduce turbidity plumes and ultimately, where required, modifying dredging works to stop plume generation.

The proponent proposes to establish an Environmental Compliance Advisory Group (ECAG) made up of relevant technical experts and government agency representatives with members selected and briefed on the EMP procedures prior to the commencement of dredging works to provide advice on trigger criteria establishment and exceedances. The conditions stipulated by the Department of the Environment under the proponent's EPBC approval include the creation of a Technical Advisory Panel (TAP). This may fulfil the same role as the ECAG.

The proponent's main proposed mitigation measures include placement of the dredge material at a non-dispersive site (as low as practical), limiting the duration of dredging, scheduling works outside the turtle nesting season and adhering to management plans which are yet to be developed or in draft form.

Consideration

- There are several alternatives to the current proposal as identified in the Supplementary PER report that avoid potential environmental impacts to the Marine Park.
- These options have been eliminated in the PER and Supplementary Report as being "disproportionate considering the low environmental impact of offshore disposal"¹²⁴.
- A draft Dredging Environmental Management Plan (DEMP) that outlines a framework for proposed monitoring and management measures during dredging and disposal activities has been provided. Details around specific monitoring and management measures (ecological relevant trigger levels) have yet to be determined or approved by relevant managing authorities.
- The proponent proposes to mitigate potential impacts at the proposed DMRA by investigating a broader area with the Marine Park for a suitable disposal site for 3 million cubic metres of dredge material that will eliminate potential impacts to Holbourne Island, Nares Rock and the wreck of the Catalina. No further information is provided about possible mitigation measures associated with identifying another disposal site within the Investigation Area.
- A technical advisory consultative committee meeting was held 19 August 2013, following the release of the supplementary PER. This meeting discussed constraints associated with

¹²² GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Appendix E, Dredged Material Relocation and Reuse Options Assessment, P3-8)

¹²³ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Appendix E, Dredged Material Relocation and Reuse Options Assessment, Page 3-8)

¹²⁴ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging. PER Supplementary Report. CDM Smith Brisbane, (Section 3 Key Issues, Environmental Management and Enhancement for MNES, Page 3-4)



identifying another possible offshore disposal site and identified three plausible options from within the Investigation Area.

- The Supplementary PER contains limited information on the benthic habitats and communities adjacent to the DMRA and within the proposed Investigation Area.
- Some of management and mitigation measures proposed by the proponent do not consider the changed and declining condition of the regional ecosystem.
- Although the proponent has not considered it, an important additional mitigation measure is the limitation of overflow dredging. "The use of a Trailer Suction Hopper Dredge without keel-level overflow should not be accepted for projects in the vicinity of coral reefs, to prevent unnecessary turbidity and dispersal of fine sediments. Further conditions should include the use of the environmental valve in the overflow duct, which reduces air entrainment in the overflow promoting the settling of the overflow material"¹²⁵.

Summary

- Alternatives to avoid the placement of dredge material offshore within the Marine Park exist but may be unfeasible for the proponent, economically.
- Alternatives come with increase cost and appear to have environmental benefits by avoiding significant potential impacts associated with dredge material disposal at sea.
- There are options that might mitigate potential impacts to Holbourne Island, Nares Rock and the wreck of the Catalina by identifying an alternative DMRA from within the Investigation Area.
- No further information is provided by the proponent about mitigation measures associated with identifying another disposal site within the Area Investigation.
- It is considered good practice to identify a specific disposal area to enable the assessment of potential impacts. Uncertainties around such a large area of potential investigation with limited information comes with increased risk.
- Land based disposal options at the Port of Abbot Point are technically feasible but have project timing and cost implications depending on volume of material being placed on land.
- Land disposal of dredge material could possibly be managed more actively than sea disposal, where the only management/mitigation measure employable to reduce ongoing re-suspension is the selection of a potentially retentive disposal site. The GBRWHA in general is a highly dispersive environment and very few areas are considered highly retentive¹²⁶.
- There is a strong focus within the PER and Supplementary PER towards monitoring and subsequent management of the proposed conduct.
- Management and monitoring of potential impacts associated with a dredge material disposal campaign is unlikely to provide enough warning for positive avoidance and adaptive management measures for sensitive areas in close proximity to the disposal site (such as the WWII Catalina heritage site).

¹²⁵ PIANC 2010. Report no. 108, *Dredging and port construction around coral reefs*

¹²⁶ SKM 2013, Improved dredge material management for the Great Barrier Reef Region, Great Barrier Reef Marine Park Authority, Townsville.

This proposal to dispose of 3 million cubic metres of dredge material to the proposed DMRA has environmental and social impacts that can potentially not be mitigated within the Marine Park. The only mitigating measure within the Marine Park that can potentially reduce the environmental, cultural, heritage and social risks is to move the DMRA to another area within the Investigation Area, this also has increased risks associated with lack of information and thorough assessment.

Further mitigating measures to reduce turbidity can include mechanical measures associated with the dredger itself and the development of adaptive trigger levels at sensitive receptors.

Monitoring and management will be required of environmental and heritage values.



[BRC(0)]

In the proposed DMRA will take place in an area in which a zoning plan applies the objectives of the zoning plan are to provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use

ASSESSMENT SUMMARY

The disposal of 3 million cubic metres at the proposed DMRA is located within a General Use Zone, of the Marine Park the objective of the General Use Zone are "to provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use"

The proposed action is likely to impact a Habitat Protection Zone (Nares Rock) and may also impact a Conservation Park Zone (Holbourne Island).

The investigation Area is located entirely with a General Use Zone.

ZONES

Under the *Great Barrier Reef Marine Park Zoning Plan 2003* dredging and dredge material disposal within the General Use Zone of the Marine Park is an activity that requires the written permission of GBRMPA to use or enter the zone.

The proposed conduct is for the disposal of up to 3 million cubic metres of capital dredge material in the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,00m³ in any one year. The original DMRA was identified as an offshore area, approximately 24km North-East of the dredge area. This DMRA is located within the Marine Park and the Great Barrier Reef World Heritage Area and has approximate depths of water ranging from -39m and -44m LAT. The proposed direct footprint of the DMRA is approximately 400 hectares, with approximate dimensions of 2km x 2km.

The proponent, through the submission of a Supplementary PER in May 2013 identified the need to investigate other potential offshore disposal locations¹²⁷ and outlined an area approximately 800km² for further investigation¹²⁸.

The proponent believes that the disposal of 3 million cubic metres of dredged material will not impact on other zones "the proposed dredged material relocation area is located within the General Use Zone of the GBRMP and as such, zones of high value will not be affected by Project activities"¹²⁹.

The location of the DMRA is in close proximity to the following other Marine Park Zones:

- a. Habitat Protection Zone (HPZ) HP-19-5175 (Nares Rock) which is located approximately 5km in an East-North-Easterly direction from the proposed DMRA.
- b. Conservation Park Zone (CPZ) CP-19-4065 (Holbourne Island) which is located approximately 7km to the North-East of the proposed DMRA.
- c. CPZ CP-19-4074 (Gloucester Island) located approximately 27km to the South-South-East of the proposed DMRA.
- d. Marine National Park Zone (MPZ) MNP-19-1102, located approximately 15km to the East of the original proposed DMRA but includes an area that extends to the North-East and South-East of the proposed DMRA.

¹²⁷ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane pg 2-10

¹²⁸ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane. Pg 2-12

¹²⁹ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane, (4. Matters of National Environmental Significance, Page 4-3)

- e. MPZ, MNP-19-1105 (Cape Upstart) and HPZ, HP-19-5179 (Camp Island Reef), located approximately 45km to the west of the DMRA and 20km from the dredging.
- f. A proposed Special Management Area is being discussed around the wreck of the Catalina (3km South of the DMRA).

Great Barrier Reef Marine Park Zoning Plan, 2003 objectives for the General Use Zone

As defined by section 2.2.2 of the *Great Barrier Reef Marine Park Zoning Plan, 2003* (Zoning Plan), the objective of the GUZ is:

"to provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use".

In accordance with section 2.2.4 (m) of the Zoning Plan, the GUZ may be used or entered with a permission for:

"carrying out works for a purpose that is consistent with the objective mentioned in 2.2.2, including:

- (ii) dumping of spoil"*

Is the proposed conduct consistent with the objectives for the General Use Zone?

The disposal of 3 million cubic metres of capital dredge material inside the General Use Zone would provide opportunities for reasonable use for port users of the Marine Park, however the disposal of capital dredge material at this location is likely to temporarily impact on opportunities for reasonable use by other Marine Park stakeholders, being

- (i) Commercial fishing operators at the DMRA and within the dredge plume (direct negative impacts on opportunity)
- (ii) Recreational fishers at the DMRA and within the dredge plume (direct negative impacts on opportunity)
- (iii) Visitors to the Marine Park- for example scuba divers diving the nearby WWII Catalina aircraft dive wreck (direct negative impacts on opportunity)
- (iv) Local seafood suppliers (indirect impacts on opportunity)
- (v) Traditional owners

(i) Commercial fishing

Commercial fishing is the fifth largest primary industry by value in Queensland, harvesting approximately 15,000 tonnes of seafood annually¹³⁰. The PER studied the fisheries within the wider project area, dredge area and area of the proposed DMRA. In total 14 fish taxa were identified within the surveyed DMRA (including fusiliers, lizard fish and flatheads)¹³¹. Mud scallops were recorded as the most abundant species within both the wider survey area and proposed DMRA.

There appears a general pre-disposition towards the capture of benthic fish, which is likely due to the sampling gear used (i.e. beam trawl). This type of sampling is unlikely to account for more pelagic and non-sessile species. The proponents PER, may therefore underestimate the species composition and biomass of fisheries resources which utilise the proposed activity area.

Data in the PER showed commercial fishing effort in both the area of the proposed DMRA and adjacent areas (Figure 16). Total commercial catch data for the 2000-2011 period identified areas near Queens Bay, the inner reef, Cape Bowling Green and around the Nares Rock and Holbourne Island as areas with the highest catch.

¹³⁰ GBRMPA. 2011. Commercial Fishing and Zoning, <http://www.gbrmpa.gov.au/zoning-permits-and-plans/zoning/commercial-fishing-and-zoning>. (Accessed on 9 December 2013)

¹³¹ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Page 3-105)

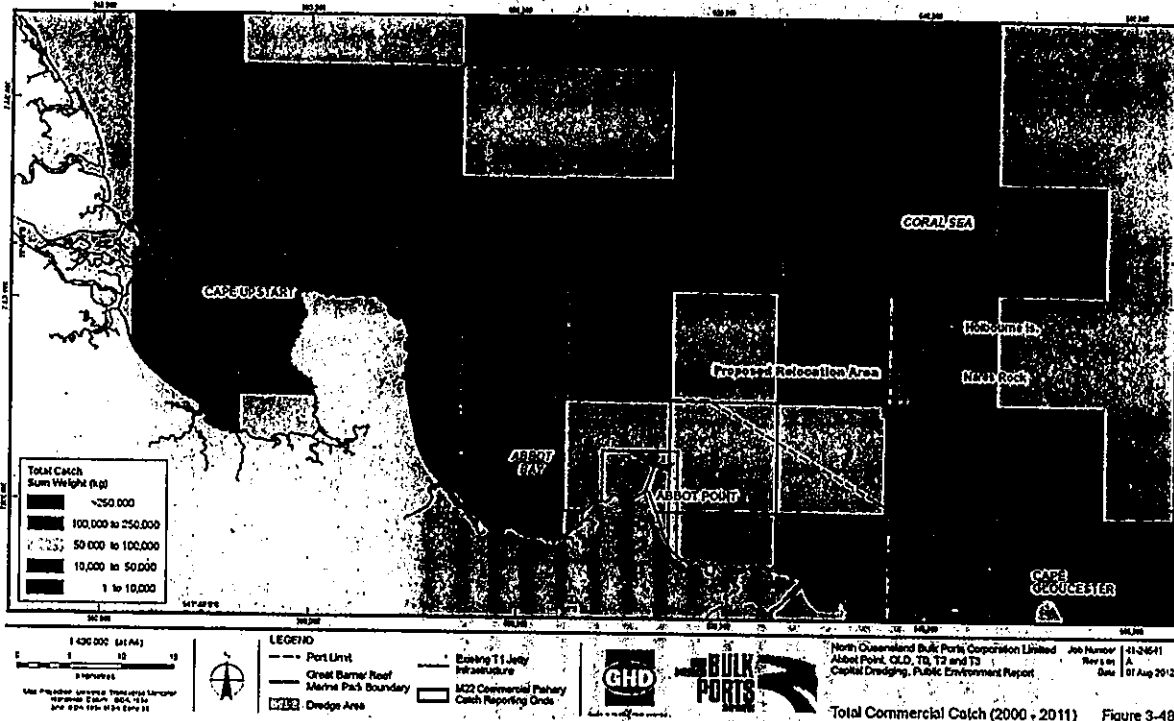


Figure 16: Total Commercial Fisheries Catch (2000 - 2011)¹³²

Examination of the likely environmental impacts from the disposal of capital dredge material and associated dredging (addressed at 88Q(a)) including temporal displacement or loss of commercial fishing effort is likely to occur as a result of the turbid plumes from the dredge material disposal; forcing commercial species and fishers out the area.

Dredge material disposal and resulting turbid plumes may directly result in the loss of fish habitat from smothering, resulting in reductions in catch rate and potential declines in seafood quality.

The displacement or loss of fishing effort may have flow on negative economic impacts for users of the Marine Park including loss of income for commercial fishers and local seafood suppliers; and a decline in reputation of the region's quality of seafood product. Commercial fishers in other areas may also be impacted by additional competition for resources by displaced fishers.

(ii) *Recreational fishing*

Limited information is available to determine the pattern of recreational fishing catch and effort within the Abbot Point region¹³³, however the number of species in the area, particularly for pelagic finfish, prawns and crabs and discussions with fishers indicates that recreational fishing is an activity that Marine Park users value as important for this area.

Negative potential impacts on the recreational fishing industry would result from the same causes as discussed under (i) commercial fishing above.

(iii) Marine tourism operators who occasionally operate in the area

¹³² GHD. 2012. Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Figure 3-48)

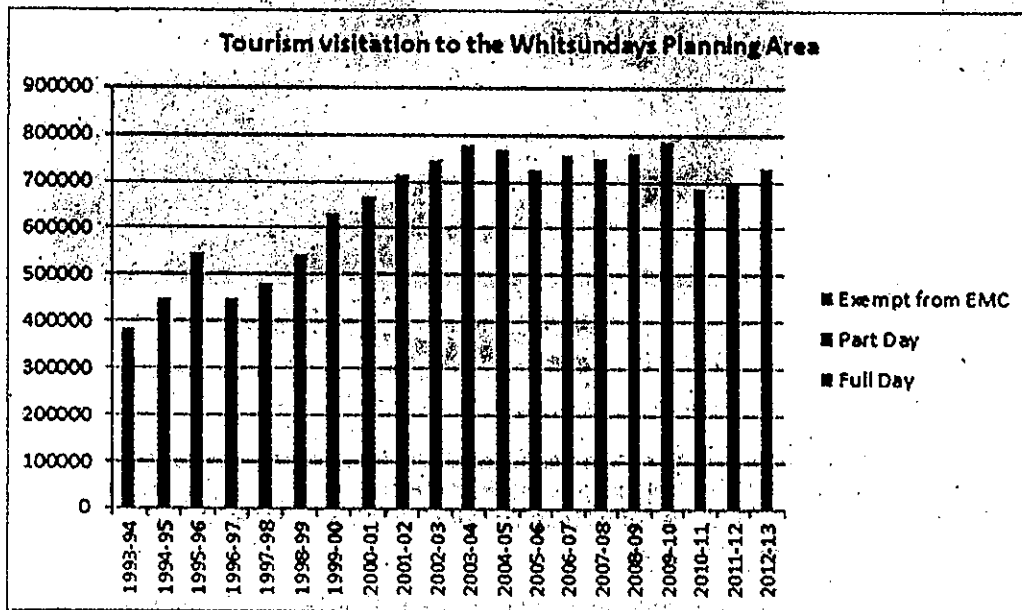
¹³³ McPhee, D., Souter, D. and Toon, J. 2012. The Potential Impact of Port Developments at Abbot Point on Fisheries (Stage One). Report Prepared for the Abbot Point Working Group (APWG)



Marine tourism near the area in question is low. Records from the Environmental Management Charge (EMC) returns show that since January 2012, there have been 10 tourism operations who have accessed Holbourne Island and Nares Rock a total of 23 days. Three of these were charter fishing operations. This may be an underestimation as permittees may use this area passing by and only identify the final EMC location that they stop at. If the water quality were to deteriorate at Holbourne Island and Nares Rock this would impact on this visitation.

- (iv) Marine tourism operators who operate in other areas of the Great Barrier Reef, including the Whitsundays

Nearly half of the visitation to the Reef is focused in the Whitsundays Planning Area. Adverse national and international media about dredging and spoil disposal or loss of World Heritage status could affect tourism visitation to the Great Barrier Reef, including the Whitsundays.



International and national media relating to Cyclone Yasi appear to have had an impact on tourism visitation to the Great Barrier Reef Marine Park (see social impact analysis- Attachment D).

- (v) Other recreational users of the Marine Park-

Other recreational users include visiting recreational users, scuba divers diving the nearby Catalina World War two aircraft wreck (which is also gravesite) and recreational boaters.

Impacts on other recreational users of the Marine Park are likely to result from reduced amenity and therefore enjoyment/appreciation of the area. Public perception of the amenity, enjoyment values and protection and management of the Marine Park may also be negatively impacted, both domestically and internationally.

Consideration

As there are a number of knowledge gaps, limitations and constraints associated with the sediment plume modelling that was undertaken for this proposal, potential impacts on adjacent and nearby zones are not well understood. Given the proposed volumes of dredge material disposal, the nature of the dredge material (in particular the fine sediments) and the scale and duration of the proposed activity (i.e. 3 million cubic metres of capital dredge material disposal in approximately 6 years), there is the potential for impacts on the adjoining zones.

The current proposal has the potential for direct and indirect impacts on the environment and other Marine Park stakeholders; a large proportion whom seek economic benefits from this area of the Marine Park. Impacts are likely to occur in adjacent zones including CPZ, HPZ and MNP.



The Granting of a Marine Park permission does not provide for exclusive use of an area.

Following an assessment of potential impacts, the disposal of dredge material within a General Use Zone of the Marine Park has previously been permitted with conditions.

Summary

The objective of a General Use Zone is: "to provide for the conservation of areas of the Marine Park, while providing opportunities for reasonable use".

Other zones adjacent to the proposed DMRA are likely to experience a decline in water quality and reduced amenity.

Limited information has been provided regarding proposed disposal location within the Investigation Area.

The disposal of 3 million cubic metres at the proposed DMRA (400 Ha) is unlikely to be completely consistent with the objectives for the General Use Zone, being that the proposal may not provide for the conservation of the area and will impact temporarily on opportunities for reasonable use of the General Use Zone on other Marine Park users such as commercial and recreational fishers.

The dredge disposal plume generated during the disposal action may travel into other zones of the Marine Park in particular the Conservation Park Zone associated with Holbourne Island and the Habitat Protection Zone associated with Nares Rock. Tourism operators to the south are worried about declines in water quality around their operations due to the proposed action.

Management and monitoring measures should be sufficient to meet the objective of the General Use Zone.



[33C](ii)

if the proposed conduct also requires an approval or permit under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or any other law of the Commonwealth, the proponent must ensure that the proposed conduct is consistent with the terms and conditions of that approval or permit.

ASSESSMENT SUMMARY

The proposal was approved on 10 December 2013 by the Minister of the Environment under the *Environment Protection and Biodiversity Conservation Act 1999*.

The approval and main conditions of the approval are summarised below. There are several options available to the delegate for this assessment that would be consistent with the EPBC approval.

- a) Approve the proposed DMRA
- b) Approve an area that includes the Investigation Area and the DMRA subject to further studies on the optimal site.

BACKGROUND

In this criteria: *assessment documentation*, in relation to [88Q(d)](ii), means:

- (a) if the action is the subject of an assessment report—that report; or
- (d) if Division 5 of Part 8 (public environment reports) applies to the action:
 - (i) the finalised public environment report relating to the action given to the Minister under section 99; and
 - (ii) the recommendation report relating to the action given to the Minister under section 100.

This proposal has been assessed, and was approved under the *Environment Protection and Biodiversity Conservation Act 1999*. The following is a summary of the approval and conditions:

- Limit the volume of dredging permitted to 1.3 million cubic metres per year.
- Approve the proposed dredge material disposal site.
- Require the proponent to develop a Dredging and Spoil Disposal Management Plan, Ecosystem Research and Monitoring Program and Disposal Site Analysis Plan.
- As part of the Disposal Site Analysis Plan, identify alternative sites for further analysis.
- The Proponent must establish a Dredging Technical Advice Panel (TAP).
- An Offsets Plan must be developed which sets out to achieve a net benefit for the World Heritage Area and reduces the total amount of fine sediments entering the marine environment in the area by 150%.

CONSIDERATION

The draft EPBC decision and proposed conditions were not made available for public comment under section 131A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The recommendation report for the Minister, prepared by the Department of the Environment, assesses the impact of the proposed conduct on Matters of National Environmental Significance. The criteria pursuant to *Great Barrier Reef Marine Park Regulations 1983* is different from the criteria used pursuant to the *Environment Protection and Biodiversity Conservation Act 1999*, which deals mostly with the significance of predicted impacts on matters of National Environmental Significance.

The recommendation report prepared by the Department of the Environment relies heavily on the information provided in the proponent's PER, including the modelling results. The assessment report documentation identifies that some of the conclusions provided in the PER are unsubstantiated and at



times overestimates (in the case of baseline water quality) or underestimates (in the case of predicted plume footprints) the predicted impacts.

The recommendation document report concludes that "the proposed dredging will place further pressure on an ecosystem under stress, and to address those cumulative impacts, the proponent is required to implement an offset strategy which will have a net benefit for the Great Barrier Reef by reducing the total sediment and nutrient load originating from onshore."

The approval associated with the EPBC approval relies heavily on the offsets being achievable, realistic and timely. There are risks to the values of the Great Barrier Reef as the offsets are possibly not achievable within the timeframe of the EPBC Act approval (by 2020). The viability of the 150% offset of suspended sediment removal from the Burdekin and the Don is yet to be established with the offset plan and associated budget not yet developed by the proponent for review.

There is a risk that the impact from the proposed activity, including the direct, indirect, cumulative, additive or synergistic effects are unlikely to be offset in the short term (by 2020).

The EPBC Act looks at the entire project and proposal where consideration under the Marine Park Act are limited to those activities requiring permission being the disposal of dredge material at sea.

An approval has been given under the EPBC Act for the proposed activity at the DMRA with conditions including the use of the Investigation Area for further investigation.

The recommendation report used pursuant to the EPBC Act decision was appropriate for a decision under that Act. The EPBC Act recommendation report which assesses the proposed action is not appropriate for use under the Great Barrier Reef Marine Park Regulations 1983 as the legislative criteria and scope of activities requiring permission under these Acts are different.

There is a risk that the Offset Plan required under the EPBC Act may not deliver the net environmental benefits to the GBR or the immediate region to counter any impacts on the values of the World Heritage Area.



88D(1)(a)

any notice, statement, advertisement or other document published or published in public, or any other matter relevant to the issue and proper management of the Marine Park

ASSESSMENT SUMMARY

The GBRMPA did not require the proponent to publish an advertisement in accordance with regulation 88D.

The draft PER was released for public consultation under section 98(2) of the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)* from 4 January 2013 to 15 February 2013. A summary of the comments is provided in Criterion [88R(b)] of this assessment.

88D(1)(b)

any other matter relevant to the issue and proper management of the Marine Park

ASSESSMENT SUMMARY

Community awareness and media coverage of this proposal may result in increased management effort and perception risk to GBRMPA's reputation as an effective management agency of the Marine Park.

Activities that require a permission for use and entry into the Marine Park are assessed on a case by case in accordance with the requirements of the Marine Park Act

The approval of this project with considerable information uncertainties may set a precedent for future dredging application in similar or more sensitive environments in the Marine Park, - that being, that it is acceptable to dispose of large quantities (millions of cubic metres) of dredge material without defining and thoroughly assessing a proposed disposal site as part of the application process. This may lead to increased management effort post permit approval.

There is no current strategic port master plan for the Port of Abbot Point. Multiple individual project by project decisions separated temporally in the same or nearby locations are unlikely to provide the best environmental outcome, nor is it considered good practice to assess the projects and their impacts in isolation. The lack of strategic master planning places considerable more emphasis on the managing agency to ensure cumulative impacts are considered.

RELATED PROJECTS AND CUMULATIVE IMPACTS

The Port of Abbot Point was established in 1984 as a single berth jetty exporting capable of exporting round 21Mtpa. Additional works completed between 2010 and 2012 increased the current export capacity to a maximum of 50mtpa. This included infrastructure upgrades and the addition of an extra berth and associated dredge areas. The Port achieved a throughput of 17.7 Mtpa for the 2012/2013 financial year, approximately 4.1 Mtpa more than the previous year. The port has never operated at its nominal operational capacity. This may change into the future, as one of the Terminal 1 coal loaders is currently undergoing refurbishment.

The marine area immediately surrounding the port is not included as part of the Great Barrier Reef Marine Park. On the terrestrial side, the 16,230ha Abbot Point State Development Area (APSDA) is located approximately 20 kilometres west of Bowen, in North Queensland.

The Abbot Point Cumulative Impact Assessment (CIA) is an industry-led, voluntary process that commenced in early 2012 between Adani, BHP Billiton and GVK Hancock in conjunction with the proponent to help address the multiple development proposals planned for the Port of Abbot Point.



This PER for dredging and disposal relies heavily on the technical studies undertaken as part of this process.

It is good practice to have port wide integration for identifying the impacts arising from the proposed expansion of the Port of Abbot Point. The CIA is seen as a positive step forward in Environmental Impact Assessment to move beyond individual case by case assessments of development proposals and provides a good starting point for which the development of port wide assessments within the Great Barrier Reef World Heritage Area can begin.

While the CIA concept is viewed positively, its application into the current project by project based assessment process has no formal bearing on regulatory processes under the GBRMPA and EPBC Act. GBRMPA raised several comments regarding this process and the findings of the technical studies in a draft letter sent to the proponent on in December 2012. These were:

- While the CIA looks at the impacts of multiple port related development proposals at Abbot Point, there is a need to look at the cumulative impacts of all activities impacting on values underpinning matters of national environmental significance (MNES) and the spatial and temporal scales at which they are occurring in order to meet our international obligation of 'sustaining or enhancing' the Great Barrier Reef's Outstanding Universal Value.
- GBRMPA does not accept the conclusion that no residual impacts on the Great Barrier Reef Marine Park are expected and as such no offsets are necessary. This was discussed at the workshop on 3 December 2012 and it was agreed that the issue of offsets and conservation objectives required more background, consistency and explanation.
- The main conservation objective of the Joint Environmental Management Framework should be to maintain and *improve/enhance* the marine environment at Abbot Point. While it is acknowledged that some of these impacts may be outside of the control of the Port of Abbot Point, the use of stewardship and partnerships to achieve conservation objectives is encouraged.
- Future reports would benefit from a discussion on future steps, including triggers for management action in the event that a conservation objective is not being met and how offsets would be applied in such situations.
- The study identifies the immediate impacts of the port development and operation but does not assess the long-term impacts of the port development and other impacts (natural and anthropogenic) on values and the synergistic interactions between the two.

There are currently four EPBC Act assessment processes that involve marine infrastructure currently underway or recently approved for the Port of Abbot Point. Two of these processes are deemed applications under the Marine Parks Act (Waratah Coal Terminal and this proposal).

The others are at different stages under the EPBC Act assessment process: Terminal 3 (Hancock Coal) has been approved by the Minister for Environment and Terminal 0 was approved with conditions on 10 December 2013 by the Minister.

Terminal 2 (BHP Billiton) was withdrawn on 23 October 2013. On the 4 October 2012 EPBC2008/4468 (Terminal 3) was approved to Hancock Coal Infrastructure Pty Ltd to construct a coal terminal at the Port comprising of onshore and offshore (a jetty and associated berths) elements. This proposal did not include dredging of the berth pockets.

As a consequence of individual project based approvals there could be an expectation from the proponent and Hancock Coal that regulators will approve the dredging works to facilitate construction of these berths.

There are risks to both proponents and management agencies in this approach, for example, the T3 project cannot progress in its current form unless the associated but separated proposal for dredging works are approved.

In December 2012 the Queensland Government released a concept plan for the first stage of the Abbot Point Expansion Project (AP-X). Registrations of Interest were sought by the QLD Government for the project and following the process, Anglo American and Northhub (a joint venture between Aurizon and Lend Lease) were named the preferred proponents.



The AP-X is likely to involve a significant amount of dredging (approximately 10 million m³) to provide multiple sheltered berths and harbours. It also proposes a multi kilometre rock groyne. Importantly the AP-X was not included in the Abbot Point Cumulative Impact Assessment.

Multiple individual project by project decisions separated temporally in the same or nearby locations do not provide for the best environmental outcome, nor is it considered best practice to assess the projects and their impacts individually and in isolation. This approach also poses several risks for industry due to the interdependencies between the individual projects and may not lead to best practice management and sound environmental outcomes for the Port of Abbot Point, and the Marine Park.

The proponent does identify in the Supplementary PER the AP-X as a risk to changing terminal configurations.

ALTERNATIVES

Section 19 (5) of the *Environment Protection (Sea Dumping) Act 1981*, in relation to the granting of a permit details that a permit may only be granted in accordance with Annex 2 to the London Protocol.

Annex 2, besides detailing that applicants must demonstrate that appropriate consideration has been given to a hierarchy of waste management options (i.e. re-use, disposal on land), clearly states that:

"6. A permit to dump wastes or other matter shall be refused if the permitting authority determines that appropriate opportunities exist to re-use, recycle or treat the waste without undue risk to human health or the environment or disproportionate costs. The practical availability of other means of disposal should be considered in light of comparative risk assessment involving both dumping and the alternatives."

There are feasible alternatives for the proposal, which will either reduce or eliminate the need for ocean disposal of dredge material. Alternatives are discussed in detailed in section [88Q(b)].

The proponent has proposed a disposal site near Holbourne Island and Nares Rock which may have conflicting uses and is proximal to fisheries habitat and a WWII aircraft wreck.

GBRMPA's Dredging and Spoil Disposal Policy 2004 states that "Disposal of dredged spoil to the marine environment in the Marine Park is to only occur at a GBRMPA approved dumping ground".

DREDGING OUTSIDE THE MARINE PARK

The dredge material is proposed to be taken at the Port of Abbot Point and represents a footprint of 185 ha.

The impacts of this are irreversible and may at some stage in the future require further maintenance dredging. The area proposed for dredging is known seagrass habitat. Criterion 88R(c) outlines the likely impacts to seagrass from the related activity of dredging.

Dredging is proposed to be undertaken using a medium or large Trailer Suction Hopper Dredge, which is proposed to operate in overflow mode. There will be a sediment plume created (potentially 410km²) by the activity of dredging.

REPUTATION RISK AND PUBLIC PERCEPTION

GBRMPA Communications team reviewed media on the proposal over a three month period between 19 February 2013 and 21 May 2013. The analysis showed that of the 83 articles found, roughly 80% raised concerns about the impacts of the proposal if approved while approximately only 5% indicated support of the project under the right conditions. The remaining percentage is made up of information articles produced by the proponent to communicate to the community.



The media interest in the Abbot Point Capital Dredging project is consistent with the public comments received during the PER public consultation phase which are summarised in criterion [88R(b)].

Approval of this project is may result in a risk to GBRMPA's reputation as an effective management agency of the Marine Park through:

- Increased demand for resources to manage the project post decision in light of current uncertainties, implementing post decision information requirements and managing public perception.
- The perception that the grant of this permit will contribute to the degradation of the values the GBRMPA is charged to protect.
- Increase resources to manage Freedom of Information requests.
- Reconsideration requests and appeal processes including potential legal challenges any decision.

CONSIDERATION

- The proponent has provided new information (in the Supplementary PER) indicating that they will not be nominating a specific offshore disposal location until after a decision an EPBC Act and potentially a GBRMPA Act decision has been made.
- The current proposal is inconsistent with GBRMPA's Dredging and Spoil Disposal Policy that states a specific disposal area must be approved by GBRMPA.
- It is considered good practice for the assessment of impacts, that a specific disposal area is proposed. Uncertainties around such a large area of potential investigation comes with increased risk.
- Potential long-term and unpredictable impacts associated with this proposal and other associated port development activities, where feasible alternatives exist may not be consistent with the orderly and proper management of the Marine Park including the Commonwealths obligation under the London Protocol.
- There are no formal strategic master plans in place or the Port of Abbot Point.
- There are multiple proponents competing individually for the export of bulk products. Port wide integration of identifying the impacts arising from the proposed expansion of the Port of Abbot Point would be considered good practice.
- The Abbot Point CIA is seen as a positive step forward in Environmental Impact Assessment to move beyond individual case by case assessments of development proposals within the Great Barrier Reef World Heritage Area.
- Multiple individual project by project decisions separated temporally in the same or nearby locations do not provide for the best environmental outcome, nor is it considered good practice to assess the projects and their impacts individually.
- The proponent did not consider the cumulative impacts of the Waratah Coal Terminal or the AP- X when relevant to environmental impacts,
- In the Supplementary PER the AP-X is identified as a risk to changing terminal configuration no further information was provided.
- The withdrawal of the BHP Terminal 2 proposal raises the question as to whether there is a currently need for the additional port capacity and the subsequent requirement to dredge 3 million cubic metres of material.

There is a degree of uncertainty on how the proposed activity relates to other proposals in a cumulative port design context and their subsequent environmental impacts to the Marine Park.

Assessment of this this proposal in isolation to other formal development proposals may lead to inconsistent decision and jeopardise the validity of other proposals.

The proposed activity is likely to require considerable management resources to manage the project in light of public expectation and information gaps not provided in the PER and Supplementary PER.



Consideration of Assessment Criteria - Discretionary Considerations:

(Note: Only those criteria which add value to the consideration by the Delegate need be included in the assessment. Criteria 88R(j)(iv), (v) and (vi) / 11(1)(i)(iv) are to be considered for all applications).

88R(j)(iv) The proponent must show that it is not possible to prevent or minimise harm to the environment in the Marine Park from activities that will be caused by their actions. Some alternative to the proposed activity are technically challenging and costly.

ASSESSMENT SUMMARY

There is no GBRMPA position, policy or informative guideline for assessing reasonable steps to prevent or minimise harm to the environment.

There are further steps that the proponent may take to prevent or minimise harm to the environment in the Marine Park from activities that will be caused by their actions. Some alternative to the proposed activity are technically challenging and costly.

The most feasible option for the proponent to minimise harm to the environment in the Marine Park is to find an alternate site within the Investigation Area that provides for a better environmental outcome.

This has been acknowledged by both the proponent and the Minister within the EPBC Act approval decision.

There are other steps which may prevent or minimise harm to the environment in the Marine Park.

The proponent has cooperated with GBRMPA's request for further information on alternatives.

REASONABLE STEPS, RISK AND EXISTING ENVIRONMENT

The proponent proposes that disproportionate costs of alternative options to ocean disposal have eliminated the provision of reason to refuse the permission¹³⁴. The proponent is using disproportionality to reason that alternatives to ocean disposal are not reasonable.

If a holistic comparison is made between the cost of alternatives to the overall cost of the project, including the rail projects, the construction of mines and the development of all terminals, perspective is gained on the additional \$100 - \$430 million alternative costs.

Two rail projects have been announced each with a gross estimation of \$5-6 billion dollars, and the Carmichael Coal Mine project has an estimated cost of approximately \$8-10 billion.

The development of the terminals is estimated to cost between \$1- \$2 billion dollars, not including the \$1.83 billion dollars that Adani paid to acquire the T1 Terminal in 2011.

Historically the Abbot Point Stage 3 expansion of T1 cost \$430 million (2004 dollars) and involved capital dredging of 100,000 cubic metres. The capacity of T0, T2 and will be 155 M metric tonnes per annum and the total value is therefore - \$15 billion revenue per year (lower estimate June 2013 price)¹³⁵.

¹³⁴ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane pg 5-26

¹³⁵ Indexmundi Coal, Australian Thermal Coal Monthly Price -- Australian Dollar per Metric Ton. 2013. Retrieved 05 August, 2013, from Index Mundi Web site: <http://www.indexmundi.com/commodities/?commodity=coal-australian&months=60¤cy=aud>



CONSIDERATION

When considering the high conservation value of the GBRMP, there is little guidance on what is be considered unreasonable (economically) for users of the Marine Park to be exposed to when operating in the WHA to adequately protect the environment.

Alternatives to the proposed activity are discussed in detail under criteria [88Q(b)].

The proponent has not provided fully detailed cost estimates of alternatives to sea disposal of dredge material, or of the holistic development of the port and associated developments. The alternative options may offer potential environmental, social, cultural and heritage benefits. Alternatives may also come with increase cost

There are further measures available to the proponent that may prevent or minimise harm to the Marine Park are to:

- select an option for development which does not require dredging;
- place dredge material onshore; and
- strategically plan the port with all potential proponents to cumulatively consider impacts;

There is uncertainty regarding the extent to which, moving the DMRA into the investigation area, will avoid or minimise impacts to the Catalina wreck, or the coral communities of Holbourne Island and Nares Rock. More information is required to determine the viability these options. Moving the proposed disposal site may potentially mitigate impacts to waters adjacent to Holbourne Island and Nares Rock and the site of the Catalina, it is unlikely to mitigate the other impacts associated with the resuspension of dredged material from the DMRA.

The proponent has not taken all reasonable steps to prevent or minimise harm to the environment in the Marine Park from activities that will be caused by their use and entry of the Marine Park.



(B00R(5))

The grant of a permission to dispose of dredge material to the Marine Park offshore from Abbot Point may detract from public appreciation, understanding and enjoyment of the Marine Park, by perception of reduced amenity and negative local and national media attention.

ASSESSMENT SUMMARY

The grant of a permission to dispose of up to 3,000,000m³ of dredge material to the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,00m³ in any one year offshore from Abbot Point may detract from public appreciation, understanding and enjoyment of the Marine Park, by perception of reduced amenity and negative local and national media attention.

The risk assessment (Attachment A) identifies that by granting the permission, there is an "Extreme" risk of an adverse social perception effects.

The granting of the EPBC approval by the Minister has generated over 14,000 emails, almost 2000 phone calls and multiple campaigns to the Great Barrier Reef Marine Park Authority calling for the delegate to refuse the dumping.

A social impact analysis has been conducted and is at Attachment D.

Public Consultation

The draft PER was made available for public comment between 4 January 2013 and 15 February 2013 through the EPBC Act assessment process.

Of the public comments received in response to the advertisement (103), approximately 92% of the responses were negative towards the proposal, 6% were supportive and 2% were indifferent. It is noteworthy that a large portion (34%) of those opposed, were associated with a group called the Abbot Point Action Group.

The public wanted to see a more detailed options study for land based disposal options. A large percentage were not against port development, rather they were opposed to dredging and unconfined offshore disposal of dredge material.

There appear to be public concern as to the independence, impartiality and unbiasedness of the PER. The public comments highlighted an apparent unscientific tone of the PER as "wishful thinking" and "naive" being consistent feedback. Some comments disagreed with the PER statements that the area does not support examples of OUV or values for which the World Heritage Area was inscribed, noting that there should be recognition that the GBRWHA is recognised for its large scale and diversity.

Climate change was a key topic with many public submissions detailing that the PER had not satisfactorily taken this into consideration. Many voiced the opinion that the PER should take into account the cumulative impacts on climate change and noted that the PER should consider the "export" of carbon emissions in the PER as that is often overlooked.

The accuracy of the predictive models was questioned in the public submissions, with many referencing the Port of Gladstone as an example of an incorrect model having unexpected impacts. Also considered as an oversight was the testing for contaminants, with several submissions concerned about the impacts of increased coal particulates and coal related Polycyclic aromatic Hydrocarbons (PAH). One submission (made by James Cook University Scientist Kathryn Burns) noted that studies had found high levels of PAH both north and south of the Abbot Point project site.

Another submission noted the previous unpermitted dumping of contaminated Garnet (containing toxic paint particles) following sandblasting operations at the port. The concern was that the PER did not mention this and therefore may not have tested effectively for the potential toxicants.

Multiple submissions raised concerns that the commercial and recreational fishing in the area would be significantly affected by the disposal of 3 million cubic metres of dredge material, and that the initial



draft PER did not adequately report on this. Several submissions by commercial fishers included data on fish catches and provided maps not included in the PER.

Concerns were raised that the Multi Criteria Analysis workshop (in 2012) on which the selection of the original offshore disposal site was based, did not invite or have representatives of the public or other industries, therefore was not relevant or equally weighted.

Some comments noted that the PER used cost considerations and disproportionality in the wrong context, asserting that the consideration of cost should be for the entire project (i.e. all terminals and related industry projects) and projected revenue, which would ultimately make it affordable to dispose of the dredge material on land. One submission in particular noted that GBRMPA emphasized this point in the 2010 BHP Hay Point project.

Numerous submissions raised the overlooked World War II aircraft wreck, the Catalina as a serious oversight in the PER and were not only concerned over the potential impact on the wreck but were worried that there may be other inadvertent omissions.

A submission by GFB Fisheries Pty Ltd (Guthalungra aquaculture farm) is concerned about the potential impact of the dredging activity on their aquaculture operation. Noting that their water intake site is located 10km west of the Abbot Point Terminal, they are concerned that consequential impacts such as introduction of invasive species were not considered adequately. They state that a Chinese parasite (not found in Australia) was recently found in their farm and caused significant loss of production. They were worried that this parasite was introduced from foreign ballast water and invasive species may become a greater risk with the expansion and increase of port operations. The proponent responded to public submissions in the supplementary PER.

In addition to the official public consultation over 14,000 emails and 2,000 phone calls were received by GBRMPA from the public following the decision by the Environment Minister on 10 December 2013. Over 685 media stories, 23 letters to the Editor, 170 Facebook messages were received up until the 7 January 2014 and were continuing to be still being received.

The geographical distribution the Get-up campaign emails received by GBRMPA (Figure 17) indicate that the majority of concern about the proposal is originating from outside Queensland further emphasising the issues associated with public perception of the reef and possible loss of tourism.



Geographical Distribution of emails received by the GBRMPA following the EPBC decision

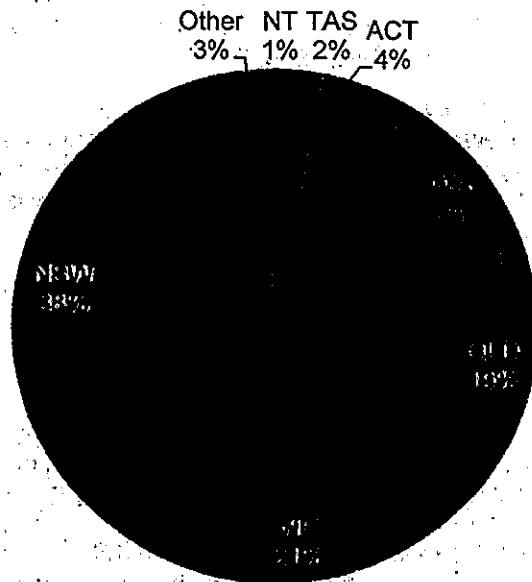


Figure 17: Origin of 9877 emails received up until the 7 January 2014 by the GBRMPA following the EPBC approval of the 10 December 2013. The 3% allocated to other are likely to have international origins

There have been regional campaigns against the proposal by the Abbot Point Action Group as well as a number of public forums and petitions opposing the dredging and disposal.

Recent preliminary results from a National Environmental Research Project (NERP) titled NERP project 10.2 : *Socio-economic systems and reef resilience*, indicate that residents and tourists in the GBR region may place a significantly higher level of importance on world heritage values than they do on Port related activities and associated benefits (Figure 18).

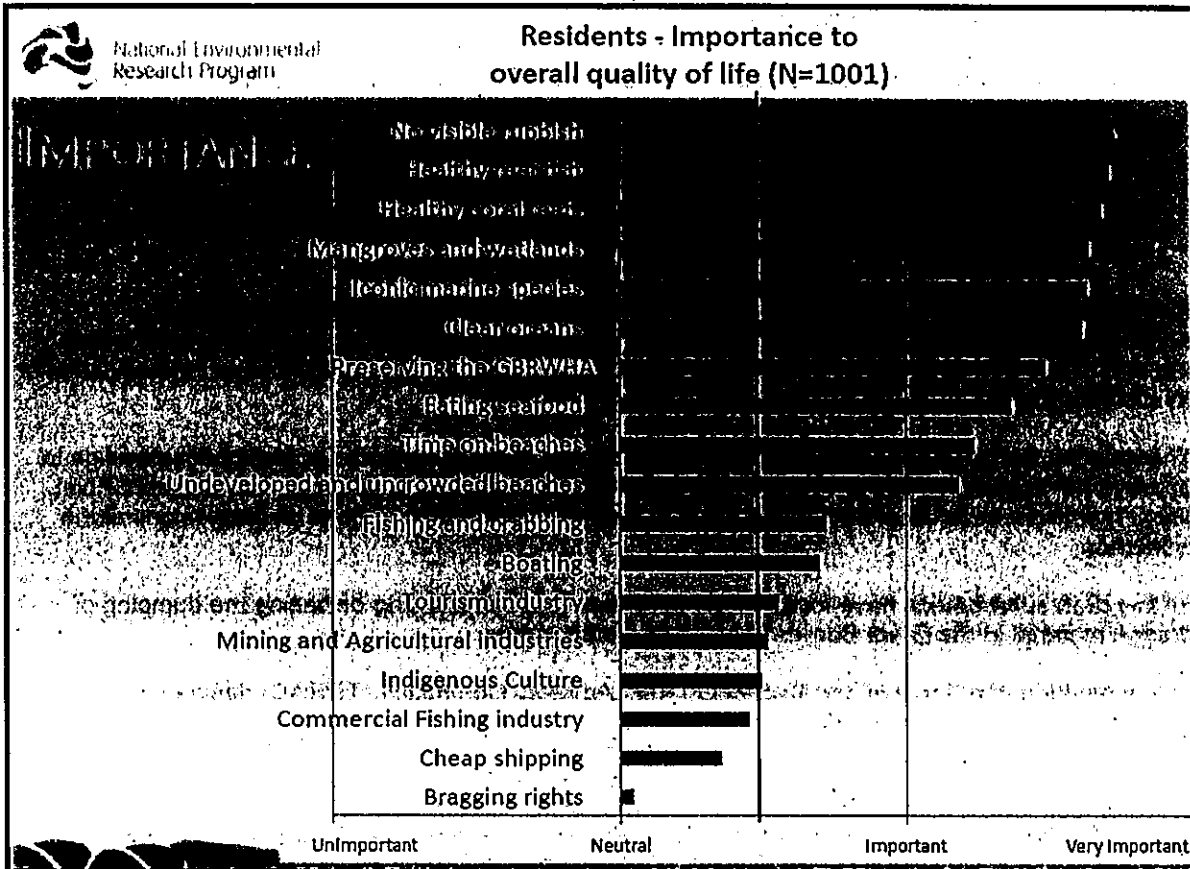


Figure 18: NERP Study, Resident's importance of values to overall quality of life (Preliminary results only, may change) (provided May 2013).

This proposal may have a significant impact on public appreciation, understanding and enjoyment of the Marine Park at and around the DMRA and the wider project area. The survey shows that 85% of tourists would likely reduce their stay by 25 to 100% if the aesthetic value of the reef was reduced¹³⁶.

The risk assessment indicates that there is an "extreme" risk to social values of the Marine Park, if this proposal is to be approved.

Additional views

A Strategic Assessment meeting of all Reef Advisory Committee (RAC) members and Local Marine Advisory Committee (LMAC) Chairs was held 12 and 13 December 2013 in Townsville.

Forty-seven members attended the workshop. The RACs are competency-based committees comprising a cross-section of stakeholder interests with expertise and experience in relevant areas.

The GBRMPA has four RACs: Catchment and Coastal, Ecosystem, Indigenous, and Tourism and Recreation. The role of the RACs is to provide issues-based advice to the GBRMPA on operational issues and to ensure that policy development and strategic direction are developed in consultation with stakeholders. There are 12 LMACS positioned along the coast from Cape York south to Burnett (below Gladstone). The LMACS enable local communities to have effective input into managing the Marine Park and provide a community forum for interest groups, government and the community to discuss issues around marine resources.

¹³⁶ NERP Project 10.2. (2013) Socio-economic systems and reef resilience. TE NERP. (In PREP)



At this meeting members were briefed on:

- the draft Great Barrier Reef Coastal Zone Strategic Assessment and draft Program Report from the Queensland Government;
- the draft Great Barrier Reef Region Strategic Assessment and draft Program Report from the Great Barrier Reef Marine Park Authority (GBRMPA); and
- the development of a Long-Term Sustainability Plan by the Australian Government Department of the Environment.

Each RAC and the LMAC Chairs were provided the opportunity to convene their individual committees after each briefing and then each group provided feedback to the meeting as a whole. At the end of the workshop each RAC and the LMAC Chairs were given time to finalise their advice prior to submitting to the Australian Government Strategic Assessment.

The meeting occurred two days after the announcement of the Australian Government's decision to approve the application by North Queensland Bulk Ports to expand its coal terminal at Abbot Point. Many members were vocal about their concern for this decision both in general discussions at the workshop.

All five draft submissions have included some reference to not allowing or halting the dumping of dredge material in the Great Barrier Reef World Heritage Area.

At this meeting, the Tourism and Recreation Reef Advisory Committee (TRRAC) decided to independently write to the Minister, the Hon Greg Hunt. The following is an extract from that letter: *"...the TRRAC requested I write to you to convey its deeply felt sense of frustration, indeed anger, and consequent sadness at what is happening on the Reef. It is clear from the information presented at the forum, as well as recent decisions made by you, that we are now at a point in history where we are on the precipice of losing one of the most important ecosystems on our planet and one Australia as a nation can ill afford to lose. Regardless of what has gone before, it is your decisions and actions as the sole individual with accountability who will now determine the future fate of our Great Barrier Reef. I implore you to take this responsibility seriously and take the strong stand and immediate actions that are now necessary."*

The letter then went on to refer to a range of proposed 'Recovery Actions' with the number one priority being *'Dredge spoil disposal in the World Heritage Area is halted'*.

Tourism operator concerns

Marine tourism operators have raised their concerns about dredging and spoil disposal and the potential for this to affect declining water quality in the inshore reefs in the adjacent Whitsundays Planning Area. Eye on the Reef data shows changes in secchi disc (water clarity) readings. This data comes from tourism operators who voluntarily monitor the health of their tourism sites as part of the GBRMPA's Eye on the Reef Program. The graphs below show approximately six years of data collected from tourism sites. It indicates that water clarity at some sites is diminishing, particularly in the southern Great Barrier Reef.

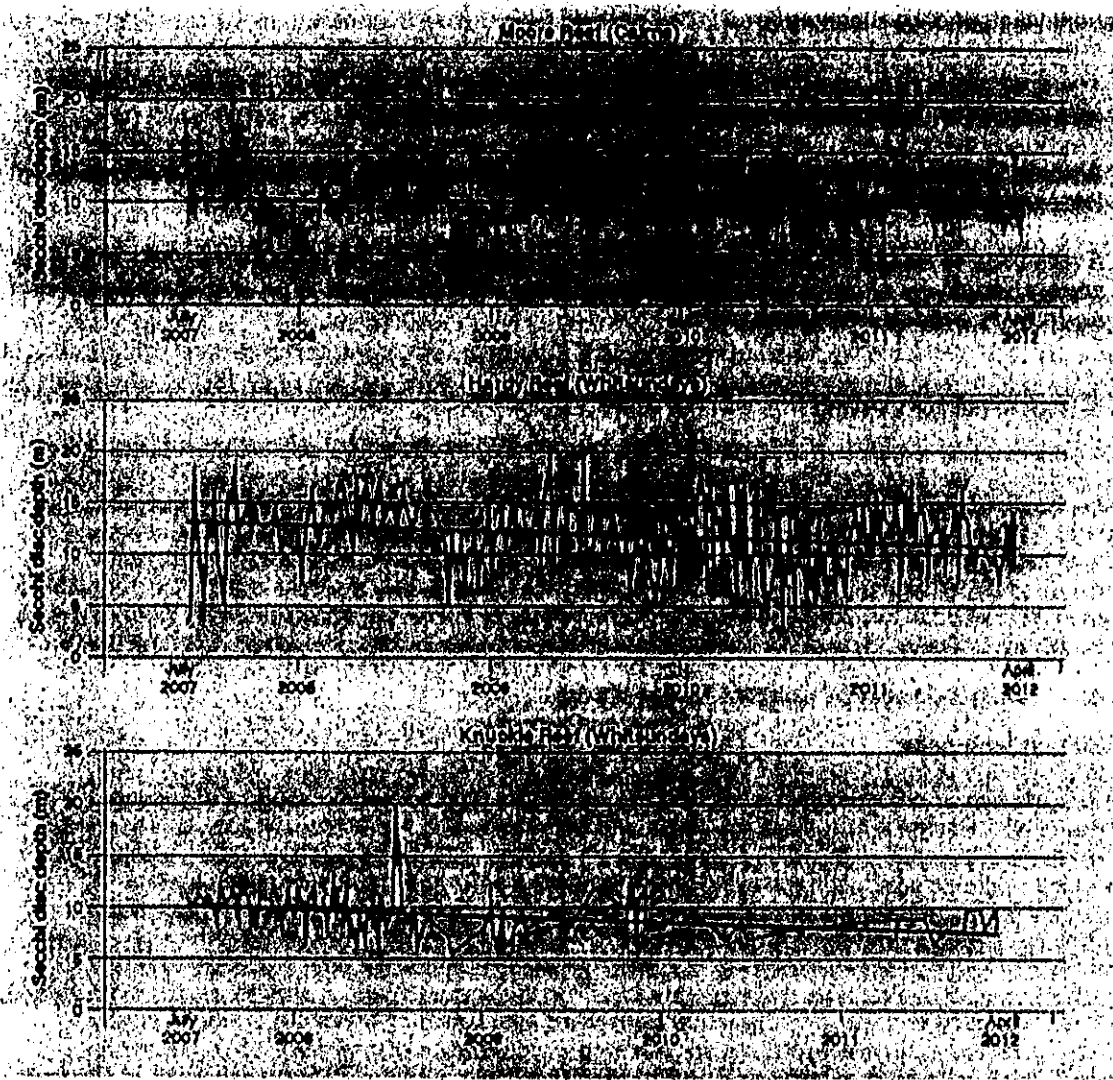


Figure 6.15 Water clarity at three tourism sites
 Seabed depth is 0.5m. Data was collected by the Great Barrier Reef Marine Park Authority as part of the Great Barrier Reef Marine Park Authority's Environmental Monitoring Program. The data shows a general decline in water clarity over the period shown, with the most significant decline occurring at Heron Reef (Whitsundays). In the south, the rate of decline has been greatest.

Consideration

The proposed DMRA and Investigation Area is not considered to have a high volume of recreational users throughout the year, although it is considered seasonally busy.

Abbot Point is recognised as an ideal port location by most stakeholders, as it is located a reasonable distance from urban areas and provides access to deep waters ideal for shipping and navigation.

There is an extreme risk that there will be a negative social impact due to adverse social perception of impacts to amenity in the region. This is supported by the fact that there is already national media surrounding the topic and that the GBRMPA has received thousands of correspondences from members of the public both foreign and domestic against the proposal since the Federal Environment Minister's approval decision in December 2013.

The dredge plume is unlikely to impact on the Whitsunday group of islands; based on the information provided in the PER. However, marine tourism operators have raised their concerns about dredging



and spoil disposal and the potential for this to affect declining water quality in the inshore reefs in the adjacent Whitsundays Planning Area.

The area offshore from Abbot Point is unlikely to have a high volume of commercial tourism, although it can be seasonally busy for recreational fishing activity.

Amenity and clear/clean water is valued higher than the services of a coal port by a subsection of the community surveyed in 2011 by the CSIRO.

A reduction of amenity and ecological services associated with the proposed activity is likely to impact negatively on social perception values of the World Heritage Area and Marine Park and represents a public perception risk.



[33] (a)

The impact of the disposal of dredge material to the Marine Park requires the assessment of the required dredging activities. The assessment of the dredging activities is based on the amount of dredge material to be disposed of in the Marine Park. The assessment of the dredging activities is based on the amount of dredge material to be disposed of in the Marine Park.

ASSESSMENT SUMMARY

The related activity of dredging occurs outside the Marine Park at the Port of Abbot Point. Indirect potential impacts associated with this activity are expected within the Marine Park especially within the Abbot Bay region where the dominant benthic habitats are seagrasses.

The dredge area footprint is approximately 185 ha and is a known seagrass habitat. Seagrass habitat within the direct foot print of the dredge area will be lost.

It is possible that coral reef ecosystems surrounding Camp Island may also be influenced by increases TSS associated with dredging.

There are multiple related and unrelated projects and operations in and around the Port of Abbot Point.

There appears to be limited strategic port master planning at the Port and a degree of uncertainty regarding the future of some of the Ports development proposals (i.e. Waratah Coal Terminal and the Abbot Point Expansion).

Other users of nearby areas include an aquaculture facility, some tourism and recreational and commercial fishing.

Management measures such as a planning process or the establishment of site management arrangement are tools that may be implemented to assess and understand cumulative impacts to the Marine Park.

Related Dredging

The disposal of 3 million cubic metres of capital dredge material to the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,00m³ in any one year requires dredging of the material outside of the GBRMP. The dredging location is located within the GBRWHA at the Port of Abbot Point. Dredging will generate a dredging plume increasing concentration of TSS which are likely to impact on water quality and benthic communities both in and outside of the Marine Park.

Dredging operations can roughly be categorised into a number of different phases all of which will have their own impacts and challenges. These phases are:

1. dislodging of the *in-situ* material;
2. raising the dredge material to the surface;
3. horizontal transport; and
4. disposal or further treatment.

The first phase of dredging, the dislodging of the material, causes the cohesion of the *in-situ* material to be broken and this causes the material to be brought into suspension, thus causing turbidity. The quantity of material brought into suspension depends on the energy applied and the way in which the material is handled¹³⁷. The second phase of dredging, the raising of the dredge material to the surface can cause further turbidity if the suction capacity is lower than the cutting capacity of the dredger, thus having a residual spill layer of loose material which has been dislodged. Any overflow of excess water causes further sediments to enter the water column thus increasing the turbidity in the area.

¹³⁷ Bray, R.N. 2009. Environmental Aspects of Dredging. Taylor & Francis. 2009.



During the third phase of dredging sediments can escape from damaged or poorly closing bottom doors of hoppers.

The exact amount of suspended sediments released during each phase of dredging is not exactly known. What is known is that when operating in overflow mode, the dredger ship will lose roughly 4%¹³⁸ of the dredged material in the turbid water released through the overflow. This material (120,000 cubic metres from overflow plus an unknown amount associated with dislodging and raising phases) will create a turbid plume that can smother benthic communities and cause declines in water quality in at least 410 km² surrounding the dredged area.

The footprint of the actual dredged area is approximately 185 ha and is a known seagrass habitat area. Seagrass habitat within the direct footprint of the dredge area will be lost.

The sediment will then be available for resuspension and the extent of the water quality and benthic community effects will be increased over scale and time as the sediment migrates until it consolidates.

The footprint of geographical area which may be impacted at levels between 5-10mg/l in a 95 percentile "worst case" scenario by the dredging activity has the dredging plume extending into the Great Barrier Reef Marine Park and reaching the Marine National Park Zone and Conservation Park Zone of Upstart Bay (Figure 19) some 30 km north west.

As the disturbance and the resuspension has been estimated to last at least six years (assuming no further dredging or disturbance occurs) and be observed outside the direct footprint of the dredging area it is anticipated that limited recovery of seagrass may occur outside of the direct footprint of the dredging area during that time. It is uncertain whether there will be enough seed banks or nearby seagrasses to recruit into the area after the six year disturbance.

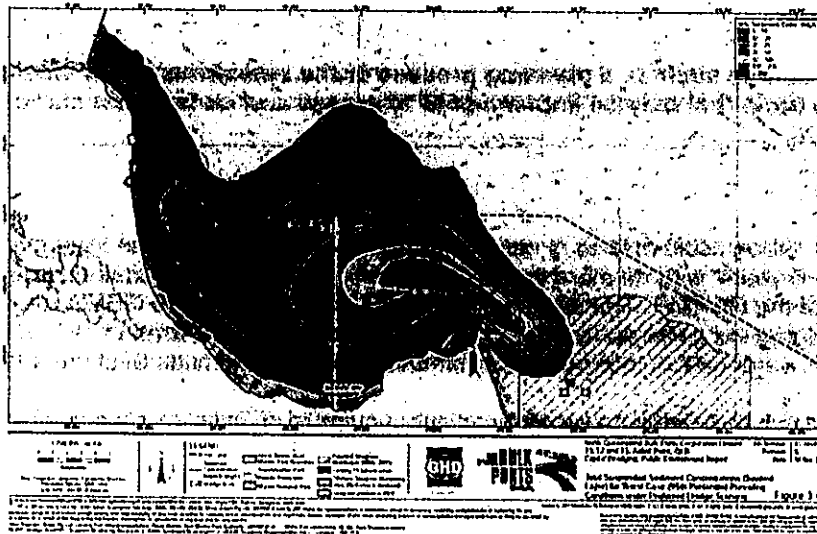


Figure 19: 95th percentile plume predicted associated with the dredging activity

The current water quality of Abbot Bay adjacent to the proposed disposal site is described in the report: Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final (2012) GHD as follows:

"A number of parameters recorded results outside when comparing the relevant comparative statistic to the ANZECC and GBRMP/QWQ guidelines".

¹³⁸ CDM Smith, 2013. Technical Note: Comparison of Material Available for Re-suspension from Dredging and Catchment Based Sources at Abbot Point. CDM Smith, Brisbane



This includes:

- TSS means during wet and dry seasons are above the GBRMP/QWQ guideline value of 2 mg/L.
- Total Phosphorus site medians above ANZECC guidelines value of 0.015 mg/l and GBRMP/QWQ guideline values of 0.02 mg/L.
- All Total Nitrogen site medians above ANZECC guideline value of 0.1 mg/L and the GBRMP/QWQ guideline of 0.14 mg/L¹³⁹
- Chlorophyll a has a concentration of 3.78 ug/L in wet season and 1.04 ug/L dry season compared to ANZECC and GBRMPA guidelines values of 1.4 and 0.45 ug/L respectively.

The guideline values of most importance to the Marine Park are the GBRMPA water quality guidelines as they are in place specifically to protect inshore coral reef ecosystems¹⁴⁰ (Table 4).

Table 4: Comparison of water quality parameters against guideline trigger values

Abbot Bay Water Quality	GBRMP Water Quality Guidelines	ANZECC Water Quality Guidelines	Wet season averages at Abbot Bay ¹³⁹	Dry season averages at Abbot Bay ¹⁴⁰
Total Suspended Solids (TSS) (mg/l)	2.0	N/A	10.7 - 20.2	13 - 20.3
Turbidity (NTU)	1	1 - 20	2.5 - 27.5	1.5 - 15
Total Nitrogen (mg/l)	0.14	0.1	0.35 - 0.34	0.28 - 0.28
Total Phosphorus (mg/l)	0.02	0.015	0.04 - 0.29	0.16 - 0.31
Chlorophyll a (ug/l)	0.45	0.7 - 1.4	3.78	1.04

Abbot Bay's water quality is influenced by run off from the Don River Catchment which covers an area of 3695 km² and the Burdekin River catchment which covers an area of 130,126 km²¹⁴³. Approximately 92% of the Don River catchment has been cleared, predominantly for agricultural use and around 73% of the Burdekin catchment has been cleared for grazing. Nutrient export from both catchments is classified as medium to high risk to the values of the Marine Park and collectively, the catchments contribute 4293 k tonnes/yr of Total Suspended Solids (TSS) into the Marine Park, of which approximately 70% is fine sediment¹⁴⁴.

The PER states that turbidity in Abbot Bay is seasonally variant and in general, turbidity is lower in the dry season (May to October) and higher in the wet season (November to April)¹⁴⁵. Spatially turbidity in

¹³⁹ GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁴⁰ GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁴¹ GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁴² GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁴³ State of Queensland. 2013. Second Report Card 2010, Reef Water Quality Protection Plan. State of Queensland, Brisbane

¹⁴⁴ State of Queensland. 2013. Second Report Card 2010, Reef Water Quality Protection Plan. State of Queensland, Brisbane

¹⁴⁵ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)



the bay is higher in shallow more energetic environments and lower in deeper offshore sites^{146,147}

TSS are generally seasonally variant and related to wind, wave and terrigenous river sediment input. TSS in Abbot Bay is elevated year round and found to be above the relevant GBRMP/QWQ guidelines¹⁴⁸

In Abbot Bay, ambient levels of nutrients during both wet and dry season in the water column exceed the ANZECC and GBRMP/QWQ guideline values¹⁴⁹. The PER indicates that there is a seasonal variability, and that the nutrient levels in the water remain above relevant guidelines all year round¹⁵⁰. All Total Nitrogen site median values are above the ANZECC guideline value of 0.1 mg/L and the GBRMP/QWQ guideline of 0.14 mg/L. All but one (which is below GBRMP/QWQ but above ANZECC) median Total Phosphorus values exceed the ANZECC guideline value of 0.015 mg/L and the GBRMP/QWQ guideline of 0.02 mg/L¹⁵¹.

Seagrass

Seagrass meadow coverage surrounding Abbot Point during surveys increased from 31% in 2005 to 42% in 2008^{152,153}. Prominent seagrass scientists Unsworth, McKenna and Rasheed have determined that seagrass distributions mapped in the 2008 surveys around the port area are likely to provide a good representation of seagrass distribution for the surrounding region¹⁵⁴. This is important to consider as not all potentially impacted areas were surveyed for seagrasses.

Following the 2010/11 La Niña event and severe Tropical Cyclone Yasi, the Port of Abbot Point Long Term Seagrass Monitoring program recorded up to an 80% reduction in seagrass meadows and for those meadows that survived, there has been a significant reduction in their distribution and biomass¹⁵⁵. This pattern has been observed throughout the GBR coastline and further significant rainfall events resulting in increased seawater turbidity is continuing to affect the availability and quality of light for seagrasses.

The latest Port of Abbot Point long term seagrass monitoring annual report (2011-2012) shows evidence that deeper offshore meadows at Abbot Bay have started to recover in 2012 while coastal meadows were yet to recover¹⁵⁶. Figure 21 shows previous vs current seagrass meadow coverage. The lack of recovery of the coastal meadows may be a result of limited seed availability¹⁵⁷.

¹⁴⁶ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)

¹⁴⁷ GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁴⁸ GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁴⁹ GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁵⁰ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)

¹⁵¹ GHD. 2012. Abbot Point Cumulative Impact Assessment Technical Report Marine Water Quality Final. GHD: Brisbane

¹⁵² Rasheed, M.A., Thomas, R. and McKenna, S.A. (2005). Port of Abbot Point seagrass, algae and benthic macro-invertebrate community survey - March 2005. DPI&F Information Series Q105044 (DPI&F, Cairns), 27 pp.

¹⁵³ Unsworth, R.K.F., McKenna, S.A. and Rasheed, M.A. (2010) Seasonal dynamics, productivity and resilience of seagrass at the Port of Abbot Point: 2008 – 2010. DEEDI Publication. Fisheries Queensland, Cairns, 68 pp.

¹⁵⁴ Unsworth, R.K.F., McKenna, S.A. and Rasheed, M.A. (2010) Seasonal dynamics, productivity and resilience of seagrass at the Port of Abbot Point: 2008 – 2010. DEEDI Publication. Fisheries Queensland, Cairns, 68 pp.

¹⁵⁵ McKenna, S.A. & Rasheed, M.A. 2011, 'Port of Abbot Point Long-Term Seagrass Monitoring: Update Report 2008-2011', DEEDI Publication, Fisheries Queensland, Cairns, 48 pp.

¹⁵⁶ McKenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.

¹⁵⁷ McKenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.



Seagrasses can recover by two main mechanisms: vegetative growth (asexual reproduction) and recruitment from propagules (seeds/sexual reproduction)¹⁵⁸.

Sedimentation/smothering of seagrass communities' can lead to mortality and sublethal impacts. While some species can respond with vertical growth, there are limits to how quickly and what depth of sedimentation/burial the seagrasses can cope with and mortality can range between 50% and 100% depending on depth of burial¹⁵⁹.

Figure 9 also shows the past extents of seagrass communities at Abbot Point, including presence at the proposed dredge area. Current extent of seagrass surveys in area are limited to roughly 20km either side of the Port of Abbot Point.

One of the major drivers of seagrass growth and distribution in shallow coastal environments worldwide is light availability¹⁶⁰. Although, offshore seagrass communities within and surrounding Abbot Bay may be well adapted to low light conditions, further reduction of light due to increased turbidity has been identified as a major cause of seagrass loss¹⁶¹. A recent study has shown that seagrasses can change their morphology and physiological processes to survive in low light conditions, however a short term further reduction in light levels can result in mortality¹⁶².

Consideration

- Seagrass communities surrounding the Port of Abbot Point, are the dominant benthic community. Dredging activities may place additional pressure on seagrass meadows with threats to water quality, and in particular light availability.
- The declines in Abbot Point seagrasses over recent years indicates that they are likely to be in a state of reduced resilience to further impacts and stressors¹⁶³. Recovery to pre 2011 wet season conditions is unlikely if other further stressors are added (such as dredging) in close proximity to known seagrass habitats^{164,165}.
- The Port of Abbot Point Long Term Seagrass Monitoring program recorded up to an 80% reduction in seagrass meadows due to flooding and Cyclone Yasi, and for those meadows that survived, there has been a significant reduction in their distribution and biomass. Recovery of impacted seagrass can range between 2 to 5 years depending on species, and the scale of disturbances¹⁶⁶. Recovery rates are likely to differ between species and species which rely on asexual reproduction will take longer to recover as long as those which rely on

¹⁵⁸ Mckenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.

¹⁵⁹ Erfemeijer, P.L.A. and Robin Lewis, R.R. (2006) Environmental impacts of dredging on seagrasses: A review. Marine Pollution Bulletin 52, 1553-1572

¹⁶⁰ Chartrand, K.M., M. Rasheed, M. K. Petrou and P. Ralph. 2012. Establishing tropical seagrass light requirements in a dynamic port environment. Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia.

¹⁶¹ Erfemeijer, P.L.A. and Robin Lewis, R.R. 2006. Environmental impacts of dredging on seagrasses: A review. Marine Pollution Bulletin 52, 1553-1572

¹⁶² Yaakub, S.M., Chen, E., Bouma, T.J., Erfemeijer, P.L. and Todd, P.A. 2013. Chronic light reduction reduces overall resilience to additional shading stress in the seagrass *Halophila ovalis*. Marine Pollution Bulletin, <http://dx.doi.org/10.1016/j.marpolbul.2013.11.030>

¹⁶³ Mckenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.

¹⁶⁴ Mckenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.

¹⁶⁵ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation Summary)

¹⁶⁶ Erfemeijer, P.L.A. and Robin Lewis, R.R. (2006) Environmental impacts of dredging on seagrasses: A review. Marine Pollution Bulletin 52, 1553-1572



seed-banks/reserves. Recovery of any affected seagrasses caused by light attenuation (TSS) and sedimentation may be a slow process¹⁶⁷.

- Seagrasses only experience "ideal" growing conditions for an average of up to five months per year (ideally from July to January), in North Queensland: Any reduction in this growing/recovery period could have adverse impacts for the remaining seagrass meadows and the species that rely on them.
- There are uncertainties regarding the PER hydrodynamic modelling and the predicted impacts on seagrasses. Predicted increases in above background TSS generated as a result of dredge material disposal is likely to be underestimated.
- Seagrasses can, under normal conditions, withstand periods of naturally high turbidity and some increase in the frequency of turbid events¹⁶⁸. It is uncertain how much turbidity seagrasses with low resilience can tolerate.
- The long term viability of remaining coastal and offshore seagrass populations in the region is at risk and given that some species are living close to their minimum light requirements¹⁶⁹, thereby reducing their resilience to further light reductions, this may not be achievable.
- In managing potential impacts associated with dredging on seagrasses further adaptive managing and monitoring measures are required, in particular, light availability to adequately manage potential impacts, as has occurred recently in Gladstone.

Summary of seagrass impacts

The proponent initially proposed to dredge in the dry season (April – October)¹⁷⁰, some of which may encompass the seagrass growing season (July to January)¹⁷¹. This has subsequently been refined to March to July as stipulated in the EPBC Act approval.

There are large areas surrounding the proposed activity that have not been surveyed for seagrasses.

Recovery of some offshore seagrasses has started in Abbot Bay and any subsequent stressors may delay the recovery.

Impacts to seagrasses or potential seagrass habitat is possible as a result of the related activities of the proposed activity.

There is considerable uncertainty as to the severity or reversibility of these impacts on seagrasses surrounding the Port of Abbot Point.

The risk assessment identifies that the proposed activity has unmitigated "HIGH" risk to cause sub-lethal impacts to seagrasses.

Management measure that may reduce this risk is to implement an adaptive water quality monitoring

¹⁶⁷ Mckenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.

¹⁶⁸ Erfemeijer, P.L.A. and Robin Lewis, R.R. (2006) Environmental impacts of dredging on seagrasses: A review. Marine Pollution Bulletin 52, 1553-1572

¹⁶⁹ Mckenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.

¹⁷⁰ GHD. 2012 Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1). GHD Brisbane (Chapter 3 Environmental Values, Potential Impacts and Mitigation, Page 3-171)

¹⁷¹ Mckenna, S.A. and Rasheed, M.A. 2013. 'Port of Abbot Point Long-term Seagrass Monitoring: Annual Report 2011-2012', JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.



program with clear locally relevant ecological triggers, implement baseline seagrass surveys in areas that are currently not surveyed, and for the proponents to re assess their baseline water quality thresholds (as they were found to be unusually high).

With these mitigating measures in place the risk assessment identifies that the residual risk to seagrass from the proposed activity is "MEDIUM".

The proponent has not considered the cumulative pressures or the current reduced state of the regions resilience to other natural pressures such as cyclones or flooding.

The exposure map below (Figure 20) shows the exposure of each area to stressors such as freshwater plumes, cyclones and temperature effects. When viewed in context of the seagrass distribution map (Figure 21), there is a relationship between exposure to stressors and impacts to seagrass and other communities. The current state of the Abbot Point region is in a recovery mode following the impacts of previous years. Therefore, the sensitivity of the environment which may be impacted by the activity is high.

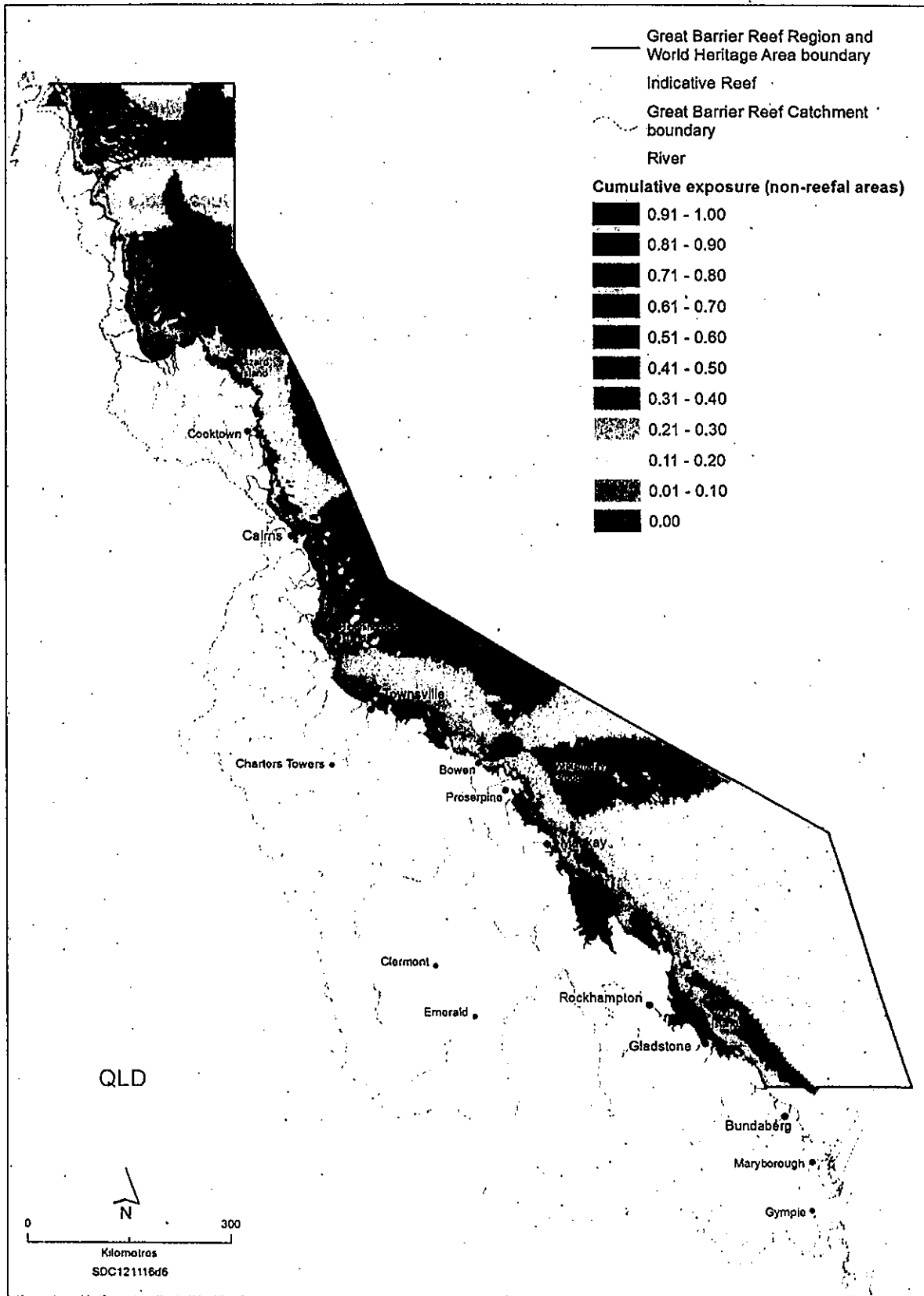


Figure 20: Cumulative exposure (non-reefal areas)

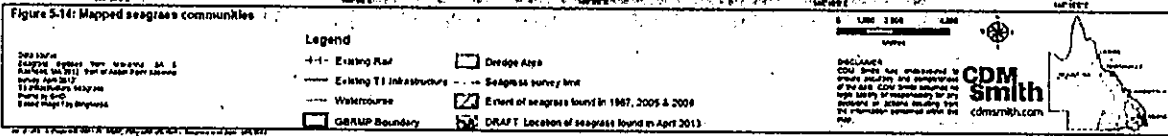
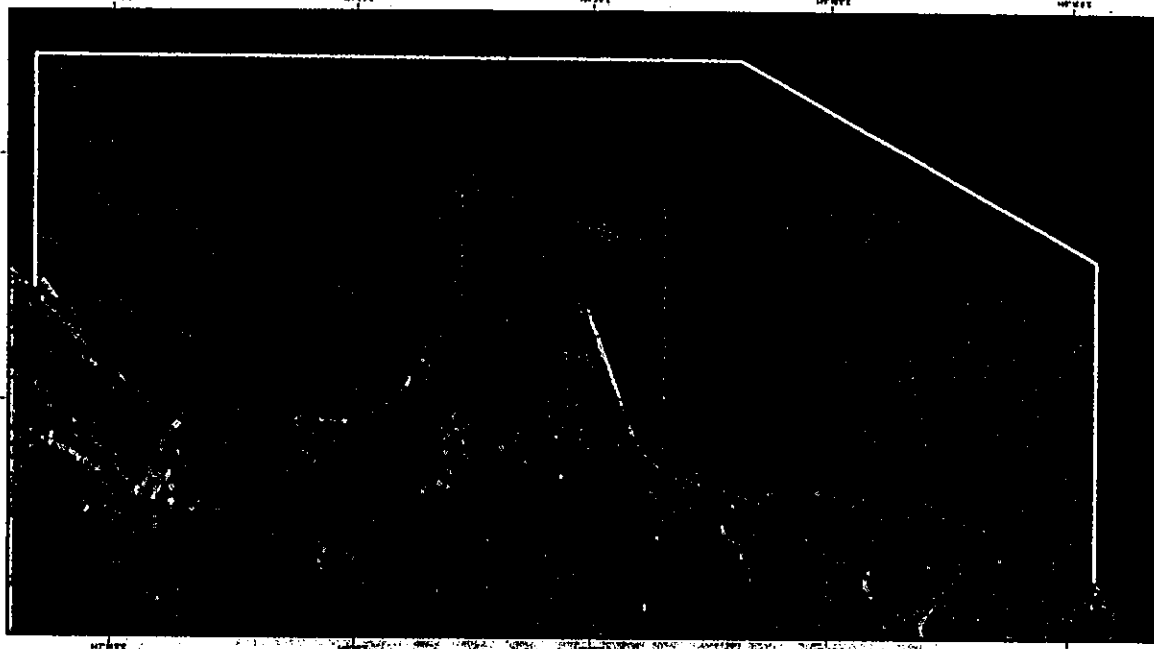


Figure 21: Mapped seagrass distribution 2013 (Dark Green) and 1987, 2005 and 2008 (Light Green)

Other Conduct

In December 2012 the Queensland Government released a concept plan for the first stage of expansion of the Abbot Point Expansion Project (AP-X) (Figure 24). Between 21 December 2012 and 20 February 2012, registrations of interest were sought by the QLD Government for the project and following the process, Anglo American and Northhub (a joint venture between Aurizon and Lend Lease) were named the preferred proponents.

The AP-X is likely to involve a significant amount of dredging (approximately 10 million cubic metres or more) to provide multiple sheltered berths and harbours. It also proposes a multi kilometre rock groyne. Importantly the AP-X was not included in the Abbot Point Cumulative Impact Assessment. Impacts from the decision of this proposal are more than likely going to affect the AP-X project. A change in the design or orientation of the trestle structures could negatively impact on the AP-X project.

Another proposal which is planned for the Port of Abbot Point is the Waratah Coal proposal (Figure 23). It is expected that, given the shallow depth of the proposed infrastructure, that a significant amount of dredging will be required, and ongoing maintenance dredging also.

The approval of this project will cumulatively impact on the GBRMP. The amount of capital dredging proposed in the GBRMP is at an all-time high (Figure 22) during a period of time when other stressors upon the values of the Marine Park are also increasing.

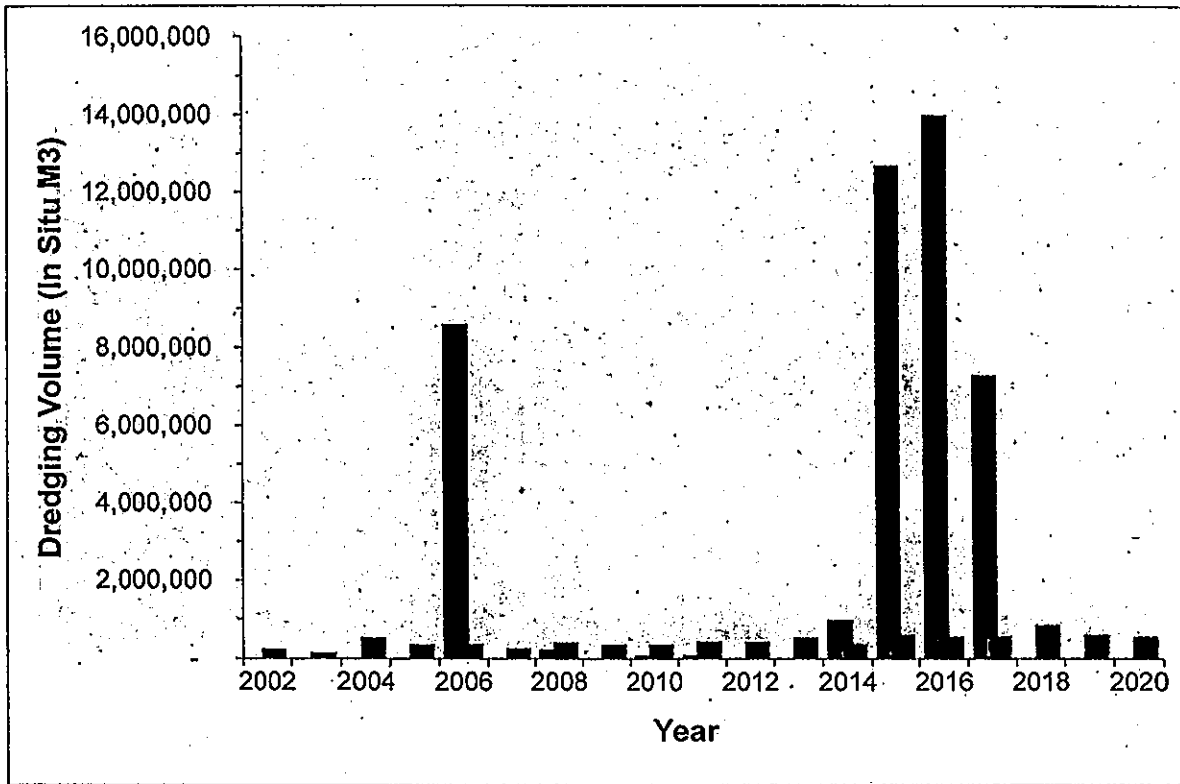


Figure 22: Actual historical dredge disposal volumes compared to projected future dredge disposal volumes to the Marine Park based on information supplied by permittees (in accordance with GBRMPA permit requirements) and EPBC referrals. (calculated December 2013)



Figure 23: Proposed infrastructure for Waratah Coal's proposal and the previous MCF¹⁷² terminal design.

¹⁷² The Multi Cargo Facility proposal at the Port of Abbot Point was formally withdrawn under the EPBC Act on 21 December 2012.

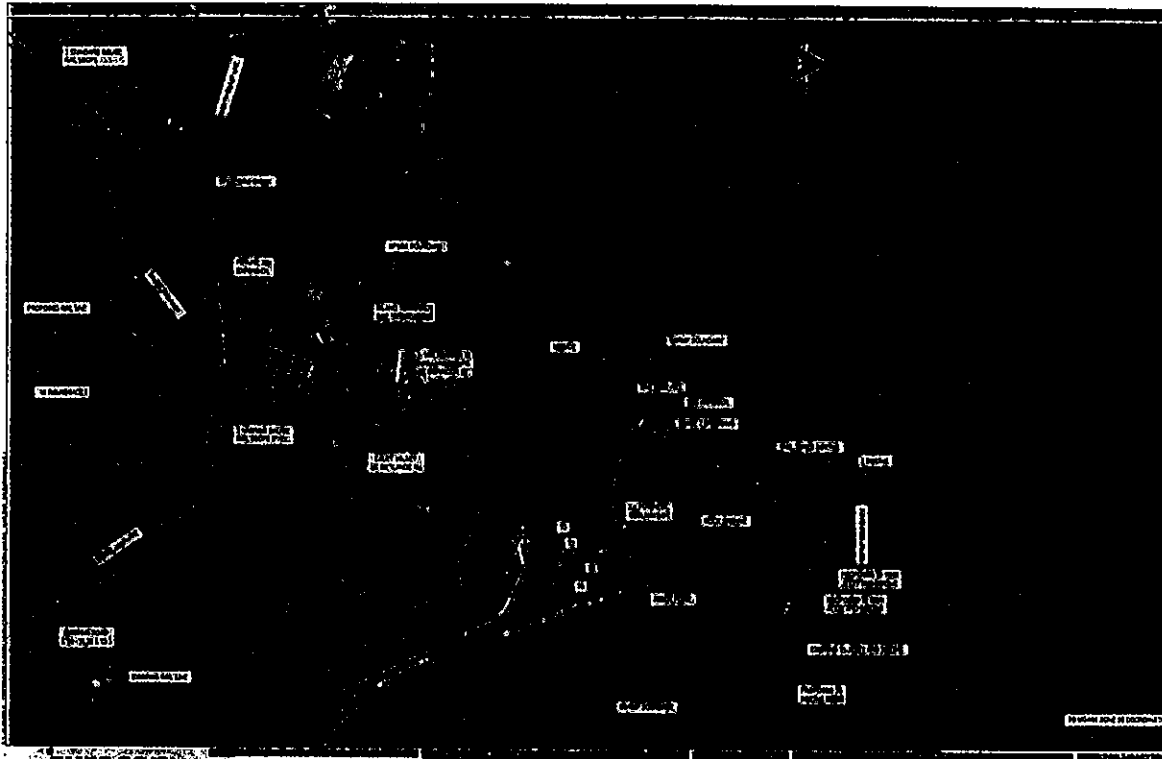


Figure 24: Conceptual design of the Abbot Point Expansion Project

Consideration

The inshore Great Barrier Reef (GBR) is in a state of serious decline¹⁷³. Key risks and contributing factors are ocean acidification, decline of water quality, extreme weather events, coral bleaching and Crown of Thorns starfish outbreaks.

There are also multiple projects planned within the Abbot Point region, which may be impacted by the decision of this application.

No master plan exists for the Port of Abbot Point. In the absence of a strategic document, no long term planning or consideration of potential impacts around existing and planned projects or developments on the values of the Marine Park and World Heritage Area can be cumulatively considered.

In circumstance where there are multiple proposals within the Marine Park for the same or similar locations, GBRMPA will often undertake a site planning process to adequately understand cumulative pressures. Often permit decisions are not made for these proposals until after the planning process has been completed or specific site management arrangements are implemented.

There is likely to be competitive implications and duplication of infrastructure in the absence of a strategic port master plan.

Without the long term strategic planning, GBRMPA cannot reliably consider cumulative impacts upon the values of the Marine Park.

¹⁷³ Brodie, J., McCulloch, M., Coles, R., Mumby, P., Fernandes, L., Pandolfi, J., Hoegh-Guldberg, O., Possingham, H., Marsh, H. and Richmond, B. 2013. Declaration by concerned scientists on industrial development of the Great Barrier Reef coast.



Management measures such as a planning process or the establishment of site management arrangements are tools that may be implemented to assess and understand cumulative impacts to the Marine Park:

ASSESSMENT SUMMARY

Relevant policies and guidelines include:

- GBRMPA Dredging and Spoil Disposal Policy;
- National Assessment Guidelines for Dredging 2009; and
- The Use of Hydrodynamic Numerical Modelling for Dredging Projects in the Great Barrier Reef Marine Park Guidelines.

The current proposal to dump 3 million cubic metres of dredge material derived from capital dredging at the Port of Abbot Point to the proposed DMRA and further investigation from within the Investigation Area, is inconsistent with GBRMPA policy on Dredging and Spoil Disposal.

Policies or Guidelines

In 2004 the GBRMPA developed a Dredging and Spoil Disposal Policy to provide a transparent, consistent and contemporary approach to environmental impact management of dredging and spoil disposal in the Great Barrier Reef Marine Park. This policy provides consistent views on the management of dredging and spoil disposal in the GBRMP, the main relevant principles being:

Principle 2 Proponents must comply with the National Assessment Guidelines for Dredging 2009 (NAGD 2009).

Principle 3 Dredging and spoil disposal are unlikely to be approved if these activities may damage sensitive environments.

Principle 4 The methods used for dredging should minimise the impact on the environment.

Principle 5 The selection of a disposal site is to provide the best overall environmental outcome recognising the high conservation value of the Marine Park.

Hydrodynamic modelling guidelines were released in August 2012 to provide guidance on the use of three-dimensional (3D) hydrodynamic models in the Great Barrier Reef Marine Park. The guidelines for "the use of Hydrodynamic Numerical Modelling for Dredging Projects in the Great Barrier Reef Marine Park" were prepared by GBRMPA to inform proponents and interested stakeholders of the specific procedures, methodologies and frameworks associated with hydrodynamic modelling and dredge plume modelling that GBRMPA expects for projects in the GBRMP.

It is noted that the hydrodynamic guidelines were not released at the time the proponent undertook their modelling.

CONSIDERATION

The proposal to dump 3 million cubic metres of dredge material derived from capital dredging at the Port of Abbot Point, at the DMRA is inconsistent with GBRMPA policy.

- The Risk assessment identifies there is a "medium to high" risk that sensitive environments will be impacted with prolonged recovery periods from the proposed activity to dispose of dredge material at the DMRA (refer to Attachment A).



- The proponent has demonstrated that they have investigated alternatives to ocean disposal, the reasons for why alternatives are unsuitable have not been clearly articulated, with broad statements indicating that this is due to disproportionate costs.
- Alternatives to ocean disposal come with increased cost when compared to ocean disposal.
- The supplementary report to the PER documents a number of alternatives to the current proposal that are likely to produce a better and more manageable environmental and social outcome than the proposed activity by avoiding impacts through eliminating the need to place dredge material in the Marine Park (land disposal, extension of trestles into deeper water)
- Investigation of another disposal site from within the Investigation Area could be an alternative to reduce the potential impacts (criteria 88Qa) associated with disposal at the current DMRA.
- The current proposed DMRA as identified in PER does not represent the best environmental outcome for offshore disposal to the Marine Park. The potential impacts on sensitive areas such as Holbourne Island, Nares Rock and the WWII Catalina may be avoided by identifying a disposal site further away from these known sensitive receptors.

The proponent has followed the guidelines set out in the NAGD 2009 for determining whether or not the sediment to be dredged is chemically suitable for ocean disposal.

There has been limited early consideration given to alternatives to ocean disposal with proponent has invested heavily in developing a sea dumping option,

Alternatives to ocean disposal come with increased cost when compared to ocean disposal

The current DMRA does not provide for the best environmental outcome to the Marine Park.

Limited information is available to adequately assess the merits of ocean disposal from an alternative DMRA located within the Investigation Area



EPBC Act 1999 - Environmental Protection and Biodiversity Conservation Act 1999

ASSESSMENT SUMMARY

The proponent funds works through in part investment from port stakeholders. Therefore the capacity of the applicant to satisfactorily develop and manage the project may be associated with factors such as coal price and investment risk for port proponents.

There are no factors in the history of previous permitted dredge disposal activities within the Marine Park associated with the proponent regarding this criterion.

The proponent is a Government Owned Corporation.

There are three other EPBC referrals for terminal infrastructure, which relate directly to this proposal; all held by separate individual private companies. One proposal under the EPBC Act has already been approved. Separate private capital backing of the project in addition to costs incurred by the proponent is expected.

It should be noted the proponent's 2011-12 Annual Report¹⁷⁴ states "Extraordinary write-offs of \$22.7 million from economic benefit reassessment of certain Abbot Point projects accounted for the after tax loss of \$1.9 million. As a result of softening demand for coal export infrastructure, NQBP has scaled back plans for future development at the Port of Abbot Point. NQBP continues to work closely with the proponents for terminals T0, T2 and T3. NQBP, together with the State Government, is developing plans for further incremental expansion at the Port of Abbot Point".

"NQBP undertook an assessment to determine whether capital work in progress in relation to the Multi Cargo Facility (MCF) and Abbot Point T4-T9 projects would continue to produce economic benefits for NQBP. Changes in the economic climate during the year have led to uncertainty with regard to the economic viability and willingness of Government and customers to fund these projects. As a substantial amount of the work carried out will be useful in any project scenario and therefore has a high likelihood of recovery, NQBP has determined that it will continue to capitalise \$30 million of costs"

Consideration

- Demand for coal export has softened (coal prices have fallen approximately 53% since 2008)
- Terminal 2 proponent BHP, has recently withdrawn their interest in the project
- It is unclear if a new proponent for the Terminal 2 project has been selected

Summary

There is some risk around the willingness of individual companies to fund capital projects in the light of the current economic climate however it is expected that the proponent has the capacity to satisfactorily develop and manage the project primarily through additional capital backing by individual terminal operators.

¹⁷⁴ NQBP, 2012, North Queensland Bulk Ports Corporation Limited 2011-12 Annual Report pg 5, 98



1999/01/19 - For copy and circulation purposes only. This document is not for circulation. It is a draft and should not be used for any purpose other than the one for which it was prepared.

ASSESSMENT SUMMARY

The Queensland Minister for Environment has considered the project and concluded that the project is not a 'significant project' under the *State Development and Public Works Organisation Act 1971*, that it was not being assessed under the Environmental Impact Statement process in Chapter 3 of the *Environmental Protection Act 1994*, and that it was also unlikely to meet the requirements for assessment under the *Sustainable Planning Act 2009*.

The proposal is likely to trigger a number of Queensland laws, in particular, dredging of the berths and apron areas is an environmentally relevant activity and will required approval from the Queensland Department of Environment and Heritage Protection.

More information can be found in the PER under section 1.14.1.



Environmental Impact Assessment Act 1974 (EIA Act) and the Environmental Protection Act 1986 (EPA Act) require the assessment of the environmental effects of proposed actions. This assessment is a key part of the decision-making process for the proposed action.

ASSESSMENT SUMMARY

Australia is a signatory state of the London Protocol.

Australia is also a signatory of the World Heritage Convention. The World Heritage Committee requested the State Party not permit any new port development or associated infrastructure outside of the existing and long-established port areas and to insure that any development which would impact individually or cumulatively on the OUV of the property is not permitted. The proposed action may be inconsistent with the request of the World Heritage Committee.

Further, the aim of the World Heritage Convention that properties on the World Heritage List be conserved for all time. States that are parties to the Convention agree to identify, protect, conserve and present World Heritage properties.

The international agreement relating to the dumping of wastes and other matter in Australian waters, including dredged material, is called the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972* (the London Protocol). The London Protocol entered into force for its parties in 2006. Australia implements its obligations under the London Protocol through the Commonwealth's *Environment Protection (Sea Dumping) Act 1981*.

The objectives of the London Protocol and the Sea Dumping Act include minimising pollution caused by ocean disposal. Evaluating the alternatives to ocean disposal and identifying and implementing measures to prevent pollution as important first steps in the assessment process.

Annex 2 to the London Protocol sets out the assessment process that must be followed by countries assessing proposals for ocean disposal.

Article 3 of the London Protocol states that "*contracting parties shall apply a precautionary approach to environmental protection from dumping of wastes or other matter whereby appropriate preventative measures are taken when there is reason to believe that wastes or other matter introduced into the marine environment are likely to cause harm even when there is no conclusive evidence to prove a causal relation between inputs and their effects.*"

PRECAUTIONARY PRINCIPLE

Application of the precautionary principle is rarely documented and requires thorough assessment and consideration of certain conditions. The two main conditions which must be satisfied are:

1. A threat of serious or irreversible environmental damage; and
2. Scientific uncertainty¹⁷⁵.

It is important to consider the direct, indirect, secondary and long-term threats and the incremental or cumulative impacts of multiple or repeated actions or decisions¹⁷⁶. Relevant factors to consider for this assessment concerning the seriousness or irreversibility of environmental damage include: the perceived value of the threatened environment; and the level of public concern. Further factors may include, the manageability of possible impacts and the reversibility of possible impacts.

Importantly the risk of environmental damage must also be substantiated by scientific evidence yet the uncertainty relates to the nature and scope of the threat of environmental damage.

¹⁷⁵ Telstra Corporation Limited v Hornsby Shire Council (2006) NSWLEC 133

¹⁷⁶ Telstra Corporation Limited v Hornsby Shire Council (2006) NSWLEC 133



The level of scientific uncertainty required is debatable, however it is documented that without scientific uncertainty the precautionary principle cannot be applied. Instead preventative measures to control or mitigate against certain threats or environmental damage are applied, as in the case of permit conditions when an approval is granted.

When applying the precautionary principle, there is a reversion of the burden of proof. That is, the burden of proving that the environmental threat does not exist or is manageable shifts to the proponent of the proposed action¹⁷⁷.

Article 4 of the London Protocol details the dumping of wastes or other matter, and notes that, "*particular attention shall be paid to opportunities to avoid dumping in favour of environmentally preferable alternatives*".

Furthermore, Section 19 (5) of the *Environment Protection (Sea Dumping) Act 1981*, in relation to the granting of a permit details that a permit may only be granted in accordance with Annex 2 to the Protocol.

Annex 2, besides detailing that applicants must demonstrate that appropriate consideration has been given to a hierarchy of waste management options (i.e. re-use, disposal on land), it clearly states that: "*6. A permit to dump wastes or other matter shall be refused if the permitting authority determines that appropriate opportunities exist to re-use, recycle or treat the waste without undue risk to human health or the environment or disproportionate costs. The practical availability of other means of disposal should be considered in light of comparative risk assessment involving both dumping and the alternatives.*"

The PER and Supplementary PER outline several alternatives to the current proposal being assessed. Alternative options are discussed in detail in [88Q(b)]. Alternatives are based around different configurations of jetty extension to deeper water and placement of dredge material on land. The PER concludes that the original proposal of dredging and disposal to the Marine Park, was preferred to any of the feasible alternatives due to disproportionate costs¹⁷⁸.

Three workshops between February 2013 and March 2013 held with the proponent, terminal proponents and regulators and supported by the Supplementary PER found that the alternatives are technically feasible. Alternatives to the current proposal may either reduce or eliminate the need for dredging and ocean disposal of dredge material.

Australia is also a State Party to the World Heritage Convention which the GBR is inscribed. The World Heritage Committee has recently voiced concern over port and other development along the Great Barrier Reef coastline.

In the 36COM 7B.8 (2012) decision, the Committee noted with great concern the potential significant impact for the unprecedented scale of coastal development. The Committee requested the State Party not permit any new port development or associated infrastructure outside of the existing and long-established port areas and to insure that any development which would impact individually or cumulatively on the OUV of the property is not permitted.

Further, the Committee warned that in the absence of substantial progress (of the above and other specific requirements such as the Independent review of Gladstone Port and the GBR Strategic Assessment), the GBR may be considered for possible inscription on the List of World Heritage in Danger.

In the 37COM 7B.10 (2013) decision, the Committee acknowledged the progress made by the State Party with the Strategic Assessment, yet noted with concern the limited progress on the key requests made in the 36 COM 7B.8 decision (i.e. no further development). The World heritage centre and

¹⁷⁷ Telstra Corporation Limited v Hornsby Shire Council (2006) NSWLEC 133

¹⁷⁸ CDM Smith. 2013. North Queensland Bulk Port Corporation Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report. CDM Smith Brisbane pg 2-6



IUCN recommend urgent and decisive action in order for the Great Barrier Reef World Heritage Area to remain of the List of World Heritage in Danger.

The Committee has not defined what is a "long-established" or "major". Abbot Point is certainly potentially a major port although is one of the younger ports established in QLD.

Consideration

- There is a degree of uncertainty surrounding the proponents predictions of environmental impact and potential recovery times.
- In contrast to other coastal ports within the Great Barrier Reef Region the Port of Abbot Point is located in close proximity to relatively deep water. Based on information provided in the Supplementary PER Report there are feasible alternatives to the current proposal, which will either reduce or eliminate the need for dredging and ocean disposal of dredge material and may consequently reduce potential impacts to nearby and adjacent sensitive receptors.
- Costs associated with the alternatives are more than the proposed activity.
- Consideration of a permit for sea disposal of dredge material in the GBRMP at an unspecified location, where appropriate opportunities exist to avoid this option, may be inconsistent with Australia's obligations under the London protocol and the *Environment Protection (Sea Dumping) Act 1981*.

In line with Article 3 of the London Protocol, acting before scientific certainty will give the benefit of the doubt to environmental protection, to avoid environmental harm and err on the side of caution, by enacting the precautionary principle.

There are possible mitigation measures which would minimise or avoid environmental and social impacts of sea disposal to the Marine Park.

The alternatives have been costed by the proponent to cost more than the proposed activity.

Approval of this proposal may be contrary to the recommendations of the World Heritage Committee.



(B333(d)) any material by a permit assessment, as a deemed application, in a case in relation to the proposed disposal of dredge material, relating to the management of the Great Barrier Reef Marine Park.

ASSESSMENT SUMMARY

This proposal has been assessed and approved with conditions under the under EPBC Act. The proposal is a deemed application under the GBRMPA Act. A decision under the GBRMPA Act must be made after a decision under the EPBC Act.

If dredging and or dredge disposal takes place within the Marine Park GBRMPA has delegations under the Sea Dumping Act to make decisions in regards to this proposal.

No decision has been made under the *Environment Protection (Sea Dumping) Act 1981* for the proposed activity.

(B333(d)) any material by a permit assessment, as a deemed application, in a case in relation to the proposed disposal of dredge material, relating to the management of the Great Barrier Reef Marine Park.

ASSESSMENT SUMMARY

Not Applicable



[Redacted text block containing assessment criteria and details]

ASSESSMENT SUMMARY

The applicant is a suitable person to hold such a permission. The suitability of the individual companies who will actually fund and possibly undertake the works, is discussed in criterion [88(Q)(f)].

The proponent has an environmental policy which is used to express commitment to the protection of the environment and to the sustainable management of its ports and activities. The Board charter does not require environmental expertise under the roles and responsibilities of the Board and of Management, rather it focuses on business acumen.

On 14 April 2010 the proponent submitted an incident report to the GBRMPA for conducting a seismic survey without a Great Barrier Reef Marine Parks permit. The proponent self-reported this incident, advising the GBRMPA that this action was a technical breach undertaken by a contractor. GBRMPA issued an advice letter to the proponent and no further action was taken.

No other compliance incidents have been reported for this applicant. Overall the applicant has a satisfactory history in relation to environmental matters.

The appropriate Permit Assessment Application Fee (PAAF), and sea dumping application fee has been paid. The applicant was informed during the process that payment of the application fees, under the GBRMPA Act does not guarantee that a permit will be granted.

The proposal is consistent with this criteria.



ASSESSMENT SUMMARY

The main object of the Act is to 'provide for the long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region'.

The proposal to dump 3 million cubic metres of dredge material at a site (the DMRA) within the Marine Park which is close to sensitive receptors has the potential to impact on the values of the Marine Park.

The other objects of the Act are to do the following, so far as is consistent with the main object:

- (a) allow ecologically sustainable use of the Great Barrier Reef Region for the purposes including ... economic activities

The proposal may affect the public enjoyment and appreciation, public education, recreation, cultural activities or research in relation to the natural, social, economic and cultural systems and value of the Great Barrier Reef Region.

Section 3AA of the Act discusses the principles of 'Ecologically sustainable use'.

Additional management measures to avoid potential impacts upon sensitive receptors, development of adaptive management plans for the proposed activity including ecologically relevant trigger levels for sensitive receptors may also assist the proposed activity to achieve the objectives of the Act.

The potential impacts associated the proposal are discussed in Criteria 88Q(a) and 88R(c):

Option for managing monitoring and mitigating the potential impacts associated with this activity are discussed in criteria 88Q(b).

In order to fully consider the activity under this criteria all matters relevant to achieving the objects of the Act are considered.

Seagrass is the dominant benthic community in close proximity to the dredging area.

An event-tree analysis was conducted for the entire proposal (Attachment B), was performed considering both dredging and disposal elements of the proposal as the disposal is considered to be wholly dependent and therefore relevant when considering any other matters as per this criterion.

Event-tree analysis is a methodology that models risk as a chain of interconnected events. It identifies hazards, probability and risks¹⁷⁹. The approach requires a more systematic and conservative approach than a traditional risk assessment¹⁸⁰. Starting with an initial event (being dredging and disposal), a number of assumptions and logic are used to determine possible outcomes and consequences. Each event is defined by probability which then determines whether or not the scenario proceeds further.

¹⁷⁹ Asante-duah, D.K. 1998. Risk Assessment in Environmental Management. John Wiley and Sons Ltd. England

¹⁸⁰ Asante-duah, D.K. 1998. Risk Assessment in Environmental Management. John Wiley and Sons Ltd. England



The event tree model indicates that there is a 69.11 percent chance of long term loss and slow recovery for seagrass within Abbot Bay, a 17.55 percent probability of complete loss and no recovery and a 13.35 percent chance of no loss.

The principles of ecologically sustainable use, according to section 3AB of the Act include:

- (a) Decision-making processes should effectively integrate both long-term and short-term environmental, economic, social and equitable considerations.
- (b) The precautionary principle
- (c) The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations;
- (d) The conservation of biodiversity and ecological integrity should be a fundamental consideration in decision-making.
- (e) Improved valuation, pricing and incentive mechanisms should be promoted.

In making a decision the principles of ecologically sustainable use must be taken into account.

The main object of the Act is to 'provide for the long term protection and conservation of the environment, biodiversity and heritage values of the Great Barrier Reef Region

In order to fully consider the proposed activity under this criteria, all matters relevant to achieving the objects of the Act are considered, in this case dredging and disposal.

The event tree analysis identifies a 69.11 percent chance of long term loss and slow recovery for seagrass within Abbot Bay.

Additional management measures to avoid potential impacts to the Marine Park and adaptive managing measures such as the development of ecological relevant trigger level may also assist the proposed activity in achieving the objects of the Act.



REFERENCES USED IN THIS ASSESSMENT

- Asante-duah, D.K. (1998). *Risk Assessment in Environmental Management*. England: John Wiley and Sons Ltd.
- Australian Institute of Marine Science. (2013). Holbourne Island Reef Surveys, Retrieved 16 January 2014 from <http://data.aims.gov.au/reefpage2/reefpage.jsp?fullReefID=19103S>
- Bray, R.N. (2009). *Environmental Aspects of Dredging*. Netherlands: Taylor & Francis.
- Brinkman, R. & Furnas, M. (2013). *Review of draft GBRMPA assessment documentation for Abbot Point, Capital Dredging Proposal T0-T3 (G34897.1)*, Townsville: Australian Institute of Marine Science.
- Broderick, A. C., Coyne, M. S., Fuller, W. J., Glen, F. & Godley, B.J. (2007). Fidelity and overwintering of sea turtles. *Proceedings of the Royal Society B*, 274, 1533-1538. doi:10.1098/rspb.2007.0211
- Brodie, J., McCulloch, M., Coles, R., Mumby, P., Fernandes, L., Pandolfi, J., ... Richmond, B. (2013). *Declaration by concerned scientists on industrial development of the Great Barrier Reef coast*.
- Brodie, J., Binney, J., Fabricius, K., Gordon, I., Hoegh-Guldberg, O., Hunter, H., ... Wilkinson, S. (2008). *Scientific consensus statement on water quality in the Great Barrier Reef*. Brisbane: State of Queensland.
- CDM Smith. (2013). *North Queensland Bulk Port Corporation: Abbot Point Terminal 0, 2 and 3 Capital Dredging PER Supplementary Report (EPBC 2011/6213/GBRMPA G34897.1)*. Brisbane: CDM Smith.
- Chartrand, K. M., Rasheed, M., Petrou, K., & Ralph, P. (2012). Establishing tropical seagrass light requirements in a dynamic port environment. *Proceedings of the 12th International Coral Reef Symposium, Cairns, Australia*.
- Constanza, R., d'Arge, R., de Groot, R., Farber, S., Grasso, M., Hannon, B., ... van den Belt, M. (1997). The value of the world's ecosystem services and natural capital. *Nature*, 387, 253-260
- Context Pty Ltd. (2013). *Defining the aesthetic values of the Great Barrier Reef: Report 1 Methodology*. Canberra: Department of Sustainability, Environment, Water, Population and Communities.
- Cooper, T. F., Uthicke, S., Humphrey, C., & Fabricius, K. E. (2007). Gradients in water column nutrients, sediment parameters, irradiance and coral reef development in the Whitsunday Region, central Great Barrier Reef. *Estuarine, coastal and Shelf Science*, 74, 458-470. doi:10.1016/j.ecss.2007.05.020
- De'ath, G., Fabricius, K.E., Sweatman, H. & Puotinen, M. (2012). The 27-year decline of coral cover on the Great Barrier Reef and its causes. *Proceedings of the National Academy of Sciences*, 109(44), 17995-17999.
- Delvin, M., Waterhouse, J., Taylor, J., & Brodie, J. (2001) *Research Publication No. 68, Flood plumes in the Great Barrier Reef: Spatial and Temporal Patterns in Composition and Distribution*. Townsville: Great Barrier Reef Marine Park Authority.
- ECOLEX. (2006). Telstra Corporation Limited v Hornsby Shire Council: NSWLEC 133. Retrieved from <http://www.ecolex.org/ecolex/ledge/view/RecordDetails?id=COU-144386&index=courtdecisions>
- Environmental Protection Agency. (2001). *Guidelines for Dredging, Appendix 4: Estimated nutrient release by dredging*. Victoria: Environmental Protection Agency.



Erftemeijer, P. L. A. & Robin Lewis, R. R. (2006). Environmental impacts of dredging on seagrasses: A review. *Marine Pollution Bulletin* 52, 1553-1572. doi:10.1016/j.marpolbul.2006.09.006

Erftemeijer, P. L. A., Riegl, B., Hoeksema, B. W. & Todd, P. A. (2012). Environmental impacts of dredging and other sediment disturbances on corals: A review. *Marine Pollution Bulletin*, 64, 1737-1765. doi:10.1016/j.marpolbul.2012.05.008

GHD. (2012). *Abbot Point Cumulative Impact Assessment: Technical Report Marine Water Quality Final*. Brisbane: GHD.

GHD. (2012). *North Queensland Bulk ports: Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report (EPBC 2011/6213/GBRMPA G34897.1)*. Brisbane: GHD.

Great Barrier Reef Marine Park Authority. (2002). *Non-reef bioregion: NB7 Mid Shelf Lagoon*. Townsville: Great Barrier Reef Marine Park Authority.

Great Barrier Reef Marine Park Authority. (2011). *Commercial Fishing and Zoning*. Retrieved December 9, 2013, from <<http://www.gbrmpa.gov.au/zoning-permits-and-plans/zoning/commercial-fishing-and-zoning>>

Great Barrier Reef Marine Park Authority. (2011). *Extreme Weather and the Great Barrier Reef*. Townsville: Great Barrier Reef Marine Park Authority.

Great Barrier Reef Marine Park Authority. (2013). *Great Barrier Reef Region Strategic Assessment Program Report: Draft for public comment*. Townsville: Great Barrier Reef Marine Park Authority.

Indexmundi. (2013) *Coal, Australian Thermal Coal Monthly Price – Australian Dollar per Metric Ton*. Retrieved August 5, 2013 from <<http://www.indexmundi.com/commodities/?commodity=coal-australian&months=60¤cy=aud>>

Jones, R. A., & Lee, G. F. (1981). The Significance of Dredging and Dredged Material Disposal as a Source of Nitrogen and Phosphorus for Estuarine Waters. In: *Estuaries and Nutrients* (pp 517-530). Clifton: Humana Press.

McCutcheon, P. (2013, February 25) The 7:30 Report: Could WWII plane shoot down coal port expansion. *Australian Broadcasting Corporation*. Retrieved June 18, 2013, from <<http://www.abc.net.au/7.30/content/2013/s3698078.htm>>

McKenna, S. A., & Rasheed, M. A. (2011) *Port of Abbot Point Long-Term Seagrass Monitoring: Update Report 2008-2011*. Cairns: Fisheries Queensland.

McKenna, S. A. & Rasheed, M. A. (2013). *Port of Abbot Point Long-Term Seagrass Monitoring: Annual Report 2011-2012*. Cairns: James Cook University, Centre for Tropical Water & Aquatic Ecosystem Research.

McPhee, D., Souter, D. & Toon, J. (2012, August 31). *The Potential Impact of Port Developments at Abbot Point on Fisheries (Stage One). Report Prepared for the Abbot Point Working Group (APWG)*. Brisbane: Wave international.

National Native Title Tribunal. (2012). *Extract from Register of Indigenous Land Use Agreements, Port of Abbot Point and Abbot Point State Development Area*. NNTT, QLD. Retrieved from <http://www.nntt.gov.au/Indigenous-Land-Use-Agreements/Search-Registered-ILUAs/Pages/QLD_-_Registered_ILUA_-_Port_of_Abbot_Point_and_Abbot_Point_State_Development_Area_ILUA_QI2011_063.aspx>

National Research Council. (2002). *Effects of Trawling and Dredging on Seafloor Habitat*. Washington, DC: The National Academies Press.



North Queensland Bulk Ports Corporation Limited, (2012, June 11). *Annual Report: 2011-2012*. Retrieved from <<http://www.nqbp.com.au/annual-report-2011-12/>>

North Queensland Bulk Ports Corporation. (2013). *Abbot Point Monthly Actual Throughput*. Retrieved June 19, 2013 from <<http://www.nqbp.com.au/abbot-point> >

O'Neill, L., & Parker, B. (2007). *Juru, Gia and Ngaru Turtle and Dugong Memorandum of Understanding*. Agreements, treaties and negotiated settlements project. Retrieved June 19, 2013 from <<http://www.atns.net.au/agreement.asp?EntityID=3722>>

PIANC. (2010). *PIANC Report 108. Dredging and port construction around coral reefs*. Retrieved from <<http://www.pianc.org/edits/articleshop.php?id=1001070>>

Pilkington, E. (2012, March 3). AVAAZ faces questions over role at centre of Syrian protest movement. *The Guardian*. Retrieved from <<http://www.theguardian.com/world/2012/mar/02/avaaz-activist-group-syria>>

Rasheed, M. A., Thomas, R., & McKenna, S. A. (2005). *Department of Primary Industries and fisheries Information Series Q105044. Port of Abbot Point seagrass, algae and benthic macro-invertebrate community survey - March 2005*. Cairns: Department of Primary Industries and Fisheries.

Sinclair Knight Merz Pty Ltd. & Asia-Pacific Applied Science Associates. (2013). *Improved dredge material management for the Great Barrier Reef Region: Synthesis Report*. Townsville: Great Barrier Reef Marine Park Authority.

State of Queensland. (2013). *Great Barrier Reef: Second Report Card 2010, Reef Water Quality Protection Plan*. Brisbane: State of Queensland.

Stoeckl, N. (2013). *NERP Project 10.2: Socio-economic systems and reef resilience*. TE NERP. (In Prep.)

Unsworth, R. K. F., McKenna, S. A., & Rasheed, M. A. (2010). *Seasonal dynamics, productivity and resilience of seagrass at the Port of Abbot Point: 2008 – 2010*. Cairns: Fisheries Queensland.

Wenger, A. S. & McCormick, M. I. (2013). Determining trigger values of suspended sediment for behavioural changes in a coral reef fish. *Marine Pollution Bulletin*, 70, 73-80.
doi:10.1016/j.marpolbul.2013.02.014

Wenger, A. S., McCormick, M. I., Mcleod, I. M. & Jones, G. P. (2013). Suspended sediment alters predator-prey interactions between two coral reef fishes. *Coral Reefs*, 32(2), 369-374.
doi:10.1007/s00338-012-0991-z

Yaakub, S. M., Chen, E., Bouma, T. J., Erfemeijer, P. L. & Todd, P. A. (2013). Chronic light reduction reduces overall resilience to additional shading stress in the seagrass *Halophila ovalis*. *Marine Pollution Bulletin*. in press. doi: 10.1016/j.marpolbul.2013.11.030



Risk Assessment

Risk Methodology:

SEVERITY	DESCRIPTION
CATASTROPHIC	Impact is likely affecting the nature of the receptor over a wide area OR impact is catastrophic and possibly irreversible over a small area or to a sensitive population or community Recovery period of greater than 20 years likely OR condition of an affected part of the ecosystem irreversibly compromised
MAJOR	Impact is significant at local or regional level or to a sensitive population or community Recovery period of 10-20 years are likely
MODERATE	Impact is present at either a local or wider level Recovery period of 5-10 years anticipated
MINOR	Impact is present but not to the extent that it would impact the overall condition of the ecosystem, sensitive population or community in the long term.
INSIGNIFICANT	No impact or, if impact is present, then not to an extent that would draw concern from a responsible person No impact on the overall condition of the ecosystem.

Table 1. Consequence (Environment - Ecosystem level)

SEVERITY	DESCRIPTION
CATASTROPHIC	Negative and extensive national media attention and national campaigns
MAJOR	Negative national media attention and national campaign
MODERATE	Negative regional media attention and regional group campaign
MINOR	Individual complaints
INSIGNIFICANT	No media attention

Table 2. Consequence (Environmental Perception)

DESCRIPTION	FREQUENCY	PROBABILITY
Almost certain	Expected to occur more or less continuously throughout a year (e.g. more than 250 days per year)	95-100% chance of occurring
Likely	Expected to occur once or many times in a year (e.g. 1 to 250 days per year)	71-95% chance of occurring
Possible	Expected to occur once or more in the period of 1 to 10 years	31-70% chance of occurring
Unlikely	Expected to occur once or more in the period of 10 to 100 years	5-30% chance of occurring
Rare	Expected to occur once or more over a timeframe greater than 100 years	0-5% chance of occurring

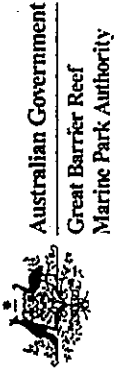
Table 3: Likelihood

LIKELIHOOD	SEVERITY	RISK GRADE
ALMOST CERTAIN	CATASTROPHIC	E
ALMOST CERTAIN	MAJOR	E
ALMOST CERTAIN	MODERATE	E
ALMOST CERTAIN	MINOR	E
ALMOST CERTAIN	INSIGNIFICANT	E
LIKELY	CATASTROPHIC	E
LIKELY	MAJOR	E
LIKELY	MODERATE	E
LIKELY	MINOR	E
LIKELY	INSIGNIFICANT	E
POSSIBLE	CATASTROPHIC	L
POSSIBLE	MAJOR	L
POSSIBLE	MODERATE	L
POSSIBLE	MINOR	L
POSSIBLE	INSIGNIFICANT	L
UNLIKELY	CATASTROPHIC	L
UNLIKELY	MAJOR	L
UNLIKELY	MODERATE	L
UNLIKELY	MINOR	L
UNLIKELY	INSIGNIFICANT	L
RARE	CATASTROPHIC	L
RARE	MAJOR	L
RARE	MODERATE	L
RARE	MINOR	L
RARE	INSIGNIFICANT	L

Table 4: Hazard Risk Grade

CONFIDENCE IN PREDICTION OF RISK	SEVERITY	RISK GRADE
High	CATASTROPHIC	E
High	MAJOR	E
High	MODERATE	E
High	MINOR	E
High	INSIGNIFICANT	E
Medium	CATASTROPHIC	E
Medium	MAJOR	E
Medium	MODERATE	E
Medium	MINOR	E
Medium	INSIGNIFICANT	E
Low	CATASTROPHIC	L
Low	MAJOR	L
Low	MODERATE	L
Low	MINOR	L
Low	INSIGNIFICANT	L
Very limited evidence, assessment based on anecdotal information or evidence points to uncertainty	CATASTROPHIC	L
Very limited evidence, assessment based on anecdotal information or evidence points to uncertainty	MAJOR	L
Very limited evidence, assessment based on anecdotal information or evidence points to uncertainty	MODERATE	L
Very limited evidence, assessment based on anecdotal information or evidence points to uncertainty	MINOR	L
Very limited evidence, assessment based on anecdotal information or evidence points to uncertainty	INSIGNIFICANT	L

PERMIT ASSESSMENT



Activity or Element	Attachment A- Risk Assessment	Date -- 19 July 2013			
	Project:	Abbot Point dredging and disposal of 3 million cubic metres			
	Project team:	Environment Assessment and Management			
	Assumptions and/or Nominal Conditions:				
	Personnel	Nicholas Baker, Adam Smith, Rean Gilbert, Kevin Edison			
	Consultation	Leigh Gray, Laurence McCook, Roger Beeden, Mark Read, Carol Honchin			
	Environment	Water quality at the mid shelf location is generally good but gets progressively worse towards the inshore area.			
	Information (Confidence)	Low -- concern about information reliability in PER and supplementary			
	Time	Decision under the GBRMP Act due on the 31 January 2014			
		Hazard	Factors and Considerations	Initial risk	Proposed Treatment/Management



WATER QUALITY	
<p>Decline in water quality in and around the DMRA by increased TSS and turbidity</p>	<p>The material to be disposed is made up of 39% fine sediments (silt and clay) which is easily resuspended and will contribute to TSS and turbidity causing a degradation of water clarity/quality. The fact that the DMRA is in deeper water does not necessarily imply that it is more retentive. The heavier fractions of the sediment will not remobilise as readily. There are uncertainties with the predictive modelling as amongst the limitations it did not take into account the long-term resuspension of fine sediments. The predictive modelling shows the area affected by TSS and turbidity from the disposal action to exceed 250 km². Three consecutive dredging/disposal campaigns over 6 years is likely to create degraded water quality in the disposal area and surroundings for 6 to 7 years thus leading to a consequence rating of Moderate.</p>
<p>Decline in water quality via increased nutrients within 250 km² from DMRA (or greater)</p>	<p>Nutrients are present in material proposed to be disposed at the DMRA. The exact pathways for exposure (the bioavailability of the nutrients in the sediment) is unclear. Sediment to be disposed contains approximately 540 tonnes of N and 810 tonnes of P.</p>
<p>Impact on water quality due to the introduction of contaminants derived from dredged and disposed sediment</p>	<p>Sediment has been tested in accordance with national guidelines and found to be suitable chemically for ocean disposal. Assessment of the sediment according to the national guidelines does not eliminate the possibility that pockets of contaminated sediment have not been sampled. The consequences of this could be moderate as the persistence of heavy metals in the marine environment is high and heavy</p>
<p>Almost Certain X Moderate/Major</p>	<p>Likely X Moderate/Major</p>
<p>Likely/Possible X Major/Moderate</p>	<p>Likely X Major/Moderate</p>
<p>Rare X Moderate</p>	<p>Rare X Moderate</p>

Disposal of 3 million cu m at Proposed Dredge Material Relocation Area (3 separate campaigns of up to 1.6 million cu m between 2014 and 2020)

¹⁸¹ The Minor consequence rating was added as a range after advice from the Water Quality group (17 January 2014)
¹⁸² The range of likelihood and consequence ratings were added after advice from the Water Quality group (17 January 2014)



SEAGRASSES	
<p>Re-suspension of fine sediments causes sub lethal impacts¹⁸³ on seagrass or seagrass habitat through increased light attenuation, due to increased TSS and turbidity and smothering due to sedimentation.</p>	<p>No seagrass at DMRA. 39% of the sediment is likely to resuspend and migrate (possibly to areas that do have seagrass). Predictive modelling did not account for resuspension of sediments over long time frames and large geographical areas. Extent of seagrass surveying was limited and thus seagrass could be present close to the DMRA. The PER predicts turbid plume extent from disposal activity to affect 2000 plus ha of potential seagrass habitat. Recovery of seagrass can range between 2 and 5 years; there is uncertainty surrounding the possibility of seagrasses ability to recover between dredge campaigns and intermittent climatic events. 6-7 year's worth of disposal will impact on seagrass habitats with low resilience with the possibility of causing long-term impacts or lethal irreversible impacts.</p>
<p>Re-suspension of fine sediments causes lethal impacts on seagrass or seagrass habitat through increased light attenuation, due to increased TSS and turbidity and smothering due to sedimentation.</p>	<p>No seagrass at DMRA. 39% of the sediment is likely to resuspend and migrate. Predictive modelling did not account for resuspension of sediments over long time frames and large geographical areas. Extent of seagrass surveying was limited. The PER predicts turbid plume extent from disposal activity to affect XX ha of potential seagrass habitat. Recovery of seagrass can range between 2 and 5 years; there is uncertainty surrounding the possibility of seagrasses to recover between dredge campaigns and intermittent climatic events. 6-7 year's worth of dredging will impact on already stressed seagrass habitats with the possibility of causing long-term impacts or lethal irreversible impacts.</p>
<p>High</p>	<p>To reduce the likelihood of sub lethal impacts on seagrasses: 1. Implement adaptive water quality monitoring and management program with 'clear stop dredge' triggers (conservative triggers) and manage turbidity plumes during dredging. 2. Implement baseline studies for seagrass distribution in the areas predicted to be affected by dredge plumes. 3. Proponent to redo baseline water quality thresholds</p>
<p>Unlikely/Minor</p>	<p>Rare/Minor</p>
<p>Unlikely/Moderate</p>	<p>MEDIUM</p>
<p>MEDIUM</p>	<p>MEDIUM</p>

¹⁸³ A sublethal impact has been used in this risk assessment to mean an impact that does not necessarily kill but causes changes in growth or other factors which may impact on its overall resilience, tolerance or viability. A sub-lethal impact for long periods of time could lead to a lethal impact. Sub-lethal indicators of seagrass stress has been the subject of debate.



				<p>seagrass. The permanent or short term loss of seagrass may have implications for dugong and turtle. There are dugong protection areas to the north and the south of the proposed disposal site.</p>	
			<p>Disposal is approximately 5-7km from Nares Rock and Holbourne Island. Holbourne Island has extensive fringing reefs. The predictive modelling shows up to 25mg/L TSS impacting on Nares Rock and no impacts on Holbourne Island. There are limitations and uncertainties surrounding the modelling and the duration of the impact. Alternate oceanographic conditions were not properly modelled and therefore there is uncertainty surrounding any impacts on Holbourne Island. Due to the uncertainties associated with the modelling the likelihood has been conservatively rated as Possible (due to proximity to proposed DMRA) and consequence rated as Moderate due to proximity to DMRA and lack of investigation into inter-annual variation.</p>	<p>Coral communities at Holbourne Island and Nares Rock will experience sub lethal impacts through increased light attenuation, and sedimentation due to increased TSS and Turbidity.</p>	<p>CORALS</p>
		<p>Possible - Moderate</p>	<p>Possible - Moderate</p>	<p>To reduce the likelihood of sub lethal impacts to corals at Holbourne Island/Nares Rock: 1. Live oceanographic plume modelling on daily basis, no disposal at proposed DMRA during times when plume is predicted to travel towards coral reefs. 2. Investigate an alternate DMRA within the Investigation Area to be used during alternate oceanographic conditions 3. Redo plume model using ocean currents and inter-annual variation to determine appropriate monitoring sites (control/impact)</p>	<p>Unlikely - Moderate MEDIUM</p>



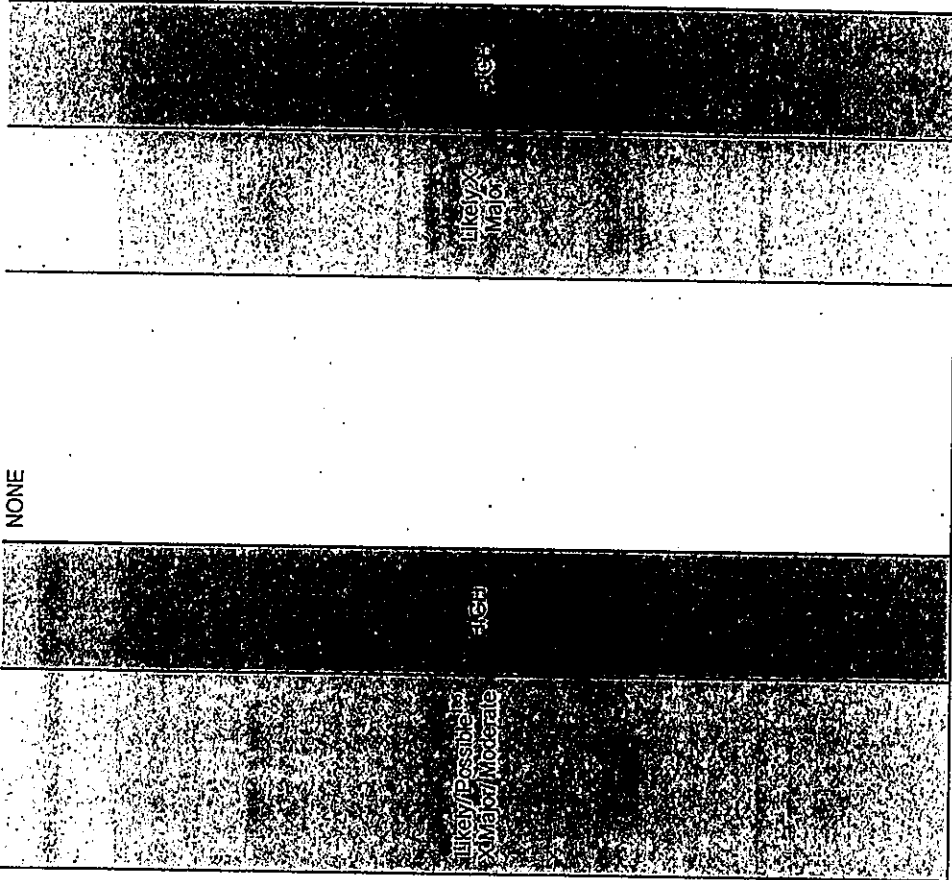
		MEGAFAUNA				
<p>Coral communities at Holbourne Island and Nares Rock will experience lethal impacts through increased light attenuation, and sedimentation due to increased TSS and Turbidity.</p>	<p>Disposal is approximately 5-7km from Nares Rock and Holbourne Island. Holbourne Island has extensive fringing reefs. The predictive modelling shows up to 25mg/L TSS impacting on Nares Rock and no impacts on Holbourne Island. There are limitations and uncertainties surrounding the modelling and thus the results may underestimate the extent and intensity of the plume. Alternate oceanographic conditions were not properly modelled and therefore there is great uncertainty surrounding any impacts on Holbourne Island. Due to the uncertainties associated with the modelling the likelihood has been conservatively rated as Possible (due to proximity to proposed DMRA and consequence rated as Moderate due to proximity to DMRA and lack of investigation into inter-annual variation).</p>	<p>Possible X Moderate</p>	<p>HIGH</p>	<p>To reduce the likelihood of lethal impacts to corals at Holbourne Island/Nares Rock: 1. Live oceanographic plume modelling on daily basis, no disposal at proposed DMRA during times when plume is predicted to travel towards coral reefs. 2. Investigate an alternate DMRA within the Investigation Area to be used during alternate oceanographic conditions 3. Redo plume model using ocean currents and inter-annual variation to determine appropriate monitoring sites (control/impact)</p>	<p>Unlikely X Moderate</p>	<p>MEDIUM</p>
<p>Sublethal/indirect impacts on dugong populations</p>	<p>A reduction in seagrass abundance may have flow-on consequences on dugongs. Dugongs main food source is seagrasses. Dugong populations have been severely impacted by the GBR wide loss of seagrass caused by the 2011-2012 extreme weather events. There are Dugong Protection Areas to the north and to the south of the dredging activity and offshore seagrasses are starting to recover. A proportion of the local dugong populations are likely to move away from the area to seek other seagrass meadows.</p>	<p>Unlikely X Minor</p>	<p>LOW</p>	<p>Mitigation measures include reducing the risk to seagrass impacts.</p>	<p>Unlikely X Minor</p>	<p>LOW</p>
<p>Sublethal/indirect impacts on marine turtles</p>	<p>A reduction in seagrass abundance may force green turtles to look for alternative foods. Movement studies indicate marine turtles maintain a high degree of site fidelity and will not move away to look for alternative seagrass meadows. If there is poor quality or insufficient quantities of forage then resident marine turtles will lose conditions and may be immuno-compromised</p>	<p>Unlikely X Minor</p>	<p>LOW</p>	<p>No proposed mitigation measures</p>	<p>Unlikely X Minor</p>	<p>LOW</p>
<p>Lethal/direct impacts to marine mega-fauna</p>	<p>Migratory and/or threatened megafauna may suffer injury or death associated with increased movement of vessels in the area and interaction with the dredge equipment</p>	<p>Rare X Moderate</p>	<p>MEDIUM</p>	<p>To reduce likelihood of megafauna and vessel interactions: 1. Implement appropriate site supervision</p>	<p>Rare X Moderate</p>	<p>MEDIUM</p>



The activity has an adverse effect on one or more of the GBR's World Heritage Values causing a degradation in environmental, social or cultural values

Criterion (i) an outstanding example representing a major stage of the earth's evolutionary history; the Disposal of dredge spoil may impact on the sediment composition at the DMRA by changing the composition. Coral reefs and seagrasses may be impacted by the disposal activities. At a GBR scale those corals and seagrasses are not unique. Criterion (ii) an outstanding example representing significant ongoing geological processes, biological evolution and man's interaction with his natural environment; the proposal may impact on man's interaction with the natural environment from both a social perspective and an indigenous perspective. Criterion (iii) contains unique, rare and superlative natural phenomena, formations and features and areas of exceptional natural beauty. The activity of disposal will form sediment plumes visible from the coastline, aircraft and satellites which may temporarily impact on the exceptional natural beauty of the GBRWHA. This is a temporary impact. Criterion (iv) provides habitats where populations of rare and endangered species of plants and animals still survive: The waters around the proposed disposal sites host a sweep of rare and endangered species. These include whales, dolphins, turtles, various snakes and dugong. The large scale of the GBRWHA creates specific spatial problems. In particular it is difficult to determine: ~ the level of activity that should be allowed to occur in the World Heritage Area whilst still being consistent with the OUV of the GBRWHA ~ how local-scale impacts affect the World Heritage value of the entire site

NONE



165 Possible likelihood and Moderate consequence added after some concerns from the Water Quality group (17 January 2014)

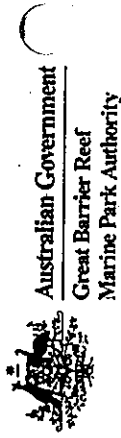


		ENVIRONMENTAL PERCEPTION ¹⁸⁶					
WWII Catalina plane wreck will be impacted by sedimentation	Disposal is approximately 3km from the Wreck 12 people perished in the crash (potential war grave) Modelling does not predict an impact There are limitations and uncertainties surrounding the modelling Portions of the wreckage have not as yet been located - location is unknown. Disturbing a WWII war grave will have 'Major' social and heritage consequences. The likelihood is unknown and therefore conservatively rated as 'Possible' Any impact on this heritage site is unacceptable.	Possible X Major	HIGH	To reduce likelihood of impacts on Catalina: 1. Live daily oceanographic plume modelling and no disposal at DMRA when plume is predicted to go towards Catalina- however due to resuspension this is unlikely to mitigate impacts on the Catalina. 2. The only mitigating measure is to avoid impacts on the WWII Catalina by finding an appropriate site for disposal within the Investigation Area	Rare X Major	MEDIUM	
Loss of income and employment of local commercial fisheries and local seafood businesses by degrading fishery resources and restricting or displacing fishers	Turbid plumes and changed benthic habitat may result in decreased fishing effort in immediate area. Commercial fishers have indicated that they will be forced to fish elsewhere if this option is approved. Scallop and prawn fisheries impacted by change in benthic habitat from dredging, mackerel and shark fisheries may be impacted by substantial turbid plumes.	Possible X Moderate	HIGH	To reduce likelihood: Identify an appropriate site for disposal within the Investigation Area	Unlikely X Moderate	MEDIUM	
Negative impact on regional reputation of seafood quality	Dredging and spoil disposal has been associated with poor seafood quality.	Possible X Major	HIGH	Communication strategy	Possible X Moderate	HIGH	
Loss of income & employment for dive operators and other marine tourism operators & suppliers for recreational activities (e.g. boats, fishing & camping equipment)	Perception of negative impacts from dredging activity may result in decreased recreational or visiting fishers in the area. Dive operators may suffer a downturn in business if WWII Catalina wreck is impacted.	Unlikely X Minor	LOW	To reduce likelihood: Identify an appropriate site for disposal within the Investigation Area	Unlikely X Minor	LOW	

¹⁸⁶ Based on Table 2: Consequence (Environmental Perception) of the EAM Risk Management Framework (2009)

Dredge Material Disposal

PERMIT ASSESSMENT



	<p>Damaged regional reputation of tourism and recreation for tourists and residents (including recreational fishing and coastal and island camping)</p> <p>The approval of dredging has an adverse social perception effect</p>	<p>There is already national media attention surrounding the proposal</p> <p>National and international media attention towards GBRMPA may be negative by permitting disposal of dredge spoil in the Marine Park. This is particularly the case as it is already recognised in the public arena that the GBR is threatened by dredging and dredging related activities and because there are known alternatives to disposal at Abbot Point (eg. extension of trestles and land disposal). This may negatively impact GBRMPA's reputation.</p> <p>There may be negative implications for the GBRWHA and GBRMPA in relation to the actual or perceived perceptions of the UNESCO World Heritage Committee that the world heritage status of the GBRWHA is not being managed in accordance with UNESCO's recommendations. This may contribute to either a downgrading of world heritage status for the GBR and/or negative publicity and ramifications for the GBRMPA and Australian Government.</p> <p>The catastrophic environmental perception consequence rating is attributed because the disposal of dredge spoil seems to be more controversial than the dredging of shipping channels; which is seen as a necessary action to keep ports operational.</p>	Likely X Major	HIGH	To reduce likelihood: Identify an appropriate site for disposal within the Investigation Area	Likely X Major	HIGH
Investigation Area offshore (3 separate campaigns of up to 1.6 million cu	<p>Water Quality</p> <p>Seagrass</p> <p>Coral</p> <p>Other Benthic Communities</p> <p>Threatened and</p>		Likely X Catastrophic	EXTREME	To reduce likelihood: Identify an appropriate site for disposal within the Investigation Area	Likely X Catastrophic	EXTREME E

**Dredge Material
Disposal**

PERMIT ASSESSMENT

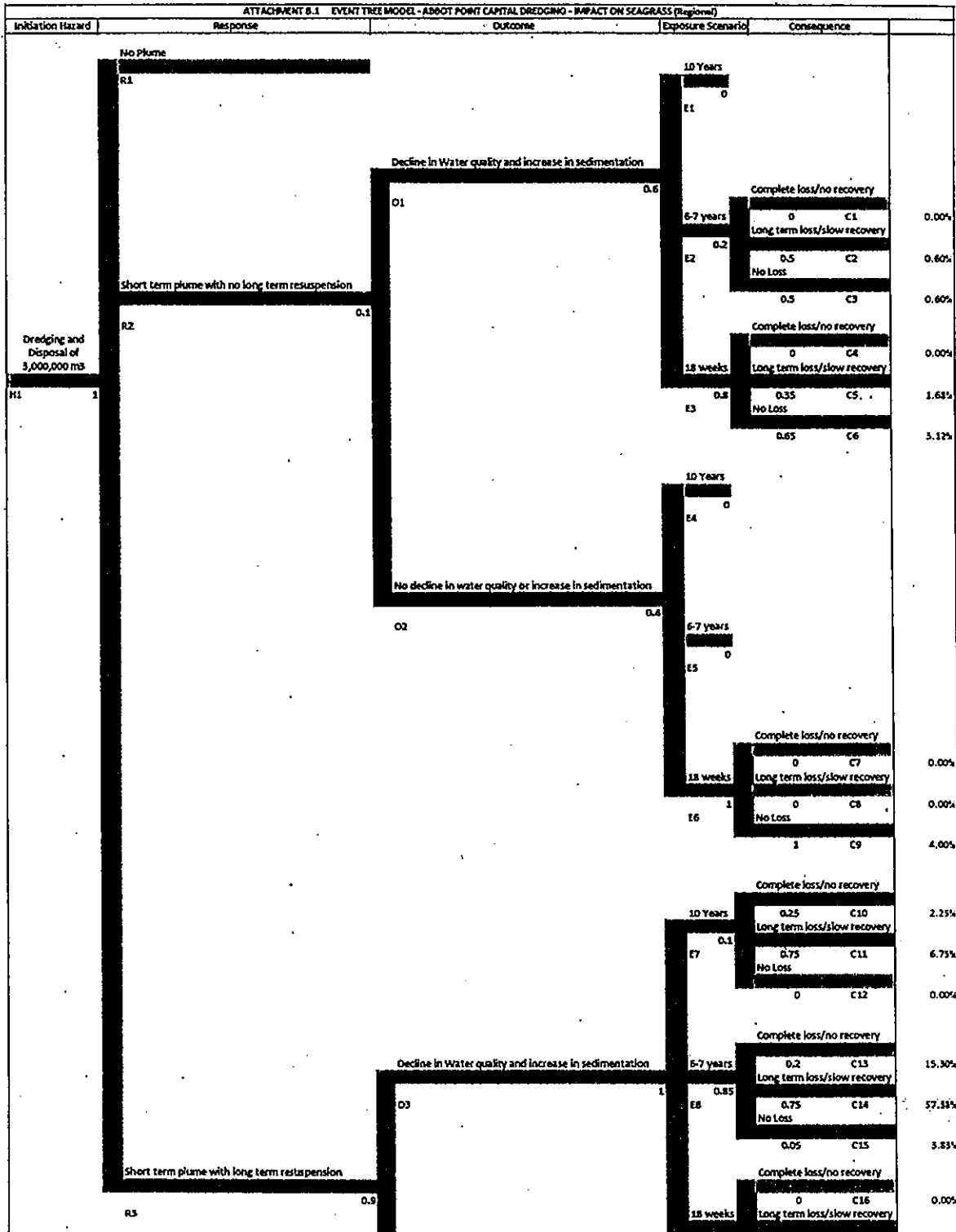


Australian Government
Great Barrier Reef
Marine Park Authority

	Migratory Species
	Social



ATTACHMENT B: Event Tree Risk Assessment





[Redacted]	E9	0.05	0.6	C17	2.70%
	No Loss				1.80%
No decline in water quality or increase in sedimentation					0.04
					100.00%

Pathway Probability (PWP) of Complete loss and no recovery	17.55%
Pathway Probability (PWP) of Long term loss and slow recovery	69.11%
Pathway Probability (PWP) of No loss	13.35%



ID	Assumptions and Reasoning	Information
H1	Three separate dredging campaigns each approximately 6 weeks long under ideal conditions.	
R1	Over the course of 18 weeks of dredging, there is a small chance that there is a small chance that the disposed material will experience ideal conditions for which appropriate consolidation and amassing can occur, therefore not resulting in long term resuspension of material.	
R2	It is assumed that there is a small chance that the disposed material will experience ideal conditions for which appropriate consolidation and amassing can occur, therefore not resulting in long term resuspension of material.	
R3	Even with a short term plume from the dredging activity and disposal. The sediment which makes up that plume will impact on water quality and eventually settle out.	
O1	This is assumed to be a certain possibility if a short term plume is coupled with a long term resuspension of dredge material.	
E1	An unlikely occurrence if there is no long term resuspension of dredged material.	
E2	No effect on water quality outside the period of dredging. This is considered a rare possibility.	
E3	An unlikely occurrence if there is no detectable decline in water quality or increased sedimentation.	
E4	A conservative assumption that there is a 10% chance of a 10 year exposure of declined water quality and increased sedimentation. There is the potential for additive and synergistic effects to last longer than 6-7 years.	
E5	No effect on water quality outside the period of dredging. This is considered a rare possibility.	
C1	A conservative assumption impacts are likely to be amplified by natural events that affect recovery and biomass.	
C2	This is considered unlikely given that resuspension is not considered likely. It would be expected that the impact to water quality is likely to be less in this scenario and therefore no permanent loss is predicted, especially given a 18 week only exposure.	
C3	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo.	
C4	No decline in water quality will assume the status quo (which importantly does not indicate a net benefit).	
C5	Over that period of exposure, there is a good chance that combined with natural impacts, there may be a permanent loss of seagrass in the region. The latest Port of Abbot Point Long-term Seagrass Monitoring report states that there are no seed-banks/reserves for coastal seagrass communities at Abbot Point. No recovery has occurred for coastal meadows following 2011 floods and cyclones. There is a good chance that other natural events combined with dredging and disposal impacts, that seagrass will not recover at Abbot Point and within Abbot Bay region.	Mckenna, S.A. and Rasheed, M.A. 2013. Port of Abbot Point Long-term Seagrass Monitoring. Annual Report 2011-2012. JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.
C6	If exposed to this length of water quality degradation and sedimentation impacts, there is 0.5% chance that seagrass will remain at status quo.	
C7	Over that period of exposure, there is a good chance that combined with natural impacts, there may be a permanent loss of seagrass in the region. The latest Port of Abbot Point Long-term Seagrass Monitoring report states that there are no seed-banks/reserves for coastal seagrass communities at Abbot Point. It will take a long time for natural recruitment of seagrass meadows in this area. There is a good chance that other natural events combined with dredging and disposal impacts, that seagrass will experience long term impacts and recover at slow rates.	Mckenna, S.A. and Rasheed, M.A. 2013. Port of Abbot Point Long-term Seagrass Monitoring. Annual Report 2011-2012. JCU Publication, Centre for Tropical Water and Aquatic Ecosystem Research, Cairns, 42pp.
C8	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C9	An unlikely scenario given only an 18 week exposure in total.	
C10	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C11	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C12	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C13	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C14	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C15	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C16	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C17	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	
C18	A generous assumption that ideal conditions will persist for seagrass growth and therefore no change to the status quo (which importantly does not indicate a net benefit).	





ATTACHMENT C: Project Chronology

ATTACHMENT C Chronology of Project		
Date	Description	Content
02-Dec-11	Referral	Kevin Kane Submits Referral under EPBC Act
05-Dec-11	Invitation for public comment	Invitation for public comment on the proposed action referral
19-Dec-11	GBRMPA advice to DSEWPaC on referral	GBRMPA wrote to DSEWPaC to provide advice on the referral, recommending that the project be declared a controlled action, requiring assessment through an Environmental Impact Statement (EIS). This letter also notified DSEWPaC that if the proposal resulted in dredge material disposal in the GBRMP, then a GBRMPA permission would be required.
06-Jan-12	Decision on approval and approach	DSEWPaC determined that the action was a controlled action and would be assessed by Public Environment Report (PER)
06-Jan-12	Correspondence from DSEWPaC	DSEWPaC wrote to advise GBRMPA on the decision to declare the project a controlled action and that the proposal would be assessed by PER.
10-Jan-12	Permit Application Assessment Fee (PAAF)	GBRMPA wrote to NQBP to confirm their application under the GBRMPA Act and advise them of the PAAF fee for which an invoice was attached.
21-Feb-12	GBRMPA Comment on draft Guidelines	GBRMPA sent DSEWPaC comments and advice on the draft Guidelines for the PER.
27-Mar-12	Multi Criteria Analysis Workshop	A multi criteria analysis was held in Brisbane over two days. The purpose of the workshop was to discuss the preferred option for the dredge material relocation. Two representatives from GBRMPA attended.
17-Apr-12	Correspondence from DSEWPaC	GBRMPA received a letter from DSEWPaC to advise that they had approved the public release of the PER guidelines. The comment period would be between 23 April 2012 and 28 May 2012.
23-Apr-12	Draft PER Guidelines	Invitation for public comment on the draft PER guidelines.
08-May-12	NQBP meeting with GBRMPA	NQBP meets with GBRMPA to discuss potential dredge disposal locations and current field work in regard to the offshore investigations. Sam Maynard and Connor Walsh LG and KE.
12-May-12	File note of meeting	GBRMPA provides comment on meeting notes including MCA outcomes and further land based options assessment work.
22-May-12	Technical Advisory Consultative Committee (TACC)	The first Abbot Point TACC meeting was held in Bowen where the main minute points related to among other things, concerns regarding dredge material disposal. Kevin Edison attended from GBRMPA
31-May-12	MCA summary of Workshop	Summary of MCA workshop was provided by NQBP
05-Jun-12	Email to DSEWPaC re PER Guidelines	GBRMPA sent an email to DSEWPaC suggesting some minor administrative changes to the guidelines.
26-Jun-12	Guidelines Issued	Draft guidelines finalised and issued to NQBP.
10-Aug-12	GBRMPA respond to meeting request	GBRMPA respond to request from NQBP re PER update meeting and suggest a copy of the land based options report would be useful as it is an agenda item for discussion.
17-Aug-12	NQBP meeting	NQBP meeting with GBRMPA - PER update including lodgement timeframes - final land based options assessment report - not provided.



29-Aug-12	NQBP sends Final Options report to GBRMPA	GBRMPA received final land based options report with PER lodgement expected any day. NO COMMENT PROVIDED WILL REVIEW AS PART OF PER.
21-Sep-12	NQBP RELEASE draft PER document	NQBP release draft PER documents for "Regulator Review" email from Sam Maynard.
15-Oct-12	Correspondence to DSEWPaC	GBRMPA wrote an email to DSEWPaC to provide and discuss the adequacy review of the draft PER. The overall recommendation was that the draft PER does not fully address all the requirement of the Guidelines.
09-Nov-12	Phone discussion with DSEWPaC and NQBP	GBRMPA, DSEWPaC and NQBP participated in a teleconference to discuss the findings of the guidelines adequacy review.
14-Nov-12	Comments addressed by NQBP	GBRMPA received an email from NQBP with an attachment addressing some of the comments from the adequacy review.
29-Nov-12	Correspondence to DSEWPaC	GBRMPA sent an email to DSEWPaC regarding the changes made by NQBP following the adequacy review. This email outlined further inadequacies.
13-Dec-12	DSEWPaC request for advice	DSEWPaC forwarded on NQBP's request for a variation to GBRMPA for our comment.
13-Dec-12	GBRMPA response to DSEWPaC's request for advice	GBRMPA responded to DSEWPaC by email regarding the request for variation in the affirmative.
13-Dec-12	Variation request to Proposal	NQBP wrote to DSEWPaC to request a variation to the proposal being a slight increase in the dredge footprint and depth as well as including the offshore disposal site as their preferred option.
13-Dec-12	Notification of Variation	DSEWPaC approved the variation.
21-Dec-12	Correspondence from DSEWPaC	GBRMPA received a letter from DSEWPaC advising that a decision had been made to publish the draft PER for public comment.
04-Jan-13	PER approved for publication	The draft PER was made available for public comment between 4/01/2013 and 15/02/2013.
23-Jan-13	GBRMPA met with Commercial Fishermen	GBRMPA and representatives from the regions commercial fishing industry met with GBRMPA to raise their concerns primarily in regards to the dredging and disposal operations of the proposal. They were concerned about displacement of fishing effort and impacts on their ongoing catch rate.
31-Jan-13	Technical Advisory Consultative Committee (TACC)	The second TACC meeting was held in Bowen. Nicholas Baker from GBRMPA attended. Meeting minutes are still outstanding as of (22/02/13).
06-Feb-12	Community Meeting Between NQBP and community groups	A community meeting was held in Bowen between NQBP and the Bowen Recreational Fishing and Outdoor club. Richard Quincey of GBRMPA attended the meeting. In summary the major theme of the meeting was that the community was not against the development of the Port, although they were unsupportive of dredge material relocation offshore.
11-Feb-13	Teleconference between DSEWPaC, GBRMPA and NQBP	GBRMPA participated in a teleconference between DSEWPaC and NQBP. The aim of the discussion was to talk about some of the public submissions which had been made and for NQBP to understand what GBRMPA and DSEWPaC required from the submission. NQBP also talked about gaining some level of endorsement on timelines for "approval".
14-Feb-13	Sea Dumping application	NQBP lodge a sea dumping application for the T0-T3 capital dredging project via email.
15-Feb-13	Correspondence to DSEWPaC	GBRMPA sent a letter to DSEWPaC identifying a number of high risks and concerns regarding the proposal. GBRMPA comments on the draft PER were also sent including a risk assessment of the proposed disposal options.



20-Feb-13	DSEWPaC sends letter, risk assessment and comments from GBRMPA to NQBP	After a phone call b/w Adam Smith and Chris Murphy it was decided that DSEWPaC was at liberty to send letter to NQBP.
22-Feb-13	Teleconference NQBP and GBRMPA	Brad Fish (CEO), Simona Duke and Gary Campbell on the phone to Adam Smith and Rean Gilbert. The concerns raised were highlighted in minutes and included the fact that Brad Fish was disappointed with the process, and that he would bring up his concerns with GBRMPA Chairman and the Minister
28-Feb-13	Meeting in TSV with NQBP, DSEWPaC and GBRMPA	Discussion regarding GBRMPA and DoE concerns and additional information required such as more detailed alternative options assessment.
14-Mar-13	Meeting in BNE with NQBP (and port proponents), DSEWPaC and GBRMPA	Workshop discussing the alternative options.
28-Mar-13	Meeting in BNE with NQBP (and port proponents), DSEWPaC and GBRMPA	Workshop discussing the alternative options.
18-May-13	Supplementary Report Published	The Supplementary Public Environment Report was made available for the public.
08-Jul-13	EBPC decision extended	A decision to extend the time in which to make a decision whether to approve a controlled action under the EPBC act was made. Extended to 9 August 2013.
08-Aug-13	EBPC decision extended	A decision to extend the time in which to make a decision whether to approve a controlled action under the EPBC act was made. Extended to 8 November 2013.
19-Aug-13	Technical Advisory Consultative Committee (TACC)	GBRMPA representatives attended the TACC which discussed the alternative options located in the Investigation Area.
21-Oct-13	EBPC decision extended	A decision to extend the time in which to make a decision whether to approve a controlled action under the EPBC act was made. Extended to 13 December 2013.
07-Nov-13	Variation of proposal	NQBP applied for a variation of their proposal under the EPBC Act, which was approved by the DoE on the same day. The variation request was to include an additional offshore disposal location being the Investigation Area.
22-Nov-13	GBRMPA letter to NQBP re SD Variation	GBRMPA wrote to NQBP asking whether they intended to vary their sea dumping application.
27-Nov-13	Letter from NQBP confirm variation request	NQBP wrote to GBRMPA to confirm a request to vary their Sea Dumping Application.
10-Dec-13	EPBC Approval	Decision to approve action with conditions under the EPBC Act.
11-Dec-13	Intention to extend time letter	GBRMPA wrote to NQBP notifying that it was GBRMPA intent to extend the timeframe for making a decision and request further information under the GBRMP Act. The letter asked NQBP to indicate the length of time that will be required to complete the information request.
18-Dec-13	NQBP request/respond with 12 month request	Letter received from NQBP requesting extension of up to 12 months to complete works.
17-Dec-13	Letter re variation request	GBRMPA wrote to NQBP to advise that the SD permit application could not be varied.



20-Dec-13	Extension of time letter	GBRMPA wrote to NQBP extending the timeframe to make a decision under the Marine Park Act to 31 January 2014.
09-Jan-14	Meeting with NQBP and GBRMPA	NQBP and GBRMPA met in Townsville to discuss Assessment.



ATTACHMENT D: SOCIAL, CULTURAL AND HERITAGE IMPACT ANALYSIS

Summary

The Port of Abbot Point is an existing operational coal port located within port limits approximately 25 kilometres North West of Bowen on the central Queensland Coast. North Queensland Bulk Ports Corporation Limited (NQBP), as operators of the Port, have made application under the Great Barrier Reef Marine Park Regulations for a permit to conduct works in the Great Barrier Reef Marine Park (Marine Park), specifically the disposal of up to 3,000,000m³ of capital dredge material to the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,00m³ of dredge material to be disposed in any one year.

Disposal of dredge material is a result of capital dredging works associated with a proposed expansion of the Port of Abbot Point. A proposed 400 hectare Dredge Material Relocation Area (DMRA) is located approximately 25 km east/north east of the Port. A proposed further Investigation Area (approximately 800 square kilometres in size) for potential dredge disposal is located directly offshore from the Port of Abbot Point

A social, cultural and heritage impact analysis report was undertaken to assist the assessment of the proposed activity under the *Great Barrier Reef Marine Park Act 1975* (Marine Park Act).

The social, cultural and heritage impact analysis report considers the following matters:

- Indigenous heritage
- Commercial use
- Recreational use
- Heritage matters
- Community feedback
- Formal public comments received as part of the EPBC Act assessment process
- Dredge spoil disposal concerns in general

A GBRMPA risk assessment identifies 'extreme' risk to perception and social values regarding the Abbot Point dredging proposal.

Since the Hon Greg Hunt MP approved action under the EPBC Act in December 2013, a social response is evident and is expected to continue. A heightened social response to this proposal is expected to continue after a decision under the Marine Park Act has been made.

The proposal to disposal of up to 3,000,000m³ of dredge material into the Marine Park over a period of approximately 5 - 6 years, with no more than 1,300,00m³ in any one year has generated the largest community (national and international) response to any individual project assessed by GBRMPA.

General feedback from community is that they felt surprised and unconsulted by the Ministers decision, especially those living outside of the GBR region.

Some responders expressed shock that dumping of dredge material was able to be considered for ocean disposal in a marine park or World Heritage Area and were concerned that the Government was more interested in the profits of large business than the protection of the Great Barrier Reef.

Generally people questioned why the alternatives which had been investigated by the proponent and found technically feasible, were not imposed by the Government, regardless of the cost to the proponent.

Formal public comment period

The draft PER was released for public comment from 4 January 2013 to 15 February 2013. A total of 103 submissions were received, including comments from the department and GBRMPA.



Of the public comments received in response to the advertisement, approximately 92 per cent of the responses were negative towards the proposal, 6 per cent were supportive and 2 per cent were indifferent. It is noteworthy that a large portion (34 per cent) of those opposed, were associated with a group called the Abbot Point Action Group.

Public submissions raised concerns about the validity of the assessment and dredge plume modelling in the PER, and noted the potential impacts of dredging and the offshore disposal of dredge material in relation to:

- Recreational and commercial fisheries in the Bowen area
 - o The commercial and recreational fishing in the area would be significantly affected by the disposal of 3 million cubic metres of dredge material, and that the initial draft PER did not adequately report on the potential impacts. Several submissions by commercial fishers included data on fish catches and provided maps not included in the PER.
 - o A submission by GFB Fisheries Pty Ltd (Guthalungra aquaculture farm) expressed concern about the potential impact of the dredging activity on their aquaculture operation. Noting that their water intake site is located 10km west of the Abbot Point Terminal, they are concerned that consequential impacts such as introduction of invasive species were not considered adequately. They state that a Chinese parasite (not found in Australia) was recently found in their farm and caused significant loss of production. They were worried that this parasite was introduced from foreign ballast water and invasive species may become a greater risk with the expansion and increase of port operations.
- The recently discovered Catalina World War II plane wreck and associated heritage and tourism values –
 - o Numerous submissions raised the overlooked World War II aircraft wreck, the Catalina as a serious oversight in the PER and called into question the possibility of other potential errors.
- Water quality and biodiversity
 - o A submission by Mackay Conservation Group indicated there are EPBC listed bird species and migratory nesting turtles at Holbourne Island/Nares Rock. Seabird feeding areas
- The local tourism industry
- The Outstanding Universal Value of the Great Barrier Reef World Heritage Area.
 - o A submission by member of the general public disagrees with the statement in the PER that says "no impact on environmentally important islands off the coast of Bowen" including Holbourne Island. Based on the experience at Hay Point it is a total disaster with the mud and sediment which impacted coral growing southern side of the tug harbour wall and Vista Island.

Overall the public requested a more detailed options study for land based disposal options. Some public submissions also stated that the development of the Port of Abbot Point as being important for the Bowen community. A large percentage were not against port development, rather they were opposed to dredging and unconfined offshore disposal of dredge material.

Commercial fishing industry concerns and comments

There is a diverse range of fisheries operating in and adjacent to the proposed disposal area including three key fisheries being East Coast Trawl Fishery, East Coast Inshore Finfish Fishery and the Coral Reef Finfish Fishery. The predominant target species include,

- Mackerel (Grey and Spanish)
- Scallop
- Prawn (Tiger and King)
- Juvenile prawns on Clark Shoal



- Moreton Bay Bugs
- Tiger Bugs

Most of the commercial fishing effort in Abbot Point region is from boat and Bowen is main the homeport.

On 23 January 2013, commercial fishers met with the Authority to discuss Abbot Point PER proposal.¹⁸⁷ The key points made by the commercial fishers included:

- Fishers are not opposed to port developments. Clearly the main concerns of fishers about port projects are the activities of dredging (particularly overflow dredging methods) and disposal of dredge material at sea and their impacts on a range of fisheries, fishery habitats and the environmental values of the Great Barrier Reef Marine Park. Fishers felt that impacts are likely to be significant enough to cause serious damage to the fisheries and threaten the livelihoods of local commercial fishers.
- It was agreed by fishers, that in the PER, the proponent has dismissed a number of commercial fisheries which provide significant economic value to the local economy, including mackerel and scallop fisheries. It was suggested that this is because catch and economic data held by the Queensland Department of Primary Industries and Fisheries (QDPI) is not made available by QDPI for fisheries supporting five commercial vessels or less.
- Fishers suggested that instead of dredging and thus disposal, NQBP could extend the jetty.
- They also expressed their concerns that minor changes in water quality can affect the health of mackerel fisheries. Disturbance to certain benthic structures such as rock from dredge spoil can prevent mackerel from gathering there.
- If Abbot Point proposal is approved it is likely to cause permanent displacement of fishing effort which will create conflict between commercial and recreational fishers.
- There are concerns about increases in ships resulting in Maritime Safety Queensland limiting fishing boasts due to space issues (which has occurred at Hay Point).
- There are also concerns about the long term fate of the dredge spoil.

The public submissions to the PER submitted by active commercial fishing operators and presented a diversity of views with respect to a desire for compensation, including those who have the desire to continue fishing.¹⁸⁹ There were a number of submissions regarding the loss of access to particular areas, such as those where there is a change to habitats that may alter species distribution and composition. In addition there were also concerns regarding direct access as a result of changes to the seabed inhibits trawling, particularly at the proposed PER disposal site.

As stated in Supplementary PER report the review of the public submissions to the PER concluded that there are potential impacts on fisheries, and the impacts vary among individual fishing businesses. Locally important fisheries grounds is one of the reasons "NQBP and the terminal proponents propose to refine the offshore spoil ground constraints analysis to investigate other potential offshore disposal locations for Abbot Point" (refer to page 2-10).¹⁸⁹

The proponent is working with the commercial fishers on an Abbot Point Fishing Framework. In their January 2014 'Abbot Point Fishing Framework' the proponent states "NQBP is committed to minimising impacts to commercial and recreational fishing stakeholders. Together with terminal proponents...NQBP has voluntarily developed a benchmarked and best practice Fishing Framework which provides a process for understanding, mitigating and offsetting impacts from port development to the commercial and recreational fishing sector."¹⁸⁸

Recreational fishing

A number of public submissions were received from recreational fishers indicating the proposed activity would have an impact on recreational fishing. There was particular mention of Nares Rock and Holbourne Island as being important areas for recreational fishing (including spear fishing).

¹⁸⁷ GBRMPA 2013, GBRMPA meeting with Commercial Fishers on 23 January 2013.

¹⁸⁸ NQBP 2014. Abbot Point Fishing Framework Q and As.



Recreational fishing is an important activity in the Bowen region and is a well-known recreational fishing region.¹⁸⁹ Based on vessel registrations over a decade both the Burdekin and Whitsunday shires have shown consistent and significant growth. However, there is limited information available on the patterns of recreational fishing catch and effort in the Bowen and Abbot Point region.

A study conducted by Cameron and Beggs in 2002 (as cited in ¹⁸⁹), found small mackerels were important species for recreational fishers, including north Queensland residents, as well as intrastate and interstate visitors. The Supplementary PER report further states "Anecdotal evidence suggests that the area around Abbot Point is an important fishing area for small mackerels and also the larger Spanish mackerel. Anecdotal evidence also suggests that the small areas of rocky reef scattered throughout the Abbot Point region (especially east of Abbot Beach) are also fished by recreational fishers for a variety of demersal reef fish and mackerels". The Supplementary PER report also acknowledges Nares Rock and Holbourne Island as important areas for recreational fishing (page 13).¹⁸⁹

Throughout the supplementary PER report in response to public submissions, NQPB have noted that both the WWII Catalina Wreck and locally important fisheries grounds, including those around Holbourne Island, are two areas of concern and states "NQBP and the terminal proponents propose to refine the offshore spoil ground constraints analysis to investigate other potential offshore disposal locations for Abbot Point" (refer to page 2-10).¹⁸⁹

The proponent is currently discussing artificial reefs as a possible benefit to the recreational lobby group if the proposal is approved. However, installation and operation of an artificial reef in the Great Barrier Reef Marine Park requires the permission of the Authority. Depending on its scale and location, an artificial reef proposal may also need to be considered under the *Environment Protection and Biodiversity Conservation Act 1999*, the *Environment Protection (Sea Dumping) Act 1981*, or the *Sea Installations Act 1987*. Also identified in Supplementary PER report a 'net-free fishing area' for the benefit of recreational fishers could be established. "Mackerel Patches" (which is within logbook grid M22) is a well-known recreational fishing focus area and is identified as a possible location for a 'net free fishing area'.¹⁸⁹ Net free fishing areas would require amendments to the *Fisheries Regulations 2008*.

Tourism

Much of the tourism industry is reliant on access to healthy reefs to present to their visitors and interest groups such as the Businesses United for Reef Protection (BURP) have formed specifically in response to Abbot Point capital dredging project. The Businesses United for Reef Protection consists largely of Whitsunday tourism operators.

There is currently a high level of concern from tourism operators in the Whitsundays (south of the proposed disposal activity). They are concerned about dredge plumes potentially migrating in a southerly direction from the disposal activity and thus impacting on their livelihoods. The probability of a southerly movement of the dredge plume is not clear as all the modelling was based on 2007 conditions when the predominant flow was towards the north. There are however, years in which the predominant ocean flow is towards the south but it is not clear how far the sediment from the disposal activity could migrate.

Local tourism near the proposed PER disposal site is evident in the EMC visitation data for Abbot Point, Abbot Bay, Nares Rock and Holbourne Island (refer to Table 5 EMC visitation data relating to Abbot Point, Abbot Bay, Nares Rock and Holbourne Island during the period of 1 August 1993 and 29 September 2013.) with 328 day visits to the locations during 1 August 1993 to 29 September 2013. In consideration of only current permittees, a total of 25 day visits (from a total of 18 permittees) occurred during 2012 and 2013 to Abbot Bay, Holbourne Island and Nares Rock. The visitation estimate may be an underestimation as many more permittees may use this area passing by but put in a different EMC location if they stop somewhere else. Of the areas potentially impacted by the

¹⁸⁹ CDM Smith 2013. Abbot Point, Terminal 0, Terminal 2 and Terminal 3 Capital Dredging Public Environment Report Supplementary Report (EPBC 2011/6213/GBRMPA G34897.1). North Queensland Bulk Ports Corporation.



disposal of dredge material, local tourism at Holbourne Island and surrounding reef and Nares Rock may be compromised.

Table 5 EMC visitation data relating to Abbot Point, Abbot Bay, Nares Rock and Holbourne Island during the period of 1 August 1993 and 29 September 2013.

Sum of VISITS	DAYS OF USE	Column Labels	Grand Total
Row Labels	(blank)		
Abbot Bay (21)	82		82
Abbot Point (22)	132		132
Holbourne Island (191031)	7		7
Holbourne Island Reef (No 1) (191032)	102		102
Nares Rock (19104)	5		5
Grand Total	328		328

Impacts could include a loss of income and employment for dive operators and other marine tourism operators, and suppliers for recreational activities (e.g. boats, fishing and camping equipment). There could be an impact on regional reputation of tourism and recreational activities (including recreational fishing and coastal and island camping), resulting in a prolonged recovery time for these industries.

People employed in reef-dependent industries may be forced to leave the area, if water quality declines, and if marine life is adversely affected by the disposal activity and other activities related to the port expansion. This in turn may cause disruption to social cohesion and social networking in the local community. Other possible social impacts associated with the proposed activity include:

- disruption to personal and cultural levels of attachment to the area;
- diminished visual (scenic) amenity above and below water;
- compromised dive experiences; and
- diminished quality of family camping holidays (at places like Dingo Beach) due to increased industrialisation of coastline.

It is anticipated if permission is granted to dispose of the 3 million cubic metres in the Marine Park off Abbot Point, there will be widespread media and social media coverage of the approved activity which is likely to influence public perception that the Great Barrier Reef is no longer worth visiting. Therefore, as well as the potential risk to the natural values in which many tourism operators are dependent, there is also significant risk that perceived impact will cause a decline in the tourism, particularly in the Whitsunday region but also more broadly across the Great Barrier Reef region. Refer to cyclone Yasi case study below for an example of how public perception of impacts and cause a decline in tourism.

Tourism operators that are based beyond the Bowen region are also concerned as articulated in the email received by the Authority on 13 December 2013 "I, as a Tourism Charter sailing to the Great Barrier Reef, would be disgusted if the Marine Authority allow any dredging or damage of any kind to our Great Barrier Reef off Abbot Point. The Great Barrier Reef is World Heritage and we need to keep protecting it. Please do not pass any permits etc to allow this to happen or it will be the start of huge embarrassment to our country, Damage to our reef and it will affect tourism. Thankyou Lisa from Big Mama Sailing in Mission Beach".



Cyclone Yasi: Case Study of Impacts of perception on tourism

The extreme weather events of the 2010-11 summer did not cause serious damage to the major tourism destinations off Port Douglas, Cairns and Airlie Beach. Despite minimal damage to major tourism destinations and popular recreation sites, tourism operators did suffer impacts following the extreme weather. There were 1.38 million visitor days to the Marine Park in the 2010-11 financial year, a 10 per cent decline from the previous year. For many tourism operators a decline in overall visitation to the region was the source of most economic hardship.¹⁹⁰

Following cyclone Yasi and the floods, a rapid assessment of social and economic impacts on the commercial tourism and fishing industries evaluated the effects of these events on Reef dependent industries. The social and economic surveys revealed many tourism operators believe the high profile of cyclone Yasi and the floods in local and international media gave the impression the entire Great Barrier Reef was severely damaged, causing tourists to postpone or cancel their plans for travel to the region. Although the vast majority of Reef tourism operations and destinations were fully operational within days following cyclone Yasi, industry sources reported visitors from outside the region (especially internationally) perceived the Great Barrier Reef as being unlikely to provide a good tourism experience as a result of cyclone Yasi and the South East Queensland floods.

If it is anticipated a permission is granted to dispose of the 3 million cubic metres in the Marine Park off Abbot Point, there will be widespread media and social media coverage of the approved activity which is likely to influence public perception that the Great Barrier Reef is no longer worth visiting. Therefore, as well as the potential risk to the natural values in which many tourism operators are dependent, there is also significant risk that perceived impact will cause a decline in the tourism, particularly in the Whitsunday region.

Indigenous heritage values

The Birrigubba indigenous society connects four to five clans from the Burdekin to Mackay region. Dreamtime stories such as 'Gabalumunda' (as depicted near Plantation Park in Ayr) connects the Birrigubba society and its clans of the Burdekin/Mackay region. Juru is one of the Birrigubba clans. On 26 July 2011 the Federal Court recognised the Juru people's non-exclusive native title rights over Cape Upstart National Park. The Juru is a bona fide group in the region but does not represent the interests of all Traditional Owners in the region, including sea country. The Juru and Ngaro Indigenous groups consider the Whitsunday area as their homeland, including Holbourne island.¹⁹¹

NQBP have consulted with the Juru Cultural Heritage Committee over a number of years and have established an Indigenous Land Use Agreement for the long term development of infrastructure at the Port of Abbot Point.¹⁸⁹ As stated in the Supplementary PER report, two meetings between NQBP and Juru Cultural Heritage Committee have been held to discuss Abbot Point expansion NQBP capital dredging options: one meeting on 5 April, and the other on 19 April 2013. The detailed meeting minutes of the 19 April 2013 are included in the Supplementary PER report. During the meeting the proximity of the proposed dredge placement site (aka 20 km option in the minutes) to reef was discussed and estimates of 20 to 30 km from placement site to the reef were provided. Holbourne Island and Nares Rock are within 4 km of the proposed PER site.

In relation to the 20 km option, the summary of meeting notes state:

- "positive for the Juru in that the area being investigated is well away from Nares Rock and Holbourne Island.
- no other major cultural heritage issue noted; and
- no potential for Aboriginal cultural sites to be located in 40m depth of water".¹⁸⁹

¹⁹⁰ GBRMPA 2011. Extreme Weather and the Great Barrier Reef. Great Barrier Reef Marine Park Authority, Townsville.

¹⁹¹ State of Queensland (Department of Environment and Resource Management) 2011, Holbourne Island National Park and adjoining State Waters. Department of Environment and Resource Management, Brisbane.



NQBP also noted that the offshore 20 km option is "possibly the preferred option, but much more information is required for the Juru to fully assess this option".

The Juru Cultural Heritage Committee members identified the main cultural heritage issue for the dredging was any potential impacts to the Dingo Beach fish trap. NQBP have discussed monitoring (including low-level aerial photography) the fish trap site before, during and after for the proposed dredging campaign. Dingo Beach is approximately 30 km south to south east of the proposed dredging and disposal locations.

Regarding the alternative jetty investigations options 1-5, there were some aspects to consider but no recorded concerns, with options 2-5 possibly located outside Juru Native Title claim area. There was no indication of how they viewed the large terminal and coal laydown areas. The Authority has not received any further information about discussions between NQBP and Juru Cultural Heritage Committee.

Traditional Owner values of sea country and their connection to sea country are significant and the proposed area for sea disposal is important sea country for Traditional Owners.¹⁹¹ All potential impacts that may affect the natural values are likely to equally affect Indigenous heritage values.¹⁹² Other aspects of Indigenous heritage (such as cultural practices, sacred sites, sites of particular significance, stories, songlines, totems, language, technology, tools and archaeology) are also likely to be affected by potential impacts. The thoughts of all the relevant Birrigubba clans, such as Ngaro and what the consequences (positive or negative) the proposal will have on their Indigenous heritage values are key knowledge gaps.

As there are uncertainties what the actual impacts on the ecosystem will be from the proposed activity there are uncertainties what the implications are for Indigenous heritage values. If there are impacts on Indigenous heritage values, the consequences of the impact (such as whether it is a site or a custom) are irreversible, as Traditional Owners cannot move into someone else's sea country and start a new practice or hunt. Mitigation measures and offsets are not suitable approaches.

In the Great Barrier Reef Marine Park Authority five year Strategic Plan an operating principle is to respect Traditional Owner culture and recognise connections to sea country within the Marine Park. A strategy includes to partner with Traditional Owners to ensure sustainable traditional use of marine resources and protection of Traditional Owner cultural and heritage values. Further, a 25 year Strategic Plan for the Great Barrier Reef Marine Park World Heritage Area includes the need to ensure that the interests of Aboriginals and Torres Strait Islanders are reflected in the management of the Area.

Historic heritage values

Concerns were raised during the public review process about potential impacts on the World War II wreckage of a Catalina aircraft, situated approximately 3 km south of the proposed disposal site for dredge material (refer to Figure 25). Given the close proximity to proposed disposal site, there is considerable risk impact from the proposed activity will occur on the cultural heritage site. As the issue is sensitive, The proponent has indicated they will investigate an alternative site in order to reduce the risk to the Catalina wreck (refer to page 5-16 of CDM Smith report).¹⁸⁹

The aircraft wreckage at the Bowen sites has cultural significance as a grave site, as well as being nationally archaeologically significant. It is potentially a well preserved example of this iconic flying class which was instrumental in the western Pacific theatre of World War II. They were long-range bombers able to operate from bases in North Queensland, and their heavy pay load made them instrumental in the rescue of hundreds of personnel from aircraft and naval incidents, and advancing Japanese forces.

Heritage staff of the Authority attended a memorial (hosted by NQBP) for those lost in the crash and asked the relatives, general public, and RSL representatives in attendance what they thought should

¹⁹² GBRMPA 2013, Chapter 6 Impacts on the values in Strategic Assessment Report Draft for Public Comment, Commonwealth of Australia.



happen to the wreck and the remains. They thought the remains should be left where they lie and that some form of protective zone should be placed around it by the Authority.

The plane wreck off Bowen is a cultural heritage sites and so the Authority is obliged to protect its heritage values under the GBRMPA Act (Section 2A (1)). GBRMPA MPA Board paper 6 January 2014 proposes a Special Management Area (SMA) at the site aimed to increase its protection. The most appropriate protection mechanism available to the Authority is the declaration of a Special Management Area (SMAs).

As mentioned in the meeting notes of the NQBP and Juru Cultural Heritage Committee Meeting No. 2 2-19 April 2013,¹⁸⁹ when one of the Juru Cultural Heritage Committee members asked about the potential impacts to the Catalina site, NQBP said "when the Catalina was raised as an issue as part of the public consultation process, NQBP then decided to avoid this area entirely as the Catalina is an historical heritage site" (page 2 of Appendix C Juru Meeting Notes (19/04/2013) of the Supplementary PER report).

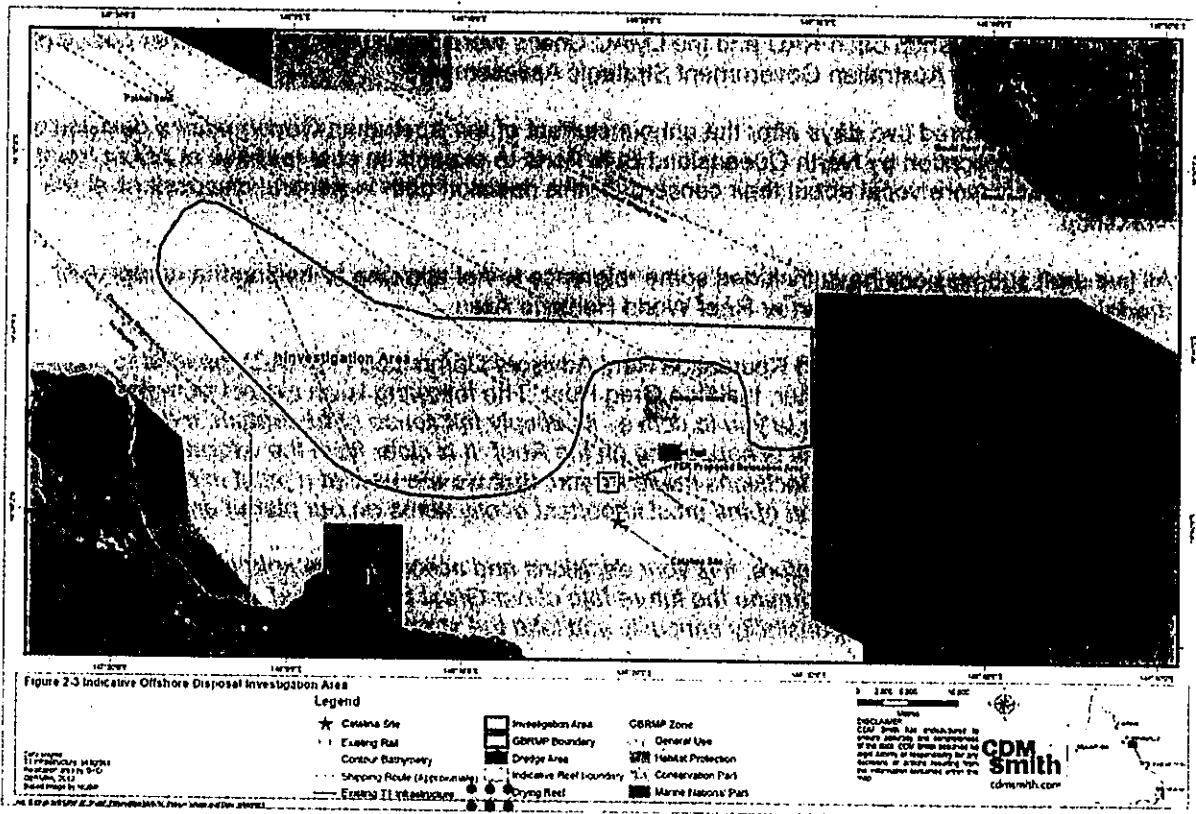


Figure 25 Catalina site in relation to the PER proposed relocation area of dredge material and the investigation area.

The proponent is working with Cosmos Archaeology in relation to the Catalina WWII wreck. In an email sent to members of the Authority (10 January 2014) the proponent states that 'Cos has been working on the INPEX dredging project in Darwin where there are WWII Catalina wrecks in very close proximity to dredging activities and is familiar with how to manage potential impacts'. No further details on how any potential impacts will be mitigated are available to the Authority at this stage.

Reef Advisory Committees and Local Marine Advisory Committee concerns

A Strategic Assessment meeting of all Reef Advisory Committee (RAC) members and Local Marine Advisory Committee (LMAC) Chairs was held 12 and 13 December 2013 in Townsville. Forty-seven members attended the workshop. The RACs are competency-based committees comprising a cross-section of stakeholder interests with expertise and experience in relevant areas. The GBRMPA has four RACs: Catchment and Coastal, Ecosystem, Indigenous, and Tourism and Recreation. The role of the RACs is to provide issues-based advice to the GBRMPA on operational



issues and to ensure that policy development and strategic direction are developed in consultation with stakeholders. There are 12 LMACS positioned along the coast from Cape York south to Burnett (below Gladstone). The LMACS enable local communities to have effective input into managing the Marine Park and provide a community forum for interest groups, government and the community to discuss issues around marine resources.

At this meeting members were briefed on:

- the draft Great Barrier Reef Coastal Zone Strategic Assessment and draft Program Report from the Queensland Government;
- the draft Great Barrier Reef Region Strategic Assessment and draft Program Report from the Great Barrier Reef Marine Park Authority (GBRMPA); and
- the development of a Long-Term Sustainability Plan by the Australian Government Department of the Environment.

Each RAC and the LMAC Chairs were provided the opportunity to convene their individual committees after each briefing and then each group provided feedback to the meeting as a whole. At the end of the workshop each RAC and the LMAC Chairs were given time to finalise their advice prior to submitting to the Australian Government Strategic Assessment.

The meeting occurred two days after the announcement of the Australian Government's decision to approve the application by North Queensland Bulk Ports to expand its coal terminal at Abbot Point. Many members were vocal about their concern for this decision both in general discussions at the workshop.

All five draft submissions have included some reference to not allowing or halting the dumping of dredge material in the Great Barrier Reef World Heritage Area.

At this meeting, the Tourism and Recreation Reef Advisory Committee (TRRAC) decided to independently write to the Minister, the Hon Greg Hunt. The following is an extract from that letter: *"...the TRRAC requested I write to you to convey its deeply felt sense of frustration, indeed anger, and consequent sadness at what is happening on the Reef. It is clear from the information presented at the forum, as well as recent decisions made by you, that we are now at a point in history where we are on the precipice of losing one of the most important ecosystems on our planet and one Australia as a nation can ill afford to lose. Regardless of what has gone before, it is your decisions and actions as the sole individual with accountability who will now determine the future fate of our Great Barrier Reef. I implore you to take this responsibility seriously and take the strong stand and immediate actions that are now necessary."*

The letter then went on to refer to a range of proposed 'Recovery Actions' with the number one priority being 'Dredge spoil disposal in the World Heritage Area is halted'.

GBRMPA public information unit (PIU) tracks their tasks (i.e. numbers of phone calls, emails, walk ins, faxes) and in December 2012 they received a total of 1904 compared to 12,864 in December 2013. The significant increase in tasks received by PIU is attributed to the public interest in the Abbot Point capital dredging decision.

Draft Strategic Assessment comments

During the draft strategic assessment comment period between 1 November 2013 and 2 January 2014, 186 comments have been received and of these comments, 88 indicate they have dredging concerns.¹⁹³

World Heritage status

The Great Barrier Reef is one of the wonders of the world and there is global awareness of the Great Barrier Reef as a place with outstanding natural values.¹⁹⁴

¹⁹³ GHD 2014. Great Barrier Reef Strategic Assessment Public Consultation Weekly Report Week 9: 2 January 2014. Great Barrier Reef Marine Park Authority, Townsville.



Australia is also a State Party to the World Heritage Convention which the GBR is inscribed. Recent decisions by the World Heritage Committee have born relevant port and dredging related considerations.

In the 36COM 7B.8 (2012) decision, the Committee noted with great concern the potential significant impact for the unprecedented scale of coastal development. The Committee requested the State Party not permit any new port development or associated infrastructure outside of the existing and long-established port areas and to insure that any development which would impact individually or cumulatively on the Outstanding Universal Values of the property is not permitted.

Further, the Committee warned that in the absence of substantial progress (of the above and other specific requirements such as the Independent review of Gladstone Port and the GBR Strategic Assessment), the GBR may be considered for possible inscription on the List of World Heritage in Danger.

In the 37COM 7B.10 (2013) decision, the Committee acknowledged the progress made by the State Party with the Strategic Assessment, yet noted with concern the limited progress on the key requests made in the 36 COM 7B.8 decision (i.e. no further development). The World heritage centre and IUCN recommend urgent and decisive action in order for the Great Barrier Reef World Heritage Area to remain of the List of World Heritage in Danger.

There is no real definition of a "long-established" or "major" port by the Committee. Abbot Point is certainly potentially a major port although is one of the younger ports in Queensland.

It could be considered that an approval decision for this project is against the required substantial progress required for protecting Outstanding Universal Values, especially given the known alternatives which exist.

Finding from a draft report of the Social and Economic Long Term Monitoring Programme (SELTMP) for the Great Barrier Reef (CSIRO in collaboration with the National Environment Research Program, James Cook University and the Great Barrier Reef Foundation), based on a national survey conducted in 2013, found that of the 2002 surveys of randomly selected Australians, the Great Barrier Reef (GBR) is Australia's most inspiring landmark of 12 Australian attractions listed in the survey (refer to Figure 26). Figure 27 provides the geographic distribution of survey respondents.

¹⁹⁴ Context Pty Ltd 2013, Defining the aesthetic values of the Great Barrier Reef: Report 1 Methodology. Department of Sustainability, Environment, Water, Population and Communities, Canberra.

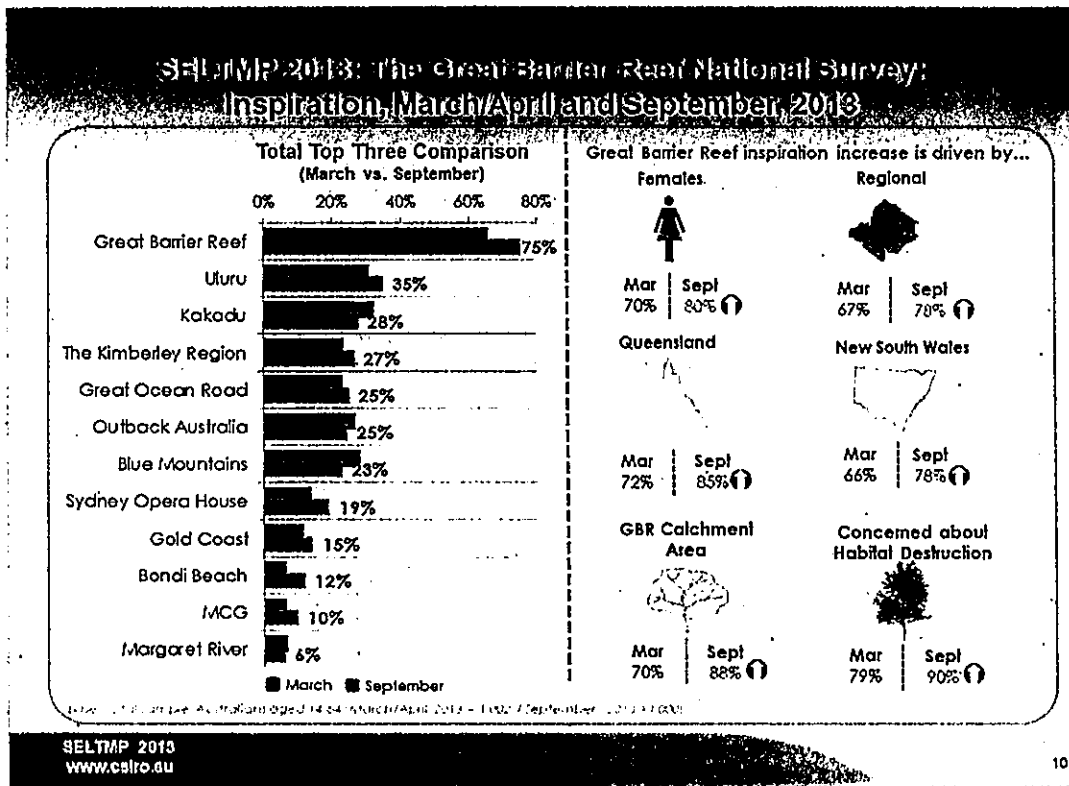


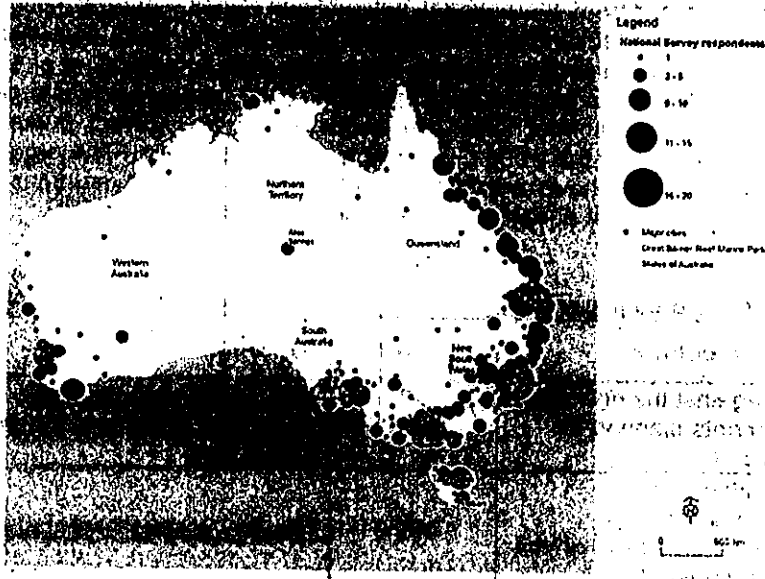
Figure 26 Summary of the Great Barrier Reef National Surveys of 2002 randomly selected Australians and comparison between March 2013 (n=1002) and September 2013 (n = 1000) surveys.

The survey also found that more than 85 per cent of the respondents in the September 2013 survey agree that they "feel proud the GBR is a World Heritage Area" and 74 per cent of respondents in the same survey agree that "the GBR is part of my Australian identity."¹⁸⁵

¹⁸⁵ Goldberg J, Marshall N A, Gooch M, Birtles A, Bohensky E, Curnock M, Parry-Husbands H, Pert P, Stone-Jovicich S, Tobin R C, Villani C. in draft, Social and Economic Long Term Monitoring Programme: National Survey. CSIRO.



**BELTMP 2013: the Great Barrier Reef National Survey:
Methods - Survey respondent locations**



BELTMP 2013
www.cslro.au

Figure 27 The geographic distribution of the Great Barrier Reef National Surveys: survey respondents locations

Reef stewardship

The Great Barrier Reef Marine Park Authority's Reef Guardian program recognises the good environmental work undertaken by communities and industries to protect the Great Barrier Reef. The program involves working closely with those who use and rely on the Reef or its catchment for their recreation or business to help build a healthier and more resilient Reef.

The program demonstrates a hands-on, community-based approach can make a real difference to the health and resilience of the Reef. Reef Guardians are taking on voluntary actions beyond what is required by law and sharing information. These actions will help to improve the economic sustainability of industries operating in the Great Barrier Reef Region and ensure the environmental sustainability of the Marine Park.

The Great Barrier Reef Marine Park Authority's Reef Guardian stewardship program began with schools in 2003 to encourage the community to take action for a healthier Reef. In 2007 the initiative was expanded to include local government councils along the Great Barrier Reef coast through the Reef Guardian Councils program. The Reef Guardian Fishers and Reef Guardian Farmers and Graziers programs were launched in 2011 to engage with industries connected to the Reef. Farmers are expected to improve land management practices and therefore reduce chemical and sediment run off into the Marine Park.

A decision by the Authority to allow the disposal of dredge material in the Marine Park, may be perceived as being inconsistent with the Authority's commitment to the Reef Guardian stewardship program. Therefore, there is a risk that future community and industry commitment and involvement in these programs could be compromised if the Port of Abbot capital dredging project is approved.



Community response

Petitions

A number of petitions have been developed in protest of the Abbot Point proposal. On 10 January 2014, the combined total of signatures on related petitions was at 1,701,197. As represented in Table 6, the petitions have originated from international, national and regional groups, including World Wildlife Fund, Greenpeace, AVAAZ, Get Up, Fight for the Reef, Change.org, North Queensland Conservation Council and Mackay Conservation Group. The largest petition consisting of 1,222,946 signatures was from AVAAZ. AVAAZ is a global civic organisation that promotes activism on issues such as climate change, human rights, animal rights, corruption, poverty and conflict. It works to close the gap between the world we have and the world most people everywhere want. The organisation operates in 15 languages and claims to have over twenty million members in 194 countries. The Guardian considers it "the globe's largest and most powerful online activist network".¹⁹⁶

Table 7. Great Barrier Reef and dredging related petitions, including specific Abbot Point petitions

Petition Creator	Content of petition	Signatures	hyperlink
Greenpeace	Petition against the new coal developments planned for Queensland	6585	http://www.change.org/en-AU/petitions/help-save-the-great-barrier-reef
Greenpeace	Petition against the expansion of the coal industry and its effects on the Great Barrier Reef	109,017	http://www.savethereef.org.au/
Greenpeace	Petition urging the Climate Change minister to stop the proposal for dredging at Abbot Point	33,872	presented to the government, July 2013
WWF	Petition urging the Australian Government to ban the industrial-scale dumping of dredge spoil in the Great Barrier Reef Marine Park	6887	http://www.change.org/en-AU/petitions/stop-dumping-on-the-great-barrier-reef
WWF	Petition urging the Government to ensure the protection of the Great Barrier Reef. Specifically ensuring there is no new port projects or industrial dredging and dumping in the World Heritage Area.	2519	http://www.change.org/petitions/world-heritage-committee-fight-for-the-great-barrier-reef
Kevin Bujold	Petition urging GBRMPA not to allow the extension of the Abbot Point port and to reject the dumping of dredge on the Great Barrier Reef	323	http://www.change.org/petitions/great-barrier-reef-marine-park-authority-don-t-allow-big-business-to-pollute-the-great-barrier-reef
Wayne Dunnett	Petition seeking the Environmental Minister to be accountable for his decision to drop dredge waste on the Great Barrier Reef Marine Park	109	http://www.change.org/petitions/australia-s-environment-minister-rescind-the-approval-to-drop-dredge-waste-onto-our-marine-parklands-the-great-barrier-reef

¹⁹⁶ Pilkington, E 2012. "AVAAZ faces questions over role at centre of Syrian protest movement". The Guardian 3 March 2012. <http://www.theguardian.com/world/2012/mar/02/avaaz-activist-group-syria>



Get up	Petition to prevent the current dredging project from damaging the Great Barrier Reef and threatening its status as a World Heritage Site	254,445	https://www.getup.org.au/campaigns/coal-seam-gas/great-barrier-reef/save-the-reef
AVAAZ.org	Petition to protect the Great Barrier Reef from damaging dredging and dumping including the Abbot Point port extension and other similar projects	1,222,946	https://secure.avaaz.org/en/australian_coal_disaster_global/
North Queensland Conservation Council	Petition asking GBRMPA to refuse the permit to North Queensland Bulk Ports (NQBP) to dispose of spoil from the proposed Abbot Point expansion in the Great Barrier Reef Marine Park	147	Presented to GBRMPA 15/12/13
Mackay Conservation Group	Petition against the issue of a permit to NQBP to dump dredge spoil from the Abbot Point port in the Great Barrier Reef Marine Park	160	Presented to GBRMPA 02/01/2014
Judith B	Petition asking Greg Hunt to put a stop on the plan to expand the Abbot Point port and dump dredging spoils on the Great Barrier Reef	63,717	http://www.thepetitionsite.com/255/028/438/australia-dont-sacrifice-the-great-barrier-reef-for-a-coal-port/
Friends of the Earth Melbourne	Petition asking Greg Hunt to protect the Great Barrier Reef by putting a stop to dredging plans at Abbot Point	145	http://friendsofearthmelbourne.nationbuilder.com/protect_the_reef

Emails

Emails regarding Abbot Point EPBC decision have been sent to several GBRMPA email addresses with an estimated total exceeding of 14,000 emails received between 7 December 2013 and 17 January 2014. Of the emails received (9920) between 7 December 2013 and 6 January 2014, the majority (i.e. 9788) were sent to GBRMPA public information unit (info@gbmpa.gov.au). A total of 84 emails were sent directly to Russel Reichelt and 40 were sent to Bruce Elliot. Emails continue to be received and this is expected to continue.

Emails have been received from nation and international origins. Based on a word cloud analysis of 150 randomly selected personalised emails, the prominent words in the emails received are "barrier reef dumping dredging please protect" (refer to Figure 28). A word cloud analysis displays more frequently used words in analysed text as larger than less frequently used words.

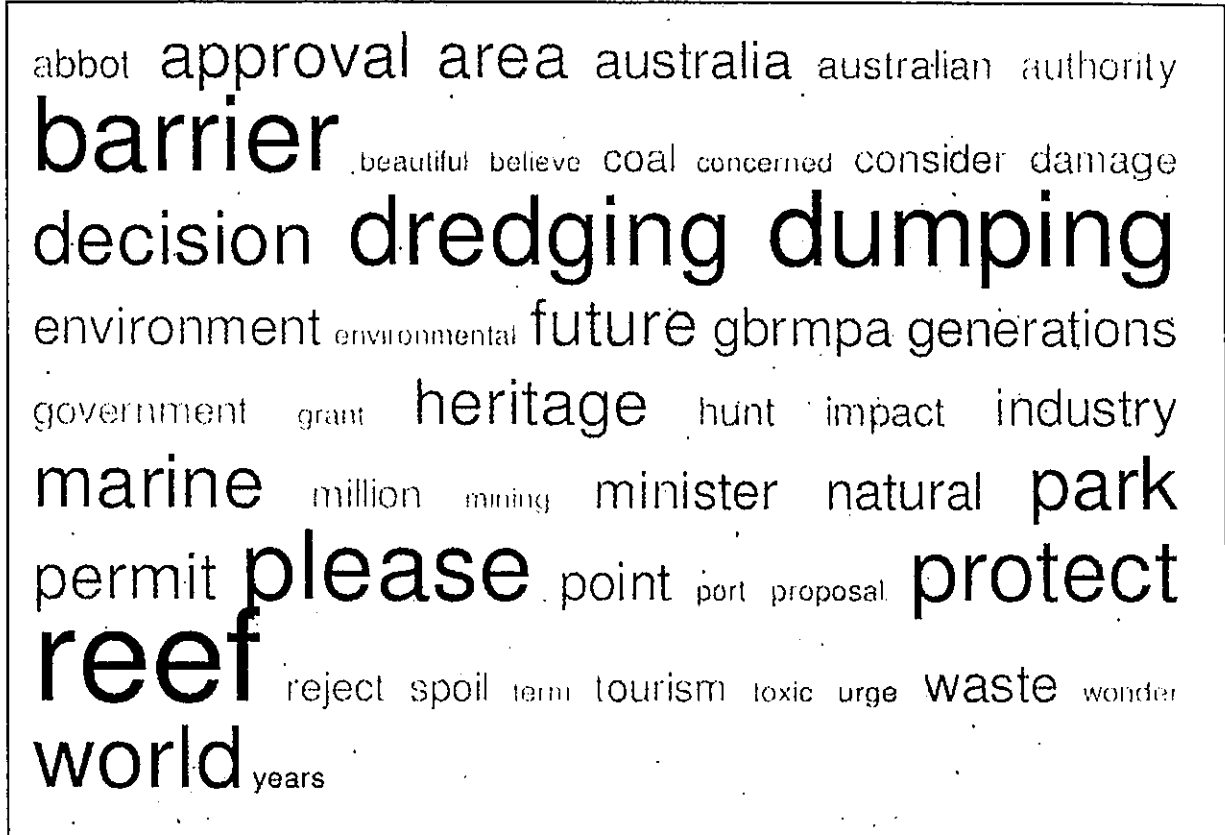


Figure 28. Word cloud analysis of 150 randomly selected personalised emails received by GBRMPA between 10 December 2013 and 6 January 2014.

Of the 160 emails sent to Russel Reichelt, Bruce Elliot, ports and shipping, permits, and GBRMPA media email addresses, only one was in support of Port of Abbot capital dredging project - a real estate agent in Bowen. Of those 160 analysed emails, a cross section of society members submitted emails including members of the general public (largest proportion), high school and university students, lecturers, solicitors, accountants, engineers, business owners in Airlie Beach/Whitsundays (such as Waltzing Matilda Charters, Explore Whitsundays Group, Biolicious) and conservation groups such as Abbot Point Action Group, Clarence Environment Centre, Mackay Conservation Group, and North Queensland Conservation Group.

Phone calls

The GBRMPA has received approximately 2000 phone calls between 10 December 2013 and 17 January 2014. The Authority is still receiving Abbot Point related phone calls and the calls are expected to continue.

Of the phone calls received and recorded in the database, none were in support of the Abbot Point permit approval. A snap shot of some phone calls received include:

- "Wanting to add my support to the protection of our pristine environment and voice my objection to mining interests being put first. Reject Abbot Point dredging proposal".
- "Phoned to say that she is totally opposed to the dumping of dredge into the reef. She doesn't believe that the offsets are adequate or can adjust for the sediment load which will happen. Thus, in her opinion, the authority to needs to oppose the approval."
- "Believe decision should be delayed until research proves spoil won't have impact on the Reef and would also be supportive of a no decision that says no to dredge spoil being dumped in the Reef full stop".
- "very concerned about the dumping (should be on land) not Marine Park. People expect pristine natural state. I'm concerned about long term viability. GBRMPA has the responsibility to look after it for us and future generations."
- "object to the development and to ask GBRMPA not to approve the permit"



- "register my objection to the decision as a member of society, a parent and a global citizen. Insulted by the decision of Minister Hunt. It will tear communities apart like Gladstone. What is the world thinking of us?"
- "Object to dumping at Abbott Pt. Travelled around the world, just got back from Thailand and have seen too many dead reefs around the world. Don't want to see the same thing happen here in Australia."
- "Terrestrial ecologist, I take uni students to Gladstone every year and dumbfounded by completely inadequate monitoring program for dredging there. Can't pin impacts to dredging due to poorly designed monitoring program. If this goes ahead, at least make sure monitoring is properly designed with clear criteria to attribute impacts."
- "The Authority should not permit if impacts on WHA values."
- "Out of work dredging contractor wanting to talk to GBRMPA about dredging methodologies favouring the Dutch companies. Also wants to share his knowledge and explain that there is no need to be dumping the dredge spoil from Abbot Point into the reef, there are alternatives."

Social media

There was also a considerable increase in social media activity on the GBRMPA platforms. This was partly due to campaigns by Greenpeace, GetUp, World Wildlife Fund and others as well as community members using this as a platform to make comments. Activity included:

- More than more 300 mentions, favourites or retweets of GBRMPA (@gbrmarinepark) on Twitter
- Increase in "likes" on our Facebook page - from 5662 likes on 12 December 2013 to 9441 likes on 6 January 2014.
- Approximately 170 direct messages on our Facebook page
- Hundreds of "posts by others" to the GBRMPA Facebook page itself and comments under individual posts

There are also a number of Facebook pages campaigning against the dredging and disposal in the Marine Park, including 'Fight for the reef' which is a partnership between WWF and the Australian Marine Conservation society (33,973 likes) and 'Abbot Point Action Group' (1226 likes).

Media

GBRMPA communications group through relevant searches has estimated 685 media stories between 10 December 2013 (Hon Greg Hunt MP EPBC approval) and 6 January 2014, including AM radio (97), Letters to the editor (23) and other stories such as newspaper articles (565).

Film

A documentary film produced by Positive Change for Marine Life (not-for-profit organisation) is about Abbot Point development and whether industry and healthy reef ecosystem can co-exist. Representatives from all sectors involved in the Abbot Point debate are being interviewed, including ports corporations, mining companies, scientists, fisherman, local business owners, economists, government officials, the tourism industry and local community. The trailer is expected to be completed in late February 2014.



PERMIT ASSESSMENT

ATTACHMENT E: GBRMPA comments (Draft PER Adequacy Review)

GBRMPA Comments on Draft PER for SEWPac October 2012

Comment No	Guideline Item no & text	Section & page number of draft PER	Comment to be addressed
1	5.5d		Future developments, Not all projects listed as controlled action within the port are covered. For example: Waratah Coal EPBC 2012/6250 is not referred to or mentioned within the document.
2	5.5(i)	Figure 3.34	This figure is misleading the General Use Zone is not shown (they are identified only by their absence), implies there is no Marine Park zoning or protected areas in close proximity to the Port.
3	5.8	1.15 pg (1-17)	Poor attempt at describing consultation undertaken, more detail is required. Newsletters, media, workshops forums etc.
5	5.9 (m)	3-105	The PER describes other use of the area and adjacent areas such as commercial fishing effort and aquaculture. There is mention within the PER that tourism is growing within the region. There is no mention how tourism interacts with the use of the area proposed by NQBP for dredging and disposal.
6		3-128	Only the bottom layer is represented for plume at a 50 th percentile TSS concentration. Need to show a range of percentiles to accurately understand plume extent and intensity.
7	5.10.8 (m)		This element is not addressed in the body of the report. Predictions of the fate of the dredge material at the disposal area over time.
8	5.10.8 (p)		It appears this element has not been addressed in the body of the report. Re-suspension of material at the disposal site. Plume modelling of disposal actions.
9	5.10.8 (r) Model Outputs		This requirement is not addressed well only showing a seasonally based effect and alternate wind scenario (possible worst case), there appears no spatial scheme that provided for a clear way of describing extent severity and duration of impact, for example zone of influence, zone of impact.
10	5.10.8 (t) Modelling		This element is not covered in the body of the report. There is no mention of a peer review of modelling outputs, terms of reference peer review report. Etc
11	5.10.1 Impacts to listed migratory species and listed threatened	4.5.4.3 Page 4-24	The impact assessment for actual seagrass and potential seagrass habitat is inconsistent with that in 3.4.4.4.



	species and ecological communities			
13	5.10.1 Impacts to listed migratory species and listed threatened species and ecological communities	4.6.3 Page 4.39	<ul style="list-style-type: none"> Conclusions regarding impacts to inshore dolphins are dogmatic and not supported by documentation or evidence. <p>Again there are inconsistencies with seagrass habitat impacts and the information provided in 3.4.4. Conclusions are unsupported.</p> <p>There is a lack of acknowledgement of the impact on inshore dolphins from habitat loss or degradation, noise pollution. There is repetitive mention of inshore dolphins "Co-existence" with ports and major development, whereas a lack of recognition of the impacts of major developments.</p> <ul style="list-style-type: none"> Note: In the 2012 A Vulnerability Assessment for the Great Barrier Reef Indo-Pacific humpback and Australian Snubfin dolphins it is noted that habitat loss and major developments are a major pressure on the vulnerability of inshore dolphins. 	
14	5.10.1 Impacts to listed migratory species and listed threatened species and ecological communities	4.6.3.3 Page 4-42 to 4-44		
15	5.10.2 Impacts to listed values of the great barrier reef world heritage property	4.3.3 Table 4.1 Page 4-8 to 4-13	<p>Unsupported conclusion on the impact to inshore dolphins.</p> <p>Overall a thorough assessment.</p>	
16	5.10.3 Impacts to listed values of the great barrier reef national heritage place	4.4 Page 4-14	<p>Although transcription as a National Heritage place requires similar values to World Heritage Transcription, the criterion are not identical and therefore further assessment against the National Heritage values is required in the PER.</p>	
17	5.10.4 Impacts to the commonwealth marine environment	<ul style="list-style-type: none"> 4.7 Table 4-16 page 4-47 – 4-48 Page 4-48 	<ul style="list-style-type: none"> Mention of temporary impacts does not represent documented long term recovery of seagrass population. A broader scope should be taken in regards to the potential impact on water quality. Currently this point only addresses turbidity and does not mention any other potential water quality issues. This table identifies mitigation measures and predicted risk levels, however it does not adequately represent the potential direct, indirect or consequential impacts of the proposed 	



PERMIT ASSESSMENT

18	5.10.5 Impacts on the Great Barrier Reef Marine Park	<ul style="list-style-type: none"> 4.8 Table 4-17 Page 4-49 to 4-51 	project.
19	5.10.6 Cumulative Impacts of the Proposed Project	5.1	This table identifies mitigation measures and predicted risk levels, however it does not adequately represent the potential direct, indirect or consequential impacts of the proposed project. The turbidity loads are described as short lived. Although temporary, over two months of increased turbidity at the proposed time of year should not be considered "short lived". Constant mention of the potential impact on seagrass communities (in this and other sections) being "within the bounds of natural variability", does not represent the current state of seagrass communities nor the vulnerability, or potential cumulative impacts given the seasonal impact or recovery cycles (which is subsequently when the proposed project is planned).
20	5.10.6 (b,c, d, g, h, i, j, k, l, m)	5.1	The overall assessment of cumulative impacts is acknowledge to be incomplete (page 5-3 & 5-6). Lacking a risk assessment of overall ecosystem resilience.
21	5.10.7 Consequential Impacts	5.3	These guidelines are vaguely introduced however not satisfactorily discussed in this PER. Although the proponent details one consequential impact (increased shipping), this is not assessed for potential impacts on World heritage values, National Heritage values, etc. The proponent did assess the impacts on those values in earlier chapters but not on consequential impacts. There should also be more consideration of potential consequences such as ongoing maintenance dredging, increased risk of invasive species etc.
22	5.11 a) Identify the level of risk associated with potential impacts already identified and those that require mitigation, monitoring or management to avoid or reduce impacts.	Table 3-16 Table 3-21 Page 3-156	A quality risk matrix has been developed. This guideline is better addressed in this table.
26	5.11 b) iv. The cost of the mitigation	3.4.4	This guideline has not been addressed in this section.



24	<p>measures</p> <p>5.11 b) iii. Any statutory or policy basis for the mitigation measures</p>	3.4.4.2	<p>This section describes statutory risk assessment and policies not mitigation measures. Therefore this guideline has not been adequately met.</p>
25	<p>5.11 c) i. Determining factors in the planning of the proposal so as to avoid damage to the environment.</p>	<p>3.4.4.4 Page 3-128 Indirect Impacts from Plumes</p>	<p>Many of the impacts listed in this section are direct impacts. This section needs to be rephrased as it is confusing and poorly written. This should at least identify what the 95th percentile is and why the proponent considers it not important. The way the figures are presented seems to indicate that 50% of the time, that is where the plume may be. Instead it indicates 50th percentile of the plume concentration at a selected point in the plume. Also, what conditions might result in the 95th percentile and what mitigation measures are in place to mitigate the impacts associated with this. Also what would the plume look like at this level? GBRMIPA needs to know</p> <ul style="list-style-type: none"> • What is the background water quality (variability and seasonality) • What ecosystems are represented and how they are impacted by poor water quality • What plume water quality is to be achieved against background (50 and 95 percentile) • What percentage of time is the plume expected to be in the area e.g. 5% versus 95 % of the time during the dredging – time of exposure e.g. number of days.
26	<p>5.11 c) i. Determining factors in the planning of the proposal so as to avoid damage to the environment.</p>	<p>Page 3-131 Plumes near Dredging, to the west</p>	<p>In text references are wrong. For example when talking about TSS levels the proponent references figure 3-20 which is a salinity results figure. Also when referencing a TSS value the proponent points to a risk analysis table. These guidelines are addressed in multiple spots</p>
27	<p>5.11 c) vi, vii, viii Matters of NES mitigation measures etc</p>	<p>3.4 and 5.2, 4,</p>	
28	<p>5.11 c) vi, vii, viii, xii, xiii, xv & 5.11 d) and e)</p>	<p>Section 6</p>	<p>Many of the risk mitigation/avoidance measures are yet to be addressed. The proponent plans to address these in more detail in the Joint Environmental Management Framework (JEMF) which will contain the Dredging Environmental Management Plan (EMP)</p>



29	5.14 Monitoring and Reporting	Section 6	<p>The proponent should address more mitigation measures in this PER.</p> <p>Good baseline data has been included in this report, and it is based on current best practice and scientifically robust methods. However the proponent acknowledges that this data is based on data for Abbot Point and is not specifically available for the dredging project. The proponent has not clearly identified what is to be monitored in this PER and instead proposes to include this in the EMP as part of the JEMF. Ideally more information regarding monitoring and management measures needs to be included in the PER.</p> <p><i>Opinion: The proponent has provided a fairly thorough discussion of the current state of water quality, ecosystems and fauna, but is somewhat dismissive of the overall potential and consequential impacts. This relaxed assessment has resulted in poor overall consideration of avoidance, mitigation or minimisation measures and therefore a lack of reporting and monitoring programs proposed.</i></p> <p>No offset measures are included in this entire PER.</p> <p>These guideline's have not been addressed. An updated draft of the EMP should be included in the PER to some extent to address these and other aforementioned issues.</p>
30	5.14 d), e), f) and g)		
31	5.15 a)	1.4	<p>There is no section 1.4</p> <p>The proponent has not referenced the GBRMP Regulations 88R in relation to their environmental history.</p> <p>No representation of any environmental records good or bad.</p>
32	5.16 A table cross-referencing information relevant to 5.16 and the mandatory considerations for applications under the GBRMP Regulations should be provided identifying relevant text in the body of the PER.	Table 7-3	<p>The proponent has missed the mark on this guideline. The proponent needs to readdress the guideline focusing on the "mandatory considerations for applications under the GBRMP Regulations not their compliance with the objectives of the GBRMPA Act.</p>
33	5.17 Conclusion	Section 7	<p>As per the rest of the PER, measures to avoid, mitigate, or offset unavoidable impacts are not addressed and as such the proponent should readdress this guideline.</p> <p>This section does however address compliance with EPBC and</p>

**Dredge Material
Disposal**

PERMIT ASSESSMENT



Australian Government
Great Barrier Reef
Marine Park Authority

			GBRMP Act's objectives.
--	--	--	-------------------------

