14 DREDGING FOR MARINE FACILITIES

14.1 INTRODUCTION

This Chapter:

- Details comments arising from the public exhibition process of the Draft EIS and QGC's responses to them.
- Provides an updated description of marine facilities and infrastructure proposed for the QCLNG Project.
- Outlines the approach and administrative arrangements for environmental assessment and permitting for the update to the marine facilities including any other proposed developments or impact assessment processes relevant to these facilities.
- Directs readers to other relevant sections of this supplementary EIS where the updated marine facilities and dredging/spoil disposal works interact with other components (e.g. LNG Plant onshore works, Acid Sulphate Soil management issues) and relevant sections addressing assessment of impacts on the environment.

In the Draft EIS, this corresponding *Chapter 14* of *Volume 2* was titled *'Swing Basin and Shipping Channel Construction'*. However, for the supplementary EIS, this Chapter has now been renamed to better reflect the full nature of the facilities being addressed.

14.2 RESPONSE TO SUBMISSIONS ON DRAFT EIS

Submissions relating to *Volume 2, Chapter 14: Swing Basin and Shipping Channel Construction* as described in the Draft EIS are summarised in *Table 2.14.1* below.

Table 2.14.1 Response to Submissions on Draft EIS

Issue Raised	QCLNG Response	Relevant Submission(s)
Submissions were made concerning the scope of dredging presented in the Draft EIS. In particular the EIS should define whether all or part of the dredging needed for this project will be subject to the Coordinator-General's approval through this EIS process, or as part of the Western Basin Dredging Project EIS.	See *Section 14.3* and *14.4*.	32, 38

Issue Raised	QCLNG Response	Relevant Submission(s)
The EIS should provide a full description of all scenarios for reclamation sites and for all dredging requirements both in the LNG project including operational policies and monitoring programs	*Section 14.5* describes the dredging requirements for the MOF, Construction Dock and Pipeline Crossing. While *Volume 6* and *Volume 5, Chapter 8* provides the impact assessment. A Draft Dredge Management Plan is attached as *Appendix 6.1* to *Volume 6* for those activities described in *Section 14.5*. For all other activities required for the LNG industry and other Port uses, the GPC's WBDD Project EIS describes and impact assesses these works. It also provides guidance as to how these works will be managed by the Port. The GPC has proposed a range of reclamation sites. These are described and impact assessed in FLNE and WBDD EIS.	21, 22, 24, 25, 26, 32

14.3 OTHER DREDGING AND DREDGED MATERIAL DISPOSAL PROJECTS

Since the public exhibition of the QCLNG Draft EIS there have been other proposed developments and environmental impact assessment (EIA) processes announced or released which have direct relevance to the QCLNG Project's dredging and dredged material (spoil) management requirements associated with development of its marine facilities. A brief outline of these developments and EIA processes are listed below.

14.3.1 Port of Gladstone Western Basin Master Plan

The Gladstone Port Western Basin Master Plan was released for public comment at the end of August 2009. The draft master plan strategically identifies current and future land and marine uses, infrastructure development (including pipeline corridors, transport networks and potential bridge access to Curtis Island), as well as port activities, common-user channels, dredging and disposal options over the next 30 years to 2039. The plan also examines conservation areas and the potential for environmental areas to be set aside as part of the required mitigation measures. The master plan sets the context of strategic development of the Port, within which specific developments would be proposed. The Master Plan does not assess the environmental and social impact of development, this being referred to the specific development proposals.

14.3.2 Fisherman's Landing Northern Expansion

The GPC published, in October 2009, an EIS for the construction of a reclamation area as a northern expansion to Fisherman's Landing. This

corresponds to the project referred to in the QCLNG Draft EIS as Fisherman's Landing 153 ha project.

14.3.3 Port of Gladstone Western Basin Dredging and Disposal Project

The GPC published, in November 2009, an EIS for the Western Basin Dredging and Disposal (WBDD) Project. This addresses the impacts of strategic dredging and disposal of spoil material required to support the continued expansion and modernisation of Gladstone Port. It includes the dredging required for the swing basin and channel and the MOF facility of the QCLNG Project.

14.3.4 Gladstone LNG Project EIS

In December 2009, the proponents Santos and PETRONAS released the Gladstone LNG Project (GLNG) Supplementary EIS (sEIS).[1]

The GLNG sEIS stated with respect to dredging and disposal of dredge material that:

- GPC has released the WBDD EIS which assesses the impacts of strategic dredging and disposal in Port Curtis and if the plan (GPC's WBDD Project) is approved, the dredging and the associated dredged material placement for the GLNG Project will be undertaken in accordance with the plan provided the timing of the approval is consistent with the GLNG Project requirements.

Should the proposal be delayed, the GLNG proponents identify a site on Laird Point as suitable for the disposal of dredge spoil. Furthermore, the GLNG EIS contains an assessment of impacts of developing a Dredged material Placement Facility (DMPF) designed to contain placement of approximately 7 million m^3 of material.

14.3.5 Fisherman's Landing LNG Project

The Fisherman's Landing LNG (FLLNG) Project proposed by LNG Limited has received Coordinator General's conditional approval for the EIS for the development of a mid-scale (3.0 million tonne per annum) liquefied natural gas plant at Fisherman's Landing in the Port of Gladstone. LNGL states that GPC is undertaking structural modifications and extensions to the existing Fisherman's Landing Wharf and dredging of the berth pocket and nearby channel.

GPC, utilising existing dredging permits has undertaken some widening and deepening the Targinie Channel and the Berth 5 to facilitate the development of the FLLNG Project. Dredged material was placed ashore on the existing Fisherman's Landing reclaim.

1 Santos Ltd and PETRONAS (2009), GLNG Project Supplementary Environmental Impact Statement, at http://www.glng.com.au/Content.aspx?p=96 .

14.3.6 East Banks Dredge Spoil Disposal Permit Application

In November 2009, GPC lodged an application under the *Environment Protection (Sea Dumping) Act 1981* (Cth) to obtain a new and separate permission to sea-dump material obtained from *capital* dredging in the Port of Gladstone for development of QCLNG Project's Construction Dock channel works. This Sea Dumping Permit Application proposes to place up to 450,000 m^3 of dredged material in the existing East Banks disposal area which GPC has been utilizing for over 10 years and for which it holds a current *maintenance* dredging Sea Dumping Permit.[2]

14.4 APPROACH TO ENVIRONMENTAL ASSESSMENT AND ADMINISTRATIVE PROCESSES FOR REVISED QCLNG DREDGING AND DISPOSAL WORKS

Since lodgement of the Draft EIS, three principle factors have continued to influence the overall environmental assessment and approvals administrative processes associated with dredging works associated with the QCLNG Project. The first has been the ongoing evolution of detailed design of the LNG Plant – in particular the marine components associated with the LNG Plant construction and construction access. The second factor has similarly been the ongoing evolution in the proposed construction and installation of the Export Pipeline marine crossing of The Narrows. The third factor has been the ongoing development of the environmental impact assessment processes for the FLNE and WBDD Projects being undertaken by GPC.

The QCLNG Project requires dredging works associated with:

- A Construction Dock (including an Initial Site Access channel and dock) to allow initial access to the LNG Plant site on Curtis Island and preliminary construction activities.
- Installation of the Export Pipeline using dredging techniques to trench, re-instate and armour the pipeline in the marine and intertidal areas of the Narrows.
- Construction-related facilities on the mainland-side of the Port of Gladstone, to be developed on GPC land adjacent to Auckland Point wharf and the RG Tanna Terminal.
- A Materials Offloading Facility.
- Swing Basin & Access Channel.
- Upgrades to some areas of the existing shipping channels from the entrance of the harbour up to the commencement of the new channel.

The proposed overall approach to environmental assessment of the components and their development, the proposed environmental approvals and condition-setting processes and administration of these conditions during construction activities is outlined below. An overview of the environmental assessment and permitting approach is shown in *Table 2.14.2*.

2 Issued by the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA) in 2007.

Table 2.14.2 Revised overall scope of dredging works required for the QCLNG Project and proposed EIS, post-EIS permitting, dredging works responsibilities

Dredging Works	Description	Dredge Volumes (m^3)	Proposed Start of Works	Environmental Assessment	Post-EIS Dredging Permits
1. Construction Dock	Dredging in three stages to provide access to Construction Dock on Curtis Island.		Q3 2010	QCLNG EIS (QGC)	GPC
(i) Initial Site Access Channel	Stage 1	110,000			
(ii) ConDock apron	Stage 2	200,000			
(iii) ConDock shore component	Stage 3	65,000			
2. Pipeline	Dredging to provide trench for placement of Export Pipeline across The Narrows	150,000 - 200,000[+]	Q1 2011	QCLNG EIS (QGC)	QGC
3. Gladstone Port Facilities					
(i) Auckland Point & RG Tanna	No dredging currently identified as required to access facilities. Dredging of channel to access facilities	<40,000	Q2 2010	N/A[%]	GPC
4. MOF	Dredging to provide access to Materials Offloading Facility on Curtis Island	2,100,000[+]	Q2 2011	WBDD EIS (GPC) QCLNG EIS (QGC)#	GPC
5. Swing Basin		7,100,000[+]	Q3 2011	WBDD EIS (GPC)	GPC
6. Curtis Spur Channel		2,100,000[+]		WBDD EIS (GPC)	GPC
7. Upgrade of Existing Channels		3,000,000[+]		WBDD EIS (GPC)	GPC

[+] Figures are unchanged from dEIS.

See text for explanation of relationship

[%] Environmental approval provided under existing GPC permits. Identified for Auckland Point as contingent should a small amount of dredging be identified subsequently

14.4.1 Construction Dock, MOF and Pipeline Components

QGC, via this EIS for the QCLNG Project is seeking environmental approvals and conditions set in the CG's report for dredging of:

- Construction Dock
- Materials Offloading Facility (MOF)
- Export Pipeline installation.

The description of the proposed construction of these facilities along with a detailed impact assessment and environmental management plans have been provided in this sEIS to complement that within the draft EIS.

Impacts from dredging for the Construction Dock and MOF which affect the MNES within the controlling provisions for EPBC referral number 2008/4401, LNG Marine Facilities, are discussed in sEIS *Volume 13*.

It is intended that environmental conditions for these components would be identified in the CG's Report for the QCLNG Project. However, where the dredging works for these components are proposed to be undertaken by GPC (which is an activity normally undertaken by the GPC within Port limits), it is proposed that GPC would obtain the post-EIS permits required for those dredging works. Therefore, following identification of relevant conditions in the CG's Report, they would be applied to any permits sought either by QGC or GPC to undertake any aspect of those works including the dredging.

The WBDD Project EIS approval process lags behind that of the QCLNG EIS. With this, together with an inherent uncertainty in timing of Government approvals, QGC are concerned that reliance on approval via the GPC's EIS processes alone would put the QCLNG construction schedule at risk. For this reason, QGC's assessment includes the MOF as well as Construction Dock dredging and spoil disposal. To the extent that the WBDD EIS process is also assessing the MOF dredging, it is not expected to identify any additional impact issues that have not been identified and addressed by QGC in this EIS. QGC are sharing all relevant data in relation to dredging with GPC for input into their EIS process.

For the disposal of spoil, the purpose of this EIS is not to assess the impact of the creation of those spoil disposal areas not already created. This is being assessed within other assessments and approvals processes, primarily under the control of the GPC. For example, the impact of disposing of spoil within the Fisherman's Landing area is addressed within *Volume 5, Chapter 8* and *Volume 6* of this sEIS. However, for example, the overall impact of the construction and operation of disposal option of the reclaim area termed Fisherman's Landing Northern Expansion is not assessed in this sEIS, it is assessed within the GPC's FLNE Project's EIS.

QGC has committed therefore to disposing of its dredge spoil only at locations permitted to accept material of the required quality. Separate processes are

proceeding to permit disposal areas not already available. QGC proposes therefore that the QCLNG Project is conditioned to allow the dredging works as described in this Chapter. QGC understands that these works would not be able to commence until a facility for the disposal of the associated spoil is available and, if not already approved, has been approved by the appropriate regulatory agencies for use by QGC or a licensed operator such as GPC.

14.4.2 Components included in the WBDD EIS

The components of MOF, swing basin and channel and upgrades to existing channels have been included in the scope of the WBSDD EIS. In the case of the swing basin, channel and existing channel upgrade components, QGC believes that the environmental conditions associated with the dredging and disposal works should primarily be identified in the CG's Report for the WBDD EIS. Such conditions would be applied to any permits the GPC needed to obtain for these works. As the MOF dredging is also assessed in the QGC EIS though, conditions pertaining to that work should also be included in the CG's Report for the QGC EIS.

Nevertheless, there are substantial risks to the QCLNG Project if for some reason the WBDD Project or the FLNE Project are delayed or do not progress. Were this to occur, QGC would consider alternative approaches to minimise the impacts of any delay in the FLNE and WBDD Projects, having regard to the reasons for such a delay. This would be done in consultation with GPC, the Queensland and Australian Governments and the community.

14.5 DESCRIPTION OF DREDGING REQUIREMENTS

14.5.1 Construction Dock Dredging Requirements

The design, layout and description of the development of the Construction Dock is discussed in *Volume 2, Chapter 13, Section 13.3.2.3*. The objective of the Construction Dock is to provide all-tidal, 24-hour construction vessel access to the LNG Plant site, in order to allow offload of aggregate and other materials for development of the MOF and to undertake initial site works. The overall volume of material estimated to be dredged is about 375,000 m^3.

Dredging works for the Construction Dock will be undertaken in three stages. The dredging works will be undertaken in conjunction with shoreline works (conducted from the land side) to remove a small area of mangroves and excavate intertidal sediments in order to complete the land-marine interface for the Construction Dock access.

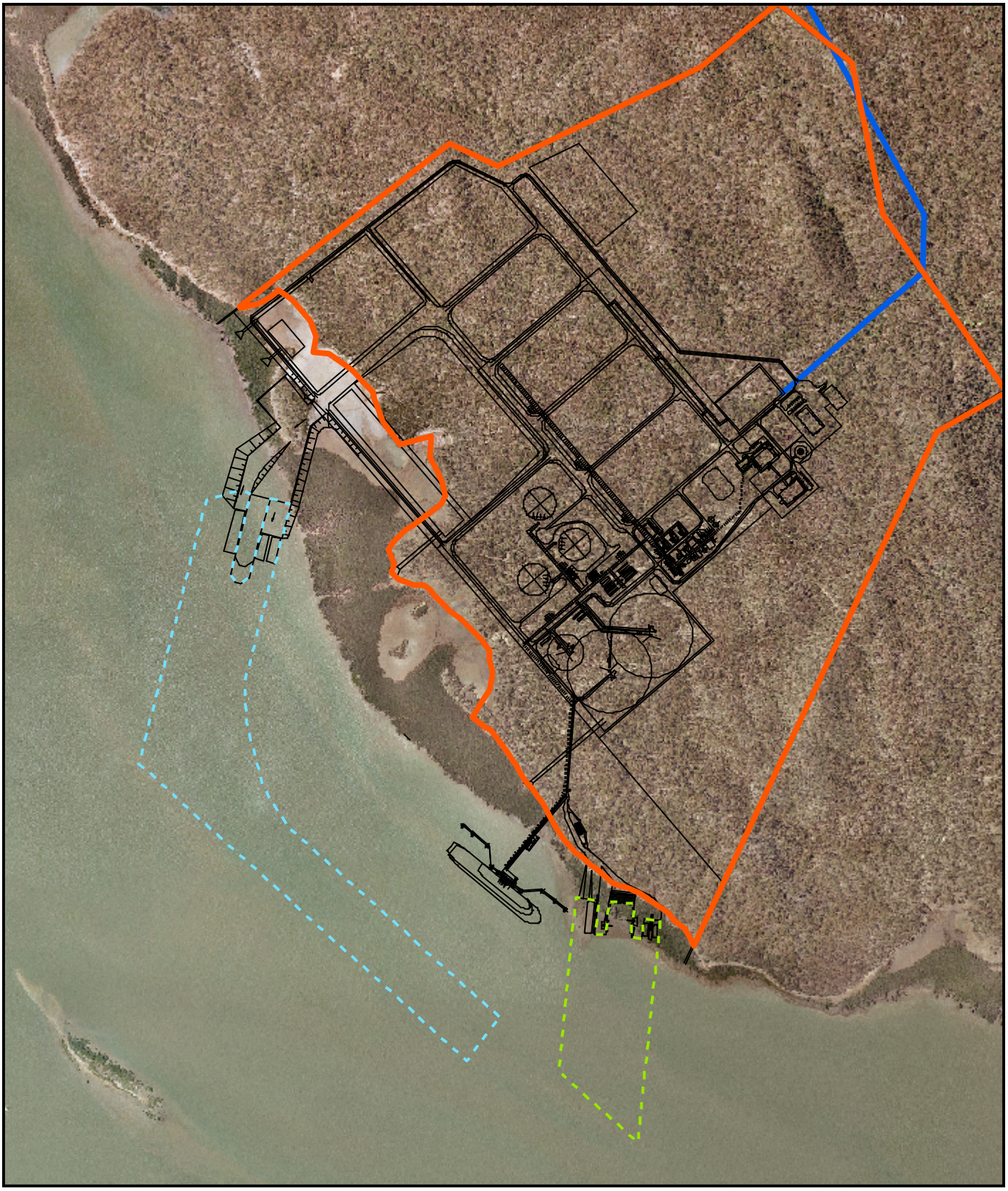
The first stage of the Construction Dock marine works will be the dredging of an Initial Site Access (ISA) Channel from approximately the -4.5 metre LAT isobath shoreward to the outer edge of the narrow mangrove fringe in this location (Stage 1).

Concurrent with this, QGC or the LNG Plant EPC Contractor will undertake shoreline works to initially remove the area of mangroves and excavate and manage post-Holocene potential acid sulphate soils (ASS) in the area adjacent the ISA Channel.

Following the completion of the ISA works, work will progress to complete the remainder of the shoreline excavation works and removal or management of the post-Holocene material. This dual phase approach to the removal of the shoreline intertidal sediments is required in order to appropriately separate and manage potential and actual ASS from non-ASS materials, acknowledging the limitations of dredges to deal with excavation of intertidal mangrove timber. Potential and actual ASS excavated as part of the shoreline works are proposed to be treated and placed into appropriate areas either on the LNG Plant site or a suitable location on the mainland in accordance with the Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines[3] and State Planning Policy 2/02 Guideline, Planning and Managing Development involving Acid Sulfate Soils[4]. ASS management information is discussed in more detail in *Appendix 2.2*.

3 Dear SE, Moore NG, Dobos SK, Watling KM and Ahern CR (2002). Soil Management Guidelines. In Queensland Government, Queensland Acid Sulfate Soil Technical Manual (Version 3.8). Department of Natural Resources and Mines, Indooroopilly, Queensland, Australia.

4 State Planning Policy 2/02 Guideline, Planning and Managing Development involving Acid Sulfate Soils



Legend

- Proposed QCLNG Site Boundary
- Proposed Export Pipeline
- Material Offload Facility Indicative Dredge Pocket
- Construction Dock Indicative Dredge Pocket

Source Note:
Aerial photo - Department of Infrastructure and Planning for QCLNG Project

Projection: UTM MGA Zone 56 Datum: GDA 94

0 100 200 400 m

N

QUEENSLAND CURTIS LNG
A BG Group business

Project	Queensland Curtis LNG Project	Title	Material Offload Facility and Construction Dock Indicative Dredge Areas
Client	QGC - A BG Group business		

ERM
Environmental Resources Management Australia Pty Ltd

Drawn	KP	sEIS Volume 2	Figure S2.14.1
Approved	DS	File No:	0086165b_SUP_GIS002_S2.14.1
Date	19.01.10	Revision	0

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Stage 2 of the marine dredging will involve removal of the remaining area of the Construction Dock apron up to approximately the +2 metre LAT isobaths. This subtidal area contains areas of potential ASS. However, these potential ASS overlie Holocene sediments which contains high calcium carbonate (mollusc shell grit) content which, when mixed with the overlying potential ASS during the dredging process acts to neutralise the acid generation potential of the ASS content. As a result, these types of dredged soils are usually allowed to be disposed of in a marine dumping ground or in intertidal/supratidal land areas.

Following the completion of the shoreline excavation works to remove the mangroves and ASS 'overburden', the dredge will then be able to access and remove just the underlying Holocene sediments in the shoreline area (Stage 3).

The preferred method is to use a small or medium capacity cutter suction dredge (CSD) to undertaking all three work stages for the Construction Dock. However, it may be necessary to use a barge-mounted backhoe or clamshell to dredge some of areas, particularly some of the shoreward margins. This will also depend on interaction with the final method determined for the shoreline mangrove removal, intertidal sediment excavation and ASS management requirements to be undertaken from the land side. The shoreline area excavation will most likely use swamp track or semi-floating track excavators to quickly undertake these relatively small volume works.

Approaches for disposal of dredged materials are discussed further below in *Section 14.5.1.1*.

The overall scheduling and timing of the dredging works will be determined by the tidal cycle in order to maximize the ability to use the high tide periods to gain greatest shoreward access and low tide periods to provide shoreside access to the intertidal area. The effect of tidal currents on the potential transport of fine sediments suspended during dredging works has also been considered and is discussed further in *Volume 6*.

Dredging works are proposed to be undertaken by Gladstone Ports Corporation (GPC). QGC and GPC are currently working closely to finalise the Dredge Management Plan (DMP) which shall form the primary condition-setting documents attached to the Queensland and Australian government approvals to undertake the dredging (and dredged material disposal) works. The Construction Dock dredging works represent – when compared to the scope of other dredging works being contemplated in the Port of Gladstone – a small volume of work, located in an area having relatively low environmental significance and a favourable location for hydrodynamic conditions. However, QGC and GPC are, nonetheless investigating within the detailed design of the dredge programme the use of advanced engineering and environmental techniques in order to reduce and mitigate any environmental risks and impacts.

Such techniques being investigated include:

- Implementation of a floating 'silt curtain' around the dredging works in order to contain the dispersion of plumes of fine sediments suspended during dredging
- Establishment of real-time monitoring of:
  - Fine sediment (effector) suspension concentrations, settling rates and re-suspension and immediate vicinity and at various times in the tidal cycle
  - Effects of silt curtains on plume containment and settling rates
  - Actual plume dispersion and deposition rates in locations away from the dredging works
  - Sensitive communities such as seagrass beds and coral reefs
- Use of the real-time monitoring data to calibrate, validate (and if necessary modify) hydrodynamic and dredging impact prediction models being utilized for the QCLNG Project (and other impact assessment processes).

14.5.2 Dredged Material Disposal

There are a number of options for disposal of the material dredged for the Construction Dock channel and apron:

a) Placement in a purpose-built, spoil disposal site on the LNG Plant site

b) Placement in the proposed Fisherman's Landing Northern Expansion (FLNE) development

c) Placement in an existing offshore marine disposal site

d) Placement in a vacant cell of the existing approved and operational Fisherman's Landing reclamation area

Each of the options is discussed in further detail below.

a) Spoil disposal site on the LNG Plant site

In the Draft EIS, QGC identified a number of suitable spoil disposal sites within the LNG Plant boundaries. These sites could be engineered and constructed to accept all or part of the dredged material from the Construction Dock.

The LNG Plant spoil disposal sites have also been investigated for potential placement of soils for acid sulfate treatment or treated soils, particularly those excavated from the surface layers of the shoreline area of the Construction Dock. Preliminary assessment of the material to be dredged from the more seaward and subtidal areas of the Construction Dock channel/apron indicates that much of it (constituted by the lower strata of Holocene material) would be able to be blended with ASS to

neutralise the ASS acid potential prior to placement in the identified spoil disposal sites.

b) Fisherman's Landing Northern Expansion (FLNE) development

As indicated in *Section 14.3.2*, the Fisherman's Landing Northern Expansion (FLNE) development is currently undergoing environmental impact assessment. However, even if it received the Coordinator General's conditional approval by February 2010, the facility is unlikely to be constructed and ready in time to accept spoil from the Construction Dock apron dredging as currently scheduled.

Nonetheless, if the proposed Construction Dock apron dredging schedule was to be delayed and the FLNE construction commenced in the near future, the spoil from the Construction Dock apron dredging may be able to be placed in a cell of the FLNE.

c) Offshore marine disposal site

GPC's East Banks Sea Disposal ground has been in use for approximately 20 years, during which time it has accepted dredged material from both capital and maintenance dredging.

GPC has lodged an application under the *Environment Protection (Sea Dumping) Act 1981* (Cth) to obtain permission to sea-dump material obtained from capital dredging from the QCLNG Project's Construction Dock (and MOF) apron(s) dredging works to the East Banks Sea Disposal ground.

d) Existing Fisherman's Landing reclamation

The existing Fisherman's Landing reclamation area has the capacity to take the required volume of spoil from the QCLNG Construction Dock channel/apron dredging works.

14.5.3 MOF Dredging Requirements

The design, layout and description of the development of the Materials Offloading Facility (MOF) for the LNG Plant at Curtis Island is discussed in *Volume 2, Chapter 4* The objective of the MOF is to provide all-tidal, 24-hour construction vessel access to offload materials for the construction of the LNG Plant. These materials include large quantities of steel and construction materials, pre-fabricated units and several large, heavy components which require heavy lift and offload capabilities. As a result, the MOF requires access by larger, deeper draft vessels than those that will access the Construction Dock channel.

The EIS indicated that the MOF Channel dredge volume was to be undertaken in two stages to a total depth of -7.8 m LAT and involving removal of a total of some 3.0 million m^3 of material. The revised footprint (see Figure 2.14.1) of

the MOF and associated dredged channel and rectangular apron adjacent the MOF now requires the removal of approximately 2.1 million m^3 of spoil.

Dredging works for the MOF channel and apron may now be undertaken in only a single operation. Apart from the above modifications, the dredging approach and methodology is as described in the Draft EIS. The preferred method is to use a medium or large capacity cutter suction dredge (CSD) to undertake the work for the MOF Channel and apron. However, it may be necessary to use a barge-mounted backhoe or clamshell to dredge some of areas, particularly some of the shoreward margins. This will also depend on interaction with the final method determined for the shoreline mangrove removal, intertidal sediment excavation and ASS management requirements to be undertaken from the land side. The shoreline area excavation which will be land-based will most likely use swamp track or semi-floating track excavators.

The final scheduling and timing of the dredging works will be determined by the tidal cycle in order to maximize the ability to use the high tide periods to gain greatest shoreward access and low tide periods to provide shoreside access to the intertidal area. The effect of tidal currents on the potential transport of fine sediments suspended during dredging works has also been considered and is discussed further in *Volume 6*.

Dredging works for the MOF are proposed to be undertaken by Gladstone Ports Corporation (GPC) and therefore GPC has also included the dredging and spoil disposal requirements for the MOF Channel and apron in the WBDD Project EIS. QGC and GPC are currently working closely to finalise the Dredge Management Plan (DMP) which will need to attach to any Queensland and Australian government permits to undertake the dredging (and dredged material disposal) works.

Similarly, QGC and GPC are working to develop plans for the spoil from the MOF Channel and apron to be disposed of in either the proposed FLNE or WBDD reclamation areas.

14.5.4 Spoil Disposal

As indicated above, dredging works and spoil disposal for the QCLNG MOF are proposed to be undertaken by GPC. GPC has therefore also included the dredging and spoil disposal requirements for the MOF Channel and apron in its WBDD Project EIS. GPC would be responsible for obtaining permits for dredging works and disposal plans. However, in the event that the approval and completion of these proposed disposal facilities are delayed, QGC proposes the following alternatives for disposal of the MOF Channel and apron dredged materials. QGC seeks CG Report conditions for these options as well, to the extent possible, so that it might “pursue” permitting of such options independent of the FLNE or WBDD EIS and approvals processes, should that become necessary.

a) Offshore marine disposal (East Banks Sea Disposal Ground)

GPC currently holds a Sea Dumping Permit issued under the *Environment Protection (Sea Dumping) Act 1981* (Cth) by DEWHA. This permit allows for sub-tidal disposal of maintenance dredging spoil. GPC has applied for a further Sea Dumping Permit to enable it to dispose of a limited volume of capital dredging to this location. It is QGC's belief that this location has further capacity to accept the full volume of material from the MOF. Preliminary environmental information collected to date would be further developed to support the lodgement of another Sea Dumping Permit application to permit the disposal of the MOF dredge volumes, if that became necessary or desirable. It is understood though that the Coordinator General may have a limited role in conditioning such a permit which is issued under Commonwealth legislation.

b) Other approved upland or reclamation site (e.g. Laird Point)

The GLNG Project EIS Supplement provides updated details from investigations undertaken by the GLNG Proponents to dispose of material dredged for its LNG Plant MOF and LNG Swing Basin and access channels. The investigations include assessment of a possible disposal area at Laird Point.

Should option (a) above not be available or feasible for disposal of dredged material from the QCLNG MOF dredging works, QGC may seek to negotiate with the Queensland Minister for Industrial Development, GPC and the GLNG Project to dispose of spoil at a DMPF at Laird Point. Conditions, in that event, might be expected to be the same as for the Santos/PETRONAS Laird Point disposal option.

However, this option would probably only be feasible if all other options were not available for disposal of dredged material required for all components for both the QCLNG and the GLNG Projects. Ship access to the QCLNG and the GLNG Projects requires the development of a common shipping channel to connect the existing Port of Gladstone channels to each project's LNG jetties which are adjacent each other. Therefore, should all other options for disposal of the relatively larger volumes of spoil required to develop this access channel and swing basins not be available, and both the QCLNG and GLNG Projects progress concurrently, it would be logical for such a combined and spoil disposal option to be cooperatively developed.

14.6 PIPELINE NARROWS CROSSING DREDGING REQUIREMENTS

These are addressed in *Volume 6.*

14.7 RG TANNA FACILITIES DREDGING REQUIREMENTS

As indicated in *Volume 2, Chapter 3*, the QCLNG Project requires marine logistics facilities on mainland to support construction of the LNG Plant and Export Pipeline upon its completion, long-term operation of the Plant. QGC has entered into an agreement with GPC to lease undeveloped wharf-side land in order to develop:

- A wharf and handling facility for loading of aggregate rock materials situated inshore of the RG Tanna coal terminal jetty (RGT Aggregate Facility) to be operated to supply materials for the construction of the LNG Plant.
- A wharf and logistics/passenger terminal for loading/receiving LNG Plant operations staff and materials (RGT Operations Terminal) to be operated during the life of the LNG Plant.

A relatively small amount of dredging is required to allow vessel access to the RGT Aggregate Facility and GPC has agreed to undertake this dredging as part of the landlord obligations to prepare and provide access to the site. As such, these works are an ancillary component of the QCLNG Project and GPC shall obtain any necessary permits required to undertake these dredging works.

14.8 SUMMARY

As planning has progressed, there has been clarification of the scope of the dredging being assessed in the QCLNG EIS; the impacts of the proposed dredging works have been assessed for:

- Construction dock and construction dock access channel.
- Materials Offloading Facility and associated access channel.
- Pipeline crossing of the Narrows, Targinie and Humpy Creeks.

Sections within the sEIS that contain material relevant to the assessment of dredging impacts are as follows. The dredging associated with the construction dock and MOF are impact assessed in *Volume 6. Volume 6* provides details relating to the dredging program, sediment modelling and possible impacts from changes to light on seagrasses and the disturbance of potential acid sulphate soils. It has also impact assessed the potential impacts from the release of tail waters to the environment that may occur from the disposal of dredge spoil for the purposes of land reclamation. This assessment was undertaken to determine the discharge levels that QGC could meet and will allow QGC to identify suitable sites for the disposal or placement of its spoil. The impacts on marine ecology from the dredging operations are described in *Volume 5, Chapter 8*. To the extent that impacts relating to dredging for the Construction Dock and MOF relate to any controlling provisions for EPBC referral number *2008/4401*, LNG Marine Facilities, these are reported in *Volume 13*.

QGC has proposed that the dredging works for the aforementioned components, as described in this sEIS are approved with appropriate and relevant conditions to allow QGC, or GPC as appropriate, to apply for the necessary approvals for the dredging works. QGC recognises that until permitted disposal sites are available for the QGC spoil, dredging works will not be able to be undertaken.

As outlined in the WBDD Project EIS, the GPC proposes to undertake dredging associated with the deepening and widening of existing channels and swing basins, and the creation of new channels, swing basins and berth pockets in the Western Basin. This infrastructure has importance to the Port as strategic infrastructure, with elements being common user infrastructure for a number of Port users. In addition, the infrastructure will have value to the Port after the decommissioning of the LNG terminal.

Material dredged during the Western Basin development is proposed to be placed into a reclamation area to the north and immediately adjacent to the existing Fisherman's Landing reclamation area, which will create a land reserve that will be used to service new Port facilities.

The WBDD EIS offers the most appropriate assessment document to consider:

- The major dredging requirements (channels and swing basins) of the maximum development case of the LNG Precinct.
- Any scheduling impacts of those parties and any other parties that will be utilising the LNG Precinct.
- The cumulative impacts of dredging works on the Gladstone harbour as a result of the expansion and modernisation of the Port.

GPC proposes to obtain the necessary approvals for the WBDD Project. If the project is approved, the dredging and the placement of dredge spoil material from the swing basin and channel (which will serve multi-users) will be undertaken in accordance with the WBDD Project and under the direction of the GPC, provided that the timing of its approval is compatible with the QCLNG Project requirements.

However, if for some reason, the WBDD Project is delayed or does not proceed, QGC will need to seek alternative disposal sites and would do so in consultation with GPC, the Queensland and Australian Governments and the community.