



Referral of a Proposal by the Proponent to the Environmental Protection Authority under Section 38(1) of the *Environmental Protection Act 1986*.

PURPOSE OF THIS FORM

Section 38(1) of the *Environmental Protection Act 1986* (EP Act) provides that where a development proposal is likely to have a significant effect on the environment, a proponent may refer the proposal to the Environmental Protection Authority (EPA) for a decision on whether or not it requires assessment under the EP Act. This form sets out the information requirements for the referral of a proposal by a proponent.

Proponents are encouraged to familiarise themselves with the EPA’s *General Guide on Referral of Proposals* [see Environmental Impact Assessment/Referral of Proposals and Schemes] before completing this form.

A referral under section 38(1) of the EP Act by a proponent to the EPA must be made on this form. A request to the EPA for a declaration under section 39B (derived proposal) must be made on this form. This form will be treated as a referral provided all information required by Part A has been included and all information requested by Part B has been provided to the extent that it is pertinent to the proposal being referred. Referral documents are to be submitted in two formats – hard copy and electronic copy. The electronic copy of the referral will be provided for public comment for a period of 7 days, prior to the EPA making its decision on whether or not to assess the proposal.

CHECKLIST

Before you submit this form, please check that you have:

	Yes	No
Completed all the questions in Part A (essential).	✓	
Completed all applicable questions in Part B.	✓	
Included Attachment 1 – location maps.	✓	
Included Attachment 2 – additional document(s) the proponent wishes to provide (if applicable). Attachment 1 – Figures Attachment 2 – Environmental Referral Document Attachment 3 – Hydrodynamic Modelling Report Attachment 4 – Terrestrial Flora and Fauna Report	✓	
Included Attachment 3 – confidential information (if applicable).	n/a	n/a
Enclosed an electronic copy of all referral information, including spatial data and contextual mapping but excluding confidential information.		

Following a review of the information presented in this form, please consider the following question (a response is optional).

Do you consider the proposal requires formal environmental impact assessment?	
<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No <input type="checkbox"/> Not sure
If yes, what level of assessment?	
<input checked="" type="checkbox"/> Assessment on Proponent Information	<input type="checkbox"/> Public Environmental Review

PROPONENT DECLARATION (to be completed by the proponent)

I, [Paul Mackey](#), (*full name*) declare that I am authorised on behalf of [Port Hedland Port Authority](#) (being the person responsible for the proposal) to submit this form and further declare that the information contained in this form is true and not misleading.

Signature 	Name (print) Paul Mackey
Position: Environment and Heritage Manager	Company: Port Hedland Port Authority
Date 16 October 2013	

PART A - PROPONENT AND PROPOSAL INFORMATION

(All fields of Part A must be completed for this document to be treated as a referral)

1 PROPONENT AND PROPOSAL INFORMATION

1.1 Proponent

Name	Port Hedland Port Authority (PHPA)
Joint Venture parties (if applicable)	N/A
Australian Business Number (if applicable)	94 987 448 870
Postal Address (where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State)	Port Hedland Port Authority PO Box 2 Port Hedland WA 6721
Key proponent contact for the proposal: <ul style="list-style-type: none"> • name • address • phone • email 	Paul Mackey Environment and Heritage Manager PO Box 2 Port Hedland WA 6721 Tel: 08 9173 0021 Email: paul.mackey@phpa.com.au
Consultant for the proposal (if applicable): <ul style="list-style-type: none"> • name • address • phone • email 	Harry Houridis Principal Marine Scientist WorleyParsons Level 7, QV1 250 St Georges Tce Perth WA 6000 Tel: 08 6311 6068 Email: harry.houridis@worleyparsons.com

1.2 Proposal

Title	Lumsden Point General Cargo Facility
Description	<p>In its port development planning, Port Hedland Port Authority (PHPA) has identified Lumsden Point as a potential site to develop a common user facility both to alleviate trade growth pressures on berths 1, 2 and 3 to accommodate potential marine supply trades supporting the offshore oil and gas and other industries.</p> <p>The proposed Lumsden Point General Cargo Facility (referred to from here on as 'the Project') will be a multi-user general cargo facility, focused primarily on the import of general cargo goods such as containers, cement and ammonium nitrate. It is being developed to ease congestion at Port Hedland port's existing general cargo berths in response to significant growth associated with expansion in the iron ore mining sector.</p>

	<p>The Project will comprise the following:</p> <ul style="list-style-type: none"> • two Handymax berths totalling a length of 500 metres (m); • deck level RL + 9.5 m chart datum (CD); • total deck width 41 m; • dredging of up to -13.5 m CD within the two berth pockets; • dredging of up to -12.0 m CD within the swing basins and access channel; • wharf with a suspended deck structure supported by piles over rock armoured revetment; • land-backed wharf area requiring reclamation of 28,663 m³ of material – approximately 26.31 hectares (ha); • temporary access route within access corridor area between the wharf and DMMA C; • heavy duty access route within the access corridor area between the wharf and DMMA C; • dredge spoil disposal (onshore only) to DMMA's: <ul style="list-style-type: none"> ○ DMMA B – covering an area of 75.35 ha, which was approved under Ministerial Statement 690 for the FMG Pilbara Iron Ore and Infrastructure Project: Port and North-South Railway (Stage A); ○ DMMA B North – covering an area of 80.46 ha, which was approved under Ministerial Statement 859 for the PHPA South West Creek Dredging and Reclamation Project; and ○ DMMA B South – covering an area of 129.92 ha, which was approved under Ministerial Statement 771 for the FMG third berth project at Anderson Point. • reclaimed earthworks footprint for the land-backed wharf area which covers an area of 26.31 ha, and forms part of this Project approval.
Extent (area) of proposed ground disturbance.	<p>The total area of ground disturbance forming part of this Project approval is 54.52ha, which comprises the:</p> <ul style="list-style-type: none"> • proposed dredge footprint covering an area of 20.08 ha; • proposed wharf footprint covering an area of 26.31 ha; and • proposed access corridor covering an area of 6.61 ha. • proposed pipeline corridors and discharge channel covering an area of 1.52 ha <p>As 31.66 ha of this area is already approved for disturbance (as part of the cyclone mooring approval) the net area of disturbance is 22.86 ha.</p>
Timeframe in which the activity	The proposed schedule has not yet been finalised.

or development is proposed to occur (including start and finish dates where applicable).	Dredging is currently planned to begin first quarter 2014 for a 20-week period. Development of the onshore facilities, including the wharf and access corridor, have not been scheduled at present.
Details of any staging of the proposal.	Not applicable.
Is the proposal a strategic proposal?	No
Is the proponent requesting a declaration that the proposal is a derived proposal? If so, provide the following information on the strategic assessment within which the referred proposal was identified: <ul style="list-style-type: none"> • title of the strategic assessment; and • Ministerial Statement number. 	No
Please indicate whether, and in what way, the proposal is related to other proposals in the region.	Not applicable. The Project is located immediately adjacent to the Department of Commerce (Western Australia) proposed Pilbara Fabrication Services Common User Facility (PFSCUF) which is in its early stages of planning.
Does the proponent own the land on which the proposal is to be established? If not, what other arrangements have been established to access the land?	The land for the Project footprint falls under the jurisdiction of PHPA. Under the <i>Port Authorities Act 1999</i> , PHPA is the custodian of all land within the port limits and is responsible for ensuring that all activities comply with state and Commonwealth legislation. PHPA is the custodian of all land within the port limits, totalling an area of 69,669 ha.
What is the current land use on the property, and the extent (area in hectares) of the property?	Under the <i>Town of Port Hedland Town Planning Scheme no. 5</i> , the area is zoned for industrial and port facilities. The Project is located within PHPA's jurisdiction. The total Project footprint will be approximately 521.39 ha, comprising 54.52 ha of marine area (for dredging, wharf construction and access corridors) and 489.73 ha of terrestrial land. The terrestrial component will primarily occupy previously disturbed land used for the placement of dredge material in the approved DMMA B, DMMA B-South, and DMMA B-North and DMMA C.

1.3 Location

Name of the Shire in which the proposal is located.	Town of Port Hedland
For urban areas:	N/A

<ul style="list-style-type: none"> • street address; • lot number; • suburb; and • nearest road intersection. 	
<p>For remote localities:</p> <ul style="list-style-type: none"> • nearest town; and • distance and direction from that town to the proposal site. 	<p>The Project is located in the Town of Port Hedland, which is located approximately 1,660 km north of Perth, in Western Australia's Pilbara region.</p> <p>Lumsden Point is situated at junction of South East Creek and South Creek within the Port Hedland Port's inner harbour (Figure 1 in Attachment 1).</p> <p>The development is located approximately 5 km south of the Port Hedland townsite and adjoins the existing light industrial area of Wedgefield.</p>
<p>Electronic copy of spatial data - GIS or CAD, geo-referenced and conforming to the following parameters:</p> <ul style="list-style-type: none"> • GIS: polygons representing all activities and named; • CAD: simple closed polygons representing all activities and named; • datum: GDA94; • projection: Geographic (latitude/longitude) or Map Grid of Australia (MGA); • format: Arcview shapefile, Arcinfo coverages, Microstation or AutoCAD. 	<p>Yes</p>

1.4 Confidential Information

<p>Does the proponent wish to request the EPA to allow any part of the referral information to be treated as confidential?</p>	<p>No</p>
<p>If yes, is confidential information attached as a separate document in hard copy?</p>	<p>N/A</p>

1.5 Government Approvals

Is rezoning of any land required before the proposal can be implemented? If yes, please provide details.		No	
Is approval required from any Commonwealth or State Government agency or Local Authority for any part of the proposal? If yes, please complete the table below.		Yes	
Agency/Authority	Approval required	Application lodged Yes / No	Agency/Local Authority contact(s) for proposal
Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC)	Environmental assessment under referral under the <i>Environmental Protection and Biodiversity Conservation Act 1999</i>	No No matters of national environmental significance are expected to be impacted by the Project's development and operation	N/A
Minister for the Environment (WA)	Approval under Part IV of the <i>Environmental Protection Act 1986 (WA)</i>	Subject of this referral	TBC
Department of Environment and Conservation (DEC)	Works approval under Part V of the <i>Environmental Protection Act 1986 (WA) – Category 58</i>	No	N/A
Western Australian State Mining Engineer	Approval by <i>Dangerous Goods Safety Act 2004</i>	No	N/A
Department of Aboriginal Affairs	Approval under Section 18 of the <i>Aboriginal Heritage Act 1972(WA)</i>	Yes	N/A

PART B - ENVIRONMENTAL IMPACTS AND PROPOSED MANAGEMENT

2. ENVIRONMENTAL IMPACTS

Describe the impacts of the proposal on the following elements of the environment, by answering the questions contained in Sections 2.1-2.11:

- 2.1 flora and vegetation;
- 2.2 fauna;
- 2.3 rivers, creeks, wetlands and estuaries;
- 2.4 significant areas and/ or land features;
- 2.5 coastal zone areas;
- 2.6 marine areas and biota;
- 2.7 water supply and drainage catchments;
- 2.8 pollution;
- 2.9 greenhouse gas emissions;
- 2.10 contamination; and
- 2.11 social surroundings.

These features should be shown on the site plan, where appropriate.

For all information, please indicate:

- (a) the source of the information; and
- (b) the currency of the information.

2.1 Flora and Vegetation

2.1.1 Do you propose to clear any native flora and vegetation as a part of this proposal?

[A proposal to clear native vegetation may require a clearing permit under Part V of the EP Act (Environmental Protection (Clearing of Native Vegetation) Regulations 2004)]. Please contact the Department of Environment and Conservation (DEC) for more information.

- (please tick) Yes **If yes**, complete the rest of this section.
 No **If no**, go to the next section

2.1.2 How much vegetation are you proposing to clear (in hectares)?

The Project will require clearing of up to 13.88 ha of mangroves within the proposed wharf and access areas. No other vegetation communities will be permanently disturbed by the Project. The area of mangroves to be removed would comprise the following:

7.02 ha of *Avicennia marina* communities;
4.47 ha of *A. marina* and *Rhizophora stylosa* communities;
1.69 ha of *A. marina* and *Ceriops australis* communities, and
0.70 ha of pneumatophores

2.1.3 Have you submitted an application to clear native vegetation to the DEC (unless you are exempt from such a requirement)?

Yes

No

If yes, on what date and to which office was the application submitted of the DEC?

2.1.4 Are you aware of any recent flora surveys carried out over the area to be disturbed by this proposal?

Yes

No

If yes, please attach a copy of any related survey reports and provide the date and name of persons / companies involved in the survey(s).

If no, please do not arrange to have any biological surveys conducted prior to consulting with the DEC.

The PHPA commissioned WorleyParsons to conduct a Level 1 terrestrial flora and vegetation assessment of the Project's terrestrial footprint. A copy of the *Lumsden Point General Cargo Facility Flora, Vegetation and Fauna Survey* report is provided as Attachment 4.

The flora survey was completed on 15 November 2012 by two WorleyParsons employees:

- Matthew Love – Lead Terrestrial Ecologist; and
- Suzana Mitrevski – Environmental Scientist.

2.1.5 Has a search of DEC records for known occurrences of rare or priority flora or threatened ecological communities been conducted for the site?

Yes

No

If you are proposing to clear native vegetation for any part of your proposal, a search of DEC records of known occurrences of rare or priority flora and threatened ecological communities will be required. Please contact DEC for more information.

DEC database records were searched as part of the desktop review conducted by WorleyParsons for the flora, vegetation and fauna survey (see Attachment 4). The records indicated that no Threatened Ecological Communities (TECs) or Priority Ecological Communities (PECs) were known within or immediately adjacent to the Project area. The search also found no Threatened (Declared Rare) flora species were recorded in the area. Eleven Priority Flora species were found to be known from the general study area.

2.1.6 Are there any known occurrences of rare or priority flora or threatened ecological communities on the site?

Yes

No

If yes, please indicate which species or communities are involved and provide copies of any correspondence with DEC regarding these matters.

No Rare or Priority Flora or TECs listed under the EPBC Act or WC Act have been recorded within the vicinity of the Project area (Attachment 4).

2.1.7 If located within the Perth Metropolitan Region, is the proposed development within or adjacent to a listed Bush Forever Site? (You will need to contact the Bush Forever Office, at the Department for Planning and Infrastructure)

Yes

No

If yes, please indicate which Bush Forever Site is affected (site number and name of site where appropriate).

2.1.8 What is the condition of the vegetation at the site?

Mangrove was the only vegetation type identified within the Project footprint. No other flora communities were identified. The mangrove vegetation identified was considered to be in excellent condition.

No vegetation associations in the Project area are considered to represent TECs, PECs or Environmentally Sensitive Areas (Attachment 4).

The vegetation recorded in the Project area is widespread in the region with 86% of pre-European extent remaining in the bioregion. The Project will remove approximately 0.5% of this pre-European-settlement habitat extent.

2.2 Fauna

2.2.1 Do you expect that any fauna or fauna habitat will be impacted by the proposal?

(please tick)

Yes

If yes, complete the rest of this section.

No

If no, go to the next section.

2.2.2 Describe the nature and extent of the expected impact.

The primary fauna habitat to be removed by the Project will be mangrove/intertidal habitat located within the Project footprint. The composition of this habitat with respect to the area has been described in detail in Section 2.1 of this referral form. The disturbance area also has transition zones between mangroves and *Triodia spinifex* hummocks, consisting of bare open ground that provides habitat for foraging marine/aquatic migratory waders.

Eighteen vertebrate fauna species were recorded during the field survey, all of which were bird species.

No significant impacts for these species are anticipated, as they are able to move away from disturbance if required and similar habitat exists in the area.

2.2.3 Are you aware of any recent fauna surveys carried out over the area to be disturbed by this proposal?

Yes

No

If yes, please attach a copy of any related survey reports and provide the date and name of persons / companies involved in the survey(s).

If no, please do not arrange to have any biological surveys conducted prior to consulting with the DEC.

The PHPA commissioned WorleyParsons to conduct a Level 1 terrestrial fauna assessment of the Project's footprint. A copy of the assessment report is provided as Attachment 4.

The terrestrial survey was completed on 15 November 2012 by two WorleyParsons employees:

- Matthew Love – Lead Terrestrial Ecologist; and
- Suzana Mitrevski – Environmental Scientist.

2.2.4 Has a search of DEC records for known occurrences of Specially Protected (threatened) fauna been conducted for the site?

Yes No (please tick)

DEC records was searched as part of the desktop assessment undertaken before the field survey (see Attachment 4).

2.2.5 Are there any known occurrences of Specially Protected (threatened) fauna on the site?

Yes No **If yes**, please indicate which species or communities are involved and provide copies of any correspondence with DEC regarding these matters.

Terrestrial fauna

The EPBC Act Protected Matters report generated for the Project area identified 80 conservation significant fauna species as potentially occurring within a 10 km radius of the Project area.

A total of 18 vertebrate fauna species were recorded during the field survey, all of which were bird species (see Attachment 4). Five of the 18 vertebrate species were conservation significant species, as outlined below.

Scientific name	Common name	Easting	Northing	Observed number of individuals
<i>Ardea modesta</i>	Eastern great egret	665182	7750192	2 individuals
<i>Actitis hypoleucos</i>	Common sandpiper	665182	7750192	1 individual
<i>Numenius madagascariensis</i>	Whimbrel	665182	7750192	15 individuals
<i>Thalasseus bengalensis</i>	Lesser crested tern	665182	7750192	4 individuals
<i>Merops ornatus</i>	Rainbow bee-eater	665182	7750192	2 individuals

It is considered unlikely the Project's development and operation will result in any significant impact on these species, given they are all migratory species, are highly mobile and have a wide distribution. In addition, the Project is not likely to affect critical feeding or breeding habitat for any migratory species.

Marine fauna

The EPBC Act Protected Matters report generated for the Project area identified nine marine conservation significant fauna species as potentially occurring within a 10 km radius of the Project area.

Of the listed species, the following have previously been identified within the vicinity of the Project area.

Flat back turtle nesting habitat exists within Cemetery Beach, Pretty Pool and Cooke Point. These areas are not close to the Project area. Juvenile green turtles have been recorded using the waters of the harbour and the surrounding mangrove creeks for foraging.

Small numbers of dolphins and dugong may also be found in the Port Hedland area. There are no known resident populations of either occurring in the area and it is therefore not expected that these marine fauna will be present in significant numbers within the inner harbour (Prince 2001).

Port Hedland is not considered an important aggregation area for dugongs and the lack of seagrass within the Project area would suggest it is not an important feeding area.

Minimal impacts to marine fauna are predicted as a result of the Project's development and operation. Management measures for the potential impacts on marine fauna are described in Section 6.3 of the *Construction and Dredging Management Plan* (Appendix 1 of Attachment 2).

2.3 Rivers, Creeks, Wetlands and Estuaries

2.3.1 Will the development occur within 200 metres of a river, creek, wetland or estuary?

- (please tick) Yes **If yes**, complete the rest of this section.
 No **If no**, go to the next section.

The Project is located at Lumsden Point, which is situated at the confluence of South East Creek and South Creek within Port Hedland port's inner harbour. The bathymetry within the Project footprint ranges from 2 m to -6 m CD.

2.3.2 Will the development result in the clearing of vegetation within the 200 metre zone?

- Yes No **If yes**, please describe the extent of the expected impact.

The development of the proposed wharf and causeway access will require clearing of vegetation within the 200 m zone. A total of 13.88 ha of mangrove vegetation within the Project footprint will be removed. Further details on the extent of this impact is provided in Section 2.1 of this document.

2.3.3 Will the development result in the filling or excavation of a river, creek, wetland or estuary?

- Yes No **If yes**, please describe the extent of the expected impact.

The proposed works will require reclamation of up to 26.3 ha (28,663 m³ of material). This reclamation area is required for development of the wharf area behind the two Handymax berths. The reclamation area is located within the intertidal zone at Lumsden Point. Current bathymetry in the area ranges from +1 m to 0 m CD.

2.3.4 Will the development result in the impoundment of a river, creek, wetland or estuary?

- Yes No **If yes**, please describe the extent of the expected impact.

2.3.5 Will the development result in draining to a river, creek, wetland or estuary?

- Yes No **If yes**, please describe the extent of the expected impact.

2.3.6 Are you aware if the proposal will impact on a river, creek, wetland or estuary (or its buffer) within one of the following categories? (please tick)

Conservation Category Wetland	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Perth's Bush Forever site	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (Swan & Canning Rivers) Policy 1998	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
The management area as defined in s4(1) of the <i>Swan River Trust Act 1988</i>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure
Which is subject to an international agreement, because of the importance of the wetland for waterbirds and waterbird habitats (e.g. Ramsar, JAMBA, CAMBA)	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Unsure

2.4 Significant Areas and/ or Land Features

2.4.1 Is the proposed development located within or adjacent to an existing or proposed National Park or Nature Reserve?

Yes No **If yes**, please provide details.

The nearest conservation area is North Turtle Island Nature Reserve, located approximately 60 km north-east of the Project area.

2.4.2 Are you aware of any Environmentally Sensitive Areas (as declared by the Minister under section 51B of the EP Act) that will be impacted by the proposed development?

Yes No **If yes**, please provide details.

2.4.3 Are you aware of any significant natural land features (e.g. caves, ranges etc) that will be impacted by the proposed development?

Yes No **If yes**, please provide details.

2.5 Coastal Zone Areas (Coastal Dunes and Beaches)

2.5.1 Will the development occur within 300metres of a coastal area?

(please tick) Yes **If yes**, complete the rest of this section.

No **If no**, go to the next section.

2.5.2 What is the expected setback of the development from the high tide level and from the primary dune?

The proposed development comprises a land-backed wharf and access corridor from the developed area known as DMMA C. The wharf and access corridor are located within an

intertidal and supratidal area extending to a current depth of 0 m CD. The area is considered a low-energy environment characterised by high tidal currents, high rates of sediment deposition and remobilisation.

2.5.3 Will the development impact on coastal areas with significant landforms including beach ridge plain, cusped headland, coastal dunes or karst?

Yes No **If yes**, please describe the extent of the expected impact.

No impacts on coastal areas with significant landforms are expected because none of these areas have been identified within the area of impact. Coastal areas that are likely to change will be limited to low-energy creek systems dominated by bare banks and mangrove communities landward.

The PHPA has undertaken modelling to assess and understand any potential changes in the hydrodynamics and geomorphic processes within the inner harbour resulting from the development. Potential impacts on hydrodynamic processes resulting from the construction and location of the berth are considered minor, with a maximum increase in current velocity of 0.7 m/s. The PHPA has ensured the berths will be configured to minimise impacts on currents within the harbour.

The Project's establishment is likely to result in a negligible impact on the hydrodynamic and geomorphic processes of the Port Hedland inner harbour.

2.5.4 Is the development likely to impact on mangroves?

Yes No **If yes**, please describe the extent of the expected impact.

The Project is expected to directly affect 13.88 ha of mangroves.

The mangrove community structure within the proposed disturbance footprint comprises three of the most common mangrove species in the Port Hedland area. Most of the 13.88 ha within the disturbance footprint is made up of *Avicennia marina* dominated vegetation complexes located within the wharf and access corridor areas. Mangrove communities include trees and shrubs of varying densities as well as other less common species of mangroves such as *Rhizophora stylosa* and *Ceriops australis* (Appendix 3 of Attachment 2). Vegetation complexes were shown to have higher densities closer to the waterline than those further away. There were no unusual or unique habitat complexes found, with all mangrove habitats within the disturbance footprint considered typical of those found in the surrounding creek systems of Port Hedland (SKM 2011; WorleyParsons 2010b).

The distribution of mangrove habitat composition identified within the wharf and access corridor areas are shown in Figures 3-2 and 3-3 in Appendix 3 of Attachment 2 (benthic survey report) respectively.

It is predicted that no indirect impacts to mangroves will result from the Project. Mangroves can be indirectly affected by increases in sedimentation from surface runoff and deposition of sediments following disturbance by dredging activities. Increases in sedimentation can cause smothering of pneumatophores. Pneumatophores are specialist root systems that grow out upwards from the sediment surface and facilitate the aeration necessary for root respiration.

Modelling undertaken to determine the level of sedimentation during the dredge program predicted sedimentation levels not to exceed 20 mm within mangrove habitat adjacent to the Project footprint. This level of sedimentation during the course of the Project is

considered unlikely to affect mangrove health, based on sedimentation values experienced by previous projects and detailed in the literature (Section 7.4.3 of Attachment 2).

Mangroves rely on continual inundation of seawater to survive. The level and period of inundation often determines the composition and morphological appearance of mangroves within these habitats. The construction of the wharf and land access areas has the potential to cause changes to inundation levels and periods due to the presence of the proposed infrastructure and, as such, may affect mangrove communities within the study area. Hydrodynamic modelling (see Attachment 3) shows that inundation levels will change by a negligible amount following completion of dredging and construction activities.

Mangrove health will be monitored as a precautionary measure at mangrove sites nearest to the proposed disturbance footprint. See Section 7.4 of the *Construction and Dredging Management Plan* (Appendix 1 of Attachment 2) for further details on the proposed monitoring of mangroves.

2.6 Marine Areas and Biota

2.6.1 Is the development likely to impact on an area of sensitive benthic communities, such as seagrasses, coral reefs or mangroves?

Yes

No

If yes, please describe the extent of the expected impact.

A description of the impacts on mangrove communities has been provided in Section 2.5.4 of the referral application.

With respect to other benthic habitat communities, the proposed dredge and wharf area will directly affect benthic substrate within the proposed footprint and may create a sediment plume that indirectly affects habitats within the vicinity of the dredging operations.

WorleyParsons was commissioned by the PHPA to acquire baseline data on the distribution of benthic habitats within the proposed footprint of the dredge and wharf area, and to determine the extent of impacts from the Project on these habitats.

On completion of the survey, habitat maps were created from the imaging data showing the spatial distribution of the main intertidal and subtidal environments within the disturbance footprint and fringing areas (see Figure 7-1 in Attachment 2).

The habitat classes observed, and the area of each that the Project will directly remove, include the following:

- 1.77 ha of macroalgae (previously approved for disturbance);
- 3.82 ha of turfing algae (previously approved for disturbance);
- 0 ha of soft coral;
- 0 ha of coral; and
- 28.26 ha of bare sediment (19.92 ha previously approved for disturbance).

It should be noted that the area of macroalgae and turfing algae listed above has been previously approved for disturbance as part of the Cyclone Mooring Project. Only 8.34 ha of bare sediment is proposed and not previously approved.

Further details on the benthic habitat survey, results and a discussion are provided in Appendix 3 of Attachment 2.

It is predicted that indirect impacts due to increases in turbidity and/or sedimentation will not occur. Sediment dispersion modelling, in addition to a review of monitoring data collected within the inner harbour during previous dredging projects, was undertaken to determine the extent of these potential impacts. It was identified that turbidity values and sedimentation were likely to be below the tolerance threshold levels of the benthic habitats identified within the study area. Appendix 5 of Attachment 2 provides further detail on the review and assessment undertaken in determining this outcome.

2.6.2 Is the development likely to impact on marine conservation reserves or areas recommended for reservation (as described in *A Representative Marine Reserve System for Western Australia*, CALM, 1994)?

Yes No **If yes**, please describe the extent of the expected impact.

The Project footprint is not located in an area identified for marine conservation.

2.6.3 Is the development likely to impact on marine areas used extensively for recreation or for commercial fishing activities?

Yes No **If yes**, please describe the extent of the expected impact, and provide any written advice from relevant agencies (e.g. Fisheries WA).

The marine aspects of the Project area are known to provide some recreational fishing value, although the area is not considered to be used extensively. It is likely some recreational fishers may be restricted to certain areas of South Creek and South East Creek during construction and dredging as a result of exclusion zones that may be required in accordance with safety requirements. No commercial fishing is undertaken in the area.

2.7 Water Supply and Drainage Catchments

2.7.1 Are you in a proclaimed or proposed groundwater or surface water protection area?

(You may need to contact the Department of Water (DoW) for more information on the requirements for your location, including the requirement for licences for water abstraction. Also, refer to the DoW website)

Yes No **If yes**, please describe what category of area.

2.7.2 Are you in an existing or proposed Underground Water Supply and Pollution Control area?

(You may need to contact the DoW for more information on the requirements for your location, including the requirement for licences for water abstraction. Also, refer to the DoW website)

Yes No **If yes**, please describe what category of area.

2.7.3 Are you in a Public Drinking Water Supply Area (PDWSA)?

(You may need to contact the DoW for more information or refer to the DoW website. A proposal to clear vegetation within a PDWSA requires approval from DoW.)

Yes No **If yes**, please describe what category of area.

2.7.4 Is there sufficient water available for the proposal?

(Please consult with the DoW as to whether approvals are required to source water as you propose. Where necessary, please provide a letter of intent from the DoW)

Yes No (please tick)

2.7.5 Will the proposal require drainage of the land?

Yes No **If yes**, how is the site to be drained and will the drainage be connected to an existing Local Authority or Water Corporation drainage system? Please provide details.

2.7.6 Is there a water requirement for the construction and/ or operation of this proposal?

(please tick) Yes **If yes**, complete the rest of this section.
 No **If no**, go to the next section.

2.7.7 What is the water requirement for the construction and operation of this proposal, in kilolitres per year?

Not applicable

2.7.8 What is the proposed source of water for the proposal? (e.g. dam, bore, surface water etc.)

Not applicable

2.8 Pollution

2.8.1 Is there likely to be any discharge of pollutants from this development, such as noise, vibration, gaseous emissions, dust, liquid effluent, solid waste or other pollutants?

(please tick) Yes **If yes**, complete the rest of this section.
 No **If no**, go to the next section.

2.8.2 Is the proposal a prescribed premise, under the Environmental Protection Regulations 1987?

(Refer to the EPA's *General Guide for Referral of Proposals to the EPA under section 38(1) of the EP Act 1986* for more information)

Yes No **If yes**, please describe what category of prescribed premise.

The Project is not considered a prescribed premise under section 38(1) of the *Environmental Protection Act 1986* and a works approval is not required.

2.8.3 Will the proposal result in gaseous emissions to air?

Yes No **If yes**, please briefly describe.

Gaseous emissions will be minimal and only associated with fuel combustion from the operation of machinery and marine vessels during the Project's construction and operation phases.

2.8.4 Have you done any modelling or analysis to demonstrate that air quality standards will be met, including consideration of cumulative impacts from other emission sources?

Yes No **If yes**, please briefly describe.

The Project requires an estimated volume of two million cubic metres of dredge material to be disposed of onshore, and has the potential to generate significant volumes of fine material. However, the fine material is maintained with a head of water throughout construction and can take many years to dry and consolidate, at which time the material cakes and crusts, such that secondary wind lift-off has not been historically observed from similar activities.

The wharf area will reclaim approximately 25 ha of land using either dredge material from the dredge area or, if this material is found to be unsuitable for reclamation material, an alternative source will be identified. The placement of material in this area has the potential to generate dust emissions which could potentially cause changes to ambient air quality. In addition, construction activities – principally land clearing, the use of earth-moving machinery for bund wall construction and vehicle and equipment traffic on unsealed roads and laydown areas – also has the potential to generate dust.

While modelling of potential levels of dust generated from the proposed development has not been undertaken for this Project, dust modelling was undertaken for the development of BHP Billiton's DMMA H for the Nelson Point dredging program. This investigation found that uncontrolled dust generated from DMMA H would not change the cumulative dust levels predicted at the Port Hedland Hospital monitoring location (BHPB 2009a). DMMA H covers an area of 204 ha, while the proposed wharf area for reclamation covers an area of 25 ha. Hence the impact of dust will be minimal.

Other gaseous emissions such as NO_x and SO_x, particulates (PM₁₀) and volatile organic compounds (VOCs) are expected to be minimal during the Project's construction and operation and only associated with fuel combustion from the operation of construction machinery and the exhaust emissions of marine vessels. Emissions of VOCs due to combustion and evaporation during welding works, as well as evaporation from paints and solvents used onsite, are likely to be in small quantities and localised in effect.

2.8.5 Will the proposal result in liquid effluent discharge?

Yes No **If yes**, please briefly describe the nature, concentrations and receiving environment.

Return water from the DMMA's will be discharged to the environment via designated discharge points. The water quality of return water will be managed and monitored in order to meet a 'high' level of ecological protection in South East Creek and South Creek.

A sediment characterisation investigation of the area proposed to be dredged was undertaken. Sediments were analysed for a suite of potential contaminants of concern and assessed against the relevant guidelines. All sediments contained contaminant concentrations below adopted guidelines except for nickel and chromium. Both nickel and chromium are known to be naturally elevated within the Port Hedland region and the contamination risk is considered to be negligible. Sediments were therefore considered suitable for dredging and placement onshore.

The proposed dredging activity has the potential to disturb sediments that will mobilise into the water column, creating a sediment plume. Sediment plumes tend to migrate away from the point of disturbance in response to hydrodynamic drivers such as currents and wave action. Consequently there are likely to be changes to background water within the zone of influence predicted by the modelling. Impacts to water quality from dredging have been assessed in detail in Section 6.4 of Attachment 2.

Potential hydrocarbon spills and generated wastes associated with the project are likely to be minimal. A hydrocarbon spill would likely be a small volume of diesel from the dredge vessel, barge or support vessel engines. An appropriate oil spill contingency plan is being developed by PHPA and will be in place before dredging activities begin. Domestic waste and any other operational wastes will be managed in accordance to approved vessel waste management plans. Further information on waste management and oil spill impacts has been provided in sections 6.8 and 6.9 respectively of the CDMP (Appendix 1 of Attachment 2).

2.8.6 If there is likely to be discharges to a watercourse or marine environment, has any analysis been done to demonstrate that the State Water Quality Management Strategy or other appropriate standards will be able to be met?

Yes No **If yes, please describe.**

Dredging is required for the Project and is likely to result in temporary changes in water quality (increased turbidity) in the vicinity of the dredge footprint. The impacts on water quality have been assessed for this proposal, including a detailed desktop review of sediment sampling and analysis programs previously completed within the Project area (Appendix 3 and Appendix 6 of Attachment 2), and predictive sediment dispersion modelling (Appendix 4 of Attachment 2).

Changes in water quality are expected to be short term and limited to localised increases in turbidity during dredging. It is expected that no residual impacts on water quality will occur as a result of the Project. The results of the assessment indicate the Project can meet the relevant requirements of the State Water Quality Management Strategy and other appropriate standards.

Water quality has been identified as one of two key environmental factors associated with this Project. A detailed assessment of impacts on water quality has been undertaken and is outlined in Section 6.4 of Attachment 2.

The proposal falls within a Moderate Ecological Protection Area (MEPA) as described in State Water Quality Management Criteria and a 90% species protection is adopted. At 250 m to the south a High Ecological Protection Area (HEPA) is defined in which a 99% species protection target is adopted. Sediment plume modelling shows the Project will meet the requirements for these levels of ecological protection based on the identified ecology of the area it encompasses (sections 6 and 7 of Attachment 2).

During dredging and construction activities water quality monitoring at key benthic primary producer (BPP) sites within the inner harbour will be done to ensure the environmental values of the local assessment unit will not be affected. Section 7.2 of the CDMP (Appendix 1 of Attachment 2) outlines the water quality monitoring proposed.

2.8.7 Will the proposal produce or result in solid wastes?

Yes

No

If yes, please briefly describe the nature, concentrations and disposal location/ method.

Dredging activities are unlikely to generate solid and liquid wastes (including hazardous wastes) other than domestic and maintenance products associated with operation of the dredge vessel. These wastes would likely include oils, lubricants, general food packaging and scraps and domestic sewerage. On occasion the Project may require the use of hazardous materials that require specific management. Suitable spill management processes will be implemented in accordance with the CDMP (Appendix 1 of Attachment 2) should a spill occur during construction and dredging activities.

Material proposed to be dredged and placed in one of the approved DMMA areas was characterised for a range of physical and chemical contaminants. Contaminant concentrations identified from collected samples showed concentrations were below relevant guideline limits except for nickel and chromium, which exceeded interim sediment quality guidelines (ANZECC 2000) in a number of samples. Nickel and chromium concentrations are known to be naturally elevated in the region. It is not expected that these concentrations will negatively affect the environment based on previous contamination studies undertaken. The management and monitoring of the dredge material will be undertaken in accordance with the CDMP (Appendix 1 of Attachment 2), as well as management protocols associated with the approved DMMA in which the material will be placed.

2.8.8 Will the proposal result in significant off-site noise emissions?

Yes

No

If yes, please briefly describe.

The key sources of potential offsite noise emissions are associated with piling activities during construction of the marine structures and operation of the cutter suction dredge. Construction and dredging noise will be managed in accordance with existing procedures that have been applied in other recent expansion projects in the Port Hedland. This will include developing a Project-specific *Construction noise management plan* (CNMP) in accordance with the Environmental Protection (Noise) Regulations 1997 with approval of the CNMP by the Town of Port Hedland. Offsite noise emissions from the proposal are not expected to be significant.

Underwater noise

Dredging and piling activities that have the potential to affect marine fauna via underwater noise (e.g. cetaceans, turtles and dugongs) may range from non-injurious effects (e.g. acoustic annoyance, mild tactile detection or physical discomfort) to varying levels of injury (i.e. non-lethal and lethal injuries). The number of marine fauna that could potentially be affected by piling activities will be minimal given there is limited known habitat, feeding and or breeding areas within the inner harbour. It is unlikely that underwater noise associated with dredging activities will cause additional underwater noise impacts during dredging and operation because the shipping and vessel noise will be at a scale of magnitude less than current shipping activities within the existing port areas.

Details of the management and monitoring of these potential impacts have been provided in sections 6.3 and 6.7 of the CDMP (Appendix 1 of Attachment 2).

2.8.9 Will the development be subject to the Environmental Protection (Noise) Regulations 1997?

Yes

No

If yes, has any analysis been carried out to demonstrate that the proposal will comply with the Regulations?

Please attach the analysis.

All activities will be undertaken in accordance with Environmental Protection (Noise) Regulations 1997 through the development of a project-specific *Construction noise management plan* (CNMP). Construction noise modelling will be completed as part of developing the CNMP. The final CNMP will be sent to DER's Noise Regulation Branch for comment before it is submitted to the Town of Port Hedland for approval.

The PHPA will also continue to consult with community stakeholders during the construction and dredging activities to ensure any noise-related concerns are identified and addressed.

Operational shipping noise is considered to be negligible and does not fall under the Environmental Protection (Noise) Regulations 1997, on which the CNMP will be based on.

2.8.10 Does the proposal have the potential to generate off-site, air quality impacts, dust, odour or another pollutant that may affect the amenity of residents and other "sensitive premises" such as schools and hospitals (proposals in this category may include intensive agriculture, aquaculture, marinas, mines and quarries etc.)?

Yes

No

If yes, please describe and provide the distance to residences and other "sensitive premises".

Noise or dust generated during construction and operation of the Project will be in areas already subject to levels of disturbance at the port site.

It is not anticipated that any odour will be generated by the development and operation of the Project.

During the Project's construction and operation dust mitigation measures will be implemented to minimise the impact on residents in the Port Hedland area, such as use of water carts and/or polymer dust suppressants.

The nearest sensitive premises are in the Town of Port Hedland, approximately 3.5 km from the Project.

2.8.11 If the proposal has a residential component or involves "sensitive premises", is it located near a land use that may discharge a pollutant?

Yes

No

Not Applicable

If yes, please describe and provide the distance to the potential pollution source

2.9 Greenhouse Gas Emissions

2.9.1 Is this proposal likely to result in substantial greenhouse gas emissions (greater than 100 000 tonnes per annum of carbon dioxide equivalent emissions)?

Yes

No

If yes, please provide an estimate of the annual gross emissions in absolute and in carbon dioxide equivalent figures.

2.9.2 Further, if yes, please describe proposed measures to minimise emissions, and any sink enhancement actions proposed to offset emissions.

2.10 Contamination

2.10.1 Has the property on which the proposal is to be located been used in the past for activities which may have caused soil or groundwater contamination?

Yes

No

Unsure

If yes, please describe.

A review of DEC's Contaminated Sites Database indicates the Project does not fall within or adjacent to any land that has been classified as 'contaminated'.

2.10.2 Has any assessment been done for soil or groundwater contamination on the site?

Yes

No

If yes, please describe.

The PHPA has undertaken a comprehensive sediment sampling and analysis program across the proposed dredge footprint at Lumsden Point.

Historically, detailed information has also been gathered regarding the presence, extent and distribution of potential acid sulfate soils (PASS) in dredged material from Port Hedland harbour. Results from previous investigations have confirmed the presence of PASS in marine harbour sediments. Specifically, PASS appears to be isolated to the most recent Holocene (the last 10,000 years) deposits. For the inner harbour area at Port Hedland, these Holocene deposits generally represent the top 1.0 to 2.0 m of the seabed.

WorleyParsons was commissioned to complete a geotechnical and environmental nearshore sediment sampling program between 10 February and 9 March 2013 for the PHPA. The sampling program comprised seven boreholes, five of which were selected for environmental sampling. The position of the boreholes is shown in Table 4 of Appendix 6 of Attachment 2.

The results can be summarised as follows:

- Five near-surface sediment samples were analysed for total petroleum, hydrocarbon (TPH), poly-nuclear aromatic hydrocarbons (PAHs), organochlorine and organophosphorus pesticides, and polychlorinated biphenyl (PCBs) at ultra-low levels of detection. No results were reported above the corresponding laboratory Practical Quantitation Limits (PQLs).
- All near-surface samples analysed for organotins were reported below the corresponding laboratory PQLs.
- No Ecological Investigation Level (EIL) assessment criteria were exceeded during the investigation.
- Based on results of the samples for suspension peroxide oxidation combined acidity and sulfur (SPOCAS) and chromium reducible sulfur (CRS) methods, ASS assessment indicated that acid generation was possible in surface sediments. However, no samples exceeded the DEC (2013) Action Criteria for net acidity, which may be attributable to the neutralising capacity of the calcareous materials.
- Results for the acid volatile sulfur (AVS) analysis indicated AVS was not likely to be a concern within the horizons sampled. Marginally elevated simultaneously extracted

metals (SEM) values were below the corresponding DEC (2010) EIL and National Assessment Guidelines for Dredging (NAGD) (2009) guideline values for seven tested metals

- Total organic carbon (TOC) concentrations indicated the TOC content of the sediment was likely to be too low for monosulfidic black ooze (MBOs) and AVS to be present in the sediments analysed.

Full field and laboratory testing results are provided in Appendix 6 of Attachment 2.

In addition, surface sediment samples were collected previously for other projects in the area (Appendix 3 of Attachment 2). Sediment samples were collected from 12 sampling locations within the dredge footprint and were analysed for a suite of potential contaminants. Of the samples analysed most were found to contain contaminant concentrations below NAGD screening levels (Commonwealth of Australia 2009) and EIL (DEC 2010) guidelines. All antimony, silver, cadmium, organotins, organochlorine pesticides, organophosphorus pesticides, PAHs and PCBs were below the limit of reporting and therefore below the assessment levels. These are presented in the laboratory reports of the previous studies (URS 2008; BHPBIO 2010; WorleyParsons 2010a).

Only two individual analytes were found to exceed assessment levels at two sample locations for nickel and chromium.

Based on the results of the sampling and analysis undertaken, the sediments proposed to be disturbed are considered to have low contaminant concentrations and to be suitable for removal from the dredge footprint and placement within the approved DMMA areas and/or the proposed wharf area depending on their geotechnical properties.

2.10.3 Has the site been registered as a contaminated site under the *Contaminated Sites Act 2003*? (on finalisation of the CS Regulations and proclamation of the CS Act)

Yes

No

If yes, please describe.

2.11 Social Surroundings

2.11.1 Is the proposal on a property which contains or is near a site of Aboriginal ethnographic or archaeological significance that may be disturbed?

Yes

No

Unsure

If yes, please describe.

The Project is situated within the WC 99/003 Kariyarra Native Title Claim (the Kariyarra). Marapikurrinya Pty Ltd (MPL) manages the conduct of Aboriginal heritage surveys for the Marapikurrinya family group on behalf of the Kariyarra native title claimants for the Port Hedland area.

Ethnographic and archaeological surveys have previously been conducted over the Project footprint with members of MPL. The PHPA is aware of the location of each of the heritage sites and where possible has adopted engineering solutions to avoid them. One registered Aboriginal heritage site, site ID 22874 (*Marapikurrinya Yintha*) was identified in the dredge area and disturbance of this site cannot be avoided. The PHPA will provide MPL with a continued right of access within this registered site where practical for health and safety reasons. The PHPA intends to seek ministerial approval under Section 18 of the *Aboriginal Heritage Act 1972* to enable construction of infrastructure within the Project footprint for the purpose of transport, storage, import and export of general cargo. Any

concerns raised by MPL would be considered by the PHPA in its management of environmental impacts as they affect heritage matters.

On 1 December 2011 the PHPA received ministerial consent under Section 18 of the *Aboriginal Heritage Act 1972* to construct DMMA B North. Any construction activities would be undertaken in accordance with the PHPA's approved Cultural Heritage Management Plan for the DMMA B North area.

The PHPA is committed to ongoing consultation with the MPL and to developing the Project in accordance with the requirements of the *Aboriginal Heritage Act 1972*.

2.11.2 Is the proposal on a property which contains or is near a site of high public interest (e.g. a major recreation area or natural scenic feature)?

Yes No **If yes**, please describe.

The Lumsden Point area is accessed on an infrequent basis by members of the public for recreational fishing, however it is not considered a major recreation area or site of high public interest.

The PHPA will continue to work with the community regarding management of access to the Lumsden Point area during construction and operation of the proposed marine precinct.

2.11.3 Will the proposal result in or require substantial transport of goods, which may affect the amenity of the local area?

Yes No **If yes**, please describe.

3. PROPOSED MANAGEMENT

3.1 Principles of Environmental Protection

3.1.1 Have you considered how your project gives attention to the following Principles, as set out in section 4A of the EP Act? (For information on the Principles of Environmental Protection, please see EPA Position Statement No. 7, available on the EPA website)

- | | | |
|--|---|-----------------------------|
| 1. The precautionary principle. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 2. The principle of intergenerational equity. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 3. The principle of the conservation of biological diversity and ecological integrity. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 4. Principles relating to improved valuation, pricing and incentive mechanisms. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |
| 5. The principle of waste minimisation. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No |

3.1.2 Is the proposal consistent with the EPA's Environmental Protection Bulletins/Position Statements and Environmental Assessment Guidelines/Guidance Statements (available on the EPA website)?

Yes No

The PHPA is committed to achieving or exceeding a level of environmental management performance consistent with national and international standards and statutory obligations. The Project will be conducted in a manner that will minimise impacts on the surrounding environment. Accordingly, environmental management strategies and commitments have been nominated throughout the Referral Information Document and its appendices.

3.2 Consultation

3.2.1 Has public consultation taken place (such as with other government agencies, community groups or neighbours), or is it intended that consultation shall take place?

Yes No **If yes**, please list those consulted and attach comments or summarise response on a separate sheet.

Stakeholder consultation will form an integral role in the planning and design stages of the Project. The PHPA is undertaking extensive consultation with representatives from local community groups, relevant local and state government bodies, local Indigenous groups and neighbouring industry.

Please see Section 9 in Attachment 2 for further details relating to stakeholder consultation for this Project.

References

BHPBIO 2009, *Environmental referral document – Nelson Point dredging, RGP6 Port Development*, Port Hedland.

BHPBIO 2010, *RGP6 Definition Phase Inner Harbour Geotechnical Investigation. Implementation of the environmental sampling programme – Hunt Point Load Out Facility*. Prepared for BHPBIO by WorleyParsons.

Commonwealth of Australia 2009, *National Assessment Guidelines for Dredging*. Department of the Environment, Heritage and the Arts, Canberra.

DEC 2010, *Assessment levels for soil, sediment and water*. Department of Environment and Conservation, Contaminated Sites Management Series.

DEC 2013, *Identification and investigation of acid sulfate soils and acidic landscapes*. Department of Environment and Conservation.

SKM 2011, *Hunt Point benthic primary producer habitat mapping*.

URS 2008, *Marine sediment sampling programme for proposed Third Berth, Port Hedland Harbour*. Prepared for FMG.

WorleyParsons 2010a, *RGP6 Definition Phase – Inner harbour geotechnical investigation factual report – implementation of the environmental sampling programme, Lumsden Point Tug Harbour*. Report no. 301012-01234-RP-080-G-12166, 2 September 2010.

WorleyParsons 2010b, *Benthic habitat dredging tolerances and implications for this Project, Tug Harbour and Cyclone Mooring Facility*.