C1

VOLUME C: MIDDLE BANKS, MORETON BAY

Context and Project Description

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1.1 Introduction

This Volume of the EIS/MDP reports on investigations and environmental issues involving the extraction of sand from Moreton Bay to provide fill for the construction of the runway.

The Volume includes the following chapters:

C2 Geology and Soils

C3 Coastal Processes and Natural Features

C4 Water Quality

C5 Marine Ecology

C6 Cultural Heritage

C7 Social Impact Assessment

C8 Landscape and Visual

The Volume concludes (C9) with a framework *Dredge Management Plan (DMP)* that summarises the best practice management strategies, measures and monitoring requirements that are proposed to be applied to the project as it relates to the key subject areas.

A final DMP will be prepared at the conclusion of the EIS/MDP process, taking into account public and agency comments on the draft EIS/MDP.

The final DMP will:

1. Be part of BAC tender documentation for selecting a dredge contractor;
2. Provide the framework for the preparation of a detailed operational DMP that will be developed by the dredge contractor prior to the commencement of the work [DMP (Dredge Operation)]; and
3. Inform more detailed approval requirements under Queensland State legislation such as the *Coastal Protection and Management Act 1995* that will need to be obtained prior to commencement of works.

1.2 Middle Banks

1.2.1 Selection of Middle Banks for Investigation

In anticipation of the increased future regional demand for sand, Queensland Government agencies initiated the Moreton Bay Sand Extraction Study (the Study) in 1999/2000 in conjunction with key stakeholder groups. The study was established as a result of the need to look holistically at the cumulative impacts of large scale dredging proposals for the northern bay including the Port expansion, the Airport's NPR project and construction industry needs.

The Study examined the environmental, economic, cultural and social impacts of sand extraction, and various alternatives to bay sand, such as land based extraction and manufactured sands.

The Study was undertaken in two principal phases. The first was a comprehensive review of all available information related to sand extraction both within Moreton Bay and from land based sources, and sought to identify both the current state of knowledge and identify data gaps.

Based on this work, five separate specialist investigations[1] were subsequently undertaken in phase two of the Study including:

- Economic analysis of sand extraction from marine and land-based sources in South East Queensland;
- Sediment geochemistry processes within the northern Moreton Bay sand banks and potential impacts to water quality;
- Benthic fauna and fisheries;
- Indigenous cultural heritage; and
- Tidal current and wave penetration numerical modelling of northern Moreton Bay.

[1] Results of the studies are included in final reports available from the Queensland Environmental Protection Agency (EPA) website: www.epa.qld.gov.au

Overall, the scientific studies indicated that large-scale sand extraction in Northern Moreton Bay was highly unlikely to result in major environmental impacts. A scientific panel established under the auspices of the Moreton Bay Waterways and Catchments Partnership and led by an eminent University of Queensland Professor, assessed key scientific reports making up the Moreton Bay Sand Extraction Study. The expert panel endorsed the scientific integrity of the reports, noting that the scientific studies indicated no major environmental impacts would be expected for the sand extraction scenarios considered in the Study.

Sand extraction of 15 million cubic metres (Mm^3) from Middle Banks for the NPR project was one of the scenarios that the Study investigated.

The 2005 Queensland Government document entitled, Moreton Bay Sand Extraction – Summary of Findings, summarises the key outcomes of the study and is available from the EPA's website along with other information sheets about the Study.

A Sand Extraction Strategy was completed by the Queensland Government in late 2004 to coincide with the release of the Study. The Strategy defines a coordinated approach for sand to be extracted from northern Moreton Bay to address regional demand for sand. In particular, the Strategy sets out that:

From a total available sand resource in Moreton Bay of approximately 3,770 Mm^3, the Government has made a decision that over the next 20 years it will support:

- Extraction of up to 40 Mm^3 (less than 1.1 percent of the total sand resource) of sand for development of Australia TradeCoast projects, including the expansion of the Brisbane Airport and the Port of Brisbane.
- Extraction of up to 20 Mm^3 (less than 0.6 percent of the total sand resource) of sand for use within the construction sector.
- Locating the majority of future sand extraction to supplement a major shipping channel straightening project in the northern part of Moreton Bay.
- In addition to sand extraction to supplement channel straightening, increased sand extraction will be allowed in the Middle Banks area of the bay (subject to environmental impact assessment), with priority to be given to the Brisbane Airport Corporation.

1.2.2 Location of Middle Banks

Middle Banks is located approximately 20 km north-east of the mouth of the Brisbane River and 4 km due west of Tangalooma Point on Moreton Island. Sediment in the eastern Bay region is dominated by sand of marine origin.

All sand at Middle Banks is sub-tidal between depths of -4 m and -30 m Lowest Astronomical Tide (LAT).

Figure 1.2 shows the main shipping channels in relation to Middle Banks and the location of existing commercial sand extraction and dredge spoil placement operations.

Middle Banks lies between the dredged Main and East Shipping Channels. It has been the source of sand for two previous dredging works undertaken for the Brisbane Airport including the original airport dredging of approximately 16 Mm^3 of sand (1983) and the dredging undertaken as part of the International Terminal development of approximately 4 Mm^3 of sand (1991).

Figure 1.2: *Location of Existing Commercial Extraction Permit Areas, Dredge Placement Sites and Maintained Shipping Channels in Moreton Bay.*

1.3 Proposed Sand Extraction Activities

As described in Chapters A4 and A5 of the EIS/MDP, construction of the new runway and associated aviation facilities on the Airport site will require dredging and reclamation of a volume of approximately 15 Mm^3 of unconsolidated marine sand.

The sand will be used to:

- Consolidate the soft compressible soils found on the project site;
- Provide a stable platform to enable the construction of the runway pavements; and
- Elevate the site to provide flood immunity.

The required volume of 15 Mm^3 of sand for the NPR project is also needed to fill the Future Aviation Facilities Area (FAFA) (an area to be developed for aviation-related facilities between the existing 01-19 runway and NPR) and the Western Apron Area (the area immediately west of the current Domestic Terminal) that will be developed in the future as a new terminal precinct. These areas are described further in Chapters A4 and A5.

The runway and taxiways, western apron area and FAFA will be developed over highly compressible materials and will consolidate significantly during the construction period. To enable the consolidation to occur at a reasonable rate, additional sand needs to be placed over the development areas to surcharge the site. At the completion of the surcharging and ground treatment phases, sand used as surcharge will be removed from the runways and taxiways to enable pavement construction (refer Chapter A5).

The total volume of sand required for the project includes the volume of sand required to construct the embankments, an allowance for the sand in embankments that is lost in the consolidation process and the volume of surcharge material.

Sand dredged from Middle Banks will be transported within the hopper of the dredge vessel to a designated mooring site at Luggage Point in the Brisbane River. From the mooring site it is to be hydraulically pumped onto the Airport reclamation site via a dredge pipeline.

Given the large volume of material needed for the project and the proposed method of pumping the sand to the reclamation site, the sand extraction operation will require specialist plant and skilled labour that will have to be sourced internationally. It is considered that a Medium to Large Class Trailer Suction Hopper Dredge (TSHD) will be the most efficient dredge for this type and scale of project.

The dredge vessel would be selected through a competitive tender process following a decision about approval for the project. The preferred dredge will have a hopper capacity between 15,000 m^3 and 25,000 m^3, which can access the pump-out berth at Luggage Point at all stages of the tide when fully loaded and have enough pump capacity to reach the reclamation site on the Airport without a booster station.

It is proposed that the extraction of sand from Middle Banks, transportation to the mooring location, discharging of sand from the dredge and the vessel returning to Middle Banks will occur in an eight hour cycle, 24 hours per day, over a 12 to 18 month period (depending upon the size of the available dredge). Continuous operation of the vessel will be dependent on weather conditions and other storm events and planned maintenance of the vessel and equipment.

Further information about the equipment proposed to be used during the dredge operation and the dredge and pump-out methodology is discussed fully in the Chapter C9, Dredge Management Plan.

1.4 Planning and Regulatory Context

1.4.1 Moreton Bay Marine Park

Moreton Bay is part of Queensland's coastal waters and generally all of the Bay's tidal waters/areas are included within the Moreton Bay Marine Park, declared under the *Marine Parks Act 2004*.

Moreton Bay Marine Park is managed under a statutory zoning plan that divides the Bay into several categories of zones, which define particular use and conservation/protection areas for the regulation of activities.

The seabed at Middle Banks is unallocated State Land (not subject to a lease) and the area is designated as a General Use Zone under the Moreton Bay Marine Park.

The management intent or 'purpose' of the General Use Zone under the *Moreton Bay Zoning Plan* is, "to provide for the general use and public enjoyment of the zone in ways that are consistent with the conservation of the marine park". Sand extraction activities require permission under the zoning plan to occur in General Use Zones.

The shallow, near-shore waters out to a distance of 1 km from the western shoreline of Moreton Island are declared as a Habitat Zone under the zoning plan. Habitat Zones have a more defined conservation focus than the management intent of the General Use Zone, seeking to conserve habitats whilst providing for reasonable public use and enjoyment of the zone.

The nearest Conservation Zones of the Marine Park to Middle Banks are located 10 – 12 km to the south in the Moreton Banks, Amity Banks and South Passage area. These areas have the highest conservation value in the Bay in terms of providing seagrass habitat for dugong and marine turtles.

1.4.2 Coastal Management Plans

Under the *Coastal Protection and Management Act 1995*, the *State Coastal Management Plan 2001* and South East Queensland (SEQ) *Regional Coastal Management Plan 2006* have the status of State Planning Policies for the purpose of making and amending planning schemes and assessing and deciding development applications. The chief executive under the Act and other regulatory authorities must consider the relevant policies in coastal management plans when making a decision about resource allocations or development applications.

As assessment of the likely impacts of the sand extraction operation against the policies of the State and South East Queensland *Regional Coastal Management Plan* are included in Chapter C9 (*Dredge Management Plan*).

The Moreton Bay Strategic Plan 1993 is also relevant to the assessment of sand extraction activities in Moreton Bay but has largely been superseded by the current *Marine Park Zoning Plan* (discussed in section 1.4.1) and South East Queensland *Regional Coastal Management Plan.*

1.4.3 Moreton Island

Moreton Island forms part of the City of Brisbane. Some 95 percent of the Island is included within the Moreton Island National Park managed by the Queensland Parks and Wildlife Service, with the remainder comprising several small townships located on the western side of the Island including Bulwer, Cowan Cowan, Tangalooma and Kooringal. Land use in the settlement areas is regulated by Brisbane City Council through the *Brisbane City Plan 2000*. With the exception of Tangalooma, these settlements provide for both permanent and holiday accommodation in small-scale, detached dwellings with limited services and infrastructure. Tangalooma is a holiday resort, providing tourist accommodation and associated recreational activities and services in a resort format.

1.4.4 Moreton Bay Ramsar Site

Parts of Moreton Bay are listed as a wetland of international importance under the *Ramsar Wetland Convention 1971*. The boundaries of the Moreton Bay Ramsar site do not extend below 6 m depth and fringe the western shoreline of Moreton Island along similar boundaries to the marine park habitat zone described in section 1.4.1. As a result, the proposed sand extraction will not occur within the boundaries of the Ramsar area.

1.4.5 Water Quality

Moreton Bay is subject to recently gazetted environmental values and water quality objectives under the *Environmental Protection (Water) Policy 1997* (EPP Water). The waters immediately on and surrounding Middle Banks are declared as areas with "slightly to moderately modified" aquatic ecosystem values. An area immediately to the east of Middle Banks (between the East Channel and Moreton Island) is declared to be a High Ecological Value (HEV) area under the EPP Water based on its high water quality and ecosystem health that occurs in the Eastern Bay.

1.4.6 Approvals Relevant to Extraction of Sand

At the Commonwealth level, the *Environment Protection and Biodiversity Conservation Act 1999*, as well as commitments under international conventions apply to sand extraction activities at Middle Banks.

Queensland statutes that regulate extraction of sand and associated activities in marine areas include:

- *Environmental Protection Act 1994* (and associated regulation/s);
- Environmental Protection Policies;
- *Coastal Protection and Management Act 1995*;
- *Fisheries Act 1994* (and associated regulation/s);
- *Transport Operations (Marine Safety) Act 1994* (and associated regulation/s);
- *Aboriginal Cultural Heritage Act 2003*;
- *Nature Conservation Act 1992* and conservation plans;
- *Marine Parks Act 2004* (and associated regulation/s); and
- *Marine Parks (Moreton Bay) Zoning Plan 1997*.

Regulatory controls under a number of these statutes are implemented through the Integrated Development Assessment System (IDAS) under the *Integrated Planning Act 1997*.

Chapter C9 (*Dredge Management Plan*) lists the regulatory approvals likely to be required for the sand extraction activity under these statutes.

1.5 Middle Banks Investigations

The Sand Extraction Study and other scientific studies relevant to Moreton Bay provide a robust information base about the nature of the sand resource in Middle Banks and the environmental issues associated with sand extraction activities in the marine environment.

Notwithstanding this, a series of new investigations were carried out in the Middle Banks area of Moreton Bay in 2005 and 2006 as part of this EIS/MDP process.

The investigations were undertaken to address information requirements in the EIS Guidelines. In particular, the investigations were targeted to provide information about the following:

- Supplement and add to the information identified from the Sand Extraction Study (particularly at the local scale in relation to Middle Banks);
- Where in the Middle Banks area the required 15 Mm^3 of sand could best be sourced (e.g. to identify a preferred dredge footprint);
- Identification of environmental or other constraints that should be avoided from direct impact in the dredge footprint; and
- To help identify the likely impacts the removal of material from the dredge footprint may have on the marine environment and the significance of any impact.

Prior to the commissioning of the investigations, an investigation or study area was defined in the Middle Banks region of Moreton Bay.

Figure 1.5 shows the Middle Banks investigation area nominated in the EIS/MDP in relation to other features in Moreton Bay, such as Moreton Island. A large area was selected for the investigation (much larger than the area needed for the dredging of the required volume of material) to ensure the project had a full picture of the natural and physical processes occurring at and around Middle Banks.

In the context of assessing potential erosion impacts on neighbouring shorelines, the investigation area also included the shallow shoal areas and the western shoreline of Moreton Island from Shark Spit to an area north of Cowan Cowan.

Figure 1.5: *Middle Banks Investigation Area.*

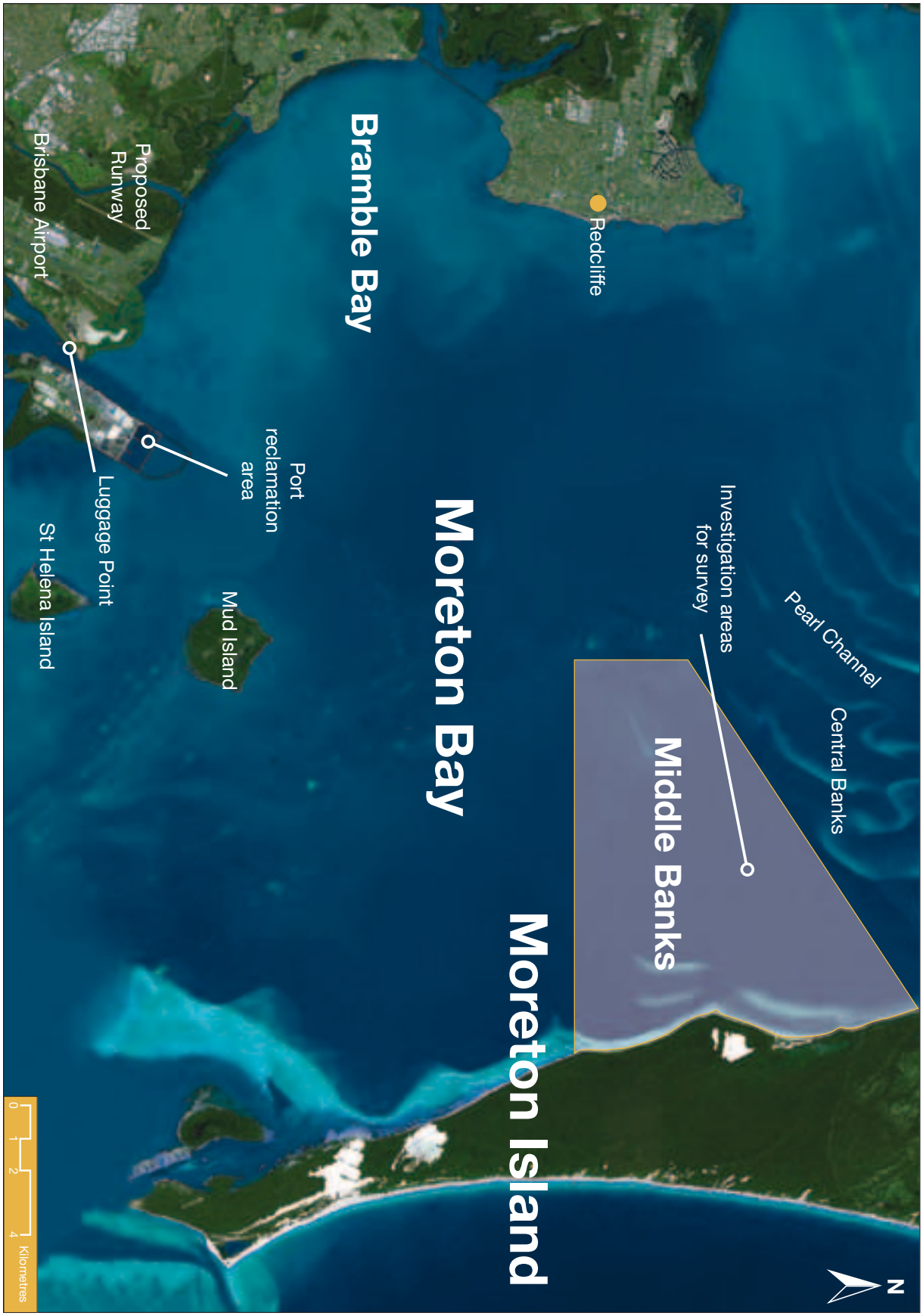

Table 1.5 below lists and summarises the investigations that were undertaken as part of this process and how the information has been used in the EIS/MDP.

Table 1.5: Investigations Undertaken at Middle Banks.

Investigation/Study	How information has been used in the EIS/MDP
Fine scale (25 m line spacing) bathymetric surveys of Middle Banks, including the shallow shoal areas adjacent to Moreton Island	Input into determining dredging footprint and dredge logistics Input into modelling potential changes to coastal processes such as waves and tidal currents and water quality
Baseline surveys of beach profiles on the western foreshore of Moreton Island between Shark Spit and an area north of Cowan Cowan	Input into modelling potential changes to coastal processes such as waves and tidal currents
Sub-bottom profiling through seismic surveys to derive an interpreted level of the Pleistocene surface at Middle Banks	Input in determining the volume of material to be taken from Middle Banks Ensuring the dredging does not extend into older Pleistocene sediments (that may have Aboriginal cultural heritage significance)
Offshore geotechnical sampling using continuous marine vibro-coring (16 boreholes sampled to an average depth of 10.4 m)	Identify the physical characteristics (eg. grain size, silt/mud content) of the in situ material Obtain sediment samples to analyse the acid sulfate potential of the in situ material Obtain porewater (water found beneath the seabed between the sand grains) from the vibro-core for chemical analysis
Seagrass and benthic habitat survey of Middle Banks using an underwater video system	Identify the presence of any seagrass communities and other benthic habitats in the area that may be impacted as a result of sand extraction
Fisheries surveys (using otter prawn trawl gear)	Assess the structure of fish and mobile invertebrate species in the Middle Banks region and assess potential changes to these assemblages as a result of sand extraction
Modelling of the turbidity plume generated by the dredge vessel hopper overflow	Determine if temporary changes to water quality from the operation of the dredge would have visual and/or ecological impacts and how these impacts could be minimised
Modelling of wave, hydrodynamic and morphological processes	Determine the nature and behaviour of currents and seabed sand transport at or near Middle Banks and any associated impacts on Moreton Island shoreline processes

1.6 Dredge Footprint Analysis

Based on the information obtained from the investigations outlined above, a dredge footprint at Middle Banks has been identified and is shown in **Figure 1.6a.**

The proposed footprint equates to an area that is roughly 1 km wide by 6 km long and up to 8 m below existing seabed (grading to existing bed levels). The required volume of 15 Mm^3 of sand would be sourced from this footprint. As shown in **Figure 1.6b**, the dredge footprint represents a small area within the overall investigation area and is located in the northern and eastern section of Middle Banks.

The footprint shape is long, narrow and linear, running parallel to the Moreton Island coastline. Tangalooma Resort and township on the Island would be the closest settlement to the proposed footprint, at a distance of approximately 2.5 km away at its closest point.

The footprint is confined to deeper water (below -10 m LAT) and largely avoids the shallow sand bank areas generally associated with the Middle Banks that can be observed from aerial photography or satellite imagery.

In relation to the shipping channels, the footprint is located immediately adjacent and running along the western boundary of the East Channel, extending north to the confluence of the Main and East Channels. The dredge will avoid and dredge around the two navigational markers that occur in the proposed footprint.

As a brief summary to the findings of this Volume of the EIS/MDP, the proposed dredge footprint has been selected on the basis of the following matters:

Targeting Holocene (clean) sand deposits that will produce superior quality fill material

Clean marine sand is the preferred material for the intended purpose of using the material for filling. Clays, silts, and other fine material in marine sediment is considered to be poor fill material for engineering purposes.

The absence of finer silts and clays in the dredged material will minimise water quality impacts from turbidity at Middle Banks during dredging. Winning fill material with low concentrations of fine sediments will also improve the quality of the supernatant tailwater (ie. the water pumped by the dredge vessel with the sand onto the reclamation site) that needs to be discharged from the reclamation site after placement of the sand has occurred.

Clean marine sands also have a naturally low acid sulfate potential due to natural buffering. The dredge footprint avoids clay, silt and muddy sediments that have a higher acid sulfate soil potential thereby avoiding acidity impacts when the material is placed on the Airport site.

The Summary of Findings of the Moreton Bay Sand Extraction Study (MBSES) (EPA 2005) found that sand within the northern delta of Moreton Bay represents material that has been transported along the coast from northern NSW. The proportion of fine silt material in the sediments is very small, and the sediments are completely free of heavy metal contaminants or other toxicants. The borehole analysis undertaken by BAC for the EIS/MDP confirmed the small percentage of fine silt material, typically in the range of 2–4 percent. Sampling data taken as part of the MBSES showed very low background levels of metals in the sediments. The data also showed that Polycyclic Aromatic Hydrocarbons (PAH) and Total Petroleum Hydrocarbons (TPH) levels were very low, below laboratory analysis detection limits. Based on the findings of the MBSES, further laboratory testing for industrial contamination of sediments at BAC's proposed dredged site was not seen as necessary.

Further information about geology and soil issues is contained in Chapter C2, Geology and Soils.

Avoiding or minimising impacts to marine ecology

While the Middle Banks site is located in the General Use Zone of the Moreton Bay Marine Park and away from areas of high conservation significance such as Ramsar-listed wetlands and declared fish habitat areas, site specific surveys

Figure 1.6a: *Plan of Proposed Dredge Footprint.*

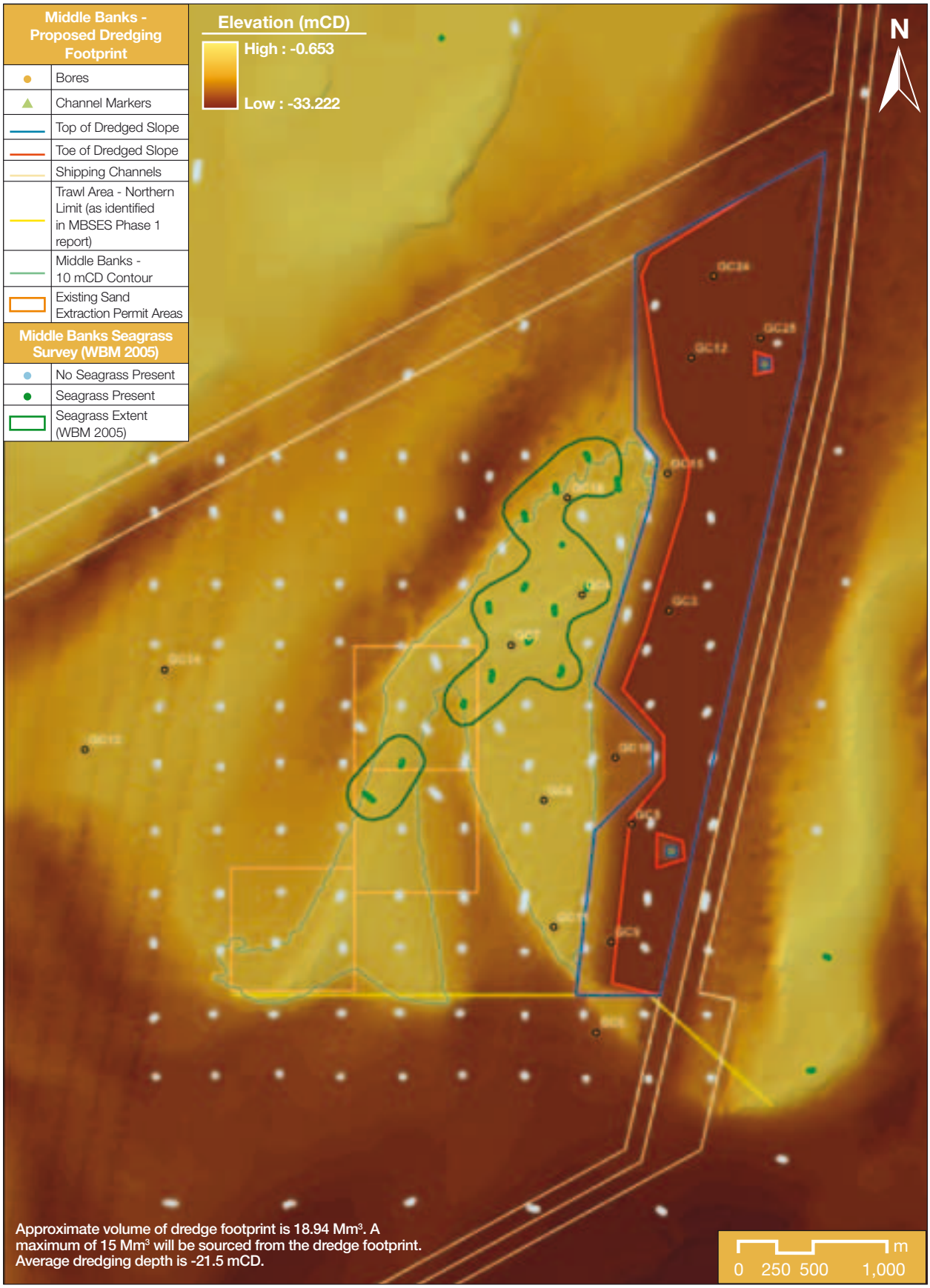

Figure 1.6b: *Proposed Dredge Footprint within the Context of the Investigation Area.*

NEW PARALLEL RUNWAY DRAFT EIS/MDP
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identified ecological habitats at a local scale (including sparse seagrass and deeper areas in the southern section of Middle Banks with high benthic invertebrate abundance).

The dredge footprint has sought to avoid these areas including ensuring no dredging is to occur into the seabed at a depth less than -10 m LAT. This will avoid direct impacts to the seagrass species at Middle Banks which are found in the photic (light) zone between 6 m and 10 m of depth.

The overall impacts on fish and invertebrate communities at Middle Banks will also be reduced by avoiding the shallow banks area and selecting a narrow and deep dredge footprint rather than a shallow footprint over a broader area. In addition to reducing the overall area of direct impact, this will facilitate re-colonisation of the dredged area by marine life following the dredging.

Further information about these issues is contained in Chapter C5, Marine Ecology.

Logistical advantages to the dredge contractor

A long, linear footprint in water greater than 10 m depth will minimise the time required to be spent by the vessel at the borrow site and minimises the overall time required to complete the dredging activity. Selecting a dredge footprint that provides adequate under-keel clearance (distance between the keel of the dredge vessel and the seabed) will also reduce turbid plumes generated by the dredge vessel, particularly for a vessel employing an environmental or "green" valve which is being investigated for the project.

Further information about this and other logistical issues are contained in the *Dredge Management Plan*, Chapter C9.

Avoiding potential conflicts with other users of the Bay

The Middle Banks area is currently used by commercial extractive industry operators (in three approved permit areas). A broad area south of Middle Banks is known to be used by commercial fishing trawlers. Both of these areas have been avoided in the proposed dredge footprint.

In terms of traffic and transport, the dredging operation in the proposed dredge footprint would not interfere with ferry services or other recreational or commercial tourist operations in the Bay with consideration of safe passage of vessels. Similarly, there are no impacts anticipated on commercial shipping given the footprint is located west of the East Channel boundary.

Further information about these issues is contained in Chapter C7, Social Impact Assessment.

Maintaining water quality

Numerical modelling based on the proposed dredge footprint has been undertaken as part of the EIS/MDP to assess and recommend best management practices to minimise impact of turbid plumes on water quality and ecological values.

Modelling shows that the dredge plume is confined locally to the dredge area and dissipates rapidly, returning to background concentrations prior to the commencement of the next dredge cycle. While an observable plume will be present, the small increase in the concentration of total suspended solids and turbidity from the dredge plume will have minor to negligible effects on water quality while dredging is occurring.

The findings of the MBSES showed that dredging in Moreton Bay results in nutrient releases of similar order of magnitude as that released by natural resuspension processes, which in turn represents only approximately 1 percent of the nitrogen (N) released by benthic efflux. The MBSES results indicated that sand dredging in the northern delta is unlikely to have a significant impact on the nutrient cycles of Moreton Bay.

Further information about this issue is contained in Chapter C4, Water Quality.

Minimising impacts to coastal processes

Numerical modelling based on the proposed dredge footprint has been undertaken as part of the EIS/MDP to assess any impacts on physical processes such as waves and tidal currents that may cause erosion or other impacts on nearby shorelines.

The modelling shows that there are no erosion impacts from the project expected at Cowan Cowan and other shorelines of Moreton Island.

Further information about this issue is contained in Chapter C3, Coastal Processes and Natural Features.

Avoiding potential impacts on cultural heritage

Restricting dredging to Holocene-age sediments reduces potential impacts on indigenous cultural heritage values that may exist in the older Pleistocene surface. This pre-Holocene land surface was likely to be used and valued by the original inhabitants as it would have been intermittently exposed above sea level during the last major marine transgression which occurred between 18,000 and 10,000 years ago.

As part of the EIS/MDP, the BAC notified an intention to develop a *Cultural Heritage Management Plan (CHMP)* for the Middle Banks area. The respondents to the notification, the Minjerribah Moorgumpin Elders in Council, have liaised with BAC in developing the CHMP which has been approved under the *Aboriginal Cultural Heritage Act 2003*. This CHMP will be implemented and remain current during the life of the project.

Further information about these issues is contained in Chapter C6, Cultural Heritage.

1.7 Chapter Layout

The chapters throughout this Volume of the EIS/MDP provide a more comprehensive and detailed analysis of the environmental and socio-economic issues that have been considered in the selection of the dredge footprint, and assess the potential impacts from the dredging operation on the marine environment.

In addition to the matters outlined above, each chapter within Volume C: Middle Banks will also include or address the following:

1) An introduction defining the meaning and scope of the environmental or socio-economic issue (eg. coastal processes, landscape and visual, etc.) that is the subject of the chapter.
2) A discussion of the development activities of the project that are relevant to the assessment for that particular issue.
3) The methodology, where relevant, used in describing the baseline (current) condition and impact assessment.
4) Limitations and assumptions, if any, made in relation to the assessment.
5) A description of the baseline conditions relevant to the issue and the project.
6) Any specific consultation undertaken as part of the baseline and impact assessment process prior to release of the EIS/MDP for public comment.
7) The key or relevant laws, policies and guidelines for the issue that were considered as part of the assessment.
8) An assessment of potential impacts of the project for the issue.
9) An assessment of any cumulative impacts and/or interactive effects.
10) Discussion about mitigation measures that could be employed to reduce or ameliorate impacts.
11) Discussion about residual effects following consideration of mitigation measures.
12) An assessment summary matrix that summarises the key findings of the chapter in terms of potential impacts.

The chapters of this Volume of the EIS/MDP should be read together in the context of identifying the key environmental and socio-economic issues relevant to the proposed sand extraction operation at Middle Banks.