

MEMORANDUM

ATTN:	Anthony Sutton	CC:	Rachael Goetze
ORGANISATION:	Assessment and Compliance Division Office of the Environmental Protection Authority	FROM:	Jonathan Anderson
PROJECT NO:	812_01_002	DATE:	17/06/2014
SUBJECT:	Albany Port Authority Maintenance Dredging referral in accordance with Section 38 of the Environmental Protection Act		

Dear Mr Sutton,

Albany Port Authority (APA) proposes to undertake maintenance dredging within their basin and entrance channel to maintain navigable depths.

On behalf of APA, this environmental impact assessment for the proposed Albany Port Authority Maintenance Dredging program is submitted to the Office of the Environmental Protection Authority, for review in accordance with the Section 38 assessment process. The Section 38 referral form is Appendix A of the environmental impact assessment document.

Please don't hesitate to contact either myself or Mark Bailey at BMT Oceanica Consulting, or Rachael Goetze, Environment Manager at APA (Rachael.Goetze@albanyport.com.au; (08) 9892-9006), should you require any further information regarding the proposed dredging.

Regards,



Dr Jonathan Anderson
 Marine Scientist
 Email: jonathan.anderson@bmtoceanica.com.au
 Telephone: 6272 0000

Office of the Environmental Protection Authority	
File:	
19 JUN 2014	
A:	<input type="checkbox"/> For Information
fa:	<input type="checkbox"/> For Discussion
Officer:	<input type="checkbox"/> For Action
<input type="checkbox"/> Dir.AC	Response please:
<input type="checkbox"/> Dir. Bus Ops	<input type="checkbox"/> GM Signature
<input type="checkbox"/> Dir. SPPD	<input type="checkbox"/> Dir for GM (copy to GM)
<input type="checkbox"/> Dir. Strat Sup	<input type="checkbox"/> Dir Signature (copy to GM)
<input type="checkbox"/>	<input type="checkbox"/> M. Direct (copy to GM)

Enc

Hard and electronic copy of:

EPA Proponent referral form under Section 38(1)

BMT Oceanica (2014) Albany Port Authority Maintenance Dredging Program Environmental Impact Assessment. Prepared for Albany Port Authority by BMT Oceanica Pty Ltd, Report No 812_01_002/2_Rev0, Perth, Western Australia, June 2014

Letter to withdraw existing EPA referral (29 May 2014)

Aboriginal Heritage Site Search output

Electronic copy of required GIS information or on CD





Environmental Protection Authority

**EPA REFERRAL
FORM
PROPONENT**

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).	✓	
Included Attachment 3 – confidential information (if applicable).		✓
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 type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Not sure
If yes, what level of assessment?		
<input type="checkbox"/> Assessment on Proponent Information	<input type="checkbox"/> Public Environmental Review	

PROPONENT DECLARATION (to be completed by the proponent)

I, Rachael Goetze declare that I am authorised on behalf of the Albany 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): Rachael Goetze
Position: Environment Officer	Company: Albany Port Authority
Date 17/06/2014	

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	Albany Port Authority (APA)
Joint Venture parties (if applicable)	N/A
Australian Company Number (if applicable)	N/A
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)	PO Box 175 Albany WA 6331
Key proponent contact for the proposal: <ul style="list-style-type: none">• name• address• phone• email	Rachael Goetze 85 Brunswick Road, Albany WA 6330 9892 9000 rachael.goetze@albanyport.com.au
Consultant for the proposal (if applicable): <ul style="list-style-type: none">• name• address• phone• email	Jonathan Anderson BMT Oceanica Consulting 353 Cambridge Street, Wembley WA 6913 6272 0000 jonathan.anderson@bmtoceanica.com.au

1.2 Proposal

Title	Albany Port Maintenance Dredging
Description	Maintenance dredging in the Albany Port to return the bathymetry to design depth with disposal of the majority of sediments to an offshore disposal site.
Extent (area) of proposed ground disturbance.	Approximately 32.25 ha in a 130 ha envelope.
Timeframe in which the activity or development is proposed to occur (including start and finish dates where applicable).	The dredging is planned to occur in 2014. The exact timing has not yet been determined as the APA is hoping to opportunistically secure a passing dredge to reduce mobilisation costs. The dredging is anticipated to take approximately 2-3 weeks; however approval will be sought for an 8 week window to allow for contingencies.
Details of any staging of the proposal.	N/A
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.	This proposal is not related to any other projects in the region.
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?	Yes. The Albany Port Authority owns approximately 90 ha of land adjacent to the harbour area.
What is the current land use on the property, and the extent (area in hectares) of the property?	The property is 90 ha with the current land use designated to Port related activities and development.

1.3 Location

Name of the Shire in which the proposal is located.	Shire of Albany
For urban areas: <ul style="list-style-type: none"> • street address; • lot number; • suburb; and • nearest road intersection. 	Princess Royal Drive, Albany WA 6330 N/A Albany Princess Royal Drive and Bolt Terrace
For remote localities: <ul style="list-style-type: none"> • nearest town; and • distance and direction from that town to the proposal site. 	N/A
Electronic copy of spatial data - GIS or CAD, geo-referenced and conforming to the following parameters: <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. 	Enclosed?: Yes, GIS information as part of data package

1.4 Confidential Information

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

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 Environment	Sea Dumping Permit	Yes	Chris Murphy
Department of Environment	EPBC Approval	Yes	Michael Ward
Department of Water	Dredging Licence	Yes	Karen McKeough

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)?

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.

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.

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.

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?

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 key potential risks of the proposal to marine fauna (cetaceans, pinnepids, sharks) include the risk of underwater noise from dredging activities and the risk of collisions due to vessel movement. Please refer to Sections 7.6 and 7.7 of the attached EIA which documents these potential impacts.

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.

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)

Please see NatureMap Report attached at end of application.

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.

A NatureMap search identified three threatened fauna species in the vicinity of the project area. These species include: the southern right whale (*Eubalaena australis*), the humpback whale (*Megaptera novaeangliae*) and the Indian yellow-nosed albatross (*Thalassarche carteri*) all of which are listed as rare or likely to become extinct.

The Southern Right Whale and the Humpback Whale are known to frequently occur in the project area, particularly during the peak whale season which runs from June to October. See Section 7.7 of the attached EIA for further details.

The Indian yellow-nosed albatross is a pelagic bird species known to feed in the South-west marine region along the edge of the continental shelf between January and November (DSEWPAC 2012). During July and August the species is common between Cape Naturaliste and King George Sound where it has been recorded feeding in offshore waters (DSEWPAC 2012). This is supported by the bird watching group 'Leeuwin Current Birding' who often sight the species in the open waters beyond Breaksea Island, Michaelmas Island and Bald Head. There are no colonies of Albatross's breeding in Albany waters, with the species migrating from Prince Edward, Crozet, Amsterdam, St Paul and Kerguelen Islands in the southern Indian Ocean (Collins P, Department of Parks and Wildlife, pers. comm). As there are no breeding colonies in the region, and the proposal is not taking place in the vicinity of the continental shelf it is unlikely that there will be any impact on the Indian Yellow-nosed Albatross.

An EPBC search of the project area was also undertaken using the online EPBC Protected Matters Search Tool. Threatened species known to be present include the endangered southern right whale (*Eubalaena australis*), the vulnerable humpback whale (*Megaptera novaeangliae*) and the vulnerable great white shark (*Carcharodon carcharias*). A full list of threatened species, their status and type of presence is given in Section 7.7.1 of the attached EIA. The proposal has been referred to the Department of Environment (formerly DSEWPAC) for assessment of 'Listed threatened species and communities' under the *Environmental Protection and Biodiversity Conservation Act 1999*.

References:

Department of Sustainability, Environment, Water, Population and Communities (2012) *Species Group Report Card – Supporting the marine bioregional plan for the South-west Marine Region*, prepared under the *Environment Protection Biodiversity and Conservation Act 1999*, Commonwealth of Australia.

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.

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.

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.

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 type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Perth's Bush Forever site	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (Swan & Canning Rivers) Policy 1998	<input type="checkbox"/> Yes	<input 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 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 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.

There are four Type 1A Nature Reserves within the vicinity of the project area including Michaelmas Island (No. 30049), Breaksea Island (No. 27614), Mistaken Island and Seal Island (No. 32199). All of the islands are managed by the local Department of Parks and Wildlife (formerly Department of Environment and Conservation).

As the proposal is marine-based, it is unlikely to impact on any of the surrounding Nature Reserves.

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 proposal is maintenance dredging therefore setback is not applicable.

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.

2.5.4 Is the development likely to impact on mangroves?

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

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.

The project area is not adjacent to any coral reefs or mangroves but is adjacent to seagrass meadows. The proposal is not expected to have any adverse impacts on adjacent seagrass meadows given the short duration of the dredging. As a precaution, Secchi depth monitoring will be undertaken during the dredging operation. Please refer to Section 7.2 and 8.1 of the attached EIA for further information.

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.

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 project area is designated for Port Use and is primarily an active shipping channel with recreational fishers having to give way to port-related activities. However, a small portion of the project area is occasionally used by recreational fishers targeting King George Whiting, trevally, leatherjacket and squid. (Ecologia 2007). Commercial fishing vessels are also known to occasionally target areas adjacent to the project area during late summer and early autumn (Ecologia 2007).

Given the short duration of the proposal, it is unlikely that there will be any adverse impact on recreational or commercial fishing activities. Community consultation with key fishing industries has been undertaken (refer to Section 9 of the attached EIA).

Recreational and commercial fishing vessels also frequently transit through the channel area from the Albany Town Jetty Marina. This transition is not expected to be impacted and a navigational warning will be in place during the proposal.

References:

Ecologia (2007) *Albany Iron Ore Project Public Environmental Review Albany Port Expansion Proposal EPA Assessment Number No. 1594*, Ecologia Environment, Perth, Western Australia.

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? [N/A](#)

2.7.8 What is the proposed source of water for the proposal? (e.g. dam, bore, surface water etc.) [N/A](#)

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.

2.8.3 Will the proposal result in gaseous emissions to air?

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

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.

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 will drain from the land disposal area back into Port waters within the Harbour Basin. The makeup of this return water is discussed in Sections 6.4.2 and 6.5 of the EIA document.

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.

The potential impacts and monitoring of the return water discharge from land disposal to Port waters is discussed in Sections 7.2.2–7.4 and 8.2 of the EIA document.

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.

Please refer to Sections 3 and 6 in the EIA document for a detailed description of the nature, concentration and Section 2 of the EIA document for the disposal location and methods.

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

Yes

No

If yes, please briefly describe.

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.

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".

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.

The harbour sediments in the berthing pockets of the Port have historically been contaminated due port-related activities and the use of antifouling paints containing tributyltin (TBT).

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

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

Sediments in the project area have been sampled and analysed for contaminants during three separate investigations in 2005, 2010 and more recently 2013. Please refer to Section 6 of the attached EIA for further information.

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.

An Aboriginal Heritage Sites search was undertaken using the Department of Aboriginal Affairs Aboriginal Heritage Inquiry System on 15 June 2014 (Attachment 2). This revealed there are no sites of Aboriginal significance within the direct project area that could be disturbed. The closest registered Aboriginal Site is King Point (ID 5743) which is located along the shoreline overlooking the entrance to the shipping channel.

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.

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 |

Please refer to Section 7.12 of the EIA document for details.

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

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.

Please refer to Section 9 of the EIA document.

NatureMap Species Report

Created By Guest user on 22/10/2013

Current Names Only Yes
 Core Datasets Only Yes
 Data Source WA Threatened Fauna Database
 Method 'By Polygon'
 Group By Conservation Status

Conservation Status	Species	Records
Rare or likely to become extinct	3	3
TOTAL	3	3

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24043 <i>Eubalaena australis</i> (Southern Right Whale)		T	
2.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		T	
3.	34134 <i>Thalassarche carteri</i> (Indian Yellow-nosed Albatross)		T	

Conservation Codes
 T - Rare or likely to become extinct
 X - Presumed extinct
 IA - Protected under international agreement
 S - Other specially protected fauna
 1 - Priority 1
 2 - Priority 2
 3 - Priority 3
 4 - Priority 4
 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.



EPA ref: A312804

Our ref: I2014107 [INF0020]

Mr Kim Taylor
General Manager
Office of the Environmental Protection Authority
Locked Bag 10
East Perth WA 6892

Attn: Mr Anthony Sutton
Director, Assessment & Compliance

29 May 2014

Dear Mr Taylor

**INTENTION TO RE-APPLY FOR A DREDGING LICENCE UNDER THE
WATERWAYS CONSERVATION ACT 1976 FOR THE MAINTENANCE
DREDGING CAMPAIGN INITIALLY PROPOSED IN 2009**

The Albany Port Authority would like to notify the Office of the Environment Protection Authority (OEPA) of our intention to re-apply for a Dredging Licence under the *Waterways Conservation Act 1976* to undertake maintenance dredging in the near future.

The Port originally proposed to undertake maintenance dredging in 2010; however this campaign was put on hold. The original scope of the 2010 proposal included the dredging of approximately 46,730 m³ within the Port's berthing area and channel.

However, a recent hydrographic survey undertaken in May 2013 has indicated a number of new highspots, resulting in a change in dredge volume to approximately 91,250 m³. Given this change, the Port has withdrawn its current Sea Dumping Application with the intention to re-submit a revised one which is more tailored to the new scope of works. The Port also intends to lodge a new application with the Department of Water for a Dredging Licence.

The Port believes that the OEPA were involved in the assessment of the original application and as a result would like to update the Office on the above matters.



ALBANY PORT AUTHORITY

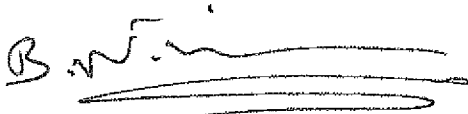
85 Brunswick Road, Albany WA 6330. POSTAL ADDRESS: PO Box 175, Albany 6331 Western Australia.
Tel: 08 9892 9000 Fax: 08 9841 7566 Email apa@albanyport.com.au Web: www.albanyport.com.au

The Port will undertake the maintenance dredging proposal independently of the Albany Port Expansion/ Grange Project. This is due to the unclear project timelines of the Albany Port Expansion Project and the need for the Port to safely re-instate the declared depths of its channel as soon as possible.

The Port will apply for the new licence in June or July 2014 at the same time as it re-submits a revised Sea Dumping Application to the Commonwealth.

Should you have any queries please contact Rachael Goetze on 9892 9000 or email rachael.goetze@albanyport.com.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'B. Williamson', with a horizontal line drawn underneath it.

Brad Williamson
Chief Executive Officer



Search Criteria

3 Registered Aboriginal Sites in Custom search area (9); 578926.37mE, 6115967.20mN (zone 50) : 597123.44mE, 6122953.50mN (zone 50)

Disclaimer

The *Aboriginal Heritage Act 1972* preserves all Aboriginal sites in Western Australia whether or not they are registered. Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist.

The information provided is made available in good faith and is predominately based on the information provided to the Department of Aboriginal Affairs by third parties. The information is provided solely on the basis that readers will be responsible for making their own assessment as to the accuracy of the information. If you find any errors or omissions in our records, including our maps, it would be appreciated if you email the details to the Department at HeritageEnquiries@daa.wa.gov.au and we will make every effort to rectify it as soon as possible.

Copyright

Copyright in the information contained herein is and shall remain the property of the State of Western Australia. All rights reserved.

Coordinate Accuracy

Accuracy is shown as a code in brackets following the coordinates.



Terminology (NB that some terminology has varied over the life of the legislation)

Place ID/Site ID: This a unique ID assigned by the Department of Aboriginal Affairs to the place

Status:

- o **Registered Site:** The place has been assessed as meeting Section 5 of the *Aboriginal Heritage Act 1972*
- o **Other Heritage Place which includes:**
 - **Stored Data / Not a Site:** The place has been assessed as not meeting Section 5 of the *Aboriginal Heritage Act 1972*
 - **Lodged:** Information has been received in relation to the place, but an assessment has not been completed at this stage to determine if it meets Section 5 of the *Aboriginal Heritage Act 1972*

Access and Restrictions:

- o **File Restricted = No:** Availability of information (other than boundary) that the Department of Aboriginal Affairs holds in relation to the place is not restricted in any way.
- o **File Restricted = Yes:** Some of the information that the Department of Aboriginal Affairs holds in relation to the place is restricted if it is considered culturally sensitive. This information will only be made available if the Department of Aboriginal Affairs receives written approval from the informants who provided the information. Download the [Request to Access Restricted Information](#) letter and form.
- o **Boundary Restricted = No:** place location is shown as accurately as the information lodged with the Registrar allows.
- o **Boundary Restricted = Yes:** place location is shown as accurately as one or more two-kilometre-square boxes.
The Department of Aboriginal Affairs maps the locations of all sites and heritage places, including sites and heritage places where the boundary is restricted, as accurately as the information lodged with the Registrar allows. However, to preserve the confidentiality of sites and heritage places where the boundary is restricted their locations are published in reports from the Register and displayed on the Aboriginal Heritage Inquiry System within one or more two-kilometre-square boxes. These 2 km boxes act as indicators for the presence of sites or heritage places rather than the exact location of the place.
- o **Restrictions:**
 - **No Restrictions:** Anyone can view the information.
 - **Male Access Only:** Only males can view restricted information.
 - **Female Access Only:** Only females can view restricted information

Legacy ID: This is the former unique number that the former Department of Aboriginal Sites assigned to the place. This has been replaced by the Place ID / Site ID.








List of Registered Aboriginal Sites with Map

Site ID	Status	File Restricted	Boundary Restricted	Restrictions	Site Name	Site Type	Knowledge Holders	Coordinates	Legacy ID
4456	Registered Site	No	No	No Gender Restrictions	LAKE VANCOUVER	Artefacts / Scatter	*Registered Knowledge Holder names available from DAA	584741mE 6117136mN Zone 50 [Reliable]	S02764
4837	Registered Site	No	No	No Gender Restrictions	LIMEKILNS POINT	Fish Trap, Man-Made Structure	*Registered Knowledge Holder names available from DAA	582641mE 6117246mN Zone 50 [Reliable]	S01904
5743	Registered Site	No	No	No Gender Restrictions	KING POINT, ALBANY.		*Registered Knowledge Holder names available from DAA	583862mE 6122608mN Zone 50 [Reliable]	S00397



Legend

Selected Heritage Sites

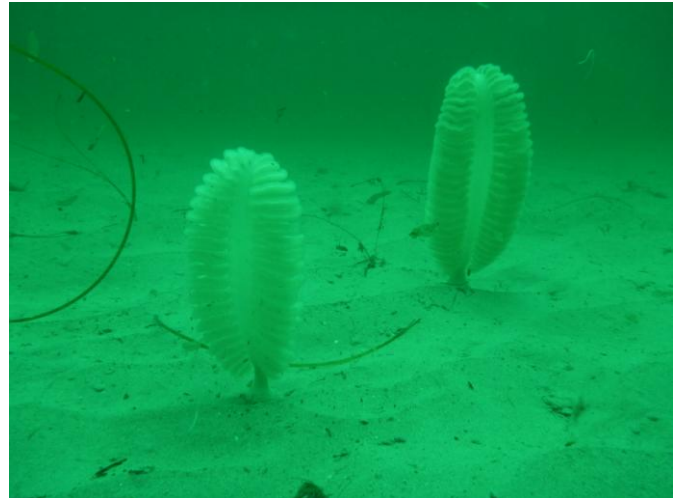
-  Registered Sites
-  Aboriginal Community Occupied
-  Aboriginal Community Unoccupied
-  Town
-  Search Area

Copyright for base map information shall at all times remain the property of the Commonwealth of Australia, Geoscience Australia - National Mapping Division. All rights reserved.

Cadastre, Local Government Authority, Native Title boundary, Roads data copyright © Western Australian Land Information Authority trading as Landgate (2014).

Geothermal Application, Geothermal Title, Mining Tenement, Petroleum Application, Petroleum Title boundary data copyright © the State of Western Australia (DMP) (2014.6)

For further important information on using this information please see the Department of Aboriginal Affairs' Terms of Use statement at <http://www.daa.wa.gov.au/Terms-Of-Use/>



Albany Port Authority Maintenance Dredging Program Environmental Impact Assessment

Albany Port Authority Maintenance Dredging Program
Environmental Impact Assessment

Prepared for

Albany Port Authority

Prepared by

BMT Oceanica Pty Ltd

June 2014

Report No. 812_01_002/2_Rev0

Client: Albany Port Authority

Document history

Distribution

Revision	Author	Recipients	Organisation	No. copies & format	Date
A	J. Anderson	L. Twomey	BMT Oceanica	1 docm	29/05/2014
B	J. Anderson	J. Phillips	BMT Oceanica	1 docm	30/05/2014
C	J. Anderson	R. Goetze	Albany Port	1 pdf	30/05/2014
D	J. Anderson	R. Goetze	Albany Port	1 pdf	13/06/2014
0	J. Anderson	R. Goetz M. Ward A. Sutton C. Murphy K. MeKeough	Albany Port DoE OEPA Sea Dumping Section DoE Department of Water	1 pdf 1 pdf 1 hardcopy 1 pdf 1 hardcopy 1 pdf 1 hardcopy 1 pdf	17/06/2014

Review

Revision	Reviewer	Intent	Date
A	L. Twomey	Technical review	29/05/2014
B	J. Phillips	Editorial review	30/05/2014
C	R. Goetze	Client review	11/06/2014
D	R. Goetze	Client review	13/06/2014

Quality Assurance



Quality
ISO 9001



BMT Oceanica Pty Ltd has prepared this report in accordance with our Quality Management System, certified to AS/NZS ISO 9001: 2008.

Status

This report is 'Draft' until approved for final release, as indicated below by inclusion of signatures from: (i) the author and (ii) a Director of BMT Oceanica Pty Ltd or their authorised delegate. A Draft report may be issued for review with intent to generate a 'Final' version, but must not be used for any other purpose.

Approved for final release:

Author

Date: 17/06/2014

Director (or delegate)

Date: 17/06/2014

Cover

Main image: Albany Port from the entrance channel (BMT Oceanica Pty Ltd)

Minor images: Vessel arriving at Albany Port (BMT Oceanica Pty Ltd)
Sarcoptilus grandis at site EC6 (BMT Oceanica Pty Ltd)

Disclaimer

This report has been prepared on behalf of and for the exclusive use of Albany Port Authority, and is subject to and issued in accordance with the agreed terms and scope between Albany Port Authority and BMT Oceanica Pty Ltd. BMT Oceanica Pty Ltd accepts no liability or responsibility for it in respect of any use of or reliance upon this report by any third party.

Copying this report without prior written consent of Albany Port Authority or BMT Oceanica Pty Ltd is not permitted.

© Copyright 2014 BMT Oceanica Pty Ltd

Contents

Acronyms	v
Executive Summary	vii
1. Introduction	1
1.1 Background	1
1.2 Purpose of this document	4
2. Dredging Operation and Disposal	5
2.1 Dredging operation	5
2.1.1 Alternative options	6
2.2 Area to be dredged	7
2.3 Disposal of dredge material	7
3. Background	9
3.1 Previous dredging programs	9
3.2 Previous sediment surveys	10
3.2.1 Review of existing information on sediment contamination	10
3.3 Contaminants of concern	11
3.3.1 Potential sources of sediment contamination	11
3.3.2 Disposal area	11
4. Existing Environment	12
4.1 Tide, currents and waves	12
4.2 Bathymetry	12
4.3 Marine fauna	15
4.4 Benthic habitats	16
4.5 Invasive marine species	16
4.6 Offshore disposal area	17
4.7 Land disposal site	17
5. Sediment Sampling and Design	18
5.1 Sampling locations	18
5.1.1 Harbour basin and entrance channel 2010 and 2014	18
5.1.2 Disposal area 2013.....	20
5.2 Sediment collection methods	22
5.3 QA/QC procedures	22
5.3.1 Field split samples	23
5.3.2 Triplicate samples.....	23
5.4 Laboratory analysis	23
5.4.1 Laboratory QA/QC.....	23
5.5 Data analysis	24
5.5.1 Normalisation of organics data	24
5.5.2 Acid sulfate sediments calculations	24
5.5.3 Computation of 95% upper confidence limit (UCL) of the mean.....	25
6. Nature of the Material to be Dredged	27
6.1 Sediment surveys	27

6.2	Sample recovery	27
6.3	Sediment physical composition	28
	6.3.1 Particle size	28
	6.3.2 Settling velocity	30
6.4	Sediment chemistry	31
	6.4.1 Metals	31
	6.4.2 Nutrients.....	34
	6.4.3 Organics.....	36
6.5	Acid sulfate sediments (applicable to land disposal)	39
6.6	Survey QA/QC	40
7.	Key Potential Impacts	41
7.1	Assessment of impact risks	41
7.2	Turbidity	47
	7.2.1 Dredge plume.....	47
	7.2.2 Disposal areas.....	47
7.3	Mobilisation of contaminants	48
	7.3.1 Release of metals.....	48
	7.3.2 Release of nutrients	48
	7.3.3 Organics.....	48
7.4	Acid sulfate sediments	49
7.5	Hydrocarbons	49
7.6	Noise	50
7.7	Marine fauna	50
	7.7.1 Threatened and migratory species	51
7.8	Introduced marine species	52
7.9	Waste management	52
7.10	Impacts to other users	53
7.11	Dust	53
7.12	Principles of environmental protection	53
8.	Environmental Monitoring and Management	55
8.1	Turbidity monitoring	55
	8.1.1 Seagrass monitoring	58
8.2	Return water	58
	8.2.1 Acidity	58
	8.2.2 TBT	58
8.3	Marine fauna	58
	8.3.1 Cetacean impact avoidance	59
	8.3.2 Trained observers	60
8.4	Introduced marine pests	60
8.5	Reporting	61
9.	Stakeholder Consultation	62
10.	References	63

List of Figures

Figure 1.1	Albany Port harbour basin, entrance channel and disposal area	2
Figure 1.2	Albany Port difference to design depth bathymetry in 2013	3
Figure 2.1	Trailer suction hopper dredge.....	5
Figure 2.2	Proposed area for land disposal of dredge materials: berthside settlement ponds within Albany Port	8
Figure 3.1	Albany Port Authority limit	9
Figure 4.1	Bathymetry of King George Sound and Princess Royal Harbour	13
Figure 4.2	Bathymetry in and around the Albany Port harbour basin and entrance channel	14
Figure 5.1	Sampling locations within the 2014 Albany Port maintenance dredging footprint.....	19
Figure 5.2	Sampling locations during 2013 within and near the proposed disposal area	21
Figure 5.3	Chromium suite flow diagram	25
Figure 6.1	Penetration depth of cores at all sites.....	28
Figure 6.2	Cumulative sediment particle size distributions in Albany Port for 2010 samples.....	29
Figure 6.3	Cumulative sediment particle size distributions in Albany Port for 2014 samples.....	29
Figure 8.1	Turbidity monitoring sites for the maintenance dredging campaign	57

List of Tables

Table 2.1	Dredge areas and material volumes.....	7
Table 3.1	Historical dredging projects at the Albany Port	10
Table 3.2	Sediment surveys within Albany Port and disposal areas (1999–2014).....	10
Table 4.1	Threatened and migratory marine species that may be present in the area.....	15
Table 4.2	Invasive marine species which have been identified in Albany waters.....	17
Table 5.1	Coordinates of sediment sites sampled in Albany Port.....	18
Table 5.2	Coordinates of sites sampled for sediment in the Albany Port proposed disposal area.....	22
Table 5.3	Laboratories used for sediment analysis in the 2010, 2013 and 2014 sediment surveys	23
Table 6.1	Sediment sampling site labelling schemes	27
Table 6.2	Particle settling velocities and time for 2010 sediment samples.....	30
Table 6.3	Particle settling velocities and time for sediment samples 2014.....	31
Table 6.4	95% upper confidence limit of the mean for total metal concentrations in sediment (mg kg^{-1})	32
Table 6.5	Disposal area sediments 80 th percentiles for total metal concentrations (mg kg^{-1}).....	32
Table 6.6	95% upper confidence limit of the mean for elutriate metal concentrations (mg L^{-1}).....	33
Table 6.7	95% upper confidence limit of the mean for bioavailable concentrations in sediment (mg kg^{-1})	34
Table 6.8	Total nutrient concentrations of nutrients 2010	34
Table 6.9	Total nutrient concentrations of nutrients in 2014	35
Table 6.10	95% upper confidence limit of mean elutriate nutrient concentrations ($\mu\text{g L}^{-1}$)	36
Table 6.11	Median inorganic nutrient concentrations ($\mu\text{g L}^{-1}$).....	36
Table 6.12	95% upper confidence limit (UCL) of standardised (1% TOC) mean concentrations of organotins in sediments.....	37

Table 6.13	Total, standardised (1% TOC) and elutriate tributyltin (TBT) concentrations from 7 April 2010 samples.....	38
Table 6.14	95% upper confidence limit of the mean for elutriate tributyltin (TBT) concentrations (mg L ⁻¹)	38
Table 6.15	Acid sulfate sediment (ASS) and acid base accounting (ABA) results for sediment samples 2010	39
Table 7.1	Risk assessment: likelihood table.....	43
Table 7.2	Risk assessment: consequence table	43
Table 7.3	Risk matrix	43
Table 7.4	Risk assessment for Albany Port maintenance dredging proposal	44
Table 7.5	Significant impact criteria for threatened and migratory species	51
Table 7.6	Principles of environmental protection and their application to the proposal program	54
Table 8.1	Secchi disk monitoring sites	56

List of Appendices

Appendix A	EPA Referral Form
Appendix B	EPBC Referral Form
Appendix C	Sea Dumping Permit Application

Acronyms

ABA	Acid base accounting
ANC	Acid neutralizing capacity
APA	Albany Port Authority
AQIS	Australian Quarantine Inspection Service
ASS	Acid sulfate soils
BTEX	benzene, toluene, ethylbenzene, and xylenes
DEC	Western Australian Department of Environment and Conservation
DEWHA	Commonwealth Department of Environment, Water, Heritage and the Arts
DoE	Commonwealth Department of the Environment
DoF	Western Australian Department of Fisheries
DoT	Western Australian Department of Transport
DoW	Western Australian Department of Water
DSEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
EIA	Environmental impact assessment
EIL	Environmental Investigation Level
EPA	Environmental Protection Authority
EPBC	Environment Protection and Biodiversity Conservation
FF	Fineness factor
HIL	Health Investigation Level
LEPA	Low ecological protection area
LoR	Limit of reporting
LWOST	Low Water of Ordinary Spring Tide
ML	Megaliter (10^6 L)
NAGD	National Assessment Guidelines for Dredging
NRM	Natural resource management
OC	Organic carbon
OEPA	Western Australian Office of the Environmental Protection Authority
PAH	Polycyclic aromatic hydrocarbon
PASS	Potential acid sulfate sediments
pH	Logarithmic scale of hydrogen ions in solution
pH _{KCl}	pH measurement of solution exacted with potassium chloride
PSD	Particle size distribution
QA/QC	Quality assurance and quality control
RPD	Relative Percent Difference
RSD	Relative Standard Deviation
S _{NAS}	Net acid soluble sulphur
TAA	Titratable actual acidity
TBT	Tributyltin
TKN	Total Kjeldahl nitrogen
TN	Total nitrogen
TOC	Total organic carbon
TP	Total phosphorus
TPH	Total petroleum hydrocarbon
TSHD	Trailer suction hopper dredge
UCL	Upper confidence limits
UWA	University of Western Australia
WA	Western Australia

Executive Summary

Albany Port Authority (APA) proposes to undertake maintenance dredging to remove high spots within the Port of Albany entrance channel and harbour basin, to reinstate the declared navigation depths. The APA proposes to dispose of approximately 91,250 m³ of dredged material to an offshore disposal area and to land disposal within the Port. The type of dredging plant yet to be determined, but it is anticipated that a trailer suction hopper dredge will be used to carry out the works.

Maintenance dredging was initially proposed to be completed in 2010, but was delayed due to potential capital dredging works, which have yet to commence. As capital dredging works have been postponed, maintenance dredging needs to be completed as soon as possible. Sediment sampling surveys were completed during January 2010 and January 2014. Additional sampling in and around the disposal area was also completed in 2013. Sediments were sampled to develop an understanding of the concentrations of potential contaminants of concern in the sediments to be dredged and to develop a strategy for disposal of the dredged sediments. Sediments were analysed for:

- physical composition (particle size and settling velocity)
- total, elutriate and bioavailable metals
- organics (hydrocarbons, and total and elutriate tributyltin)
- acid sulfate sediments.

Sediment analyses indicated that material adjacent to the dredge areas A and C2 (berths 1, 2 and 3) is unsuitable for unconfined ocean disposal, but all other areas are suitable for ocean disposal. APA proposes to dispose of the majority (82,400 m³) of dredged material at an offshore disposal area (G7) with the remainder (8,850 m³ from dredge areas A and C2) being placed into land disposal within the port facilities. Dredged material is proposed to be pumped from the dredge to the onshore disposal area with return waters from the settlement pond to be discharged back into Port waters.

A number of management and monitoring measures have been proposed to reduce the risk of potential impacts due to:

- turbidity
- mobilisation of contaminants and nutrients
- acidity from acid sulfate sediments
- hydrocarbon spills
- noise
- vessel movements
- threatened or migratory species
- introduced marine species
- waste management
- impacts to other users
- dust
- exposure to contaminants.

Relevant stakeholders have been consulted to ensure they are aware of the project. The outcome of this consultation has informed the document.

This document presents an Environmental Impact Assessment (EIA) that serves three purposes:

- To support a referral to the Western Australian Office of the Environmental Protection Authority in accordance with Section 38(1) of the *Environmental Protection Act 1986*, for a decision on whether formal assessment is required.
- To be submitted to the Commonwealth Department of the Environment (DoE) in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* for a decision on whether formal assessment is required.
- To support an application to the DoE for a sea dumping permit, in accordance with the *Environmental Protection (Sea Dumping) Act 1981*.

1. Introduction

1.1 Background

The Port of Albany is on the southern coast of Western Australia with infrastructure in Princess Royal Harbour and King George Sound (Figure 1.1). The port is an industrial port operated by Albany Port Authority (APA) under the *Port Authorities Act 1999*. The regional port services the City of Albany and the Great Southern region of Western Australia. The main cargoes handled by the port include exported bulk materials (grain, silica sand and woodchips) and imported fertiliser and fuel.

The Port of Albany is currently dredged to -12.2 m LWOST (Low Water of Ordinary Spring Tide) in parts of the entrance channel and berthing areas. The harbour basin is up to 550 m wide, with a navigable section of entrance channel 3.22 km long and 145 m wide. In August 2013, APA received the latest hydrographic survey results from the Western Australian Department for Planning and Infrastructure, obtained using multi-beam sidescan sonar technology. The survey identified a number of high spots that have accumulated within APA's marine infrastructure areas (Figure 1.2), reducing the port's declared channel and berthing area depths and thus reducing the safety margins required by the Harbour Master and APA's Marine Pilots.

Albany Port Authority proposes to undertake maintenance dredging to remove these high spots as a matter of urgency and to reinstate the design depths as soon as possible. The Port proposes to dispose of the majority of dredged material at an offshore disposal area (G7) (Figure 1.1).

A sediment sampling and analysis plan (SAP) within the entrance channel and the berth areas was previously prepared and submitted to the Commonwealth Department of the Environment (DoE) (formerly Department of Environment, Water, Heritage and the Arts; DEWHA) in November 2009 (Oceanica 2009). The sediments of the entrance channel and berth areas were subsequently sampled and analysed for physicochemical properties, with results presented in the SAP implementation report (Oceanica 2010a). The report was submitted on 3 June 2010 in support of a sea dumping permit application (SD2010/1702), but was withdrawn in December 2013 on recommendation from the DoE. An Environmental Impact Assessment (EIA) document (Oceanica 2010b) in support of the EPBC referral (EPBC: 2010/5527) was submitted on the same date to the DEWHA, then withdrawn on 21 October 2013. An application for a dredging and/or reclamation license was submitted to the Western Australian Department of Water (DoW) on 3 June 2010, which was subsequently referred to the Western Australian Environmental Protection Authority (EPA) (document reference A312804) as the decision making authority.

Currently, a new sea dumping permit application has been submitted to the DoE, which includes all sampling from 2010, sampling of the disposal area in 2013, and sampling of sediments in the harbour basin and entrance channel in 2014. Data from the initial SAP implementation report (Oceanica 2010a) have been combined with the results from the 2014 sampling regime to develop a single SAP implementation report (BMT Oceanica 2014). The original EIA document (Oceanica 2010b) has been revised to incorporate all available data and to update and improve the assessment of potential impacts, the monitoring of the environment and the subsequent management of the dredge practices.

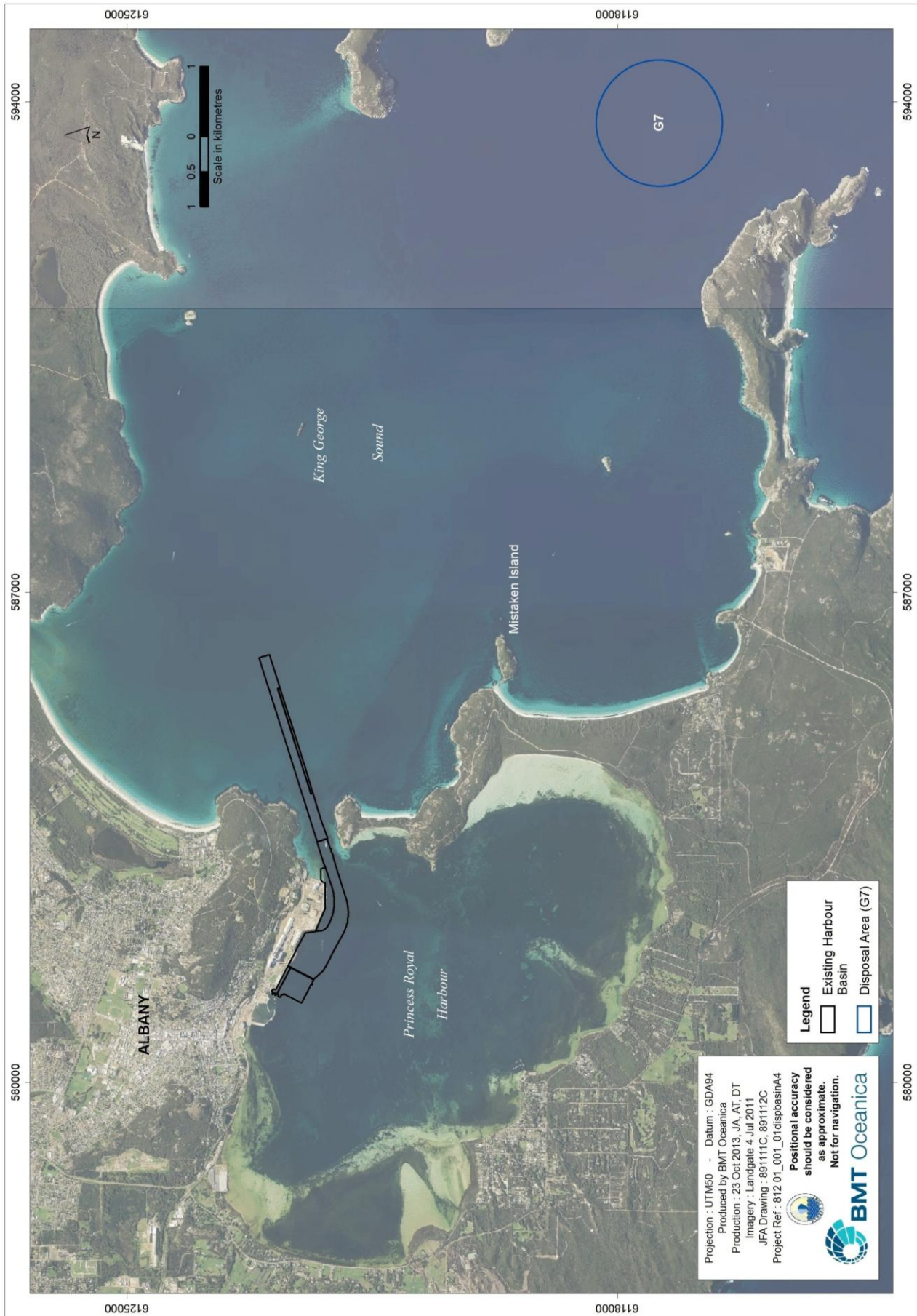


Figure 1.1 Albany Port harbour basin, entrance channel and disposal area

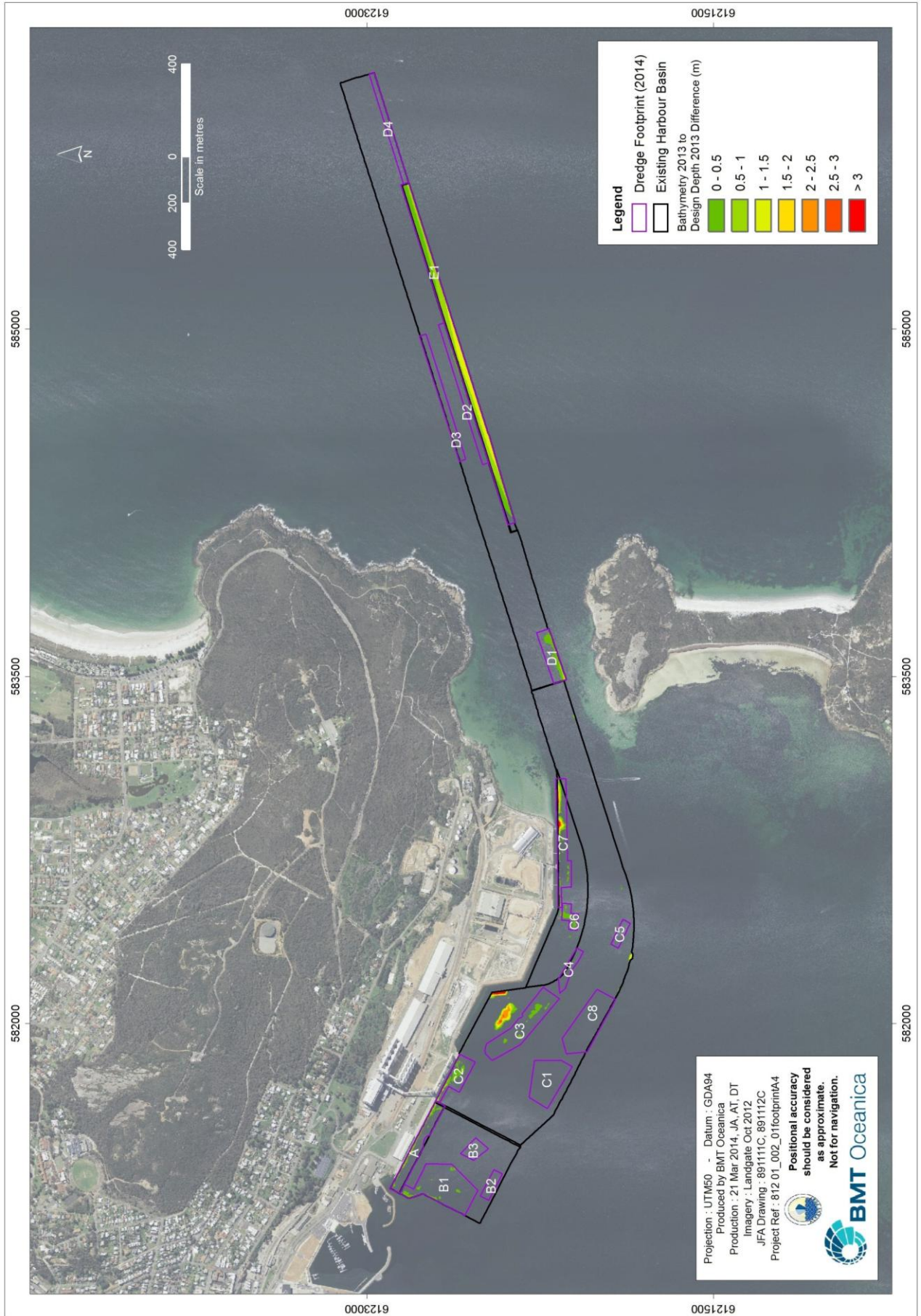


Figure 1.2 Albany Port difference to design depth bathymetry in 2013

1.2 Purpose of this document

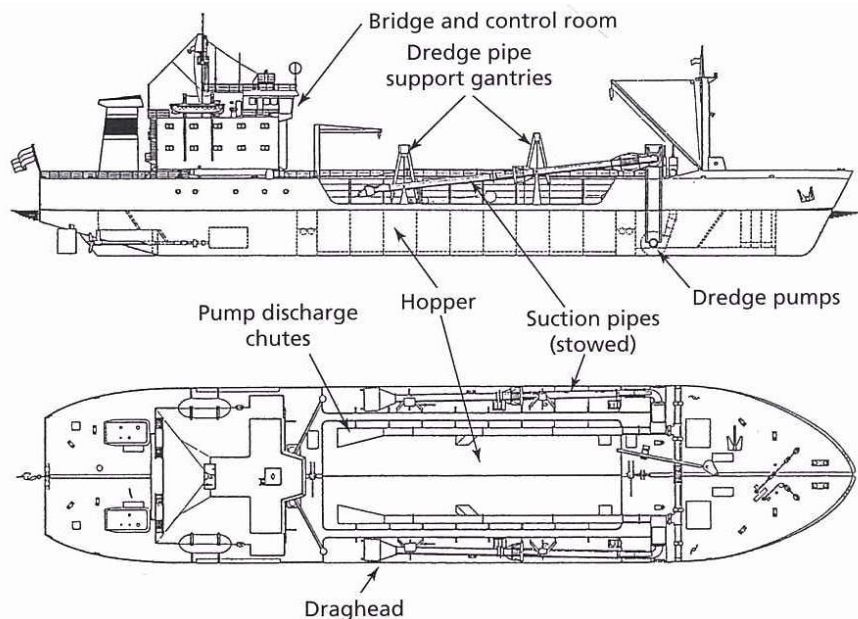
This document presents an EIA that serves three purposes:

1. To support a referral (Appendix A) to the Western Australian Office of the Environmental Protection Authority (OEPA) in accordance with Section 38(1) of the Western Australian *Environmental Protection Act 1986* for a decision on whether formal assessment is required.
2. To be submitted in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), whereby the proposed maintenance dredging is referred to the Commonwealth Department of the Environment (DoE) for a decision on whether formal assessment is required. The EPBC referral form has been completed and is attached as Appendix B.
3. To support an application for a sea dumping permit (Appendix C). The EIA along with the Sampling and Analysis Plan (SAP) (Oceanica 2009; BMT Oceanica 2013) and the SAP Implementation Report (BMT Oceanica 2014) is submitted to the DoE, in accordance with the *Environmental Protection (Sea Dumping) Act 1981*.
4. In addition to the above listed purposes, this document will also accompany an 'application for a licence to carry out dredging' to be submitted to the Western Australian Department of Water for approval under the *Waterways Conservation Act 1976*.

2. Dredging Operation and Disposal

2.1 Dredging operation

The type of dredging plant has yet to be determined, but it is anticipated that the Albany Port maintenance dredging works will use a trailer suction hopper dredge (TSHD). A TSHD is a self-propelled ship with a hopper for the temporary storage of dredged material (Figure 2.1). It is a highly mobile vessel that uses a trailing suction pipe(s) to remove material from the seabed and is generally defined in terms of its 'hopper capacity', that is the maximum volume of water/sediment mix that can be contained in the hopper. The hopper capacity of the TSHD that will be used for the Albany Port maintenance dredging is expected to be in the range of 1000–3000 m³.



Source: Bray (2008)

Figure 2.1 Trailer suction hopper dredge

A TSHD is fitted with one or two drag arms that can be lowered over the side to the seabed. The end of the drag arm is fitted with a drag-head that can be fitted with ripping teeth and high pressure water jets as required. The dredge fills the hopper by travelling at low speeds (1–2 knots) with the drag-head on the seabed. A vacuum is created at the drag-head by the dredge pumps. The vacuum entrains sediment and water off the seabed, which is then transported up the drag arm as slurry. The slurry travels through the dredge pump and is discharged into the hopper.

In the hopper, the sediment settles out from the water and is retained for disposal. Once the hopper reaches capacity with the sediment/water slurry, it is possible to overflow the surface water in the hopper to allow loading of sediment to continue. While draining off the water, fines that have not settled out will also be discharged in the overflow mix. The concentration of fines leaving the hopper via the overflow depends on the composition of the material being dredged and the 'retention time' in the hopper. Thus, the concentration of fines in the overflow will increase as the volume of solids in the hopper increases (and free water in the hopper reduces). Filling of the hopper ceases either when the dredge reaches its maximum load, or when the concentration of sediment (fines) contained in the overflow reaches an unacceptable limit. This limit is usually dictated by the economics of the operation or environmental constraints placed on the dredging. In some scenarios no overflow at all is permitted, such as when dredging contaminated sediments or when dredging adjacent to areas of very high environmental sensitivity and/or value.

The total volume of solids that can be transported during each trip depends on the particle size and density of the material being dredged, and the limits on the fines in the overflow. During the Albany Port maintenance dredging it is expected that the amount of solids transported each trip in the hopper will be ~40% of the hopper volume when disposing offshore and ~20% when disposing to land.

Material in the hopper will be discharged to the land-based disposal site via pumping through a pipeline connection in the dredge vessel bow. Disposal to the offshore disposal area will be via bottom dumping.

The typical sequence for a dredging cycle for the Albany Port can be summarised as:

- dredge travels to dredging area with an empty hopper
- the drag arm(s) are lowered to the seafloor, dredging commences to load the hopper – no overflow
- dredging continues, hopper full and overflow of water and fine sediment from hopper commences
- dredging ceases – hopper full. The time to fill the hopper depends on the material being dredged but is assumed for Albany Port it will be ~3 hours when disposing offshore (with overflow) and ~2 hours when disposing to land (with no overflow). Drag arm(s) raised and brought onboard
- dredge travels loaded to the discharge pipe (when disposing to land)
- material discharged via pumping to land-based disposal site or bottom dumping to the offshore disposal area.

The maintenance dredging is planned for the earliest dredge availability. Conservatively, assuming that a small dredge will be used (hopper capacity 1000–3000 m³), the dredging works will take 1–2 weeks to complete with dredging occurring continuously (with allowance for up to 3 weeks in the event of adverse weather conditions). The typical cycle will be ~3 hours when dumping at the offshore disposal area, and ~2.5 hours when pumping to the land disposal site.

2.1.1 Alternative options

Options considered for the management of the harbour depths maintenance dredging were:

- No action
- Reuse for beach renourishment
- Land disposal.

Taking no action or to delay the maintenance works until the Port is unable to accommodate vessels was not considered feasible as the decreasing drafts within the harbour basin and in the channel would restrict ship movements and reduce the safety and operability of the Port. Delaying the dredging was not considered to be in keeping with APA's charter as a responsible corporate citizen and carries unacceptable risks to the community, the Port's customers, the regional economy and the environment.

Reusing the dredge material for beach renourishment at Middleton beach was considered excessively costly due to transport costs, the material grade may not be adequate for renourishment, lack of hydrodynamic knowledge to make an informed decision and the disposal material may be visually unappealing for beach re-nourishment.

Land disposal has been adopted for disposal of materials which are deemed not appropriate for sea disposal (i.e. dredge areas A and C2).

2.2 Area to be dredged

Reinstating the design level of Albany Port requires the removal of ~91,250 m³ of material (Table 2.1), which involves removing sediment from 17 dredge areas (Figure 1.2).

Table 2.1 Dredge areas and material volumes

Dredge area	Estimated design volume (m ³)	Estimated design volume and over dredge volume (m ³)
A	3170	5240
B1	220	3320
B2	0	220
B3	0	190
C1	0	800
C2	1870	3610
C3	160	3020
C4	0	270
C5	0	150
C6	150	860
C7	11,310	16,050
C8	0	1620
D1	430	2210
D2	50	2800
D3	50	2760
D4	0	670
E1	29,520	47,460
Total	46,930	91,250

2.3 Disposal of dredge material

For dredge areas B1–3, C1, C3–8, D1–4 and E1 (total volume 82,400 m³) ocean disposal of the dredge materials at a single disposal area is proposed. The offshore disposal area (G7) is in King George Sound. This disposal area has not previously been used, but has been established for the proposed Albany Port Expansion Project (SKM 2007).

For areas A and C2 (total volume 8850 m³) disposal into berthside settlement ponds previously used for APA maintenance dredging campaigns is proposed (Figure 2.2). The rationale for the combination of ocean disposal and land disposal is given in Sections 6 and 7.

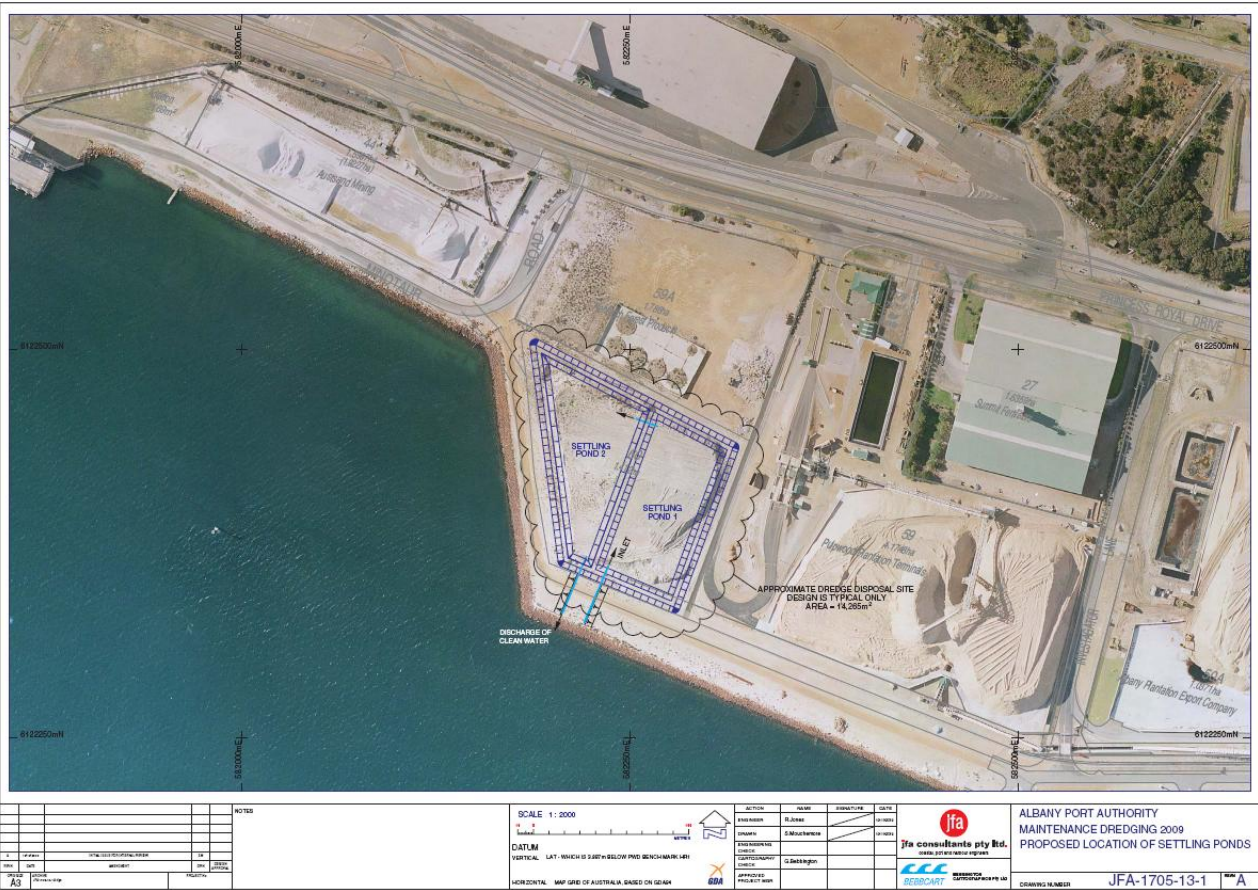


Figure 2.2 Proposed area for land disposal of dredge materials: berths side settling ponds within Albany Port

3. Background

Albany Port Authority waters encompass Princess Royal Harbour and extend out as far as Michaelmas and Breaksea Islands on the western boundary of King George Sound (Figure 3.1).

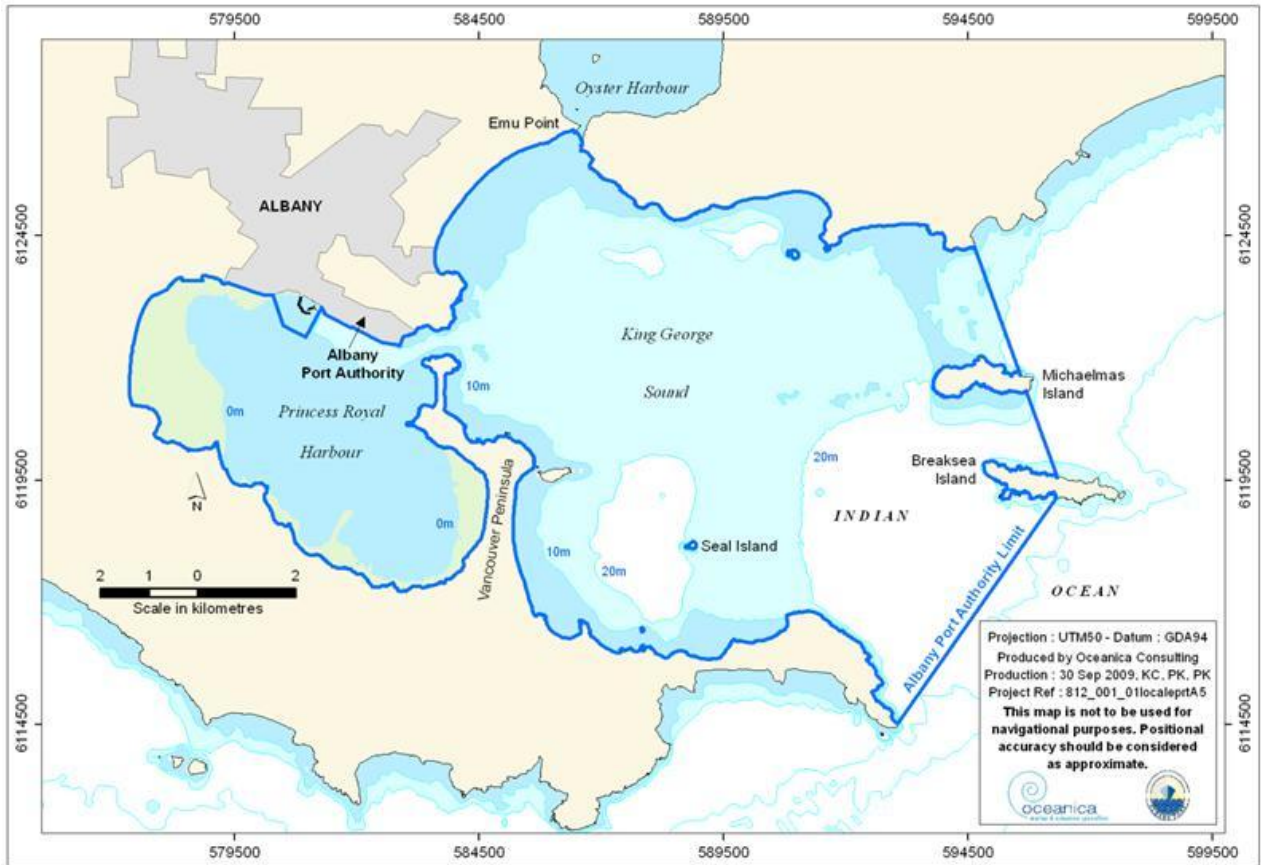


Figure 3.1 Albany Port Authority limit

3.1 Previous dredging programs

The Port of Albany was constructed in 1893 in the vicinity of present day Port jetty. It has developed to its current size through a number of dredging and reclamation programs spanning 120 years (Table 3.1).

Table 3.1 Historical dredging projects at the Albany Port

Time	Dredge volume (estimated m ³)	Disposal method	Reason for action
1893	800,000	Ocean disposal in Middleton Bay	Initial construction
1901–1903	Unknown	Unknown	Deepen entrance channel and extend harbour basin
1922–1923	Unknown (22 ha area)	Unknown	Deepen harbour basin
1951–1952	Unknown (39 ha area)	Land disposal	Deepen harbour basin and reclamation
1967	Unknown	Majority land disposal Limited ocean disposal within Princess Royal Harbour	Extend reclaimed land and increase harbour basin area
1978–1979	Unknown (>50 ha)	Land disposal	Deepen entrance channel and harbour basin. Extend reclaimed area
1985	100–200,000	Ocean disposal Material used for beach renourishment at Middleton beach	Maintenance dredging to remove 1984 storm deposits.
2000–2001	470,000	Land disposal	Construction of berths 5 and 6
2009	24,000	Land disposal	Maintenance dredging to ensure safe navigation

Source: ATA Environmental (2000)

Historically, very little dredged material has been disposed of via ocean disposal as it has been utilised for land reclamation in the development of the Port.

3.2 Previous sediment surveys

In the past 15 years, multiple surveys have been conducted to assess sediment properties for dredging campaigns (Table 3.2).

Table 3.2 Sediment surveys within Albany Port and disposal areas (1999–2014)

Date	Related dredging campaign	Undertaken by	Time dredging completed
1999/2000	Development of Berth 5 and 6	Alan Tingay & Associates	2000/2001
2005	Grange/Albany Port Expansion	SKM	Not completed
2010	Current maintenance dredging	Oceanica	Currently proposed
2011	Grange/Albany Port Expansion (not within current proposed dredge footprint)	Bastyan & Associates	Not completed
2013	Current maintenance dredging (Disposal area survey)	Bastyan & Associates	Currently proposed
2014	Current maintenance dredging	BMT Oceanica	Currently proposed

3.2.1 Review of existing information on sediment contamination

A detailed review of relevant sediment data available for Albany Port is presented in the Sediment Sampling and Analysis Plans (Oceanica 2009; BMT Oceanica 2013). Only data from the past 5 years have been used to assess the feasibility for ocean and land disposal.

3.3 Contaminants of concern

3.3.1 Potential sources of sediment contamination

The Public Environmental Review for the Albany Port Expansion Project (Ecologia 2007) described the main sources of pollution in Princess Royal Harbour as:

“...industrial effluents, agricultural and urban runoff. The Albany townsite occupies approximately 235 ha of the Princess Royal Harbour catchment and the steep topography and shallow topsoil results in a large proportion of the urban runoff flowing directly into the harbour. The volume of runoff is estimated to be 6140 ML or 7% of the total volume of the Harbour, with the actual amount entering the harbour each year dependant on the variations in rainfall, soils moisture content and other factors (ATA Environmental 2000).”

3.3.2 Disposal area

The proposed disposal area for this project is an area of 900 m radius, near the boundaries of the Port waters. The disposal area was authorised for sea dumping for the Grange/Albany Port Expansion project (Sea Dumping Permit No. SD2006/0035 dated 11 June 2010). The disposal area is 35–44 m chart datum. Data has been collected on the sediment physical and chemical properties of the area in 2005 (SKM 2007) and 2013 surveys. The area is dominated by fine to medium sands with very low concentrations of total organic carbon and metals. The area has never been used for disposal of dredge material and it is believed to have no sources of contamination.

4. Existing Environment

4.1 Tide, currents and waves

The hydrodynamic characteristics of the area are described in the Albany Port Expansion Proposal Public Environmental Review (Ecologia 2007):

"The dominant influence on the circulation in the waters of King George Sound and Princess Royal Harbour is the local wind. Tides are relatively weak at Albany and vary from diurnal to semi-diurnal throughout the year with a spring tidal range of approximately 1.1 m. Water levels are also influenced by the weather systems, with wind driven setup resulting from sustained winds in King George Sound that at times can be readily transmitted into Princess Royal Harbour.

Modelling conducted by Mills and Brady (1985) of wind driven water circulation in Princess Royal Harbour indicated that west to north-west winds in winter generate predominantly anti-clockwise circulation. During summer, however, winds from the south to south-east sector generate a predominantly anti-clockwise circulation in King George Sound, and winds from the east to north-east sector generate a predominantly clockwise circulation in King George Sound (GEMS 2007).

The broad high latitude westerly flow over the Southern and Indian Oceans produces a highly energetic wave climate at the south-west corner of the continent. However, the south-easterly to easterly aspect of King George Sound provides a significant level of protection to these waves. During winter, sustained strong westerly winds generate what appears to be a shelf wave along the continental shelf outside King George Sound resulting in current speeds over 1 knot at depths of 40 m (GEMS 2007)."

4.2 Bathymetry

The current bathymetry difference from design depth of the Princess Royal Harbour and shipping channels is shown in Figure 1.2. The Albany Port basin and entrance channel is currently dredged to a depth of 12.2 m LWOST with water depths within the harbour becoming progressively shallower in the southern and western areas of the Harbour due to a wide sandy intertidal shelf <2 m deep. The bathymetry of King George Sound is highly variable and relatively shallow (5–40 m) (Figure 4.1). The areas immediately surrounding the harbour basin are shallow (3–11 m) (Figure 4.2).

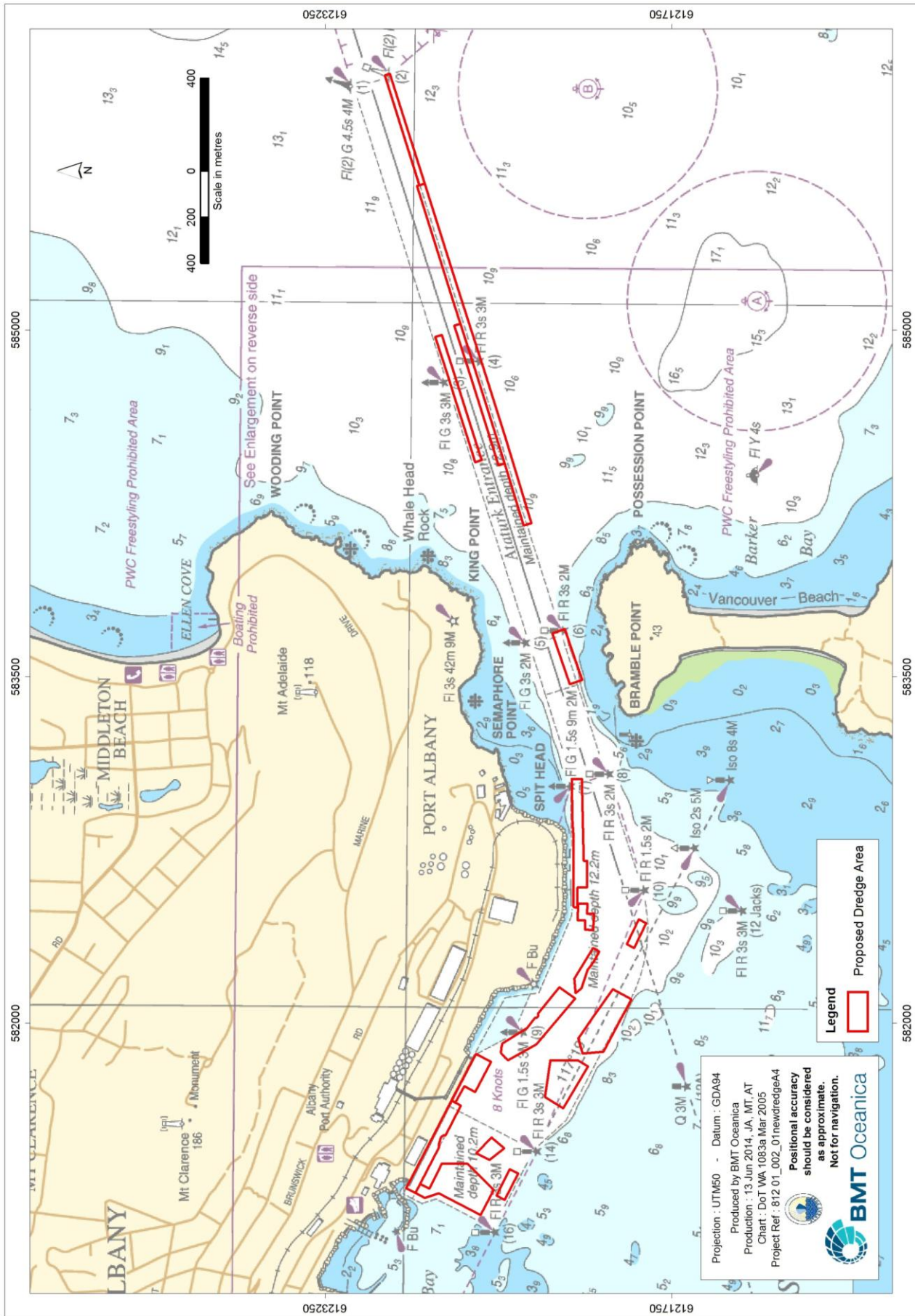


Figure 4.2 Bathymetry in and around the Albany Port harbour basin and entrance channel

The sediment within the existing shipping channel has been described as consisting of unconsolidated material to ~8–10 m depth into the seabed with a particle size composition of medium to coarse silica sand and some fine silt (SKM 2007). Diver observations (JFA 2005) described the material from the existing harbour and channel as a dark grey, fine to medium grained sand with minimal organic material and the material offshore as clean white sand.

Probe and sidescan surveys (Fugro 2005 in Ecologia 2007, JFA 2005,) were done as part of the EIA for the Albany Port Expansion Project and found that consolidated material does not generally occur at a shallower depth than the proposed dredge depth for the port expansion. Probe refusal occurred in the proposed Berth 7 location and south of Gio Batta Patch (JFA 2005) but subsequent seismic reflection surveys did not identify any limestone or granitic bedrock (Fugro 2005 in Ecologia 2007).

The high spots proposed to be dredged during the maintenance dredge are all soft sediments that have accumulated over time.

4.3 Marine fauna

The coastal waters near Albany provide habitat, breeding grounds and migratory routes for cetaceans and other marine fauna, including the southern right whale (*Eubalaena australis*), humpback whale (*Megaptera novaeangliae*), bottlenose dolphin (*Tursiops truncatus*), common dolphin (*Delphinus delphis*), great white shark (*Carcharodon carcharias*) and Australian sea-lion (*Neophoca cinerea*) (DoE 2014, Ecologia 2008). The southern right whale, humpback whale, Australian sea-lion and great white shark are protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as threatened and/or migratory species. A full list of species that may occur in the Albany region, and which are protected under the EPBC Act, is provided in Table 4.1.

Table 4.1 Threatened and migratory marine species that may be present in the area

Species	Status	Type of presence
Threatened species		
Blue whale (<i>Balaenoptera musculus</i>)	Endangered	Species or species habitat may occur within area
Southern right whale (<i>Eubalaena australis</i>)	Endangered	Breeding known to occur within area
Humpback whale (<i>Megaptera novaeangliae</i>)	Vulnerable	Species or species habitat likely to occur within area
Australian sea-lion (<i>Neophoca cinerea</i>)	Vulnerable	Breeding known to occur within area
Loggerhead turtle (<i>Caretta caretta</i>)	Endangered	Species or species habitat likely to occur within area
Green turtle (<i>Chelonia mydas</i>)	Vulnerable	Species or species habitat likely to occur within area
Grey nurse shark (<i>Carcharias taurus</i>)	Vulnerable	Species or species habitat may occur within area
Great white shark (<i>Carcharodon carcharias</i>)	Vulnerable	Species or species habitat known to occur within area
School shark (<i>Galeorhinus galeus</i>)	Conservation Dependent	Species or species habitat may occur within area
Whale shark (<i>Rhincodon typus</i>)	Vulnerable	Species or species habitat may occur within area
Migratory species		
Bryde's whale (<i>Balaenoptera edeni</i>)	Migratory	Species or species habitat may occur within area
Blue whale (<i>Balaenoptera musculus</i>)	Migratory	Species or species habitat may occur within area
Pygmy right whale (<i>Caperea marginata</i>)	Migratory	Species or species habitat may occur within area
Southern right whale (<i>Eubalaena australis</i>)	Migratory	Breeding known to occur within area
Dusky dolphin (<i>Lagenorhynchus obscurus</i>)	Migratory	Species or species habitat may occur within area
Humpback whale (<i>Megaptera novaeangliae</i>)	Migratory	Species or species habitat likely to occur within area
Killer whale (<i>Orcinus orca</i>)	Migratory	Species or species habitat may occur within area
Loggerhead turtle (<i>Caretta caretta</i>)	Migratory	Species or species habitat likely to occur within area
Green turtle (<i>Chelonia mydas</i>)	Migratory	Species or species habitat likely to occur within area
Great white shark (<i>Carcharodon carcharias</i>)	Migratory	Species or species habitat known to occur within area
Whale shark (<i>Rhincodon typus</i>)	Migratory	Species or species habitat may occur within area

4.4 Benthic habitats

Benthic habitat types in the region include seagrass meadows on sandy substrate in both Princess Royal Harbour (PRH) and King George Sound, and algal-dominated limestone reef in central King George Sound (notably Gio Batta Patch and Michaelmas Reef) and on the subtidal areas of rocky shoreline and islands in King George Sound. The maintenance dredging proposed in this document is not adjacent to any reefs, but the harbour basin and portions of the entrance channel are adjacent to seagrass meadows.

Seagrass meadows have an important role in providing habitat and food for marine organisms and dispersing wave energy. Seagrasses in PRH are dominated by *Posidonia australis* and *P. sinuosa* (Ecologia 2007). Both species of *Amphibolis* (*griffithii* and *antarctica*) are also present throughout King George Sound, while *P. kirkmanii* occurs along the north-eastern shores (MPRSWG 1994). *P. robertsoniae* is common along the edges and inside of blowouts (MPRSWG 1994) and *P. coriacea* has been identified near Bramble Point (DoW 2008).

Extensive historical loss of seagrass has occurred in PRH and was first reported in 1986 (EPA 1990). Between 1962 (when the seagrass meadows were considered to be in pristine condition) and 1984, 66% of the seagrass meadows in PRH were lost. By 1988 the loss had increased to 90% (EPA 1990). A two-year intensive 'Albany Harbours' study coordinated by the EPA in 1988–89 concluded that the major cause of seagrass loss was attributable to light reduction from macroalgae smothering, which was driven by excessive nutrient loads. The study also concluded that it was unlikely that luxuriant *Posidonia* meadows would ever be re-established, but that there could be recovery in remaining areas and that bare areas could be colonised by other species (EPA 1990).

Water quality improvements and a reduction in macroalgal accumulations in PRH since the 1980s have enabled a gradual recovery of seagrass meadows. Seagrass in PRH was mapped during a collaborative exercise between LandCorp and the DoW in 2006. This study showed that the extent of seagrass had increased considerably since the 1980s, particularly the areas of dense seagrass with 45% cover or more (Strategen 2008).

4.5 Invasive marine species

Of the 60 known species of marine species believed to be introduced by humans in Western Australia, 25 of these had been identified within the Albany area (Huisman et al. 2008). An extensive survey in 2007 for introduced marine species within Albany Port and Oyster Harbour identified additional species, bringing the total to 29 (McDonald et al. 2009; Table 4.2). The current distribution and density of the 29 recorded introduced marine species within Port waters is unknown.

Table 4.2 Invasive marine species which have been identified in Albany waters

Group	Scientific Name	Common Name
Algae	<i>Elachista orbicularis</i>	Brown algae
	<i>Stictyosiphon soriferus</i>	Brown algae
	<i>Codium fragile</i> ssp. <i>fragile</i>	Dead man's fingers/Oyster thief
	<i>Grateloupia imbricata</i>	Forked grateloup's weed
	<i>Ulva fasciata</i>	Sea lettuce
Bryozoans	<i>Bugula flabellata</i>	Bryozoan
	<i>Bugula neritina</i>	Bryozoan
	<i>Bugula stolonifera</i>	Bryozoan
	<i>Cryptosula pallasiana</i>	Bryozoan
	<i>Schizoporella errata</i>	Bryozoan
	<i>Schizoporella unicornis</i>	Single horn bryozoan
	<i>Watersipora arcuata</i>	Bryozoan
<i>Watersipora subtorquata</i>	Bryozoan	
Crustaceans	<i>Amphibalanus amphitrite</i>	Striped barnacle
	<i>Tesseropora rosea</i>	Rose barnacle
Hydroids	<i>Antenella secundaria</i>	Knotted thread hydroid
	<i>Eudendrium carneum</i>	Red stick hydroid
	<i>Halecium delicatulum</i>	Delicate hydroid
	<i>Obelia dichotoma</i>	Sea thread hydroid
	<i>Sarsia eximia</i>	Hydroid
Molluscs	<i>Mytilus edulis</i> ssp. <i>planulatus</i>	Blue mussel
	<i>Ostrea edulis</i>	European flat oyster
	<i>Polycera hedgpethi</i>	Hedgpeth's dorid
Polychaetes	<i>Sabella spallanzanii</i>	European fanworm
Ascidians	<i>Ascidiella aspersa</i>	European sea squirt
	<i>Botryllus schlosseri</i>	Star ascidian/Golden star tunicate
	<i>Ciona intestinalis</i>	Solitary ascidian
	<i>Styela clava</i>	Leathery sea squirt/Rough sea squirt /Club tunicate/Asian tunicate
	<i>Styela plicata</i>	Solitary ascidian

4.6 Offshore disposal area

The offshore disposal area (G7) is south of Breaksea Island, near the western boundary of the Ports water limit of King George Sound. Water depths are 35–44 m chart datum. The disposal area has never been used for dredge material disposal.

The disposal area is described as a flat seabed with very sparsely distributed epifauna (SKM 2007). The epifauna observed were:

- sponges
- sea pens (*Sarcoptilus grandis*)
- colonial ascidian (*Sycozoa* sp.)
- southern blue-spotted flathead (*Platycephalus speculator*)
- sand dollar.

No rare or endangered epifauna were observed and the most numerous biota were small, oval sponges (Ecologia 2007).

4.7 Land disposal site

Berthside settlement ponds are bare of vegetation and are specifically zoned as Port reclamation areas. As such, no vegetation or fauna will be impacted by the land disposal.

5. Sediment Sampling and Design

5.1 Sampling locations

5.1.1 Harbour basin and entrance channel 2010 and 2014

Sediments in the harbour basin and entrance channel were sampled as per the relevant SAPs (Oceanica 2009; BMT Oceanica 2013), on 4–5 January 2010 and on 28 January 2014. The harbour has been designated into 17 individual dredge areas for the 2014 maintenance dredging (Figure 1.2). Dredge volumes per dredge area are shown in Section 2.2. The sampling sites within these dredge areas are shown in Figure 5.1 and coordinates of the 29 sampling locations are shown in Table 5.1. Sample locations A'1, B2, and C1 are no longer in the current (2014) dredging footprint, but the data are presented as they assist in understanding the sediment characteristics in each area. A total of 43 sediment samples were taken across the 29 sites.

Table 5.1 Coordinates of sediment sites sampled in Albany Port

Survey date	Harbour section	Dredging area	Sampling location	Target depth (m)	Easting	Northing
2010	Entrance Channel	D2 (A)	A1	1.0	584809	6122584
		E1 (A)	A2	1.0	584982	6122627
		(A')	A'1	1.0	583903	6122429
		D3 (A')	A'2	1.0	584728	6122689
	Harbour Basin	C7 (B)	B1	1.0	582869	6122145
		(B)	B2	1.0	582973	6122210
		C5 (C)	C1	0.5	582584	6121897
		C4 (D)	D1	0.5	582273	6122099
		C3 (E)	E1	1.0	582012	6122305
			E2	1.0	581979	6122348
		C3 (F)	F1	0.5	581932	6122401
		C2 (G)	G1	1.5	581808	6122581
			G2	1.5	581749	6122654
		A (H)	H1	1.5	581660	6122703
			H2	1.0	581436	6122819
		B1-3 (I)	I1	1.0	581305	6122764
			I2	1.0	581223	6122668
2014	Harbour Basin	C1, C8	BA1	0.5	581946	6122019
		C6	BA2	0.5	582474	6122146
		C7	BA3	1.0	582617	6122157
			BA4	2.0	582640	6122115
			BA5	2.0	582917	6122165
	Entrance Channel	D1	EC1	0.5	583514	6122149
			EC2	1.0	583673	6122226
		E1	EC3	1.5	584408	6122452
		D3	EC4	0.5	584723	6122690
		D2	EC5	0.5	584824	6122611
E1	EC6	1.5	584979	6122626		
D4	EC7	0.5	585645	6122840		

Notes:

- Coordinates are in GDA94
- Dredging areas in () denote 2009 dredging footprint sections (Oceanica 2009)

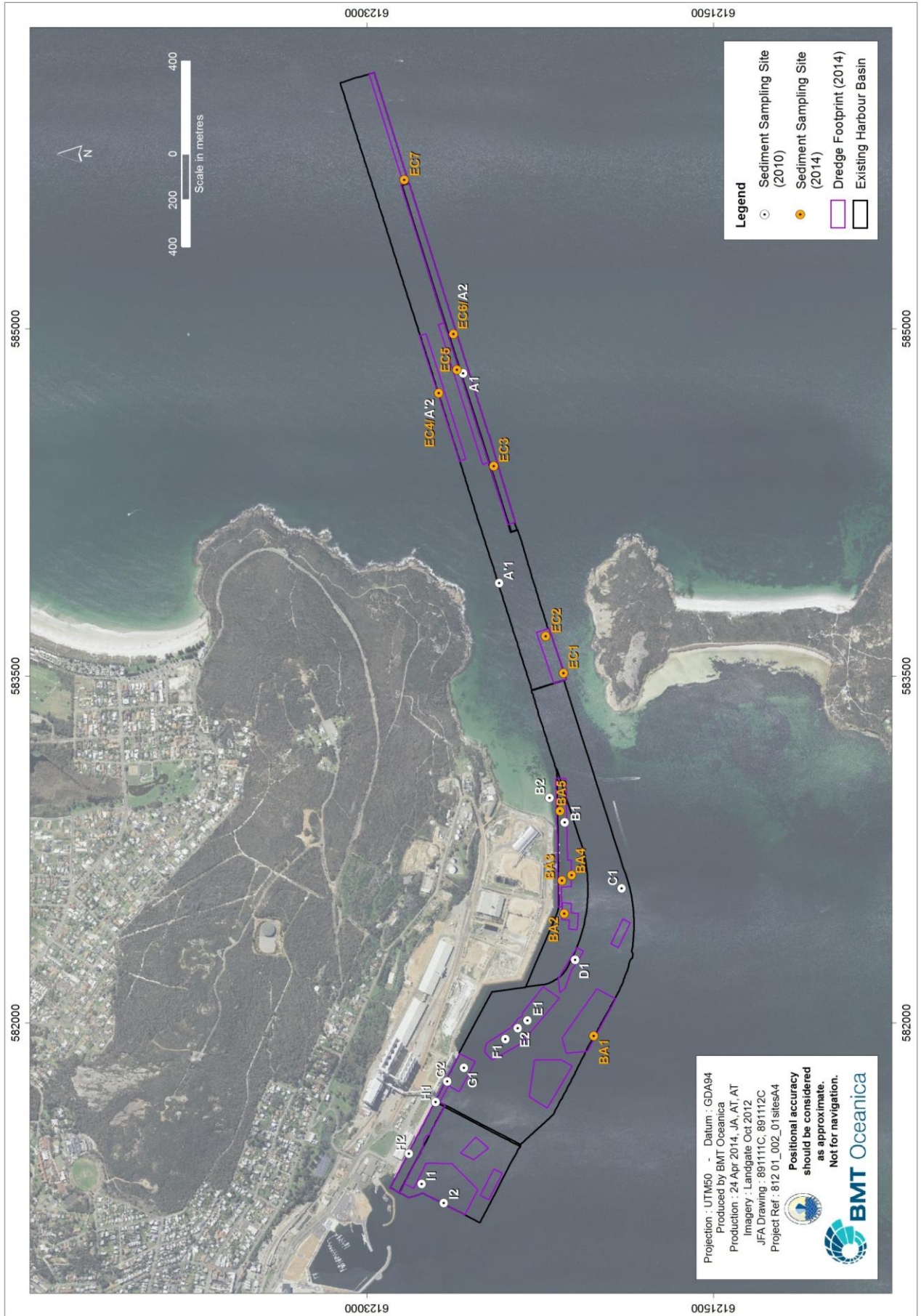


Figure 5.1 Sampling locations within the 2014 Albany Port maintenance dredging footprint

5.1.2 Disposal area 2013

Sediments were collected at six sites (DS1–6; Figure 5.2, Table 5.2) within and near the disposal area by Bastyan & Associates in 2013. Samples were collected using a Van Veen grab to retrieve surface sediments from 35–44 m water depths.

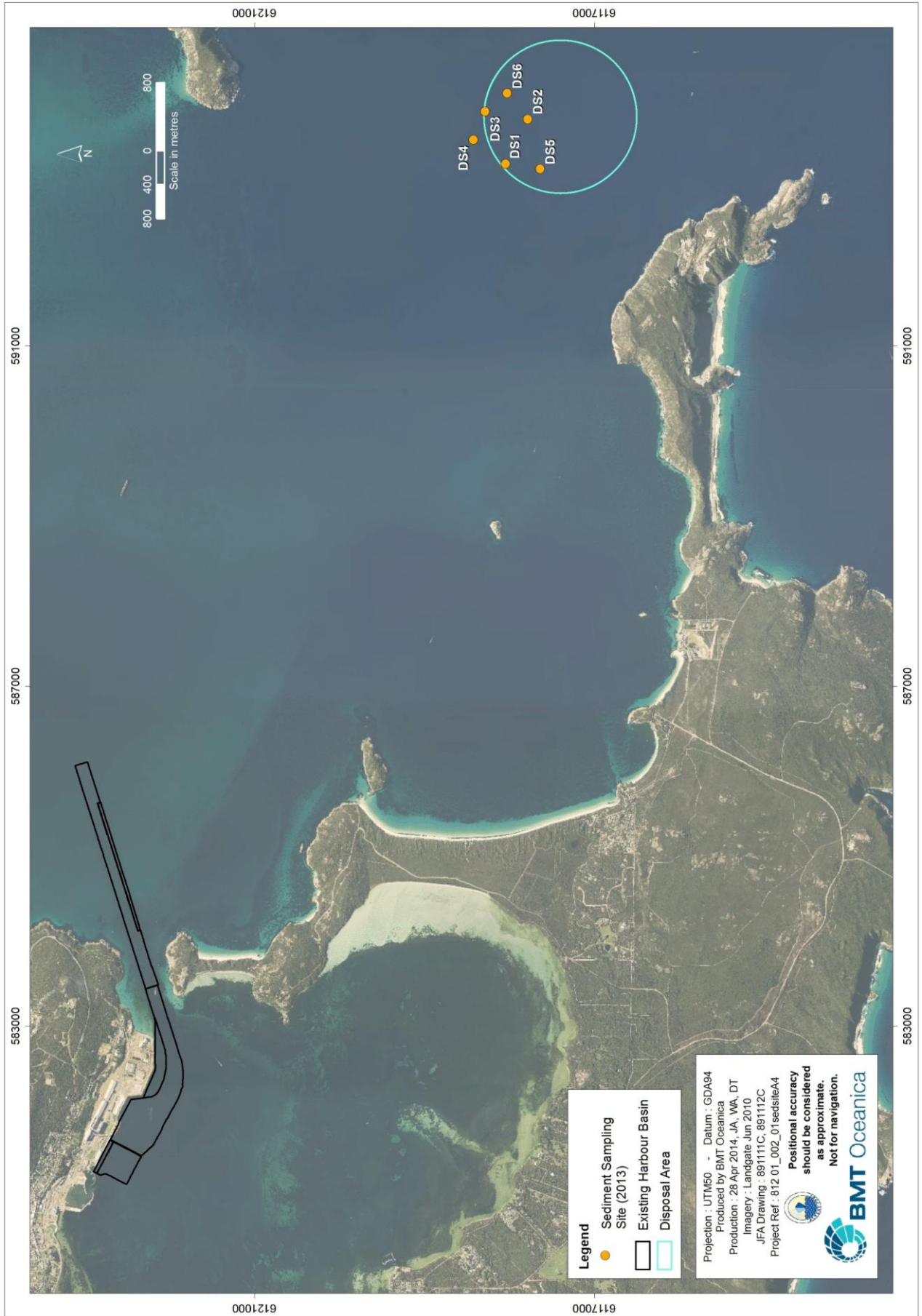


Figure 5.2 Sampling locations during 2013 within and near the proposed disposal area

Table 5.2 Coordinates of sites sampled for sediment in the Albany Port proposed disposal area

Site	Easting	Northing
DS1	593144	6118044
DS2	593670	6117787
DS3	593764	6118289
DS4	593429	6118428
DS5	593087	6117642
DS6	593977	6118030

Note:

1. Coordinates are in GDA94

5.2 Sediment collection methods

Within the harbour basin and entrance channel, sediments were collected using a core (PVC pipe with an internal diameter of 50 mm) hammered into the sediment by a diver until the target depth was reached or until corer refusal occurred. When the corer reached the maximum depth, a rubber bung was inserted in the end of the core. The core was slowly pulled from the sediment. The vacuum created in the core allowed the sediment to be retained. When the bottom opening was just below the seabed surface, a rubber bung was inserted to hold the sediment in place during ascent.

At the surface, water was carefully poured out of the top, ensuring no sediment was lost. The sediment was extracted from the PVC pipe onto a core tray. Once the sediment was extracted, the core was photographed, length recorded and sediment characteristics noted into the sediment core log (BMT Oceanica 2014). Sediment cores longer than 0.5 m, were sampled in 0–0.5 m, 0.5–1 m, 1–1.5 m and 1.5–2.0 m depth increments.

All sampling gear was cleaned with Decon 90 and rinsed in clean seawater between each sampling depth interval and site. Each section of the core was placed in a glass bowl and homogenised before subsamples were placed in glass jars and zip-lock bags as described in the SAPs (Oceanica 2009; BMT Oceanica 2013) and stored on ice. At the end of each field day, the samples were stored in appropriate refrigeration with the samples being transported to laboratories upon arrival in Perth.

5.3 QA/QC procedures

There were two types of field quality assurance/quality control (QA/QC) samples:

- Field splits, where one sample was collected, homogenised, split into three in the field and analysed individually. Two samples were analysed at the primary laboratory and one sample was analysed at the secondary laboratory (Section 5.4) for comparison.
- Triplicates, where three cores were obtained at the same location and analysed individually at the primary laboratory.

The results of the field QA/QC sampling were analysed as described in the National Assessment Guidelines for Dredging (NAGD; CoA 2009) by calculating the Relative Percent Difference (RPD) between two samples, and Relative Standard Deviation (RSD) between three samples. The results should agree within a RPD or RSD of $\pm 50\%$, although the guidelines note that this may not always be the case where the sediments are very heterogeneous or greatly differing in grain size (CoA 2009).

5.3.1 Field split samples

Field splits were sampled at a minimum of 5% of sampling locations as specified in the SAPs (Oceanica 2009; BMT Oceanica 2013). The Relative Percent Difference (RPD) was calculated for field replicates as follows:

$$RPD (\%) = \frac{(\text{difference between field splits}) \times 100}{(\text{average of field splits})}$$

The acceptable RPD for field splits is $\pm 50\%$ (CoA 2009).

5.3.2 Triplicate samples

Sediments were sampled in triplicate at a minimum of 10% of the sampling locations as specified in the SAP (Oceanica 2009; BMT Oceanica 2013). The Relative Standard Deviation (RSD) was calculated for field triplicates as follows:

$$RSD (\%) = \frac{(\text{standard deviation of triplicate}) \times 100}{(\text{average of triplicate})}$$

The acceptable RSD for triplicates is $\pm 50\%$ (CoA 2009).

5.4 Laboratory analysis

Analysis of sediment samples were completed by the laboratories as specified in Table 5.3. Laboratory methods are explained in detail in the relevant SAP (Oceanica 2009 or BMT Oceanica 2013).

Table 5.3 Laboratories used for sediment analysis in the 2010, 2013 and 2014 sediment surveys

Analysis	2010 survey		2014 survey		2013 disposal area ⁹
	Primary	Secondary	Primary	Secondary	
Nutrients and metals	MAFRL	AAA	NMI	MPL	ALS
Organics, organotins and acid sulfate sediments (ASS in 2010 only)	NMI				
Particle size distribution	Microanalysis Australia				

Notes:

1. Primary being the laboratory used for the main analysis
2. Secondary being the laboratory used for QA/QC of the splits
3. MAFRL – Marine and Freshwater Research Laboratory
4. NMI – National Measurement Institute
5. AAA – Advance Analytical Australia Laboratory
6. MPL – member of the Envirolab group
7. ASS – acid sulfate sediments
8. ALS – ALS Environmental (nutrients not determined for disposal area)
9. Samples collected by Bastyan & Associates

5.4.1 Laboratory QA/QC

As part of their procedures all laboratories undertook the required testing of blanks, spikes and standards and completed laboratory duplicates as required by the NAGD and to the satisfaction of the National Association of Testing Authorities requirements. Laboratory QA/QC reports are included in the individual laboratory reports within the relevant appendices.

5.5 Data analysis

5.5.1 Normalisation of organics data

Sediment tributyltin (TBT), polycyclic aromatic hydrocarbons (PAHs), total petroleum hydrocarbons (TPHs) and benzene, toluene, ethylbenzene and xylene (BTEX) levels were standardised to 1% total organic carbon (TOC) prior to reporting unless concentrations were less than the limit of reporting (LoR). Contaminant concentrations were standardised to 1% TOC as follows:

- IF TOC ≤ 0.2% in sediment the contaminant concentration was multiplied by 5 (i.e. 1/0.2)
TOC ≥ 10% in sediment the contaminant concentration was multiplied by 0.1 (i.e. 1/10)
TOC > 0.2% but <10% the contaminant concentration was multiplied by 1/TOC%.

If contaminant concentrations were below the LoR, but were required for statistical purposes, half the LoR value was used in statistical analysis (CoA 2009).

5.5.2 Acid sulfate sediments calculations

The chromium reducible sulfur suite method allows an estimate of the actual and potential acidity of a sediment sample, the acid neutralising capacity and the total net acidity via a number of steps (Figure 5.3). The reduced inorganic sulfur content (S_{CR}) provides an estimate of the potential sulfuric acidity of the sediment. The soil pH, in potassium chloride suspension (pH_{KCl}), estimates the actual acidity of the sediment. Titratable Actual Acidity (TAA_{KCl}) and or Net Acid Soluble Sulfur (S_{NAS}) are analysed if pH_{KCl} is <6.5. The acid neutralising capacity (ANC) provides an estimate of the ability of the sediment to naturally neutralise any acid produced (for example due to the presence of carbonate material).

The total net acidity is calculated via Acid-Base Accounting (ABA), using the following equation:

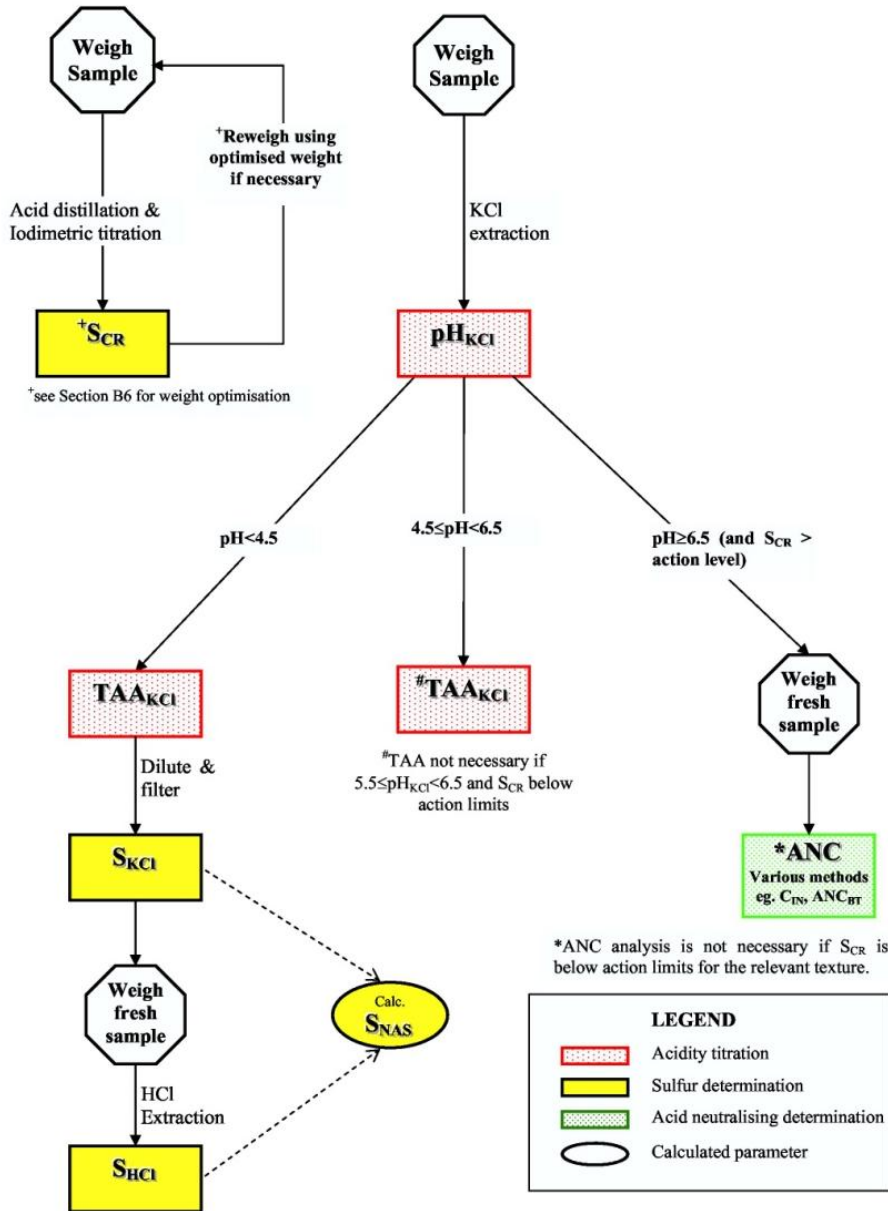
$$Net\ acidity = Potential\ sulphidic\ acidity + Existing\ acidity - \frac{ANC}{FF} \quad (\text{Ahern et al. 2004})$$

where:

- potential sulfidic acidity is represented by S_{CR} (converted from %S to mol H^+ tonne⁻¹ by multiplying by 623.7)
- if there is no existing acidity in these sediments the existing acidity term is neglected (if $TAA=0$)
- acid neutralising capacity (ANC) is represented by ANCBT (converted from %CaCO₃ to mol H^+ tonne⁻¹ by multiplying by 199.8)
- fineness factor (FF) = 1.5.

As the samples are finely ground in the laboratory, the net acid risk likely to be experienced in the field could be underestimated. To allow for this, the measurement of ANC is divided by a fineness factor (FF) during ABA. The minimum fineness factor that should be applied to any ANC is 1.5; however larger factors (e.g. 2, 2.5 or 3) may be applicable for shell or other forms of neutralising inclusions in the soil (Ahern et al. 2004). A fineness factor of 1.5 was selected for this study to ensure a conservative calculation of the neutralising capacity for the fine shell and carbonate silts.

CHROMIUM SUITE



Source: Ahern et al. (2004)

Figure 5.3 Chromium suite flow diagram

5.5.3 Computation of 95% upper confidence limit (UCL) of the mean

Initially all data were screened by depth for trends of contamination within sampling depth intervals. Due to the limited number of samples at the deeper depths (>1.0 m) and a lack of trends based on depth intervals, it was determined to pool all depths for assessment purposes. Data from all sites and depths were originally pooled (discussed as 'all areas'). As there were screening levels exceedances in individual sites, the contaminated dredge areas (A and C2) were identified and analysis was undertaken on all data pooled, except areas A and C2 (referred to as 'all areas minus A and C2') and also for areas A and C2 only (referred to as 'A and C2') (Figure 1.2). The contaminated dredge areas A and C2 include sampling sites G1, G2, H1 and H2 (Table 5.1). The pooled data were tested for normality using the software ProUCL 4.0 (USEPA 2007). Depending on the distribution of the data, size of the dataset and the proportion of values below LoR the software recommended the most appropriate method for calculating the 95% UCL of the mean. If some data were >LoR, while other data within the same category were <LoR, the samples <LoR were assigned a value of LoR/2 to compute a 95% UCL of the mean (CoA 2009).

6. Nature of the Material to be Dredged

6.1 Sediment surveys

Harbour sediments (entrance channel and harbour basin) were collected and analysed in 2010 and 2014. Where practicable the results from both surveys were presented together. Where the figures were too large or complex, the data were presented by survey (i.e. either 2010 or 2014) in individual figures. Disposal area data (2013) were also presented in the relevant sections. Sediments at the disposal area were collected by Bastyan & Associates and analysed by ALS in 2013. These unpublished data (disposal area) were presented for comparison against the sediment proposed for disposal (i.e. harbour basin and entrance channel sediments) at this site.

The sediment sampling site labelling differed between the two surveys due to the overlapping coding of the two different dredging footprints (i.e. 2010 and 2014). For quick reference the labelling schemes have been summarised in Table 6.1.

Table 6.1 Sediment sampling site labelling schemes

2010 survey		2014 survey	
Site name based on individual 2009 dredge section		Site name based on harbour section (distinct sediment deposition area)	
Harbour section	Sites in group	Harbour section	Label code
entrance channel	A1, A'1, A2, A'2	entrance channel	EC
harbour basin	B1, B2, C1, D1, E1, E2, F1, G1, G2, H1, H2, I1, I2	harbour basin	BA
Sediment depth interval	Label suffix	Sediment depth interval	Label suffix
0–0.5 m	top	0–0.5 m	S
0.5–1.0 m	mid	0.5–1.0 m	0.5–1
1.0–1.5 m	bot	1.0–1.5 m	1–1.5
-	-	1.5–2.0 m	1.5–2

Results are presented in the relevant sections to show UCL (95%) in the main text and tables in the context of evaluating against the NAGD screening levels for the acceptability of ocean and land disposal. Summary tables of results showing means by depth, within sites, are presented in the SAP implementation report appendices (BMT Oceanica 2014). Additionally, laboratory reports of the raw data, laboratory QA/QC reports and statistical outputs for all 95% UCL calculations are provided in the SAP implementation report appendices (BMT Oceanica 2014).

6.2 Sample recovery

Samples were obtained at 100% of sites and penetration depth varied from 0.5 to 2.0 m (Figure 6.1).

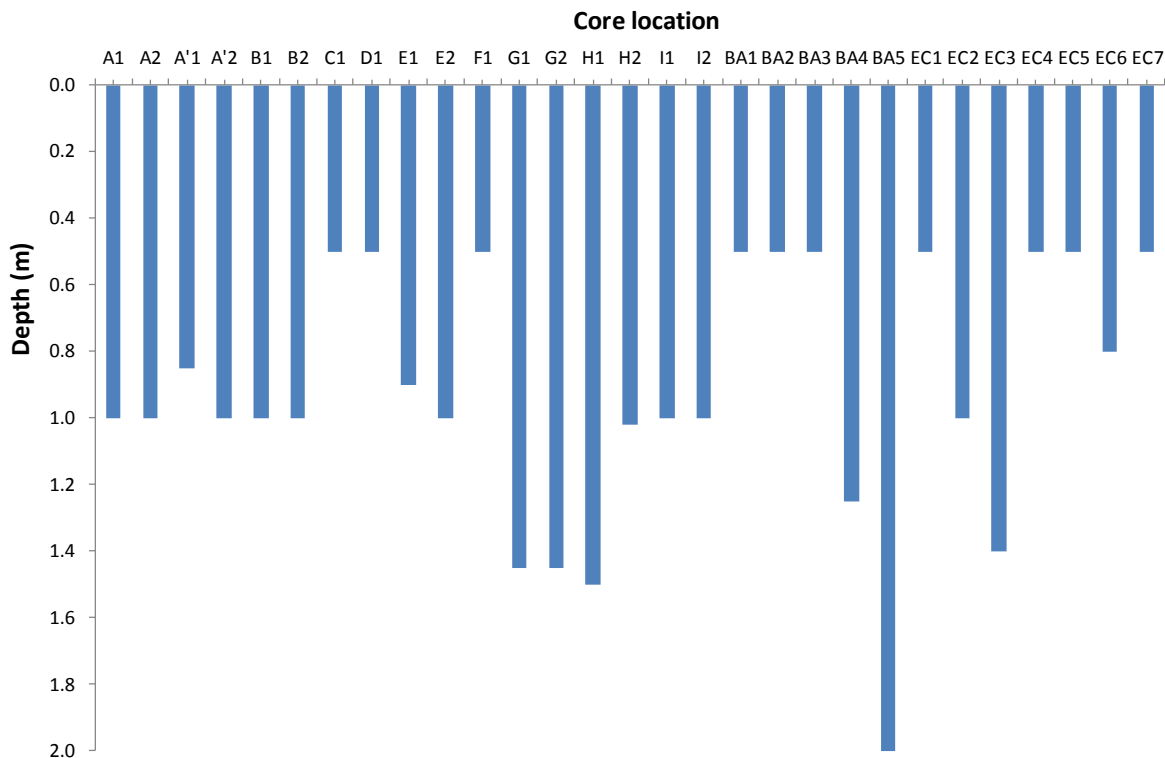


Figure 6.1 Penetration depth of cores at all sites

6.3 Sediment physical composition

6.3.1 Particle size

The sediments were generally dominated by fine to medium grained sands, but harbour basin sites had higher percentages of silt/clay than the entrance channel (Figure 6.2 and Figure 6.3). Sites C1, D1, E1, F1, G1, H2, I1, I2, BA1, BA3 and BA4 had silt/clay fractions >20%. All of these sites were in the harbour basin. All sites in the entrance channel had silt/clay contents <3%. Particle size distribution summary tables and cumulative particle size distribution curves are shown in the SAP implementation report (BMT Oceanica 2014). Particle size distributions were not completed for samples A1, A'1, A2 and A'2 during the 2010 survey.

For sediments collected in 2010, the particle size distributions in the 0–0.5 m layer, the 0.5–1 m layer and the 1–1.5 m layer of each site were generally similar (Figure 6.2). Exceptions occurred at sites E1 and I1 where the bottom sediments were coarser than the surface layer.

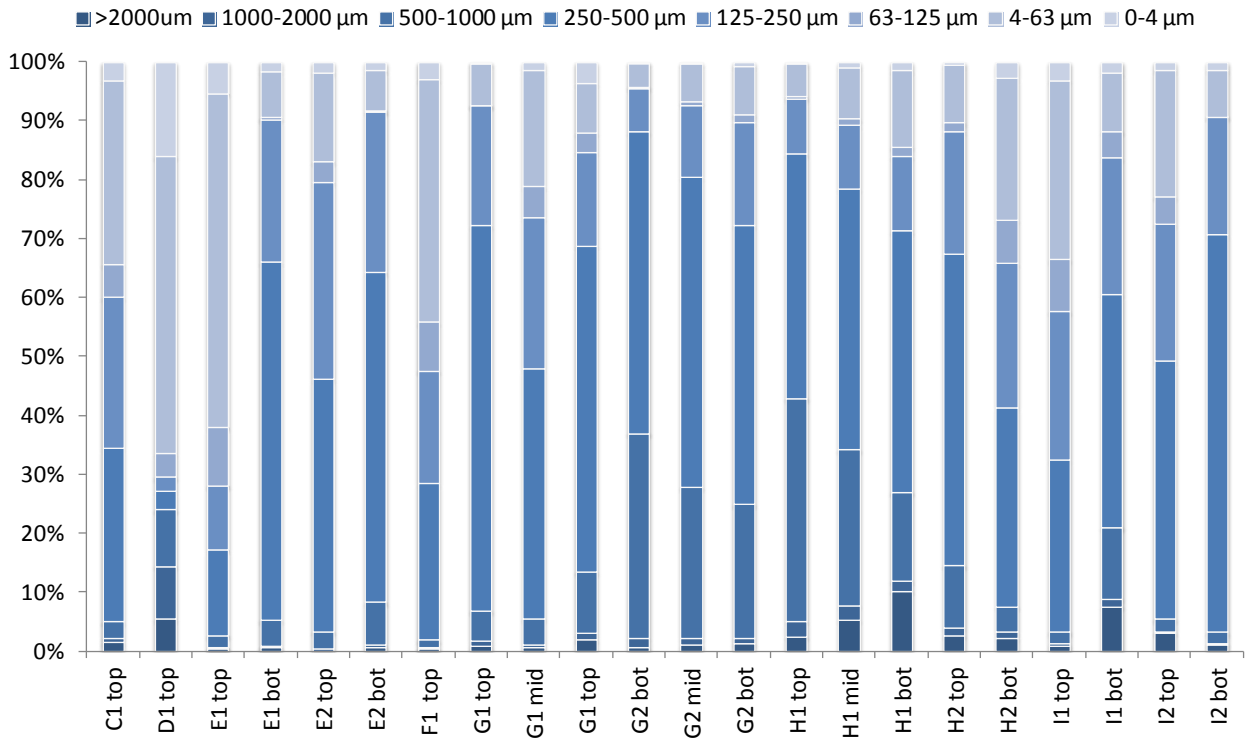


Figure 6.2 Cumulative sediment particle size distributions in Albany Port for 2010 samples

For sediments collected in 2014, the particle size distributions within the entrance channel were generally similar for each depth interval within a site (Figure 6.3). Within the harbour basin area, profiles showed sediments were coarser with depth, although the 1.5–2.0 m depth interval (site BA5) had a greater portion of fines than the shallower depth interval.

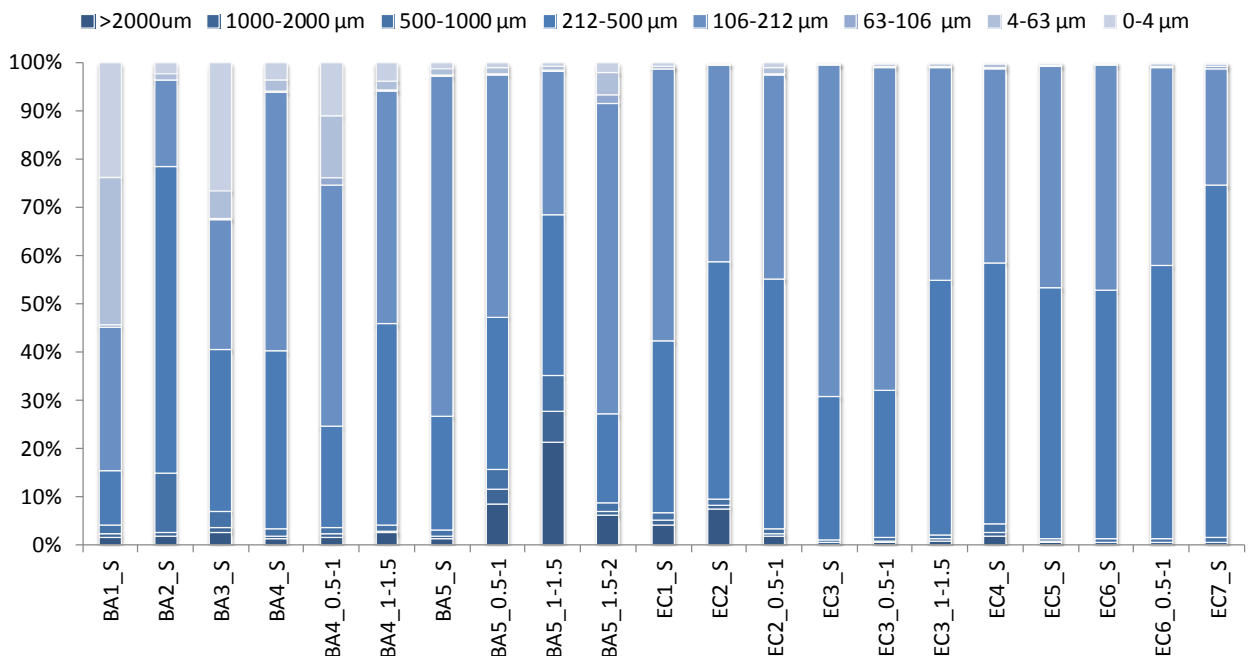


Figure 6.3 Cumulative sediment particle size distributions in Albany Port for 2014 samples

Sediments at the disposal area were classified as fine to medium grain sand with the silt and clay portions being <6% at all sites (BMT Oceanica 2014). Sediment particle size distributions at the disposal area were similar to the sediment particle size distributions found in the entrance channel.

6.3.2 Settling velocity

The 50% and 90% of particle settling velocities and times were determined for the 2010 survey (Table 6.2) and the 2014 survey (Table 6.3). For all sediments, 50% of the material would settle through 1 m of water column in less than 36 minutes (0.6 hours). Most sediment samples (32 out of 43) required less than one hour for 90% of the sediments to settle through 1 m of water column. Of the remaining 11 samples, seven had settling times for 90% of the particles to settle in less than 10 hours. The four samples (D1 top, BA1_S, BA3_S and BA4_0.5–1.0) with times greater than 10 hours are considered likely to not be accurately calculated due to limitations from assumptions associated with using Stokes' Law to determine settling velocity. The four samples with calculated 1 m settling times of 90% of the particles being >10 hours had high clay contents (D1 top – 16%; BA1_S – 24%; BA3_S – 26.6%; and BA4_0.5–1.0 – 11.1% clay).

Table 6.2 Particle settling velocities and time for 2010 sediment samples

Sample	50% of particles		90% of particles	
	Minimum settling velocity of 50% of particles (mm s-1)	Time for 50% of particles to settle over 1 m (hours)	Minimum settling velocity of 90% of particles (mm s-1)	Time for 90% of particles to settle over 1 m (hours)
C1 top	25.94	0.011	0.07	3.828
D1 top	0.46	0.600	0.01	49.307
E1 top	1.12	0.249	0.03	9.266
E1 bot	73.59	0.004	13.93	0.020
E2 top	45.22	0.006	0.28	0.990
E2 bot	70.78	0.004	16.17	0.017
F1 top	8.14	0.034	0.06	4.321
G1 top	83.33	0.003	21.51	0.013
G1 mid	45.28	0.006	0.21	1.321
G1 bot	91.11	0.003	0.63	0.444
G2 top	139.00	0.002	44.39	0.006
G2 mid	119.90	0.002	25.87	0.011
G2 bot	102.80	0.003	10.31	0.027
H1 top	175.06	0.002	33.09	0.008
H1 mid	129.55	0.002	4.19	0.066
H1 bot	106.58	0.003	0.50	0.556
H2 top	84.26	0.003	2.61	0.106
H2 bot	36.17	0.008	0.10	2.708
I1 top	21.66	0.013	0.07	3.722
I1 bot	75.29	0.004	0.89	0.311
I2 top	49.34	0.006	0.21	1.333
I2 bot	79.63	0.003	16.57	0.017

Note:

- Bold text** indicates a settling time >1 hour

Table 6.3 Particle settling velocities and time for sediment samples 2014

Sample	50% of particles		90% of particles	
	Minimum settling velocity of 50% of particles (mm s-1)	Time for 50% of particles to settle over 1 m (hours)	Minimum settling velocity of 90% of particles (mm s-1)	Time for 90% of particles to settle over 1 m (hours)
BA1_S	1.32	0.314	0.002	193.2
BA2_S	144.54	0.001	25.44	0.01
BA3_S	37.97	0.01	0.0001	2013
BA4_S	46.11	0.01	15.99	0.02
BA4_0.5-1	31.05	0.01	0.01	23.30
BA4_1-1.5	51.07	0.01	16.41	0.02
BA5_S	38.88	0.01	16.89	0.02
BA5_0.5-1	52.84	0.01	18.35	0.02
BA5_1-1.5	170.63	0.001	22.66	0.01
BA5_1.5-2	37.84	0.010	14.67	0.02
EC1_S	48.57	0.010	18.63	0.01
EC2_S	85.67	0.003	21.09	0.01
EC2_0.5-1	71.90	0.004	19.28	0.01
EC3_S	41.44	0.01	18.14	0.02
EC3_0.5-1	41.92	0.01	17.97	0.02
EC3_1-1.5	70.50	0.004	20.26	0.01
EC4_S	81.92	0.003	17.32	0.01
EC5_S	65.72	0.004	20.04	0.01
EC6_S	64.72	0.004	20.16	0.01
EC6_0.5-1	78.95	0.004	20.70	0.01
EC7_S	118.30	0.002	25.76	0.01

Note:

1. **Bold text** indicates a settling time >1 hour

6.4 Sediment chemistry

6.4.1 Metals

Whole sediment metals

The 95% UCL of the mean for all metals in sediments were below NAGD screening levels (Table 6.4). Individual sites had concentrations exceeding the NAGD screening levels for arsenic ($I1 - 58 \text{ mg kg}^{-1}$), cadmium ($H2 - 2.1 \text{ mg kg}^{-1}$) and mercury ($BA1 - 0.3$ and $E1 - 0.24 \text{ mg kg}^{-1}$) (BMT Oceanica 2014). No values were greater than the NAGD high value. No trends of metal concentrations occurred by depth within sites. A summary table of means per depth at each site is in the SAP implementation report (BMT Oceanica 2014). For potential disposal to land (dredge areas A and C2), the proposed site is an existing settlement pond array adjacent to the Port berths, and return water will be discharged into the marine environment. Therefore, metal concentrations were compared to both Environmental Investigation Levels (EILs) for sediment, and – because ultimately the holding ponds will be filled in and used as Port land – to Health Investigation Levels for soils, Category F (commercial and industrial sites) (DEC 2010). The EILs for metals are the same as the NAGD Screening Levels so the comments above with respect to NAGD Screening Levels apply. The 95% UCL mean concentrations of metals were below the Health Investigation Levels (HIL) (DEC 2010) (Table 6.4) as were metal concentrations at each site.

Table 6.4 95% upper confidence limit of the mean for total metal concentrations in sediment (mg kg⁻¹)

Analyte	Limit of reporting	NAGD ¹ screening level	NAGD ¹ high value	EIL ²	HIL ³ (F)	All areas (n=43)	All areas minus A and C2 (n=32)	A and C2 (n=11)
Antimony	0.2	2	25	NA	410	0.23	0.26	0.18
Arsenic	0.5	20	70	20	500	6.94	10.75	3.96
Cadmium	0.1	1.5	10	3	100	0.33	0.75	0.71
Chromium	0.2	80	370	NA	NA	9.89	11.24	8.57
Copper	0.2	65	270	100	5,000	3.62	3.45	5.17
Lead	0.2	50	220	600	1,500	8.10	9.13	6.99
Mercury	0.01	0.15	1	1	75	0.079	0.095	0.071
Nickel	0.1	21	52	60	3,000	3.69	4.76	5.98
Silver	0.1	1.0	3.7	NA	NA	0.43	0.37	<LoR
Zinc	0.2	200	410	200	35,000	13.1	9.9	24.2

Notes:

1. NAGD = National Assessment Guidelines for Dredging (CoA 2009)
2. EIL = Environmental Investigation Level (DEC 2010)
3. HIL = Health Investigation Level (DEC 2010)
4. NA = no guideline available

Concentrations of total metals at the disposal area (Table 6.5) were generally below the LoR except for chromium (8.9–11.8 mg kg⁻¹), which was in concentrations similar to those found in the harbour basin and entrance channels. Disposal area laboratory report data are provided in the SAP implementation report (BMT Oceanica 2014).

Table 6.5 Disposal area sediments 80th percentiles for total metal concentrations (mg kg⁻¹)

Analyte	Limit of reporting	80 th percentile (n=6)
Antimony	0.5	<0.5
Arsenic	1.0	0.5 ¹
Cadmium	0.1	<0.1
Chromium	1.0	11.6
Copper	1.0	<1.0
Lead	1.0	0.5 ¹
Mercury	0.01	0.005 ¹
Nickel	1.0	<1.0
Silver	0.1	<0.1
Zinc	1.0	1.2 ¹

Note:

1. Some concentrations were >LoR, so the remaining samples that were <LoR were assigned the value LoR/2 for the determination of the 80th percentile

Elutriate metals

Elutriate analysis was undertaken for all metals from the 2010 survey harbour basin sites (i.e. not including A1, A1', A2 and A2') (BMT Oceanica 2014). During the 2014 survey, elutriate metals were only analysed for those contaminants of concern that had concentrations >LoR in the 2010 survey; namely, arsenic, cadmium and mercury. These were sampled in the harbour basin sites only (i.e. site BA1-5).

The 95% UCL of the mean for all elutriate metal concentrations (except arsenic) were below either the laboratory LoR or the default ANZECC/ARMCANZ (2000) guidelines (Table 6.6). No trends in concentrations occurred with depth. One individual sample (BA3_S) had a cadmium concentration (0.0008 mg L⁻¹) that exceeded the guideline. A summary table of means per depth at each site is in the SAP implementation report (BMT Oceanica 2014). If the dredge material is disposed to land, return water will be discharged into waters alongside the Port of Albany. Under the present State approach, this area is likely to be considered an area of Moderate Ecological Protection, for which ANZECC/ARMCANZ (2000) guidelines for 90% species protection apply. As the 95% UCL of the mean for all elutriate metal concentrations except arsenic were below either the laboratory LoR or the ANZECC/ARMCANZ (2000) guidelines, the required level of protection for land disposal is easily met.

Table 6.6 95% upper confidence limit of the mean for elutriate metal concentrations (mg L⁻¹)

Analyte	Areas sampled	Limit of reporting	ANZECC/ARMCANZ (2000) guidelines (marine waters)	All areas ²	All areas minus A and C2 ³	A and C2 (n=11)
Arsenic	All harbour basin sites ²	0.0004	NA	0.013	0.017	0.095
Cadmium	All harbour basin sites ²	0.0001	0.0007	0.00039	0.00044	<LoR
Chromium	2010 harbour basin sites only ³	0.001	0.027	<LoR	<LoR	<LoR
Copper	2010 harbour basin sites only ³	0.001	0.001	<LoR	<LoR	<LoR
Lead	2010 harbour basin sites only ³	0.01	0.004	<LoR	<LoR	<LoR
Mercury	All harbour basin sites ²	0.0001	0.007	<LoR	<LoR	<LoR
Nickel	2010 harbour basin sites only ³	0.004	0.001	<LoR	<LoR	<LoR
Silver	2010 harbour basin sites only ³	0.01	0.001	<LoR	<LoR	<LoR
Zinc	2010 harbour basin sites only ³	0.001	0.015	<LoR	LoR ⁴	<LoR

Notes:

- <LoR indicates that all samples were below the limit of reporting
- All harbour basin sites (n=32 for all areas; n=21 for all areas minus A and C2)
- 2010 harbour basin sites only (n=22 for all areas; n=11 for all areas minus A and C2)
- Zinc had one value >LoR : site C1 = 0.003

Bioavailable metals

In 2010, dilute acid extraction of arsenic in sediments was undertaken for sample 'I1 bot' only as this was the only sample that exceeded the NAGD screening level for arsenic in sediments (BMT Oceanica 2014). In 2014, bioavailable fractions were analysed for arsenic, cadmium and mercury for all samples located within the harbour basin (i.e. BA1-5) (BMT Oceanica 2014). The bioavailable fractions of arsenic varied from <LoR to 4.9 mg kg⁻¹, while cadmium was <LoR for all samples and mercury was <LoR for all samples except at BA1 S_1. No trends in concentrations occurred with depth. Bioavailable concentrations (95% UCL) of arsenic, cadmium and mercury were well below NAGD screening levels (Table 6.7). Mercury was below the limits of reporting for all sites, except one BA1_S (0.01 mg kg⁻¹). A summary table of means per depth at each site is in the SAP Implementation report (BMT Oceanica 2014).

Table 6.7 95% upper confidence limit of the mean for bioavailable concentrations in sediment (mg kg⁻¹)

Analyte	Limit of reporting	NAGD ¹ screening level	All sampled sites
Arsenic	0.5	20	2.33 ²
Cadmium	0.1	1.5	<LoR ³
Mercury	0.01	0.15	LoR ^{3,4}

Notes:

1. NAGD = National Assessment Guidelines for Dredging (CoA 2009)
2. Sites include BA1-5 (2014) and I1 'bot' (2010) (n=11)
3. Sites include BA1-5 (2014) only (n=10)
4. Site BA1_S was reported at the LoR (i.e. 0.01 mg kg⁻¹)

6.4.2 Nutrients

Whole sediment nutrients

No guidelines exist for the concentration of nutrients within marine sediments. However, mean sediment nutrient values from the 2010 survey for total Kjeldahl nitrogen (0.1–3.6 mg g⁻¹) and total phosphorus (0.08–1.5 mg g⁻¹) were within the range expected for estuarine and coastal waters in the region (Hillman et al. 1990), apart from the high total phosphorus value (8.60 mg g⁻¹) in sample 'H2 bot' (Table 6.8). Percentage of organic carbon content in the 2010 survey sediments ranged from 0.13 to 3.80%. Total organic carbon at the disposal area was 0.14%. The SAP implementation report contains a summary table of the nutrient means by depth at each site and the laboratory report for nutrients from the 2010 survey.

Table 6.8 Total nutrient concentrations of nutrients 2010

Sample	Total organic carbon (%)	Total Kjeldahl nitrogen (mg g ⁻¹)	Total phosphorus (mg g ⁻¹)
Limit of reporting	<0.02	<0.1	<0.05
Background concentration range¹	0.8–37.5	0.34–7.39	0.05–1.75
C1 top	1.10	1.5	0.19
D1 top	0.68	0.7	0.13
E1 top	3.80	3.6	0.55
E1 bot	0.19	0.2	<0.05
E2 top	1.15	0.9	0.15
E2 bot	1.40	0.3	0.09
F1 top	2.30	2.7	0.39
G1 top	0.16	0.1	0.08
G1 mid	0.46	0.9	0.42
G1 bot	1.30	0.3	<0.05
G2 top	0.13	0.2	0.09
G2 mid	0.15	0.2	0.16
G2 bot	1.40	0.3	1.50
H1 top	0.19	0.2	0.16
H1 mid	0.25	0.4	0.30
H1 bot	0.31	0.4	0.54
H2 top	0.22	0.4	0.95
H2 bot	1.00	1.1	8.60
I1 top	1.53	1.7	0.64
I1 bot	0.90	0.6	0.29
I2 top	1.00	1.5	0.58
I2 bot	1.30	0.3	0.12
Disposal area	0.14 ²	Not determined	

Notes:

1. Data from Hillman et al. (1990)
2. 80th percentile (n=6)

Mean sediment nutrient concentrations in 2014 for total nitrogen (0.10–1.30 mg g⁻¹) and total phosphorus (0.04–0.65 mg g⁻¹) were also within the range expected for estuarine and coastal waters in the region (Hillman et al. 1990), apart from the high total nitrogen value at site BA1 (10.43 mg g⁻¹) (Table 6.9). Percentage of organic carbon content in the 2014 survey sediments ranged from 0.07 to 6.77%. Total organic carbon at the disposal area was 0.14%. The SAP implementation report contains a summary table of the nutrient means by depth at each site the laboratory report for nutrients from the 2014 survey.

Table 6.9 Total nutrient concentrations of nutrients in 2014

Sample	Total organic carbon (%)	Total nitrogen (mg g ⁻¹)	Total phosphorus (mg g ⁻¹)
Limit of reporting	<0.02	<0.05	<0.005
Background concentration range ¹	0.8–37.5	0.34–7.39	0.05–1.75
BA1_S	6.77	10.43	0.65
BA2_S	0.14	0.20	0.06
BA3_S	0.34	0.57	0.08
BA4_S	0.55	0.45	0.08
BA4_0.5-1	1.30	1.30	0.20
BA4_1-1.5	0.04	0.17	0.04
BA5_S	0.28	0.10	0.05
BA5_0.5-1	0.17	0.13	0.09
BA5_1-1.5	0.30	0.14	0.07
BA5_1.5-2	0.28	0.15	0.05
EC1_S	0.43	NA	
EC2_S	0.08		
EC2_0.5-1	0.07		
EC3_S	0.54		
EC3_0.5-1	0.56		
EC3_1-1.5	0.66		
EC4_S	0.57		
EC5_S	0.33		
EC6_S	0.40		
EC6_0.5-1	0.44		
EC7_S	0.25		
Disposal area	0.14 ²		

Note:

1. Data from Hillman et al (1990)
2. 80th percentile (n=6)

Elutriate nutrients

Elutriate nutrient analysis was carried out to assess the potential impacts on water quality following the disturbance of sediments during the dredging operation. Potential impacts include toxicity due to ammonia concentrations. The 95% UCLs of the mean for ammonia in sediments were below the default ANZECC/ARMCANZ (2000) guideline for slight to moderately disturbed ecosystems (Table 6.10), indicating low risk of toxicity due to ammonia. A summary table of elutriate nutrient means by depth, at each site is in SAP Implementation report as are the laboratory reports for elutriate nutrients. Nutrients were not measured at the disposal area.

Table 6.10 95% upper confidence limit of mean elutriate nutrient concentrations ($\mu\text{g L}^{-1}$)

Parameter	Limit of reporting	ANZECC/ARMCANZ (2000) default trigger value for marine waters	All areas (n= 32)	All areas minus A and C2 (n =21)	A and C2 (n=11)
Ammonia	<3	910	714	854	859
Nitrate + nitrite	<2	NA	8	10.3	8.8
Total dissolved nitrogen	<50	NA	999	1121	999
Total phosphorus	<5	NA	111	154	45
Orthophosphate phosphorus	<2	NA	18.6	17.6	21.2

Land disposal

To assess the potential for nutrient-stimulated growth of algae during dredging and discharge of dredge material return water from land disposal areas, median inorganic nutrient concentrations were compared to default ANZECC/ARMCANZ (2000) guidelines for inshore marine waters in south-west Australia. The results for inorganic nutrients indicate some potential for nutrient stimulation of algal growth due to ammonia (Table 6.11).

Table 6.11 Median inorganic nutrient concentrations ($\mu\text{g L}^{-1}$)

Parameter	Limit of reporting	ANZECC/ARMCANZ (2000) default trigger value for marine waters	All areas (n= 32)	All areas minus A and C2 (n =21)	A and C2 (n=11)
Ammonia	<3	5	286	273	300
Nitrate + nitrite	<2	5	3	4	2
Total dissolved nitrogen	<50	230	745	863	630
Total phosphorus	<5	20	45	84	26
Orthophosphate phosphorus	<2	5	2.5	6.7	1

Note:

1. ANZECC/ARMCANZ (2000) default trigger value for inshore marine waters of south-west Australia (these are the same for offshore waters)

6.4.3 Organics

TPH, BTEX and PAH

Concentrations of TPHs and BTEX were below the laboratory LoR in all samples (Table 6.12). Concentrations of TPHs and BTEX were not measured at the disposal area. There were four samples (G2 bot, H1 bot, H2 bot and I1 top) with measurable total PAH concentrations in the harbour basin (BMT Oceanica 2014). The 95% upper confidence limits of the mean for total PAHs in sediments were below the NAGD screening levels. Concentrations of PAH at the disposal area sites were all <LoR (0.004 mg kg^{-1}). A summary table of the concentrations by depth within sites is in the SAP Implementation report. No trends in concentrations with depth occurred.

BTEX concentrations at all sites were below the LoR and therefore below the HILs (BMT Oceanica 2014). Total PAHs were below the EILs and HILs at all sites (BMT Oceanica 2014).

TBT

Concentrations of TBT in the entrance channel sites were all <LoR (BMT Oceanica 2014). TBT concentrations were greater than the NAGD screening level in dredge areas A (sites H1 and H2) and C2 (sites G1 and G2). Although not conclusive, there appeared to be a trend of increased concentrations of TBT with depth within dredge areas A and C2 during the 2010 survey. During the 2014 survey, very low concentrations of TBT were found and no trends occurred with sediment depth. Concentrations of TBT at the disposal area sites were all <LoR ($0.5 \mu\text{g Sn kg}^{-1}$). A summary table of the concentrations by depth within sites is in the SAP implementation report (BMT Oceanica 2014).

The 95% UCL of the mean for TBT for all dredge areas was above the NAGD screening level (Table 6.12). When dredge areas A and C2 were segregated from the other areas, the 95% UCL was well below the screening level. The 95% UCL for the dredge areas A and C2 was above the screening level and was above the Sediment Quality High Value ($70 \mu\text{g Sn kg}^{-1}$) (Table 6.12).

Table 6.12 95% upper confidence limit (UCL) of standardised (1% TOC) mean concentrations of organotins in sediments

Analyte	LoR ¹	NAGD ² screening level	NAGD ² high quality value	EIL ³	HIL ⁴	All areas	All areas minus A and C2	A and C2 (n=11)
TBT ($\mu\text{g Sn kg}^{-1}$)	<0.5	9	70	5	NA	29.5 ⁶	0.9 ⁷	85.4
PAH (mg kg^{-1})	<0.16	10	50	4	100	0.3 ⁸	<LoR ⁹	0.3
TPH (mg kg^{-1})	<275	550	NA	NA	NA	<LoR ⁸	<LoR ⁹	<LoR

Notes:

1. LoR = limit of reporting
2. NAGD = National Assessment Guidelines for Dredging (CoA 2009)
3. EIL = Environmental Investigation Level (DEC 2010)
4. HIL = Health Investigation Level (DEC 2010)
5. NA = no guideline available
6. All sites were measured for TBT (n=43)
7. All sites minus dredge area A (sites H1 and H2) and area C2 (sites G1 and G2) (n=32)
8. All 2010 sites (n=22)
9. All 2010 sites minus dredge area A (sites H1 and H2) and area C2 (sites G1 and G2) (n=11)

Elutriate tributyltin

Further TBT testing was carried out in 2010 in accordance the NAGD (CoA 2009) and the procedure outlined in Section 4.5.1 of the SAP (Oceanica 2009). The identified TBT contaminated sites (G1, G2, H1 and H2) were confined to two discrete areas (dredge areas A and C2). Sediments were re-sampled on 7 April 2010 at these sites (Table 6.13) for elutriate analysis of TBT to determine suitability for ocean disposal.

Table 6.13 Total, standardised (1% TOC) and elutriate tributyltin (TBT) concentrations from 7 April 2010 samples

Sample	Total TBT ($\mu\text{g Sn kg}^{-1}$)	Standardised TBT ($\mu\text{g Sn kg}^{-1}$)	Elutriate TBT ($\mu\text{g Sn L}^{-1}$)
Screening Level	9	9	NA
Sediment Quality High Value	70	70	NA
99% Species Protection Trigger Value ¹	n/a	n/a	0.0004
95% Species Protection Trigger Value ¹	n/a	n/a	0.006
90% Species Protection Trigger Value ¹	n/a	n/a	0.02
G1 top	4.7	32.5	0.005
G2 mid	98.1	39.5	0.016
G2 bot	25.3	27.9	0.005
H1 mid	12.1	34.8	<0.005
H1 bot	66.7	187.1	0.018
H2 bot	76.7	39.0	0.071

Note:

1. ANZECC/ARMCANZ (2000) Trigger Values for marine water.

Because TBT contamination was confirmed within the A and C2 dredge areas in the 2010 survey, a conservative approach was adopted in the 2014 survey whereby elutriate TBT was analysed in sediments from all harbour basin and one of the entrance channel sites (BMT Oceanica 2014). All concentrations of elutriate TBT from the 2014 survey were <LoR. The 95% UCL for elutriate TBT concentrations was greater than the ANZECC/ARMCANZ (2000) guideline trigger value for marine waters (Table 6.14). When dredge areas A and C2 are segregated no measureable concentrations of elutriate TBT were recorded outside of these areas.

Table 6.14 95% upper confidence limit of the mean for elutriate tributyltin (TBT) concentrations (mg L^{-1})

Analyte	LoR	ANZECC/ARMCANZ (2000) default guidelines for marine waters	All areas (n=17) ²	All areas minus A and C2 (n=11) ³	A and C2 (n=6)
Elutriate TBT	<0.002	0.0004	0.0257	<LoR	0.0641

Notes:

1. LoR = limit of reporting
2. Samples are 2010 re-sampled sediments and 2014 harbour basin sites BA1-5 and EC1
3. 2014 harbour basin sites and EC1

Elutriate TBT results were compared against the ANZECC/ARMCANZ (2000) 99%, 95% and 90% Species Protection Trigger Values for marine waters Table 6.13. It was considered possible that the 99% Species Protection Trigger Value may be applied if the dredge material is disposed to the offshore disposal area. If the dredge material is disposed to land, return water will be discharged into marine waters adjacent to Port berths, which is likely to be considered an area of Moderate Ecological Protection under the present State approach. ANZECC/ARMCANZ (2000) guidelines for 90% species protection typically apply to areas of Moderate Ecological Protection.

The elutriate TBT concentration of all samples, except 'H1 mid' exceeded the 99% Species Protection Trigger Value (applied if material is disposed offshore) and the elutriate TBT concentration of 'H2 bot' exceeded the 90% Species Protection Trigger Value (applied if material is disposed to land, as return water will be discharged into Albany Port). The highest elutriate TBT concentration of the samples representing sediments to be dredged is 0.071 µg Sn L⁻¹ (H2 bot). Under the NAGD (CoA 2009) for ocean disposal, a 178-fold dilution of 'H2 bot' elutriate would be required within the first 4 hours following disposal to meet the 99% Species Protection Trigger Value for TBT. If 'H2 bot' material were disposed to land, the elutriate results indicate a four-fold dilution would be required to meet the 90% Species Protection Trigger Value.

6.5 Acid sulfate sediments (applicable to land disposal)

The in situ acidity of the sediments may be determined from pH_{KCl} values (Table 6.15). The pH_{KCl} values were greater than 6.5 for all samples analysed, indicating none of the samples exhibited actual acidity (Table 6.15). However, the sulfur values (%S (S_{CR})) of most samples taken exceeded the Action Criteria (0.03% DEC 2011) indicating that they are potential acid sulfate sediments (PASS). The samples taken in areas A, A' and B, except for sample 'A'1 bot', all had sulphur values below the 0.03% action criteria.

The net acidity indicates that some of the potential acidity will be buffered by alkaline components within the soils. This neutralising capacity includes the recommended safety factor (fineness factor = 1.5) when calculating neutralisation requirements (Ahern et al. 2004). Thirteen of the 23 samples that had sulfur values above the Action Criteria exhibited sufficient neutralising capacity within the sediments to result in negative net acidity (Table 6.15). The ten remaining samples exhibited positive net acidity.

Table 6.15 Acid sulfate sediment (ASS) and acid base accounting (ABA) results for sediment samples 2010

Sample	pH _{KCl}	Potential sulfidic acidity			Acid neutralising capacity (ANC)			Net acidity
		%S (S _{CR})	Equivalent acidity (mol H ⁺ tonne ⁻¹)	Existing acidity	ANCBT (%CaCO ₃)	ANC (mol H ⁺ tonne ⁻¹)	Fineness Factor	Net acidity (mol H ⁺ tonne ⁻¹)
A1 top	9.8	0.01	6.24	None	n/m	n/m	1.5	n/m
A1 bot	9.8	0.01	6.24	None	n/m	n/m	1.5	n/m
A'1 top	9.6	0.03	18.71	None	n/m	n/m	1.5	n/m
A'1 bot	9.5	0.10	62.37	None	6.3	1258.7	1.5	-776.8
A2 top	9.7	0.03	18.71	None	n/m	n/m	1.5	n/m
A2 bot	9.7	0.03	18.71	None	n/m	n/m	1.5	n/m
A'2 top	9.7	0.02	12.47	None	n/m	n/m	1.5	n/m
A'2 bot	9.7	0.02	12.47	None	n/m	n/m	1.5	n/m
B1 top	9.6	0.02	12.47	None	n/m	n/m	1.5	n/m
B1 bot	9.7	0.02	12.47	None	n/m	n/m	1.5	n/m
B2 top	9.7	0.01	6.24	None	n/m	n/m	1.5	n/m
B2 bot	9.6	0.01	6.24	None	n/m	n/m	1.5	n/m
C1 top	9.1	0.21	130.98	None	6.7	1338.7	1.5	-761.5
D1 top	9.1	0.30	183.99	None	2.3	449.6	1.5	-115.7
E1 top	8.9	0.74	461.54	None	10.0	1998.0	1.5	-870.5
E1 bot	8.7	0.31	193.35	None	0.8	163.8	1.5	84.1
E2 top	8.9	0.87	540.54	None	1.9	386.3	1.5	283.0

Sample	pH _{KCl}	Potential sulfidic acidity			Acid neutralising capacity (ANC)			Net acidity
		%S (S _{CR})	Equivalent acidity (mol H ⁺ tonne ⁻¹)	Existing acidity	ANCBT (%CaCO ₃)	ANC (mol H ⁺ tonne ⁻¹)	Fineness Factor	Net acidity (mol H ⁺ tonne ⁻¹)
E2 bot	6.9	0.88	548.86	None	0.9	181.8	1.5	427.6
F1 top	9.0	0.04	24.95	None	6.4	1278.7	1.5	-827.5
G1 top	9.4	0.17	106.03	None	0.8	155.8	1.5	2.1
G1 mid	9.2	0.33	205.82	None	2.1	419.6	1.5	-73.9
G1 bot	8.1	0.31	193.35	None	0.6	119.9	1.5	113.4
G2 top	8.8	0.17	106.03	None	0.5	105.9	1.5	35.4
G2 mid	9.3	0.15	93.56	None	1.5	299.7	1.5	-106.2
G2 bot	9.2	0.20	124.74	None	1.3	259.7	1.5	-48.4
H1 top	9.3	0.15	93.56	None	0.7	143.9	1.5	-2.3
H1 mid	9.1	0.21	130.98	None	0.6	125.9	1.5	47.1
H1 bot	9.1	0.26	162.16	None	1.1	219.8	1.5	15.6
H2 top	9.4	0.07	43.66	None	1.8	359.6	1.5	-196.1
H2 bot	8.9	0.31	193.35	None	4.0	799.2	1.5	-339.5
I1 top	9.0	0.54	336.80	None	5.1	1019.0	1.5	-342.5
I1 bot	8.2	1.20	748.44	None	1.6	319.7	1.5	535.3
I2 top	9.2	0.18	112.27	None	3.3	659.3	1.5	-327.3
I2 bot	8.4	0.33	205.82	None	1.0	189.8	1.5	79.3

Notes:

1. **Bold** indicates value > action criteria
2. n/m = parameter not measured. ANC and Net Acidity were not measured for sites that did not exceed the Action Criteria (0.03 %S) for disturbance of >1000 tonnes of sediments (DoE 2011)

6.6 Survey QA/QC

Quality assurance and control was very good during the survey and laboratory results are considered highly reliable. Full details and analysis of QA/QC is presented in the SAP Implementation report.

7. Key Potential Impacts

7.1 Assessment of impact risks

This section describes the potential impacts on relevant environmental factors. Each potential impact of the proposal was rated by likelihood of occurrence (Table 7.1) and consequence of impact (Table 7.2) to give an inherent risk (Table 7.3). Potential impacts of the proposal are presented in Table 7.4. A number of management measures are proposed to reduce the inherent risk (Table 7.4) and are used to determine the residual risk. Most potential impacts were reduced to a low risk after implementation of management measures and no impacts were rated as high risk after management. Further detail is provided on the medium risks and some potential impacts with low risk in the following section. These potential impacts are:

- turbidity and sedimentation
- mobilisation of contaminants
- acid sulfate sediments
- hydrocarbon spills
- noise
- vessel movement
- threatened or migratory species
- introduced marine species
- waste management
- impacts to other users
- dust
- exposure to contaminants.

Table 7.1 Risk assessment: likelihood table

Value	Descriptor	Description
1	Rare	Occurs only in exceptional circumstances
2	Unlikely	Could occur but not expected
3	Possible	Should occur at some time
4	Likely	Will probably occur in most circumstances
5	Almost Certain	Is expected to occur in most circumstances

Source: modified from AS/NZS ISO 31000:2009

Table 7.2 Risk assessment: consequence table

Value	Description	Natural environment	Human environment	Marine fauna (individuals)
1	Insignificant	Negligible impact with no remediation required No alteration to ecosystems	Very minor disruption to small section of community Insignificant impacts on quality of life No community interest/concern	Behaviour, physiology, and well-being barely or weakly affected
2	Minor	Minor impacts with minimal remediation required Minor alteration to ecosystems Recovery period measured in weeks to months	Appearance of a threat but no actual harm Isolated short-term disruption to some communities Minor reductions in quality of life Limited community interest/concern Possible isolated local and individual concern	Behaviour, physiology, and well-being affected to a degree that minimally influences individual reproductive success
3	Moderate	Moderate impacts with some remediation required Moderate alteration to ecosystems Recovery period measured in months to years	Small number of minor illnesses Significant disruption to some communities Significant short-term or minor long-term reduction in quality of life Moderate community interest/concern and discussion but limited (if any) regional or state interest	Behaviour, physiology, and well-being affected to a degree that individual reproductive success is reduced
4	Major	Major impacts with considerable remediation required Major alteration to ecosystem Recovery period measured in years to decades	Small numbers of illnesses or loss of life Significant, widespread disruption to communities Significant long-term decline in quality of life Widespread community interest/concern - local and regional interest	Behaviour, physiology, and well-being substantially affected with reduction in individual reproductive success
5	Catastrophic	Massive impacts with significant remediation required Irreversible alteration to ecosystems Long term environmental recovery that may take decades or longer	Large numbers of illnesses or loss of life Severe and widespread disruption to communities Severe long-term reductions in quality of life State, national and potential international interest/concern	Behaviour, physiology, and well-being severely (or mortally) affected with individual reproductive success greatly reduced or ceased

Source: modified from AS/NZS ISO 31000:2009

Table 7.3 Risk matrix

Likelihood	Rare	Unlikely	Possible	Likely	Almost Certain
Insignificant	1	2	3	4	5
Minor	2	4	6	8	10
Moderate	3	6	9	12	15
Major	4	8	12	16	20
Catastrophic	5	10	15	20	25

Risk Severity	Low (1-4)	Medium (5-10)	High (11-25)

Source: modified from AS/NZS ISO 31000:2009

Table 7.4 Risk assessment for Albany Port maintenance dredging proposal

Issue	Potential impacts	Likelihood	Consequence	Inherent risk rating	Supporting evidence and management measures	Likelihood	Consequence	Residual risk rating
Biophysical								
Turbidity and sedimentation from dredging	<ul style="list-style-type: none"> Light limitation to benthic flora Smothering of benthic habitat 	4	2	8	<ul style="list-style-type: none"> The dredging campaign is of very short duration (anticipated <4 weeks) Any effects will be largely confined to waters within the Port: <ul style="list-style-type: none"> there will be no overflow during berth dredging of sediments with a significant portion of fines, which will reduce turbidity channel sediments have low fines content so turbidity from dredging and overflow will be minimal 	3	2	6
Turbidity and sedimentation from disposal at offshore disposal area	<ul style="list-style-type: none"> Light limitation to benthic flora Smothering of benthic habitat 	3	2	6	<ul style="list-style-type: none"> As the disposal area is sandy substrate at a depth of >35 m there is no significant benthic habitat The dredge will dump in a different area each trip and as the sediment is predominately sand with little silt or clay fractions the high settling velocity will result in suspended sediments clearing quickly 	2	2	4
Turbidity and sedimentation during disposal at onshore disposal area	<ul style="list-style-type: none"> Light limitation to benthic flora Smothering of benthic habitat 	2	2	4	<ul style="list-style-type: none"> Dredge material will be pumped to the onshore disposal area Pipes will be maintained to minimise risk of leakage of dredge material Within the Port the benthic habitat is sand that has been dredged and no benthic flora is present 	1	2	2
Turbidity and sedimentation from settling pond discharge	<ul style="list-style-type: none"> Light limitation to benthic flora Smothering of benthic habitat 	4	2	8	<ul style="list-style-type: none"> Settling pond will be constructed with internal containment bunds to increase settling time and therefore maximise sediment retention and minimise outflow A weir box will be present at the discharge point so discharge will be able to be ceased or reduced if required Discharge water will enter Port waters from the settling pond. There is no benthic habitat within the dredged areas of the Port 	2	2	4
Mobilisation of contaminants during dredging	<ul style="list-style-type: none"> Deteriorating water quality Contamination of marine organisms 	3	2	6	<ul style="list-style-type: none"> Dredge will not overflow during dredging of berth sediments 	2	2	4
Mobilisation of contaminants during disposal	<ul style="list-style-type: none"> Deteriorating water quality Contamination of marine organisms 	4	2	8	<ul style="list-style-type: none"> Contaminated sediments will be disposed of to land Sediments meet relevant environmental and health guidelines for their relevant disposal areas Settling pond will be constructed with internal containment bunds to increase settling time and therefore maximise sediment retention and minimise outflow Discharge water will enter Port waters from the settling pond. There is no benthic habitat within the dredged areas of the Port Depth of chosen offshore disposal area results in dilutions that exceed those required 	2	2	4
Acid sulfate sediments	<ul style="list-style-type: none"> Acidification of waters Deoxygenation of the water column Release of heavy metals 	1	4	4	<ul style="list-style-type: none"> Analysis showed that all samples that had sulfur values above the Action Criteria exhibited sufficient neutralising capacity to result in negative net acidity so no management measures are required The pH of the return water shall be monitored 	1	4	4
Hydrocarbon spill (dredge)	<ul style="list-style-type: none"> Contamination of marine environment 	4	3	12	<ul style="list-style-type: none"> Dredge inspection conducted daily by vessel crew Conduct scheduled maintenance Follow refuelling, spill response and clean-up procedures Ensure spill kits are appropriately located and stocked 	2	2	4
Hydrocarbon spill (land based plant)	<ul style="list-style-type: none"> Contamination of terrestrial environment Contamination of marine environment 	4	3	12	<ul style="list-style-type: none"> Plant inspection conducted daily Conduct scheduled maintenance Follow refuelling, spill response and clean-up procedures Ensure spill kits are appropriately located and stocked 	2	2	4

Issue	Potential impacts	Likelihood	Consequence	Inherent risk rating	Supporting evidence and management measures	Likelihood	Consequence	Residual risk rating
Noise	<ul style="list-style-type: none"> Disturbance of marine/terrestrial fauna 	2	2	4	<ul style="list-style-type: none"> The expected noise level from the dredge is within the frequency and range of background ship noise and below the estimated bandwidth for most marine mammals Dredge and terrestrial plant will undertake scheduled servicing to ensure that noise levels are minimised 	2	1	3
Vessel movement	<ul style="list-style-type: none"> Collision with marine mammals 	1	4	4	<ul style="list-style-type: none"> The timing of the dredging will be chosen to avoid the key period of whale migration of July to November if possible Monitoring measures will be implemented throughout the dredging program to avoid potential impacts to large marine fauna during dredging as outlined in Section 8.3.1 	1	4	4
Threatened or migratory species	<ul style="list-style-type: none"> Significant impact of proposal on threatened or migratory species 	1	4	4	<ul style="list-style-type: none"> Dredging is not likely to result in a significant impact on threatened or migratory species as outlined in Section 7.7.1 	1	4	4
Introduced marine species	<ul style="list-style-type: none"> Introduction of marine species 	3	4	12	<ul style="list-style-type: none"> Dredge contractor to confirm that vessel arrives to Port with non-fouled hulls, with adequate hopper washing and ballast water exchanges being performed in accordance with AQIS ballast water requirements DoF will be notified prior to the dredge arrival of name, previous location, and most recent inspection date of the dredge vessel Upon arrival, APA will coordinate a survey of the hull and onboard inspection for sediment to confirm the fulfilment of contract conditions. 	1	3	3
Waste management	<ul style="list-style-type: none"> Damage to fauna or flora 	4	3	12	<ul style="list-style-type: none"> Waste management will be implemented in accordance with contractor construction management plans Segregation of wastes will occur and wastes will be secured to avoid the potential for wind-blown wastes entering the marine environment or terrestrial areas of the Port and surrounds 	2	2	4
Social								
Impacts to other users	<ul style="list-style-type: none"> Restricted commercial values 	4	2	8	<ul style="list-style-type: none"> Interruption to shipping movements will be minimised and navigable waters improved on completion Access to dredge and disposal area will be controlled for safety reasons All contaminant concentrations are below the HIL 	3	1	3
Dust	<ul style="list-style-type: none"> Reduced aesthetics and health of local community Impacts on Port users 	4	2	8	<ul style="list-style-type: none"> APA will ensure dust emissions are reduced as low as possible during all construction works and operation of the Port 	2	2	4
Turbidity	<ul style="list-style-type: none"> Reduced aesthetics and recreational values 	4	2	8	<ul style="list-style-type: none"> Dredging is occurring within the Port area which is not a favoured recreational area Community liaison will be undertaken so that they are aware of the dredging 	4	1	4
Aesthetics of onshore disposal site	<ul style="list-style-type: none"> Reduced aesthetics 	3	2	6	<ul style="list-style-type: none"> Settling pond is within the industrial area of the Port On completion of dredging or after use of dredged material for reclamation the settling pond and temporary stockpiles will be returned to the design level of the reclamation area 	2	1	3
Exposure to contaminants in dredge material	<ul style="list-style-type: none"> Reduced health of local community 	2	3	6	<ul style="list-style-type: none"> Settling pond is within the industrial area of the Port As the reclamation area is in the Port public access is restricted Dredging of the berth areas with significant fines will be without overflow reducing the risk of mobilising contaminants All contaminant concentrations are below relevant health investigation levels 	1	3	3
Noise	<ul style="list-style-type: none"> Reduced aesthetics and health of local community 	3	2	6	<ul style="list-style-type: none"> Dredging is taking place within an operating Port and noise levels will be similar to those from current shipping Dredge and terrestrial plant will undertake scheduled servicing to ensure that noise levels are minimised 	2	2	4

Notes:

1. DoF = Western Australian Department of Fisheries
2. APA = Albany Port Authority
3. AQIS = Australian Quarantine Inspection Service
4. HIL = Health Investigation Level (DEC 2010)

7.2 Turbidity

7.2.1 Dredge plume

Minimal release of sediment into the water column surrounding the dredge is expected due to the rapid intake velocity at the dredge head. Sediment remaining in suspension and the dredge head is generally less than 0.5% of the gross production (Bridges et al. 2008). Overflow of the dredge may occur during dredging and when travelling to the offshore disposal area hence, some turbidity will be generated as these overflow waters are likely to contain a proportion of the finer sediment particles.

Experience and observations from a long-term trailer suction and jet suction dredging campaign has not resulted in long-term adverse impacts on adjacent seagrass beds when the dredge has been mobile (in Owen Anchorage by Cockburn Cement; Oceanica 2007). The small quantities of sediments that overflow and are suspended during the dredging will be transported in the direction of the prevailing currents. Any change in water quality is likely to be limited only to an increase in turbidity for short durations.

The main vegetated habitat adjacent to the Port is *Posidonia sinuosa* seagrass meadows. Shading studies have shown that *Posidonia* species can survive beyond 206 days where there is a 91% reduction in incident light at the canopy (Collier 2006). The proposed maintenance dredging duration will be considerably shorter and will result in much less shading than levels investigated by Collier (2006). It is therefore very unlikely that the maintenance dredging will have an adverse impact on nearby seagrass, but as a precaution Secchi depths will be monitored during the dredging operation (Section 8.1).

7.2.2 Disposal areas

Onshore disposal

There is no significant benthic habitat within the harbour basin of the Port. Dredge material will be pumped to the settlement pond through pipes that will be maintained to minimise risk of leakage of dredge material. The settling pond will be constructed with internal containment bunds to increase settling time and therefore maximise sediment retention and minimise outflow. A weir box will be present at the discharge point so discharge will be able to be ceased or reduced if required. As noted in Section 6.3, the berth sediments consist mainly of fine to medium grained sands with some clay or silt fractions. It is believed that there will be minimal turbidity associated with discharge water re-entering Port waters from the settling pond.

Offshore disposal

Although turbidity will result from disposal of dredge materials at the offshore disposal area, the majority (68%) of the sediments to be disposed are clean fine to medium grained sands (from entrance channel) that should generate minimal turbidity during dumping. Due to the relatively small amounts of material (<3000 m³) dumped per trip into the deep water (35–44 m), it is expected that any turbidity will be short lived. The disposal site has been modelled and determined to be a retentive site for sediment disposal (Ecologia 2007). Modelling has shown that only a small area of seabed will be impacted by direct disposal and adjacent areas will have minimal deposition (Ecologia 2007).

7.3 Mobilisation of contaminants

7.3.1 Release of metals

The 95% UCL for metal concentrations were below the NAGD (CoA 2009) screening levels for all metals. Four individual samples had concentrations of metals which exceed the NAGD screening levels. Site I1 exceeded the arsenic (58 mg kg^{-1}), site H2 exceeded the cadmium (2.1 mg kg^{-1}) and sites BA1 and E1 (0.3 and 0.24 mg kg^{-1} , respectively) exceeded the mercury screening levels. No trends in concentrations occurred with depth within sites. Elutriate analysis concentrations were <LoR for all metals, except arsenic and cadmium, which had 95% UCLs below the ANZECC/ARMCANZ (2000) guidelines for marine waters. Bioavailable concentrations for arsenic, cadmium and mercury were all well below NAGD screening levels.

No effect to the environment is expected to occur due to the limited metal mobilisation during ocean disposal or land disposal.

7.3.2 Release of nutrients

Sediment nutrient concentrations for dredge areas were within the range expected for Western Australia estuarine and coastal waters in the region, apart from a high phosphorus concentration at site H1 and a high nitrogen value at site BA1_S. Elutriate analysis for nutrients resulted in the 95% UCL mean concentrations for ammonia being below the ANZECC/ARMCANZ (2000) guidelines for marine waters. The 95% UCL mean concentrations for ammonia were below ammonia Toxicant Trigger Value.

Onshore disposal

For land disposal of dredge material, median elutriate nutrient concentrations were compared to default ANZECC/ARMCANZ (2000) guidelines for physical and chemical stressor in inshore marine waters in south-west Australia, to assess the potential for nutrient stimulation of algal growth due to dredging and discharge of dredge material return water. The results indicated some potential for nutrient stimulation of algal growth due to ammonia. Therefore, epiphyte growth of seagrass shall be monitored pre, during and post dredging (Section 8.1.1).

Offshore disposal

No effect to the environment is expected to occur due to the limited nutrient mobilisation and large dilution during ocean disposal.

7.3.3 Organics

Total petroleum hydrocarbons and BTEX concentrations were below the LoR in all samples. Concentrations of PAHs were measureable at four sites only, which were well below the NAGD screening levels.

Tributyltin (TBT) was found in moderate to high concentrations during the 2010 survey in the dredge areas A and C2. The standardised concentrations exceeded the NAGD screening levels and the NAGD high value was exceeded in one sample at one site. The 95% UCL for standardised TBT concentrations were well below the NAGD screening level for all areas when dredge areas A and C2 are segregated out. Dredge areas A and C2 had a 95% UCL above the NAGD screening level and the NAGD high value level. Subsequent elutriate analysis of the samples resulted in concentrations that exceeded the ANZECC/ARMCANZ (2000) 99% and 95% protection trigger values at sites G and H and the 90% protection trigger value in one sample (H2 bot), all of which are located in dredge areas A and C2.

Onshore disposal

The contaminated material from dredge areas A and C2 (sites G and H) will be disposed of to land reclamation. Up to 178-fold dilution of the TBT concentration in the elutriate from material from dredge areas A and C2 would be needed to meet the 99% protection trigger value and up to a four-fold dilution would be needed to meet the 90% protection trigger value. A dilution of 178-fold will be very difficult to achieve at the discharge point into Port waters, while a four-fold dilution will be comparatively easy.

It is therefore considered unlikely that return water from the land disposal of material from dredge areas A and C2 will exceed the 90% Species Protection Trigger Value, but monitoring will be undertaken to confirm this (Section 8.2.2).

Offshore disposal

No effect to the environment is expected to occur due to the limited organics mobilisation during ocean disposal.

7.4 Acid sulfate sediments

Disturbance of PASS in the sediments is unavoidable, due to the need to maintain navigable depths in the Albany Port. Disposal of the sediments has the potential to generate actual acidity at the land-based disposal site and increase the acidity of the excess water returned to the harbour. Six of the 11 samples from dredge areas A and C2 exhibited negative net acidity, indicating neutralisation capacity was greater than potential acidity. During dredging, due to the vertical variability in sediment characteristics, sediments with potential acidity will be mixed with sediments with lower potential acidity and higher neutralisation capacity and much of the potential acidity will be neutralised.

Daily monitoring of return water pH during the 2008 Albany Port UXO recovery pumping program (Mackey & Fretton 2008) and weekly monitoring during the 2009 Albany Port maintenance dredging (Mackey 2009) showed that the pH did not fall below 7.2.

Since PASS characteristics of the material to be dredged in 2010 are similar to that of material dredged in 2008 and 2009 (Mackey & Fretton 2008, Mackey 2009), it is likely that sediments disposed to land will respond similarly. However, as a precaution, the pH of the return water shall be monitored (Section 8.2).

7.5 Hydrocarbons

An accidental release of hydrocarbons has the potential to impact on the environment. Hydrocarbons will be used throughout the proposed dredging and disposal. Potential sources of hydrocarbon release include hydraulic spills, refuelling spills, release of contaminated bilge waters, grease and spills resulting from incorrect storage and handling.

The risk of hydrocarbon spills will be managed by:

- daily onshore plant and dredge inspections by dredge Master
- scheduled maintenance of onshore plant and dredge
- adherence to refuelling, spill response, clean up procedures and APA permit requirements
- spill kits with appropriate stock and location.

7.6 Noise

A key potential risk of the maintenance dredging to large marine fauna (whales, cetaceans, pinnipeds and sharks) is underwater noise from the dredge causing temporary or permanent harm. Noise from cutter suction dredges has been found to be of low to moderate frequency (around 100 Hz) with some tonal noise, and an acoustic intensity of around 180 dB re 1 μ Pa at 1 m (SKM 2009). Noise levels from a TSHD would likely be equal or lower than that of a cutter suction dredge. These noise levels are within the frequency and intensity range of ambient background ship noise (approximately 5–100 Hz and 177 dB re 1 μ Pa m⁻¹, respectively) (SKM 2009), and below the estimated auditory bandwidth for the majority of marine mammals (Southall et al. 2007).

Impacts to terrestrial fauna are unlikely as the area is an operating Port and the proposed works will not result in significantly increased noise levels. Scheduled servicing will be undertaken on dredge and terrestrial plant to ensure that noise is minimised. Landside operations will be subject to APA's DEC Regulation 17 Noise Approvals.

7.7 Marine fauna

The key potential risks of the maintenance dredging to large marine fauna (whales, cetaceans, pinnipeds and sharks) are:

- the dredge colliding with an animal (vessel strikes)
- underwater noise from the dredge causing temporary or permanent harm (Section 7.6).

Southern right whales are generally sighted in the waters near Albany during the months of June to October, whereas humpback whales are generally sighted from late-May to early-September. The timing of the proposed dredging is dependent on the availability of the dredging vessel, but it is expected that dredging will occur sometime between November 2014 and April 2015. Therefore, there is a low potential for any interaction between the dredging operation and migrating whales. Although cetaceans are regularly seen in the area, there have been no known reports of impacts to cetaceans in the history of shipping and infrequent dredging at Albany Port (Ecologia 2007). In general, the risk of collisions is low as the dredge vessel will be operating at slower speeds than regular shipping traffic, the dredge will only cross the whale migration route when travelling to and from the offshore disposal area (approximately eight times per day), and whales and other species are likely to easily move away from the slow moving dredge plant. Although the turtle species (logger head and green) have been identified as 'likely to occur' by the EPBC search output it is noted that they are rarely reported and there is no breeding or egg laying habitat within the Port Authority waters. The expected duration of maintenance dredging is also very brief (2–3 weeks).

To further avoid any potential impacts on whales and other large marine fauna during dredging, monitoring and management of marine fauna that enter the vicinity of the dredging will be carried out throughout the dredging program (Section 8.3).

7.7.1 Threatened and migratory species

Approval under the EPBC Act is required if a proposal is likely to have a ‘significant impact’ on a matter of national environmental significance (NES). Whether an action is likely to have a significant impact is dependent on the sensitivity, value and quality of the environment and the intensity, duration, magnitude and geographic extent of the impacts.

The matter of NES relevant to Albany Port maintenance dredging is the presence of threatened and migratory marine fauna in the surrounding area. The significant impact criteria for threatened and migratory species are considered with regard to the maintenance dredging of Albany Port in Table 7.5. The maintenance dredging campaign is not likely to result in a significant impact on threatened or migratory species.

Table 7.5 Significant impact criteria for threatened and migratory species

Significant impact criteria	Risk	Notes
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of a population	None	Short term operation No direct interaction with marine fauna anticipated Monitoring program in place
Reduce the area of occupancy of the species	Low	Maintenance of existing infrastructure Short term operation Very small footprint area
Fragment an existing population into two or more populations	None	Maintenance of existing infrastructure Short term operation
Adversely affect habitat critical to the survival of a species	None	Maintenance of existing infrastructure Short term operation Very small footprint area
Disrupt the breeding cycle of a population	Low	Short term operation
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	None	Maintenance of existing infrastructure Short term operation Very small footprint area
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species’ habitat	Low	Introduced marine pests monitoring measures
Introduce disease that may cause the species to decline or	Low	Introduced marine pests monitoring measures
Interfere with the recovery of the species	None	Short term operation.
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long term decrease in the size of an important population of a species	None	Short term operation No direct interaction with marine fauna anticipated. Monitoring program in place
Reduce the area of occupancy of an important population	Low	Maintenance of existing infrastructure Short term operation Very small footprint area
Fragment an existing important population into two or more populations	None	Maintenance of existing infrastructure Short term operation

Significant impact criteria	Risk	Notes
Adversely affect habitat critical to the survival of a species	None	Maintenance of existing infrastructure Short term operation Very small footprint area
Disrupt the breeding cycle of an important population	Low	Short term operation;
Modify, destroy, remove or isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline	None	Maintenance of existing infrastructure Short term operation Very small footprint area
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Low	Introduced marine pests monitoring measures
Introduce disease that may cause the species to decline	Low	Introduced marine pests monitoring measures
Interfere substantially with the recovery of the species	None	Short term operation
An action is likely to have a significant impact on migratory species if there is a real chance or possibility that it will:		
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for migratory species	None	Maintenance of existing infrastructure Short term operation Very small footprint area
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species	Low	Introduced marine pests monitoring measures
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) or an ecologically significant proportion of the population of a migratory species	Low	Short term operation No direct interaction with marine fauna anticipated Monitoring program in place

7.8 Introduced marine species

A key risk of dredging programs is the introduction of marine species via dredging vessels. Introduced marine species are marine plants or animals that are not native to Australia, but have been introduced by human activities such as shipping (CoA 2014). They have the potential to significantly impact marine industries and the environment. Australia has over 250 introduced marine species; most remain relatively harmless, but some have become aggressive pests. Aggressive species have significant impacts on marine ecosystems and marine industries.

The primary ways that foreign marine species are introduced are through ballast water¹ and biofouling². It is anticipated that the dredge vessel will be travelling from another location within Western Australian state waters prior to arriving in the Port. Details on management of invasive marine species are provided in Section 8.4.

7.9 Waste management

Release of waste material can adversely impact on the environment. Wastes requiring management include solid wastes, hazardous wastes and sewage and grey water. Waste management will be implemented in accordance with contractor waste management plans that meet Port and regulatory environmental management requirements. Segregation of wastes will occur and wastes will be secured to avoid the potential for wind-blown wastes entering the marine environment or terrestrial areas of the Port and surrounds.

¹ Ballast water refers to water that a ship takes on board at a port before commencing a voyage in order to provide stability in unladen ships, with marine organisms taken on board as well.

² Biofouling refers to the attachment of biological material (microorganisms, plants, algae and animals) on submerged structures such as ships hulls and internal areas.

7.10 Impacts to other users

Albany Port is a regional port that handles multiple cargo types. Navigable access to and from this Port is critical to ensure the ongoing operation of this industry. It is anticipated that the negative impacts on users will be minor as:

- interruption to shipping movements will be minimised during dredging and navigable waters will be greatly improved on completion
- access to the dredging and disposal areas will be controlled for safety reasons
- all contaminant concentrations fall below the HILs (DEC 2010) for dredge material so there are no public health concerns.

7.11 Dust

Dust can adversely impact on the social and biological values of the environment. It is anticipated that dust impacts will be minor to none, as no reclamation works will occur and dredged material disposal to the settling ponds will be as wet slurry.

7.12 Principles of environmental protection

This document has been developed with consideration of the principles of environmental protection as outlined in Table 7.6.

Table 7.6 Principles of environmental protection and their application to the proposal program

Principle (EPA 2004)	Application to Proposed Program
<p>1. The precautionary principle: Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.</p> <p>In application of this precautionary principle, decisions should be guided by</p> <ul style="list-style-type: none"> a) Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and b) An assessment of the risk – weighted consequences of various options. 	<p>The need for the program has been clearly demonstrated as navigational safety is a major priority. The potential impacts on the environment during dredging are minimal as any adverse conditions will only exist for a short time period. The potential impacts on the environment during operations are well understood from existing operations</p>
<p>2. The principle of intergenerational equity: The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.</p>	<p>The program seeks to minimise impacts to marine water quality, marine fauna and benthic habitats</p>
<p>3. The principle of the conservation of biological diversity and ecological integrity: Conservation of biological diversity and ecological integrity should be a fundamental consideration.</p>	<p>The program seeks to minimise impacts to marine water quality, marine fauna and benthic habitats and ensures that a high level of ecological protection will be achieved outside the Port area</p>
<p>4. Principles relating to improved valuation, pricing and incentive integrity:</p> <ul style="list-style-type: none"> a) Environmental factors should be included in the valuation of assets and services. b) The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement. c) The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste. d) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solution and responses to environmental problems. 	<p>APA bears the costs associated with this program</p>
<p>5. The principle of waste minimisation: All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.</p>	<p>Any wastes produced by the program will be managed through a contractor construction management plan including segregation and appropriate disposal of waste relevant to material type</p>

8. Environmental Monitoring and Management

The proposed maintenance dredging operation involves the removal of sediment from the Port's harbour and channel. Environmental monitoring during the previous maintenance dredging campaign consisted of twice weekly Secchi disk monitoring and weekly pH monitoring of return water (Mackey 2009). No significant environmental issues were encountered.

The environmental monitoring and management plan for dredging operations is detailed below. The monitoring and management plan is adapted from those previously approved by the DoW for the APA's maintenance dredging operations, but as this maintenance dredging operation involves transit to an offshore disposal area it also includes monitoring and management to ensure minimal risk of potential impacts on whales.

8.1 Turbidity monitoring

The seagrasses in Princess Royal Harbour and King George Sound are known to be capable of withstanding several months of shading, although large environmental changes over several months can temporarily affect the density and vigour of the seagrass meadow (EPA 1990). It is noted that even with severe and continuous shading, measurable responses in seagrasses do not occur in less than 2 weeks (e.g. EPA 1990). The turbidity generated by the proposed maintenance dredging is not expected to have a measurable impact on adjacent seagrasses due to the short duration (2–3 weeks), the limited potential to generate turbidity and the intermittent nature of the turbidity.

Although not necessary if dredging is completed in under two weeks, turbidity will be monitored in case there is any unexpected extension of the dredging program. Turbidity will be monitored using Secchi depths as a proxy (as per previous maintenance dredging programs; Mackey 2009) at five 'inner sites' and 7 'outer sites' and one 'control site' (Table 8.1; Figure 8.1). The inner sites are adjacent to the port infrastructure, with one site just outside Princess Royal Harbour and are included to determine the attenuation of the dredge plume (if any) relative to the outer sites. The outer sites are located along the 5 m contour, which is the lower depth limit of seagrass in Princess Royal Harbour (Mackey 2009), and at the depth limit (~10 m) of the nearest seagrass habitats that could potentially be affected by the plume in King George Sound (based on the clockwise water circulation that occurs most of the time). The control site provides a means for measuring any regional increase in turbidity due to storms or catchment runoff.

A staged trigger and action approach shall be employed, as follows:

1. Secchi disk monitoring shall be carried out twice weekly at all sites (Table 8.1; Figure 8.1).
2. If the Secchi depth at one or more of the outer sites is below 4 m (8 m for sites OS7 and OS8) while the Secchi depth at site CS1 remains above 4 m, monitoring shall be increased to daily.
3. If Secchi depths remain below 4 m (8 m for sites OS7 and OS8) at one or more outer sites on three consecutive days while site CS1 remains above 4 m then dredging shall cease and land reclamation cells shall be shut until Secchi depths greater than 4 m are recorded at all outer sites (8 m for sites OS7 and OS8).

A visual record of turbidity plumes within the harbour basin will be captured by a time-lapse camera. The harbour basin turbidity plumes will be recorded, where available, to capture a record of the distribution of plume movement over time to assist with planning for future dredging campaigns.

Table 8.1 Secchi disk monitoring sites

Site	Description	Location (GDA94 UTM 50)	
		Easting	Northing
IS1	Inner Site	581189	6122602
IS2	Inner Site	581810	6122071
IS3	Inner Site	582488	6121452
IS4	Inner Site	582893	6121888
IS5	Inner Site	584587	6122043
OS1	Outer Site	581322	6122247
OS2	Outer Site	580438	6121720
OS3	Outer Site	581536	6120946
OS4	Outer Site	582724	6121301
OS5	Outer Site	583113	6121558
OS6	Outer Site	583117	6121903
OS7	Outer Site	584336	6121669
OS8	Outer Site	584374	6121495
CS1	Control Site	580479	6122764

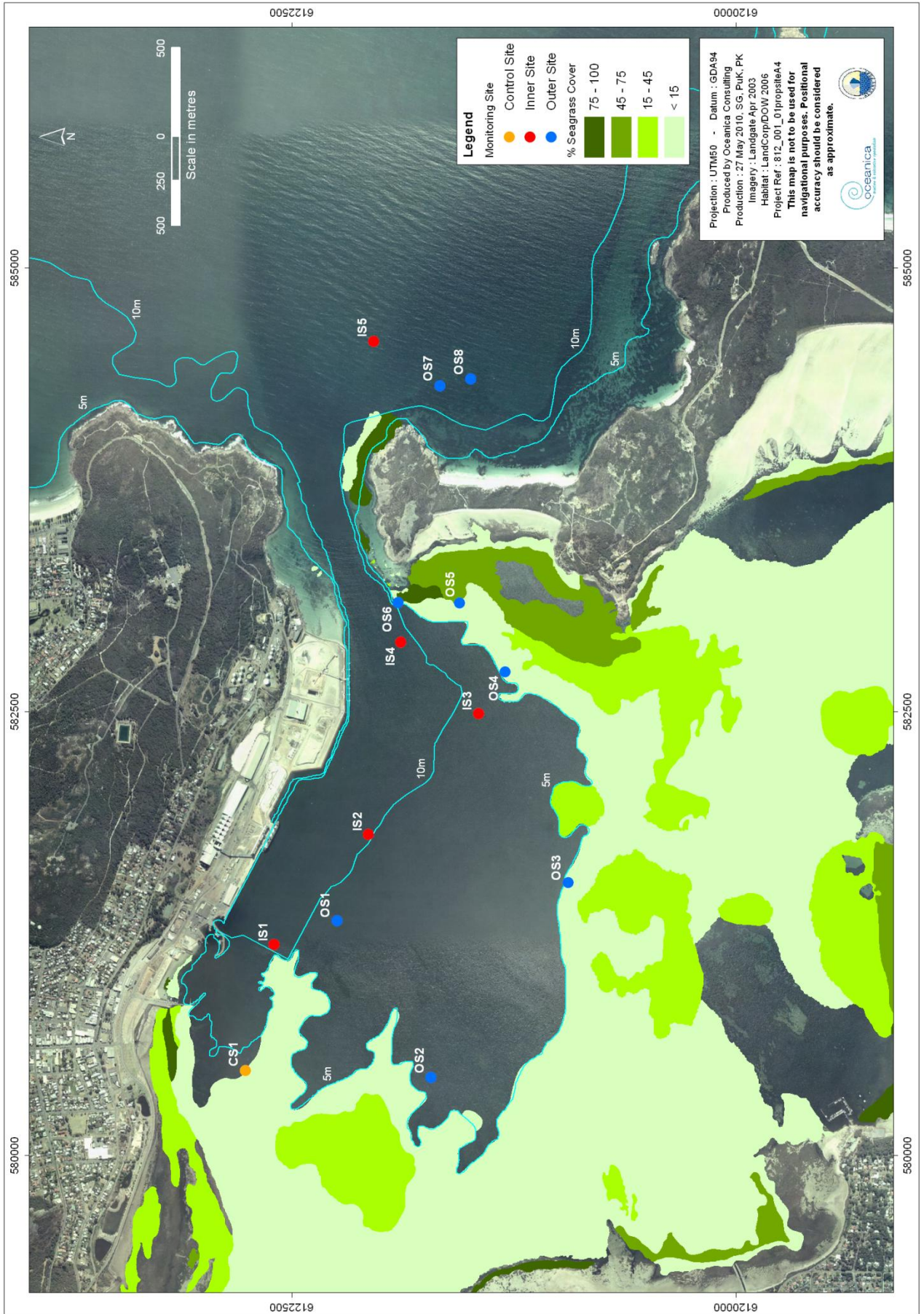


Figure 8.1 Turbidity monitoring sites for the maintenance dredging campaign

8.1.1 Seagrass monitoring

Seagrass epiphyte loading will be monitored to document any potential effect of nutrient release on epiphyte growth. Photographs of the seagrass meadows shall be taken in ten randomly placed 20 x 20 cm quadrats, one week prior to, once during and one week after dredging at each of the outer sites with seagrass (CS1, OS5, OS6, OS7 and OS8) (Table 8.1; Figure 8.1). Epiphyte cover shall be visually assessed from the photographs and qualitatively classified as low, medium or high density. Any change in epiphyte cover shall be documented in the close-out report.

8.2 Return water

Return water will be monitored for TBT and acidity during sediment disposal to land.

8.2.1 Acidity

The return water shall be tested daily using a hand-held pH probe. If the pH of the return water falls below 7.2 the cells shall be closed and dosed with lime through a direct agitation method until the pH of the return water is greater than 7.2.

8.2.2 TBT

The levels of TBT in the return water are not expected to be an issue as the small amount of TBT contaminated sediments in dredge areas A and C2 will be mixed with clean sediments during dredging. However, TBT concentrations in the return water will be measured to confirm that the ANZECC/ARMCANZ (2000) Trigger Levels are not exceeded. Three samples of return water shall be taken from the settlement pond prior to overflow. The water samples shall be kept cool (not frozen) and couriered to the laboratory as soon as possible. Results shall be compared against the ANZECC/ARMCANZ (2000) 90% Species Protection Trigger Values for marine water. It is noted that the results from these laboratory analysis will likely not be available until after the dredging operation is already complete due to the short duration. If the monitoring results show that the 90% trigger level is not met in return waters for any of the contaminants, a conservative Low Ecological Protection Area (LEPA) will be defined covering an area of 50 x 50 m around the discharge point. A one-off sampling exercise will be conducted adjacent to the discharge point, following cessation of discharge, to ensure that the 90% trigger level is met in the marine environment for TBT in discharge waters. Depth integrated water samples will be collected from five sites within the LEPA and sent to a laboratory for analysis. If the 90% trigger level is not met, monitoring will continue on a monthly basis until the trigger is met. Results shall be documented in the close-out report.

8.3 Marine fauna

These monitoring and management guidelines have been developed to avoid, reduce or mitigate any potential impacts to whales (and other protected marine fauna visible at the surface) as a result of dredging operations during the maintenance dredging of Albany Port. Observations will also be made of other protected marine fauna (e.g. sea lions, dolphins, sharks and any schooling fish) during the monitoring program to inform future dredging operations.

The management guidelines have been developed with reference to DEWHA (2008) *EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales*. However, it should be noted the proposed monitoring and management has been adapted from this policy statement. The policy document has been developed for seismic explorations which generate more noise than trailer suction dredging, which is similar to the noise of background shipping. A level of conservatism has been adopted and the dredging has been assumed to be an elevated acoustic disturbance due to an absence of noise modelling or measurements of noise generated by the dredge vessel. The plan and measures employed are based on the likelihood of

encountering a whale (or other marine faunal species) protected by the EPBC Act during the survey.

Modifications to the recommendations in the DEWHA (2008) policy statement have been adopted due to the low level of noise generated by the dredge vessel in relation to background shipping noise; the low likelihood of encountering whales (the dredge will only cross the whale migration route when travelling to and from the offshore disposal area – a maximum of eight times per day, during 1–2 weeks of dredging) and the inability for a TSHD to operate at ‘low power’ or turn off engines. The dredge vessel requires the engine to be running to navigate safely.

Several EPBC listed marine species (sharks, dolphins, turtles and sea lions) may be present in the vicinity of the dredge and disposal area. These species are smaller than whales and able to change direction more quickly to avoid impacts. As such the risk of impact during dredging and disposal activities is considered low and sightings of these species will not trigger a delay in dredging.

8.3.1 Cetacean impact avoidance

Pre-start up procedures

- Visual observations for the presence of protected marine fauna are to be undertaken by a suitably trained observer (Section 8.3.2) for at least 5 min before the commencement of dredge suction. Visual observations will be conducted during day operations using binoculars and from the bridge of the dredge vessel at night.
- Activities may only commence if no protected marine fauna have been sighted within 300 m (the exclusion zone). Visual observations will commence during the period of steaming to the dredge location and can include the time where the drag-heads are lowered to the bed (the noise generated during this process is similar to background shipping traffic).
- If any protected marine fauna are observed within the exclusion zone, dredging may not commence until the animal is observed to leave the exclusion zone, until 20 min of observations have passed since the last sighting or until the dredge moves at least 300 m away from the marine fauna.
- All observations will be recorded on the Environment Australia Whale and Dolphin Sighting Report form (http://data.aad.gov.au/aadc/whales/report_sighting.cfm).

Start-up procedures

- Start-up procedures should be used each time dredging is initiated with the dredge suction turned on only after the pre-start up procedure has been followed. The noise of the vessel engine steaming to the site will provide a ramp-up of the acoustic source, which may alert whales in the area to the presence of the dredging and enable animals to move and avoid (or stand off) at distances where injury is unlikely.
- If any protected marine fauna are spotted within, or are about to enter, the exclusion zone, the dredge vessel should navigate away from the fauna (as the engine cannot be shut down completely for navigation safety).
- Start-up procedures should only resume after the animal is observed to leave the exclusion zone, until 20 min of observations have passed since the last sighting or until the dredge moves at least 300 m away from the marine fauna.

Operations procedures

- During dredging, a trained observer will undertake regular visual observations during the acoustic operations. As a minimum, at least one observer should scan the exclusion zone at 1 hour intervals for at least 5 min.

Stop work/continuation procedures

- If any protected marine fauna are sighted within, or about to enter, the exclusion zone during operations, the dredge vessel should navigate away from the marine fauna (as the engine cannot be shut down completely for navigation safety).
- The dredge vessel can navigate at least 300 m away from the marine fauna and continue dredging in a new exclusion zone.
- The dredge vessel can return to the area of dredging and commence suction, only after the protected marine fauna has been observed to move outside the exclusion zone, or when 20 min has lapsed since the last sighting.

8.3.2 Trained observers

The APA will ensure that there are sufficiently trained observers to satisfy the basic requirements outlined above. The trained observers will be briefed prior to the commencement of dredging by a person with proven experience in marine fauna observation, distance estimation and reporting.

A briefing will be provided to all observers on environmental matters, protected marine fauna identification and the environmental legal obligations for companies operating in Australian waters. Appropriate reference materials, visual aids and reporting materials will be provided to the trained observers to assist reporting any protected marine fauna sighted.

8.4 Introduced marine pests

It is anticipated that the dredge vessel will be travelling from another location within Western Australian state waters prior to arriving in the port. The APA will confirm with the contractor that the dredger arrives with non-fouled hulls, and to have performed adequate hopper washing and ballast water exchanges in accordance with the Australian Quarantine Inspection Services (AQIS) ballast water management requirements prior to arrival in Albany Port. Ships must also submit a Quarantine Pre-Arrival Report (QPAR) to AQIS 12–48 hours prior to arrival and complete the ballast water uptake/discharge log and treatment/exchange log and retain these on board. In addition, the Western Australian Department of Fisheries (DoF) will be notified in advance of the: name; previous location; and most recent inspection date of the dredge vessel.

Upon arrival, the APA will coordinate a diving survey of the hull and an onboard inspection for mud and sediment to confirm the fulfilment of contract conditions. The control of ballast water and management of introduced species is managed by the AQIS. Following the IMO Ballast Water Protocols and AQIS's Mandatory Ballast Water Requirements during port operations it is unlikely that there will be a significant increase in the risk of introductions. The APA will immediately notify the DoF, AQIS and the DoW if any introduced marine pests are observed.

8.5 Reporting

The results of the Secchi depth, seagrass and return water pH and TBT monitoring shall be included in the close-out report. A copy of the completed close out report shall be made available to the DoW within 2 months of the works completion.

An additional report, on the dredging operations and any protected marine fauna interactions will be provided to the DoE within 2 months of the works completion. The report will contain:

- the location, date and start time of dredging
- name, qualification and experience of any trained observers (or scientists) involved in the observation
- the location, times and reasons when observations were hampered by poor visibility or high winds
- the location and time of any start-up delays or stop work procedures instigated as a result of protected marine fauna sightings
- the location, time and distance of any protected marine fauna sighting including species where possible and
- the date and time of survey completion.

All observation records will be collated and archived by APA and made available to the DoE on request.

9. Stakeholder Consultation

Representatives from the following stakeholders have been consulted in relation to the proposed maintenance dredging in the Port of Albany:

- Port customers
- Department of Water
- Department of Fisheries
- Department of Transport
- Department of Parks and Wildlife
- Department of Environment and Regulation
- City of Albany
- South Coast Diving Supplies
- Albany Ocean Adventures
- Albany Whale Tours
- South Coast Purse Seine Fishery
- Great Southern Aquaculture Association
- Environmentalists/surfers
- Centre for Excellence in Natural Resources – UWA
- South Coast NRM.

Albany Port Authority continues to present details on the maintenance dredging proposal and the campaign based on the EIA document (this document) to the stakeholder members. Stakeholder meetings were held on 16, 17 and 18 June 2014 and the APA CEO discussed the dredging campaign on local ABC radio on 11 June 2014 to raise public awareness.

10. References

- Ahern CR, McElnea AE, Sullivan LA (2004) Acid Sulfate Soils Laboratory Methods Guidelines. Queensland Department of Natural Resources Mines and Energy, Indooroopilly, Queensland, June 2004
- ANZECC, ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Volume 1: The Guidelines. Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council of Australia and New Zealand, Canberra, Australian Capital Territory, October 2000
- ATA Environmental (2000) Albany Port Developments Dredge and Dredge Spoil Disposal Management Plan, Volume II, Appendices 7. Prepared for Albany Port Authority by ATA Environmental, Report No. 2000/62, Perth, Western Australia, September 2000
- BMT Oceanica (2013) Albany Port Authority Maintenance Dredging Program – Sediment Sampling and Analysis Plan (SAP). Prepared for Albany Port Authority by BMT Oceanica Pty Ltd, Report No. 812_01_001/1_Rev0, Perth, Western Australia, October 2013
- BMT Oceanica (2014) Albany Port Authority Maintenance Dredging Program – Sediment Sampling and Analysis Implementation. Prepared for Albany Port Authority by BMT Oceanica Pty Ltd, Report No. 812_01_002/1_Rev0, Perth, Western Australia, May 2014
- Bridges TS, Ells S, Hayes D, Mount D, Nadeau SC, Palermo MR, Patmont C, Schroeder P (2008) The Four Rs of Environmental Dredging: Resuspension, Release, Residual, and Risk. US Army Corps of Engineers, Engineer Research and Development Center, Report No. ERDC/EL TR-08-4, Washington, DC, February 2008
- CoA (2009) National Assessment Guidelines for Dredging. Commonwealth of Australia, Canberra, Australian Capital Territory
- CoA (2014) Marine Pests. National System for the Prevention and Management of Marine Pest Incursions, Commonwealth of Australia, Canberra, Australian Capital Territory. Available at <http://www.marinepests.gov.au/marine_pests> [Accessed May 2014]
- Collier CJ (2006) Characterising responses of the seagrass *Posidonia sinuosa* to changes in light availability. PhD Thesis, Faculty of Computing, Health and Science, Edith Cowan University, Perth, Western Australia
- DEC (2009) Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes: Acid Sulfate Soils Guideline Series. Department of Environment and Conservation, Contaminated Sites Branch Environmental Regulation Division, Perth, Western Australia, May 2009
- DEWHA (2008) EPBC Act Policy Statement 2.1 – Interaction between offshore seismic exploration and whales. Department of the Environment Water Heritage and the Arts, Canberra, Australian Capital Territory, September 2008
- DEC (2010) Contaminated Sites Management Series – Assessment Levels for Soil, Sediment and Water –. Department of Environment, Perth, Western Australia, February 2010
- DoE (2011) Treatment and Management of Soils and Water in Acid Sulfate Soil Landscapes. Department of Environment, Perth, Western Australia, July 2011
- DoE (2014) EPBC Act Protected Matters Report. Department of the Environment, Canberra, Australian Capital Territory. Available at <<http://www.environment.gov.au/epbc/pmst>> [Accessed 29 May 2014]

- DoW (2008) Princess Royal Harbour and Oyster Harbour benthic habitat survey. Internal report. Perth, Western Australia
- Ecologia (2007) Albany Iron Ore Project Public Environmental Review, Albany Port Expansion Proposal. EPA Assessment No. 1594. Prepared for the Albany Port Authority by Ecologia Environment, Perth, Western Australia
- Ecologia (2008) Dredging and Land Reclamation Environmental Management Plan – Albany Port Expansion Proposal. EPA Assessment No 1594. Prepared for Albany Port Authority by Ecologia Environment, Perth, Western Australia, August 2008
- EPA (1990) Albany Harbours Environmental Study 1988–89, Bulletin 412. Environmental Protection Authority, Perth, Western Australia, February 1990
- Hillman K, Lukatelich RJ, Bastyan G, McComb AJ (1990) Distribution of Biomass of Seagrasses and Algae, and Nutrient Pools in Water, Sediments and Plants in Princess Royal Harbour and Oyster Harbour. Centre for Water Research, Report No. EPA Technical Series 40, Perth, Western Australia, November 1990
- Huisman JM, Jones DS, Wells FE, Burton T (2008) Introduced marine biota in Western Australian waters. *Records of the Western Australian Museum* 24:323–366
- JFA (2005) Southdown Magnetite Iron Ore Project – Albany Port Upgrade. Prepared for Grange Resources Limited by JFA Consultants Pty Ltd, Perth, Western Australia, August 2005
- Mackey P (2009) Return Water Management Plan for the Minor Maintenance Program required to Safely Re-instate the Declared Depths at Albany Port. Prepared for the Albany Port Authority, January 2009
- Mackey P, Fretton S (2008) Return Water Management Plan for UXO Recovery Pumping at the Old Curved and Straight-Armed Jetties located at Port Albany. Prepared for the Albany Port Authority, April 2008
- McDonald JI, Wells FE, Travers J (2009) Results of the 2007 survey of the Albany Marine Area for Introduced Marine Species. Department of Fisheries, Report No. 188, Perth, Western Australia
- MPSRWG (1994) A Representative Marine Reserve System for Western Australia. Marine Parks & Reserves Selection Working Group, Perth, Western Australia, June 1994
- Oceanica (2007) Owen Anchorage Pressure State Response Report. Prepared for Department of Environment and Conservation by Oceanica Consulting Pty Ltd, Report No. 508/1, Perth, Western Australia, February 2007
- Oceanica (2009) Albany Port Authority Maintenance Dredging Program – Sediment Sampling and Analysis Plan (SAP). Prepared for Albany Port Authority by Oceanica Consulting Pty Ltd, Report No. 812_001/1, Perth, Western Australia, September 2009
- Oceanica (2010a) Albany Port Authority Maintenance Dredging – Sediment Sampling and Analysis Implementation Report. Prepared for Albany Port Authority by Oceanica Consulting Pty Ltd, Report No. 812_001/2, Perth, Western Australia, May 2010
- Oceanica (2010b) Albany Port Proposed Maintenance Dredging 2010 – Environmental Impact Assessment. Prepared for Albany Port Authority by Oceanica Consulting Pty Ltd, Report No. 812_001/3, Perth, Western Australia, June 2010
- SKM (2007) Albany Iron Ore Project Albany Port Expansion Proposal: Sampling and Analysis Plan and Benthic Primary Producer Habitat Report, Revision 7. Prepared for Grange Resources by Sinclair Knight Merz Pty Ltd, Perth, Western Australia, October 2007

- SKM (2009) Cape Lambert Port B Development – Cetacean Management Plan. Prepared for Rio Tinto by Sinclair Knight Merz Pty Ltd, Perth, Western Australia, August 2009
- Southall BL, Bowles AE, Ellison WT, Finneran JJ, Gentry RL, Greene Jr. CR, Kastak D, Ketten DR, Miller JH, Nachtigall PE, Richardson WJ, Thomas JA, Tyack PL (2007) Marine mammal noise exposure criteria: Initial scientific recommendations. *Aquatic Mammals* 33:411–414
- Strategen (2008) Albany Protected Harbour Development – Environmental Protection Statement. Prepared for LandCorp by Strategen, Perth, Western Australia, September 2008
- USEPA (2007) ProUCL version 4.0. United States Environmental Protection Authority, Atlanta, Georgia

Appendix A
EPA Referral Form



Environmental Protection Authority

**EPA REFERRAL
FORM
PROPONENT**

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).	✓	
Included Attachment 3 – confidential information (if applicable).		✓
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 type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> Not sure
If yes, what level of assessment?		
<input type="checkbox"/> Assessment on Proponent Information	<input type="checkbox"/> Public Environmental Review	

PROPONENT DECLARATION (to be completed by the proponent)

I, Rachael Goetze declare that I am authorised on behalf of the Albany 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): Rachael Goetze
Position: Environment Officer	Company: Albany Port Authority
Date 17/06/2014	

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	Albany Port Authority (APA)
Joint Venture parties (if applicable)	N/A
Australian Company Number (if applicable)	N/A
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)	PO Box 175 Albany WA 6331
Key proponent contact for the proposal: <ul style="list-style-type: none">• name• address• phone• email	Rachael Goetze 85 Brunswick Road, Albany WA 6330 9892 9000 rachael.goetze@albanyport.com.au
Consultant for the proposal (if applicable): <ul style="list-style-type: none">• name• address• phone• email	Jonathan Anderson BMT Oceanica Consulting 353 Cambridge Street, Wembley WA 6913 6272 0000 jonathan.anderson@bmtoceanica.com.au

1.2 Proposal

Title	Albany Port Maintenance Dredging
Description	Maintenance dredging in the Albany Port to return the bathymetry to design depth with disposal of the majority of sediments to an offshore disposal site.
Extent (area) of proposed ground disturbance.	Approximately 32.25 ha in a 130 ha envelope.
Timeframe in which the activity or development is proposed to occur (including start and finish dates where applicable).	The dredging is planned to occur in 2014. The exact timing has not yet been determined as the APA is hoping to opportunistically secure a passing dredge to reduce mobilisation costs. The dredging is anticipated to take approximately 2-3 weeks; however approval will be sought for an 8 week window to allow for contingencies.
Details of any staging of the proposal.	N/A
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.	This proposal is not related to any other projects in the region.
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?	Yes. The Albany Port Authority owns approximately 90 ha of land adjacent to the harbour area.
What is the current land use on the property, and the extent (area in hectares) of the property?	The property is 90 ha with the current land use designated to Port related activities and development.

1.3 Location

Name of the Shire in which the proposal is located.	Shire of Albany
For urban areas: <ul style="list-style-type: none"> • street address; • lot number; • suburb; and • nearest road intersection. 	Princess Royal Drive, Albany WA 6330 N/A Albany Princess Royal Drive and Bolt Terrace
For remote localities: <ul style="list-style-type: none"> • nearest town; and • distance and direction from that town to the proposal site. 	N/A
Electronic copy of spatial data - GIS or CAD, geo-referenced and conforming to the following parameters: <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. 	Enclosed?: Yes, GIS information as part of data package

1.4 Confidential Information

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

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 Environment	Sea Dumping Permit	Yes	Chris Murphy
Department of Environment	EPBC Approval	Yes	Michael Ward
Department of Water	Dredging Licence	Yes	Karen McKeough

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)?

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.

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.

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.

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?

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 key potential risks of the proposal to marine fauna (cetaceans, pinnepids, sharks) include the risk of underwater noise from dredging activities and the risk of collisions due to vessel movement. Please refer to Sections 7.6 and 7.7 of the attached EIA which documents these potential impacts.

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.

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)

Please see NatureMap Report attached at end of application.

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.

A NatureMap search identified three threatened fauna species in the vicinity of the project area. These species include: the southern right whale (*Eubalaena australis*), the humpback whale (*Megaptera novaeangliae*) and the Indian yellow-nosed albatross (*Thalassarche carteri*) all of which are listed as rare or likely to become extinct.

The Southern Right Whale and the Humpback Whale are known to frequently occur in the project area, particularly during the peak whale season which runs from June to October. See Section 7.7 of the attached EIA for further details.

The Indian yellow-nosed albatross is a pelagic bird species known to feed in the South-west marine region along the edge of the continental shelf between January and November (DSEWPAC 2012). During July and August the species is common between Cape Naturaliste and King George Sound where it has been recorded feeding in offshore waters (DSEWPAC 2012). This is supported by the bird watching group 'Leeuwin Current Birding' who often sight the species in the open waters beyond Breaksea Island, Michaelmas Island and Bald Head. There are no colonies of Albatross's breeding in Albany waters, with the species migrating from Prince Edward, Crozet, Amsterdam, St Paul and Kerguelen Islands in the southern Indian Ocean (Collins P, Department of Parks and Wildlife, pers. comm). As there are no breeding colonies in the region, and the proposal is not taking place in the vicinity of the continental shelf it is unlikely that there will be any impact on the Indian Yellow-nosed Albatross.

An EPBC search of the project area was also undertaken using the online EPBC Protected Matters Search Tool. Threatened species known to be present include the endangered southern right whale (*Eubalaena australis*), the vulnerable humpback whale (*Megaptera novaeangliae*) and the vulnerable great white shark (*Carcharodon carcharias*). A full list of threatened species, their status and type of presence is given in Section 7.7.1 of the attached EIA. The proposal has been referred to the Department of Environment (formerly DSEWPAC) for assessment of 'Listed threatened species and communities' under the *Environmental Protection and Biodiversity Conservation Act 1999*.

References:

Department of Sustainability, Environment, Water, Population and Communities (2012) *Species Group Report Card – Supporting the marine bioregional plan for the South-west Marine Region*, prepared under the *Environment Protection Biodiversity and Conservation Act 1999*, Commonwealth of Australia.

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.

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.

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.

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 type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Perth's Bush Forever site	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Unsure
Environmental Protection (Swan & Canning Rivers) Policy 1998	<input type="checkbox"/> Yes	<input 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 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 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.

There are four Type 1A Nature Reserves within the vicinity of the project area including Michaelmas Island (No. 30049), Breaksea Island (No. 27614), Mistaken Island and Seal Island (No. 32199). All of the islands are managed by the local Department of Parks and Wildlife (formerly Department of Environment and Conservation).

As the proposal is marine-based, it is unlikely to impact on any of the surrounding Nature Reserves.

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 proposal is maintenance dredging therefore setback is not applicable.

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.

2.5.4 Is the development likely to impact on mangroves?

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

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.

The project area is not adjacent to any coral reefs or mangroves but is adjacent to seagrass meadows. The proposal is not expected to have any adverse impacts on adjacent seagrass meadows given the short duration of the dredging. As a precaution, Secchi depth monitoring will be undertaken during the dredging operation. Please refer to Section 7.2 and 8.1 of the attached EIA for further information.

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.

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 project area is designated for Port Use and is primarily an active shipping channel with recreational fishers having to give way to port-related activities. However, a small portion of the project area is occasionally used by recreational fishers targeting King George Whiting, trevally, leatherjacket and squid. (Ecologia 2007). Commercial fishing vessels are also known to occasionally target areas adjacent to the project area during late summer and early autumn (Ecologia 2007).

Given the short duration of the proposal, it is unlikely that there will be any adverse impact on recreational or commercial fishing activities. Community consultation with key fishing industries has been undertaken (refer to Section 9 of the attached EIA).

Recreational and commercial fishing vessels also frequently transit through the channel area from the Albany Town Jetty Marina. This transition is not expected to be impacted and a navigational warning will be in place during the proposal.

References:

Ecologia (2007) *Albany Iron Ore Project Public Environmental Review Albany Port Expansion Proposal EPA Assessment Number No. 1594*, Ecologia Environment, Perth, Western Australia.

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? [N/A](#)

2.7.8 What is the proposed source of water for the proposal? (e.g. dam, bore, surface water etc.) [N/A](#)

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.

2.8.3 Will the proposal result in gaseous emissions to air?

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

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.

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 will drain from the land disposal area back into Port waters within the Harbour Basin. The makeup of this return water is discussed in Sections 6.4.2 and 6.5 of the EIA document.

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.

The potential impacts and monitoring of the return water discharge from land disposal to Port waters is discussed in Sections 7.2.2–7.4 and 8.2 of the EIA document.

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.

Please refer to Sections 3 and 6 in the EIA document for a detailed description of the nature, concentration and Section 2 of the EIA document for the disposal location and methods.

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

Yes

No

If yes, please briefly describe.

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.

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".

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.

The harbour sediments in the berthing pockets of the Port have historically been contaminated due port-related activities and the use of antifouling paints containing tributyltin (TBT).

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

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

Sediments in the project area have been sampled and analysed for contaminants during three separate investigations in 2005, 2010 and more recently 2013. Please refer to Section 6 of the attached EIA for further information.

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.

An Aboriginal Heritage Sites search was undertaken using the Department of Aboriginal Affairs Aboriginal Heritage Inquiry System on 15 June 2014 (Attachment 2). This revealed there are no sites of Aboriginal significance within the direct project area that could be disturbed. The closest registered Aboriginal Site is King Point (ID 5743) which is located along the shoreline overlooking the entrance to the shipping channel.

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.

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 |

Please refer to Section 7.12 of the EIA document for details.

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

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.

Please refer to Section 9 of the EIA document.

NatureMap Species Report

Created By Guest user on 22/10/2013

Current Names Only Yes
 Core Datasets Only Yes
 Data Source WA Threatened Fauna Database
 Method 'By Polygon'
 Group By Conservation Status

Conservation Status	Species	Records
Rare or likely to become extinct	3	3
TOTAL	3	3

Name ID	Species Name	Naturalised	Conservation Code	Endemic To Query Area
Rare or likely to become extinct				
1.	24043 <i>Eubalaena australis</i> (Southern Right Whale)		T	
2.	24051 <i>Megaptera novaeangliae</i> (Humpback Whale)		T	
3.	34134 <i>Thalassarche carteri</i> (Indian Yellow-nosed Albatross)		T	

Conservation Codes
 T - Rare or likely to become extinct
 X - Presumed extinct
 IA - Protected under international agreement
 S - Other specially protected fauna
 1 - Priority 1
 2 - Priority 2
 3 - Priority 3
 4 - Priority 4
 5 - Priority 5

¹ For NatureMap's purposes, species flagged as endemic are those whose records are wholly contained within the search area. Note that only those records complying with the search criterion are included in the calculation. For example, if you limit records to those from a specific datasource, only records from that datasource are used to determine if a species is restricted to the query area.

Appendix B

EPBC Referral Form



Australian Government

Department of Sustainability, Environment, Water, Population and Communities

Referral of proposed action

What is a referral?

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) provides for the protection of the environment, especially matters of national environmental significance (NES). Under the EPBC Act, a person must not take an action that has, will have, or is likely to have a significant impact on any of the matters of NES without approval from the Australian Government Environment Minister or the Minister's delegate. (Further references to 'the Minister' in this form include references to the Minister's delegate.) To obtain approval from the Environment Minister, a proposed action should be referred. The purpose of a referral is to obtain a decision on whether your proposed action will need formal assessment and approval under the EPBC Act.

Your referral will be the principal basis for the Minister's decision as to whether approval is necessary and, if so, the type of assessment that will be undertaken. These decisions are made within 20 business days, provided sufficient information is provided in the referral.

Who can make a referral?

Referrals may be made by or on behalf of a person proposing to take an action, the Commonwealth or a Commonwealth agency, a state or territory government, or agency, provided that the relevant government or agency has administrative responsibilities relating to the action.

When do I need to make a referral?

A referral must be made for actions that are likely to have a significant impact on the following matters protected by Part 3 of the EPBC Act:

- World Heritage properties (sections 12 and 15A)
- National Heritage places (sections 15B and 15C)
- Wetlands of international importance (sections 16 and 17B)
- Listed threatened species and communities (sections 18 and 18A)
- Listed migratory species (sections 20 and 20A)
- Protection of the environment from nuclear actions (sections 21 and 22A)
- Commonwealth marine environment (sections 23 and 24A)
- Great Barrier Reef Marine Park (sections 24B and 24C)
- A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
- The environment, if the action involves Commonwealth land (sections 26 and 27A), including:
 - actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land);
 - actions taken on Commonwealth land that may have a significant impact on the environment generally;
- The environment, if the action is taken by the Commonwealth (section 28)
- Commonwealth Heritage places outside the Australian jurisdiction (sections 27B and 27C)

You may still make a referral if you believe your action is not going to have a significant impact, or if you are unsure. This will provide a greater level of certainty that Commonwealth assessment requirements have been met.

To help you decide whether or not your proposed action requires approval (and therefore, if you should make a referral), the following guidance is available from the Department's website:

- the Policy Statement titled Significant Impact Guidelines 1.1 – Matters of National Environmental Significance. Additional sectoral guidelines are also available.

- the Policy Statement titled Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies.
- the draft Policy Statement titled Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources.
- the interactive map tool (enter a location to obtain a report on what matters of NES may occur in that location).

Can I refer part of a larger action?

In certain circumstances, **the Minister may not accept a referral for an action that is a component of a larger action and may request the person proposing to take the action to refer the larger action for consideration under the EPBC Act (Section 74A, EPBC Act)**. If you wish to make a referral for a staged or component referral, read 'Fact Sheet 6 Staged Developments/Split Referrals' and contact the Referral Business Entry Point (1800 803 772).

Do I need a permit?

Some activities may also require a permit under other sections of the EPBC Act or another law of the Commonwealth. Information is available on the Department's web site.

Is your action in the Great Barrier Reef Marine Park?

If your action is in the Great Barrier Reef Marine Park it may require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If a permission is required, referral of the action under the EPBC Act is deemed to be an application under the GBRMP Act (see section 37AB, GBRMP Act). This referral will be forwarded to the Great Barrier Reef Marine Park Authority (the Authority) for the Authority to commence its permit processes as required under the Great Barrier Reef Marine Park Regulations 1983. If a permission is not required under the GBRMP Act, no approval under the EPBC Act is required (see section 43, EPBC Act). The Authority can provide advice on relevant permission requirements applying to activities in the Marine Park.

The Authority is responsible for assessing applications for permissions under the GBRMP Act, GBRMP Regulations and Zoning Plan. Where assessment and approval is also required under the EPBC Act, a single integrated assessment for the purposes of both Acts will apply in most cases. Further information on environmental approval requirements applying to actions in the Great Barrier Reef Marine Park is available from <http://www.gbrmpa.gov.au/> or by contacting GBRMPA's Environmental Assessment and Management Section on (07) 4750 0700.

The Authority may require a permit application assessment fee to be paid in relation to the assessment of applications for permissions required under the GBRMP Act, even if the permission is made as a referral under the EPBC Act. Further information on this is available from the Authority:

Great Barrier Reef Marine Park Authority

2-68 Flinders Street PO Box 1379
Townsville QLD 4810
AUSTRALIA

Phone: + 61 7 4750 0700
Fax: + 61 7 4772 6093

www.gbrmpa.gov.au

What information do I need to provide?

Completing all parts of this form will ensure that you submit the required information and will also assist the Department to process your referral efficiently. If a section of the referral document is not applicable to your proposal enter N/A.

You can complete your referral by entering your information into this Word file.

Instructions

Instructions are provided in blue text throughout the form.

Attachments/supporting information

The referral form should contain sufficient information to provide an adequate basis for a decision on the likely impacts of the proposed action. You should also provide supporting documentation, such as environmental reports or surveys, as attachments.

Coloured maps, figures or photographs to help explain the project and its location should also be submitted with your referral. Aerial photographs, in particular, can provide a useful perspective and context. Figures should be good quality as they may be scanned and viewed electronically as black and white documents. Maps should be of a scale that clearly shows the location of the proposed action and any environmental aspects of interest.

Please ensure any attachments are below three megabytes (3mb) as they will be published on the Department's website for public comment. To minimise file size, enclose maps and figures as separate files if necessary. If unsure, contact the Referral Business Entry Point (email address below) for advice. Attachments larger than three megabytes (3mb) may delay processing of your referral.

Note: the Minister may decide not to publish information that the Minister is satisfied is commercial-in-confidence.

How do I submit a referral?

Referrals may be submitted by mail or email.

Mail to:

Referral Business Entry Point
Environment Assessment Branch
Department of Sustainability, Environment, Water, Population and Communities
GPO Box 787
CANBERRA ACT 2601

- If submitting via mail, electronic copies of documentation (on CD/DVD or by email) are required.

Email to: epbc.referrals@environment.gov.au

- Clearly mark the email as a 'Referral under the EPBC Act'.
- Attach the referral as a Microsoft Word file and, if possible, a PDF file.
- **Follow up with a mailed hardcopy including copies of any attachments or supporting reports.**

What happens next?

Following receipt of a valid referral (containing all required information) you will be advised of the next steps in the process, and the referral and attachments will be published on the Department's web site for public comment.

The Department will write to you within 20 business days to advise you of the outcome of your referral and whether or not formal assessment and approval under the EPBC Act is required. There are a number of possible decisions regarding your referral:

The proposed action is NOT LIKELY to have a significant impact and does NOT NEED approval

No further consideration is required under the environmental assessment provisions of the EPBC Act and the action can proceed (subject to any other Commonwealth, state or local government requirements).

The proposed action is NOT LIKELY to have a significant impact IF undertaken in a particular manner

The action can proceed if undertaken in a particular manner (subject to any other Commonwealth, state or local government requirements). The particular manner in which you must carry out the action will be identified as part of the final decision. You must report your compliance with the particular manner to the Department.

The proposed action is LIKELY to have a significant impact and does NEED approval

If the action is likely to have a significant impact a decision will be made that it is a *controlled action*. The particular matters upon which the action may have a significant impact (such as World Heritage values or threatened species) are known as the *controlling provisions*.

The controlled action is subject to a public assessment process before a final decision can be made about whether to approve it. The assessment approach will usually be decided at the same time as the controlled action decision. (Further information about the levels of assessment and basis for deciding the approach are available on the Department's web site.)

The proposed action would have UNACCEPTABLE impacts and CANNOT proceed

The Minister may decide, on the basis of the information in the referral, that a referred action would have clearly unacceptable impacts on a protected matter and cannot proceed.

Compliance audits

If a decision is made to approve a project, the Department may audit it at any time to ensure that it is completed in accordance with the approval decision or the information provided in the referral. If the project changes, such that the likelihood of significant impacts could vary, you should write to the Department to advise of the changes. If your project is in the Great Barrier Reef Marine Park and a decision is made to approve it, the Authority may also audit it. (See "*Is your action in the Great Barrier Reef Marine Park*," p.2, for more details).

For more information

- call the Department of Sustainability, Environment, Water, Populations and Communities Community Information Unit on 1800 803 772 or
- visit the web site www.environment.gov.au/epbc

All the information you need to make a referral, including documents referenced in this form, can be accessed from the above web site.

Referral of proposed action

Project title: Albany Port Maintenance Dredging

1 Summary of proposed action

NOTE: You must also attach a map/plan(s) and associated geographic information system (GIS) vector (shapefile) dataset showing the location and approximate boundaries of the area in which the project is to occur. Maps in A4 size are preferred. You must also attach a map(s)/plan(s) showing the location and boundaries of the project area in respect to any features identified in 3.1 & 3.2, as well as the extent of any freehold, leasehold or other tenure identified in 3.3(i).

1.1 Short description

The objective of this proposal is to conduct maintenance dredging in the Albany Port to safely re-instate the declared depths of the waters thus ensuring safe navigability. A hydrographic survey undertaken in June 2013 revealed significant sediment accretion in sections of both the channel and the berthing area, posing a risk to shipping activities. As a result, the Albany Port Authority (APA) proposes to dredge the channel and the berthing area back to design levels. It is proposed to dispose the majority of the material to an existing offshore disposal ground and to dispose a portion of the material into the APA's existing settlement ponds. See sections 1 and 2 of the EIA document for further detail.

1.2 Latitude and longitude

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

location point	Latitude			Longitude		
	degrees	minutes	seconds	degrees	minutes	seconds

Please See Excel spreadsheet and metadata attached in data package

If the area is less than 5 hectares, provide the location as a single pair of latitude and longitude references. If the area is greater than 5 hectares, provide bounding location points.

There should be no more than 50 sets of bounding location coordinate points per proposal area.

Bounding location coordinate points should be provided sequentially in either a clockwise or anticlockwise direction.

Also attach the associated GIS-compliant file that delineates the proposed referral area. If the area is less than 5 hectares, please provide the location as a point layer. If greater than 5 hectares, please provide a polygon layer. If the proposed action is linear (eg. a road or pipeline) please provide a polyline layer (refer to GIS data supply guidelines at [Attachment A](#)).

Do not use AMG coordinates.

Dredge Footprint:

Please See Excel spreadsheet and metadata attached
 "dredge-point-prop-891121C_albany_20130924_utm50_gda94.xlsx"

Disposal Ground:

Centre Coordinates, 900 m radius	Latitude (s)			Longitude (e)		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	35	04	55	118	01	40

Settlement Pond:

Single Location Reference Point	Latitude (s)			Longitude (e)		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	35	02	12	117	54	10

1.3 **Locality and property description**

The Albany Port is located on Princess Royal Drive, Albany, Western Australia 6330 on the northern shoreline of Princess Royal Harbour.

1.4 **Size of the development footprint or work area (hectares)**

Dredge footprint: 32.25 ha
 within a 130 ha envelope.

Disposal ground: 254.5 ha

Settlement Pond: 1.4 ha

1.5 **Street address of the site**

N/A

1.6 **Lot description**

N/A

1.7 **Local Government Area and Council contact (if known)**

N/A

1.8 **Time frame**

The timing of the maintenance dredging has not yet been determined as the APA is hoping to opportunistically secure a passing dredge to reduce mobilisation costs. The dredging is anticipated to be carried out in 2014 with the process taking approximately 2-3 weeks. However, approval will be sought for an 8 week window to allow for contingencies.

1.9	Alternatives to proposed action Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?		No
		✓	Yes, you must also complete section 2.2
1.10	Alternative time frames etc Does the proposed action include alternative time frames, locations or activities?		No
		✓	Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	State assessment Is the action subject to a state or territory environmental impact assessment?		No
		✓	Yes, you must also complete Section 2.5
1.12	Component of larger action Is the proposed action a component of a larger action?	✓	No
			Yes, you must also complete Section 2.7
1.13	Related actions/proposals Is the proposed action related to other actions or proposals in the region (if known)?	✓	No
			Yes, provide details:
1.14	Australian Government funding Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	✓	No
			Yes, provide details:
1.15	Great Barrier Reef Marine Park Is the proposed action inside the Great Barrier Reef Marine Park?	✓	No
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.7.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

Please refer to Attachment 1 - EIA document (Sections 1 and 2)

2.2 Alternatives to taking the proposed action

This should be a detailed description outlining any feasible alternatives to taking the proposed action (including not taking the action) that were considered but are not proposed (note, this is distinct from any proposed alternatives relating to location, time frames, or activities – see section 2.3).

Please refer to Sections 2.1.2 of the EIA document

2.3 Alternative locations, time frames or activities that form part of the referred action

If you have identified that the proposed action includes alternative time frames, locations or activities (in section 1.10) you must complete this section. Describe any alternatives related to the physical location of the action, time frames within which the action is to be taken and alternative methods or activities for undertaking the action. For each alternative location, time frame or activity identified, you must also complete (where relevant) the details in sections 1.2-1.9, 2.4-2.7, 3.3 and 4. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, time frames or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

The timing of the maintenance dredging has not yet been determined as the APA is hoping to opportunistically secure a passing dredge to reduce mobilisation costs. The dredging is anticipated to be carried out between November 2014 and April 2015 with the process taking approximately 2-3 weeks. However, approval will be sought for an 8 week window to allow for contingencies.

2.4 Context, planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (e.g. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

The design depth of Albany Port is 12.2 m LAT in the harbour basin and 12.9 m LAT in the entrance channel. A hydrographic survey conducted in 2013 shows that some areas have accreted sediment up to 2 m thus posing a risk to navigational safety. Albany Port Authority proposes to dredge the harbour basin and entrance channel to restore design depths.

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.11) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

The attached document constitutes an environmental impact assessment which will be submitted along with a referral to the Environmental Protection Authority under Section 38(1) of the *Environmental Protection Act 1986*, and with an application for a sea dumping permit under the *Commonwealth Environmental Protection (Sea Dumping) Act 1981*. These two applications will be submitted concurrent to this application.

2.6 Public consultation (including with Indigenous stakeholders)

Your referral must include a description of any public consultation that has been, or is being, undertaken. Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral. Where appropriate include copies of documents recording the outcomes of any consultations.

Please refer to Section 9 of the EIA document.

2.7 A staged development or component of a larger project

N/A

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

3.1 (a) World Heritage Properties

Description

N/A

Nature and extent of likely impact

N/A

3.1 (b) National Heritage Places

Description

N/A

Nature and extent of likely impact

N/A

3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

Description

N/A

Nature and extent of likely impact

N/A

3.1 (d) Listed threatened species and ecological communities

Description

A search of the online EPBC Act protected Matters Search Tool revealed that a number of threatened marine species may occur within the waters near Albany including whales, pinnipeds and sharks. Threatened species known to be present include the endangered southern right whale (*Eubalaena australis*), the vulnerable humpback whale (*Megaptera novaeangliae*) and the vulnerable great white shark (*Carcharodon carcharias*). A full list of threatened species, their status and type of presence is given in Section 7.7 of the attached EIA.

Nature and extent of likely impact

Address any impacts on the members of any listed threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

Potential impacts on threatened species are addressed in Sections 7.6 and 7.7 of the EIA document.

3.1 (e) Listed migratory species

Description

A search of the online EPBC Act protected Matters Search Tool revealed that a number of migratory marine species may occur within the waters near Albany including whales and sharks. Migratory species known to be present include the endangered southern right whale (*Eubalaena australis*), the vulnerable humpback whale (*Megaptera novaeangliae*) and the vulnerable great white shark (*Carcharodon carcharias*). A full list of migratory species, their status and type of presence is given in Section 7.7 of the attached EIA document.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

Potential impacts on threatened species are addressed in Sections 7.7 of the EIA document.

3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

Description

N/A

Nature and extent of likely impact

N/A

3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

Description

N/A

Nature and extent of likely impact

N/A

3.1 (h) The Great Barrier Reef Marine Park

Description

N/A

Nature and extent of likely impact

N/A

3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development

Description

N/A

Nature and extent of likely impact

N/A

3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park

3.2 (a)	Is the proposed action a nuclear action?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (b)	Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment

3.2 (c)	Is the proposed action to be taken in a Commonwealth marine area?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))

3.2 (d)	Is the proposed action to be taken on Commonwealth land?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))

3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	✓	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))

3.3 Other important features of the environment

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

3.3 (a) Flora and fauna

Please refer to Figure 8.1 in the EIA document which shows monitoring locations and the known extent of seagrass near Albany Port. Section 7.7 details the known marine fauna in the Albany area.

3.3 (b) Hydrology, including water flows

N/A

3.3 (c) Soil and Vegetation characteristics

N/A

3.3 (d) Outstanding natural features

N/A

3.3 (e) Remnant native vegetation

N/A

3.3 (f) Gradient (or depth range if action is to be taken in a marine area)

Bathymetric maps of the King George Sound and areas near the Port are in the EIA document Section 4.4

3.3 (g) Current state of the environment

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

Please refer to Section 3 and 4 of the EIA document.

3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values

N/A

3.3 (i) Indigenous heritage values

N/A

3.3 (j) Other important or unique values of the environment

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

Please refer to Section 4 of the EIA document for existing environment

3.3 (k) Tenure of the action area (eg freehold, leasehold)

The Port has jurisdiction over approximately 90 hectares of land that is managed by the Albany Port Authority. The APA also has jurisdiction over all of the waters and sea bed of Princess Royal Harbour (excluding the area around the Town Jetty) and all of King George Sound to an imaginary line which runs from Limestone Head to Breaksea Lighthouse and through to Herald Point. This equates to a total area of approximately 12,000 ha. Please refer to Figure 3.1 in the EIA document.

3.3 (l) Existing land/marine uses of area

The primary and legislated use of the adjacent land/marine area is for Port operations and the facilitation of trade. However, other uses of the area include recreational (e.g. fishing, boating and whale watching) and commercial (e.g. fishing, diving).

3.3 (m) Any proposed land/marine uses of area

N/A

4 Measures to avoid or reduce impacts

Note: If you have identified alternatives in relation to location, time frames or activities for the proposed action at Section 2.3 you will need to complete this section in relation to each of the alternatives identified.

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

For any measures intended to avoid or mitigate significant impacts on matters protected under the EPBC Act, specify:

- what the measure is,
- how the measure is expected to be effective, and
- the time frame or workplan for the measure.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

Provide information about the level of commitment by the person proposing to take the action to implement the proposed mitigation measures. For example, if the measures are preliminary suggestions only that have not been fully researched, or are dependent on a third party's agreement (e.g. council or landowner), you should state that, that is the case.

Note, the Australian Government Environment Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided on the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (eg be identified in the referral and fall within the responsibility of the person proposing to take the action),
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected, and
- must be realistic and practical in terms of reporting, auditing and enforcement.

More general commitments (eg preparation of management plans or monitoring) and measures aimed at providing environmental offsets, compensation or off-site benefits CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, if your proposal proceeds to these stages).

The Albany Port maintenance dredging program is of very short duration and is unlikely to cause any significant impact upon threatened or migratory species (refer to Section 7.7 of the attached EIA document) if completed between the time period of November 2014 and May 2015. However, an environmental monitoring program will be in place for the duration of dredging to avoid, reduce and mitigate potential impacts to threatened and migratory species (refer to Section 8.3 of the EIA document).

5 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

5.1 Do you THINK your proposed action is a controlled action?

- No, complete section 5.2
 Yes, complete section 5.3

5.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

The Albany Port Authority maintenance dredging program is small-scale and of short duration. Significant impacts on listed threatened or migratory species are unlikely because:

- There is a low likelihood of encountering whales and other large marine fauna because the dredge vessel will be operating at slower speeds than regular shipping traffic, the dredge will only cross the whale migration route when travelling to and from the offshore disposal site and whales and other species are likely to move away from the dredge plant. The expected duration of maintenance dredging is also very brief (2–3 weeks). The dredge vessel will also be travelling at very slow speeds, so the risk of vessel strikes is low. And the expected period for dredging (between November 2014 and May 2015) is outside the timeframe of the whale migration.
- Noise generated from dredging will be low-level (within the background limits of shipping disturbance)
- Throughout previous dredging campaigns for APA, as well as day-to-day shipping movements, there have not been any reported impacts upon marine fauna
- A marine fauna monitoring and management (including exclusion zones) program will be adopted to ensure any threatened or migratory protected marine fauna are not impacted by vessel strike or marine noise during the proposed dredging.

5.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

Matters likely to be impacted

<input type="checkbox"/>	World Heritage values (sections 12 and 15A)
<input type="checkbox"/>	National Heritage places (sections 15B and 15C)
<input type="checkbox"/>	Wetlands of international importance (sections 16 and 17B)
<input type="checkbox"/>	Listed threatened species and communities (sections 18 and 18A)
<input type="checkbox"/>	Listed migratory species (sections 20 and 20A)
<input type="checkbox"/>	Protection of the environment from nuclear actions (sections 21 and 22A)
<input type="checkbox"/>	Commonwealth marine environment (sections 23 and 24A)
<input type="checkbox"/>	Great Barrier Reef Marine Park (sections 24B and 24C)
<input type="checkbox"/>	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
<input type="checkbox"/>	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
<input type="checkbox"/>	Protection of the environment from Commonwealth actions (section 28)
<input type="checkbox"/>	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

6 Environmental record of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

	Yes	No
<p>6.1 Does the party taking the action have a satisfactory record of responsible environmental management?</p> <p>Provide details Albany Port Authority is committed to delivering best practice environmental management through implementation of the Ports environmental management system. The Environmental Management Plan documents the strategy for identification and assessment of environmental risks, and the implementation of controls/procedures to reduce risk. Albany Port Authority uses this process to drive continuous improvement.</p> <p>Each year APA develops an environmental management program identifying actions to enable legislative reporting requirements, reduce key environmental risks from Port activities and maintain the environmental management system. The Port is required to operate under the National Pollutant Inventory, waste legislation and other statutory environmental requirements.</p>	✓	
<p>6.2 Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</p> <p>NO If yes, provide details</p>		✓
<p>6.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</p>	✓	

If yes, provide details of environmental policy and planning framework

Albany Port Authority has a comprehensive environmental management plan in place which includes an environmental policy as detailed below.

The Albany Port Authority is committed to managing its operations in an environmentally and sustainably responsible manner. These operations include the transit of commercial vessels in Port waters and product handling into and out of the Port.

Operational risks of APA to the environment will be minimised by:

- Implementing sustainability initiatives, including the practice of waste minimisation through responsible purchasing, reuse and recycling
- Developing and maintaining an effective, environment management system including a risk register under the guiding principles of AS/NZS ISO14001
- Seeking continual improvement to improve long term outcomes for the Environment
- Making open and transparent decisions based on data, information and knowledge
- Complying with all legislative requirements
- Protecting social, community and workplace values
- Taking responsibility for the environment across all employees, contractors and lessees
- Communicating this policy to the employees, community, and relevant stakeholders.
- Providing sufficient resources to implement this policy.

6.4 Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

✓

Provide name of proposal and EPBC reference number (if known)

Albany Port Expansion Project EPBC REF 2006/2540

7 Information sources and attachments

(For the information provided above)

7.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

BMT Oceanica (2014) Albany Port Authority Maintenance Dredging Program – Environmental Impact Assessment. Prepared for Albany Port Authority by BMT Oceanica Pty Ltd, Report No 812_01_002/Rev0, Perth, Western Australia, 2014

EPBC search 20140529

7.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

All information is current and reliable. Details are contained in EIA document.

7.3 Attachments

Indicate the documents you have attached. All attachments must be less than three megabytes (3mb) so they can be published on the Department's website. Attachments larger than three megabytes (3mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)		Included in EIA document
	GIS file delineating the boundary of the referral area (section 1)		Included on CD
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)		Included in EIA document
If relevant, attach	copies of any state or local government approvals and consent conditions (section 2.5)	N/A	
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)	N/A	
	copies of any flora and fauna investigations and surveys (section 3)	N/A	
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)		Included in EIA document
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		Included in EIA document

8 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action¹.

Project title: Albany Port Authority Maintenance Dredging

8.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act², this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action³.

Organisation Albany Port Authority
ACN / ABN (if applicable) 601 058 121 12
Postal address PO Box 175 Albany WA 6331
Telephone (08) 9892 9000

¹ If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.

² If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A, EPBC Act). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.

³ If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Business Entry Point (1800 803 772) to obtain an alternative contacts, signatures and declarations page.

8.2 Person preparing the referral information (if different from 8.1)

Individual or organisation who has prepared the information contained in this referral form.

Name Rachael Goetze

Title Environment Officer

Organisation Albany Port Authority

ACN / ABN (if applicable) 601 058 121 12

Postal address PO Box 175 Albany WA 6331

Telephone (08) 9892 9000

Email rachael.goetze@albanyport.com.au

Declaration I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.
I understand that giving false or misleading information is a serious offence.
I agree to be the proponent for this action.

Signature



17th June 2014

Signature

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- Completed all required sections of the referral form?
- Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- Provided a map showing the location and approximate boundaries of the project area?
- Provided a map/plan showing the location of the action in relation to any matters of NES?
- Provided a digital file (preferably ArcGIS shapefile, refer to guidelines at Attachment A) delineating the boundaries of the referral area?
- Provided complete contact details and signed the form?
- Provided copies of any documents referenced in the referral form?
- Ensured that all attachments are less than three megabytes (3mb)?
- Sent the referral to the Department (electronic and hard copy preferred)?

Geographic Information System (GIS) data supply guidelines

If the area is less than 5 hectares, provide the location as a point layer. If the area greater than 5 hectares, please provide as a polygon layer. If the proposed action is linear (eg. a road or pipeline) please provide a polyline layer.

GIS data needs to be provided to the Department in the following manner:

- Point, Line or Polygon data types: ESRI file geodatabase feature class (preferred) or as an ESRI shapefile (.shp) zipped and attached with appropriate title
- Raster data types: Raw satellite imagery should be supplied in the vendor specific format.
- Projection as GDA94 coordinate system.

Processed products should be provided as follows:

- For data, uncompressed or lossless compressed formats is required - GeoTIFF or Imagine IMG is the first preference, then JPEG2000 lossless and other simple binary+header formats (ERS, ENVI or BIL).
- For natural/false/pseudo colour RGB imagery:
 - If the imagery is already mosaiced and is ready for display then lossy compression is suitable (JPEG2000 lossy/ECW/MrSID). Prefer 10% compression, up to 20% is acceptable.
 - If the imagery requires any sort of processing prior to display (i.e. mosaicing/colour balancing/etc) then an uncompressed or lossless compressed format is required.

Metadata or 'information about data' will be produced for all spatial data and will be compliant with ANZLIC Metadata Profile. (http://www.anzlic.org.au/policies_guidelines#guidelines).

The Department's preferred method is using ANZMet Lite, however the Department's Service Provider may use any compliant system to generate metadata.

All data will be provide under a Creative Commons license (<http://creativecommons.org/licenses/by/3.0/au/>)

Appendix C

Sea Dumping Permit Application



Sea Disposal Application Dredged or Excavated Material

Important Information

ABOUT THIS FORM

Important – Please read this information carefully before you complete your application. Once you have completed your application we strongly advise that you keep a copy for your records.

WHO SHOULD USE THIS FORM?

This application form was approved on 26 June 2012, pursuant to subsection 18(2) of the *Environment Protection (Sea Dumping) Act 1981* (the Sea Dumping Act). If you propose to dispose of dredged or excavated material at sea then you must complete this form.

COMPLETE APPLICATIONS

The department encourages the lodgement of complete applications. If further information is required to assess your sea disposal application, then the time within which the Minister is required to assess your application will be paused and reset pursuant to section 18 of the *Environment Protection (Sea Dumping) Act 1981* (Sea Dumping Act).

You should read this application in conjunction with the **National Assessment Guidelines for Dredging 2009** (NAGD). The NAGD detail the procedures which should be followed in sampling, testing and assessing the suitability of material to be disposed of at sea. The guidelines also detail how disposal sites are to be evaluated and monitored. The NAGD are available at:

www.environment.gov.au/coasts/pollution/dumping/guidelines.html

Where you require a specialist report to fulfil the requirements set out in the NAGD, then you should attach the specialist report to your application. You should also provide brief answers to the questions provided, cross-referenced to the relevant sections of the report.

Your application must clearly:

- demonstrate that you have considered alternatives to sea disposal;
- describe the material to be disposed of at sea including how it will be transported from the origin to the disposal site and how it will be disposed of at sea;
- identify the origin and quantity of the material to be disposed of at sea;

- provide details of the physical and chemical composition of the material to be disposed of at sea;
- detail any toxicity characteristics of the material to be disposed of at sea; and
- provide details regarding the disposal locality and any potential environmental impacts at the disposal site.

OBLIGATION TO COOPERATE WITH INSPECTORS

Sections 26 to 32 of the Sea Dumping Act provide amongst other things that the Minister may appoint inspectors for the purpose of policing the Sea Dumping Act. An inspector may board vessels, aircraft or platforms or stop and detain vessels or aircraft.

ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, heritage places, the Commonwealth marine area and the Great Barrier Reef Marine Park — defined in the EPBC Act as matters of national environmental significance. For a detailed discussion of assessment under the EPBC Act and how it interacts with the Sea Dumping Act refer to Section 2.1.2 of the NAGD.

The EPBC Act affects any group or individual (including companies) whose actions may have a significant impact on a matter of national environmental significance. Persons who may have a significant impact on a matter of national environmental significance must refer their proposed action pursuant section 68 of the EPBC Act.

Section 160 of the EPBC Act requires the a decision maker in some circumstances to seek advice under the EPBC Act prior to making a decision with respect to a sea disposal permit. To ensure efficient co-ordination of the assessment process, it is important that the department is aware of any referrals the proponent has made under the EPBC Act. As such, it is advisable that proponents discuss proposed actions with the department prior to submitting a sea disposal application.

Please note that if the project has been referred under the EPBC Act that a decision on a sea disposal permit application cannot be made until the project has either been determined to be "not a controlled action" or the Minister has approved the proposal.

APPLICATION FEE

The *Environment Protection (Sea Dumping Regulations) 1983* (the Sea Dumping Regulations) prescribe the fee payable for a sea disposal application. For an application for a permit to dispose of dredged or excavated material into any part of the sea, the following fees are prescribed pursuant to clause 5(2) of the Sea Dumping Regulations as follows:

- (a) if the volume of the material exceeds 100 000 m³ -- \$23 500;
- (b) if the volume of the material does not exceed 100 000 m³ -- \$10 000.

Clause 5B of the Sea Dumping Regulations requires the application fee to be paid no later than 30 days after the application is submitted. A failure to pay the application fee within the prescribed timeframe will result in the application being invalid. This means that if your application is invalid you will need to submit a new application to the Department if you wish to pursue an application.

METHOD OF PAYMENT

To make a payment, the department's preferred methods of payment are by credit card, bank cheque, money order or by electronic funds transfer (EFT).

Cheques

You must make your payment payable to "Department of Sustainability, Environment, Water, Population and Communities". You should include a remittance advice.

EFT Payments

EFT Payments can be made to:

BSB: 092-009

Bank Account No. 115859

Amount: \$

Account Name: Department of Sustainability, Environment, Water, Population and Communities

Bank: Reserve Bank of Australia

Bank Address: 20-22 London Circuit Canberra ACT 2601

Reference: Cost Centre 12106, GL A/c 52300

Description: Sea Disposal Permit Application – Name of Project

LODGING YOUR APPLICATION

You may lodge your application at the following address:

Director

Ports and Marine Section

Department of Sustainability, Environment, Water, Population and Communities

GPO Box 787

Canberra ACT 2601

WHAT HAPPENS NEXT?

Your application will be considered and you may be asked to provide additional information to enable a decision to be made.

FURTHER INFORMATION

Further information may be obtained from: portsandmarine@environment.gov.au

PART A – APPLICATION SUMMARY

What is the legal name of the business, organisation or company?

Albany Port Authority

Contact Person:

Rachael Goetze

Type of Material Requiring Disposal:

Capital

Maintenance

Dredge

Excavation

WGS84 co-ordinates of disposal site:

The boundaries of the disposal site (G7) situated in King George Sound are identified by the coordinates provided below. This disposal site has not previously been used, but has been established and approved for the Albany Port Expansion Project (Sea Dumping Permit No. SD2006/0035 dated 11 June 2010.).

King George Sound spoil ground boundary coordinates (WGS84)

Centre Coordinates, 900 m radius	Latitude (s)			Longitude (e)		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
	35	04	55	118	01	40

Dates of proposed disposal operations:

Approximately 1-2 weeks in 2014 (Please see Attachment 1 – EIA document – Section 2)

Volume (cubic metres) of material to be disposed of:

91, 250 m³ to be dredged with 82,400 m³ being disposed to the offshore disposal site. (Please see Attachment 2 – SAP Implementation report – Section 4.7 and Appendix C)

Length of permit applied for in this application:

8 weeks. The APA anticipates completion of dredging over a 2-3 week period. However, the APA is seeking approval for an 8 week window to allow for any unforeseen circumstances. (EIA document – Section 2)

Details of previous sea disposal permits that you have been granted:

The APA was granted a sea dumping permit in June 2010 for the disposal of 12 million m³ as part of the Albany Port Expansion Project capital dredging program. However, at this stage, no capital dredging has been undertaken with the project currently placed on hold pending the status of Grange Resources' Southdown Joint Venture. This approval will lapse on 31 December 2015.

Permit number	Volume approved for disposal (cubic metres)
SD2006/0035 – New Ref SD2014/2722	12 million m ³

PART B - APPLICANT

2.0 Identity of applicant

2.1 Applicant Details

What is the legal name of the business, organisation or company?

[Albany Port Authority](#)

What is the registered business name or trading name under which you operate? (if different from legal name)

Australian Business Number (ABN)

[601 058 121 12](#)

Australian Company Number (ACN) (if applicable)

[N/A](#)

Street address of the business (where the business is physically located)

[85 Brunswick Road Albany Western Australia 6330](#)

Postal address of the business (If same as street address, write 'AS ABOVE')

[PO Box 175 Albany Western Australia 6331](#)

2.2 Contact Person

Contact person for enquiries: [Rachael Goetze](#)

Phone: [\(08\) 9892 9000](#)

Email: rachael.goetze@albanyport.com.au

3.0 Identity of the owner of the material to be disposed of at sea

(if different to 2.0)

3.1 Owner Details

What is the legal name of the business, organisation or company?

What is the registered business name or trading name under which you operate? (if different from legal name)

Australian Business Number (ABN)

Australian Company Number (ACN) (if applicable)

Street address of the business (where the business is physically located)

Postal address of the business (If same as street address, write 'AS ABOVE')

3.2 Contact Person

Contact person for enquiries:

Phone:

Email:

PART C – ALTERNATIVES TO SEA DISPOSAL

4.0 Consider alternatives to sea disposal

4.1 You should identify alternative options for the disposal of dredged or excavated material other than sea disposal. These options should include:

- not dredging or excavating;
- re-use (e.g. land creation, beach nourishment, offshore berms, fill);
- off-site recycling (for example, as construction material);
- treatment to destroy or remove hazardous constituents for beneficial use; and
- disposal on land.

Please specify the options you have considered.

The APA has considered the following as alternative options to sea dumping:

- No action – considered to be a safety hazard to navigation and unacceptable
- Reuse for beach re-nourishment – considered excessively costly due to transport costs, material grade may not be adequate for re-nourishment, lack of hydrodynamic knowledge to make an informed decision, and the disposal material may be visually unappealing for beach re-nourishment.
- No off-site recycling or beneficial use opportunities were available
- Land disposal – has been adopted for disposal of materials which are deemed not appropriate for sea disposal

(EIA document – Section 2.1.2)

4.2 Explain why your preferred option for disposal of the dredged or excavated material is sea disposal. In explaining why sea disposal is your preferred option you should provide:

- comparative cost estimates of the above alternatives (including sea disposal);
- detail any risk(s) to human health of the above alternatives (including sea disposal); and
- detail any risks to the environment of the above alternatives (including sea disposal).

Sea disposal is the preferred option for disposal of the dredged material due to the limited opportunities for beneficial use. The negative potential impacts for the only potential alternative, beach renourishment, outweighed the limited potential benefits.

(EIA document – Section 2.1.2)

PART D – DETAILS OF TESTING AND MONITORING PREVIOUS TO THIS APPLICATION

5.0 Testing and Monitoring

5.1 Details of previous permits

Permit Number	Testing Conducted	Monitoring Conducted
SD2006/0035 – new ref SD2014/2722	Yes	Yes – seagrass (1ha) was transplanted

Note: for the purpose of question 5.1 “testing” means testing of sediment undertaken in the course of being granted a previous sea disposal permit and “monitoring” means any monitoring required as a condition of that sea disposal permit.

Please attach any information on testing (for example a Sampling and Analysis Plan (SAP) Implementation Report) and/or monitoring that was conducted in relation to previous sea disposal permits.

Please see Attachment 3 – Albany Iron Ore Project Albany Port Expansion Proposal - Sampling and Analysis Plan and Benthic Primary Producer Habitat report (SKM 2007)

Please see Attachments 4 and 5 – Report on Seagrass Transplantation Monitoring August 2013 and April 2014

6.0 Exemptions

Has an exemption from detailed testing requirements been given? (refer to section 4.2.1 of the NAGD for grounds for exemption).

If yes, attach a copy of the exemption notice.

No.

PART E - DESCRIPTION AND ANALYSIS OF MATERIAL TO BE DISPOSED OF AT SEA

7.0 Description of the material to be disposed of at sea

7.1 Type of Material Requiring Disposal:

- | | | | |
|-------------------------------------|-------------|-------------------------------------|------------|
| <input type="checkbox"/> | Capital | <input checked="" type="checkbox"/> | Dredge |
| <input checked="" type="checkbox"/> | Maintenance | <input type="checkbox"/> | Excavation |

7.2 What is the volume of material (in situ) in cubic metres to be disposed of?
82,400 m³ will be disposed to the offshore disposal ground

7.3 Describe the project that will generate the dredged or excavated material.

The Albany Port Authority maintenance dredging program 2014 is designed to remove deposited sediment in the navigation channel to ensure safe passage of vessels into and out of the Port. The projects background is presented in Section 1 of the SAP Implementation report.

7.4 Location of material to be dredged or excavated.

Attach a location and site plan including WGS84 co-ordinates and street address (where relevant). For dredged material include bathymetric contours. For excavated material, specify the location where the material can be inspected.

Bathymetric maps of are included in Section 4.4 of the EIA document. Additional information is in Section 1 of the SAP Implementation report which details the dredging footprint and Figure 1.2 shows the difference from design bathymetry determined from the 2013 hydrographic survey. No materials are to be excavated from land. Coordinates (WGS84) of dredge areas are supplied as a shapefile and spreadsheet on the CD.

7.5 Physical description of material

Characterise the material (for example, gravel, sand, mud, clay, peat, rock or mixtures of these) and provide a brief summary of the geological features (such as, rock types, sediments found in dredge area, thicknesses of individual strata).

In the harbour basin sediments are dark grey, fine to medium grained sands with a significant fines component in some samples; and the sediments in the entrance channel are fine to coarse clean white sands with a low portion of fines. Section 3.2 of the SAP Implementation report details the physical description of sediments in the dredge footprint. As the project is maintenance dredging there will be no disturbance to the underlying limestone rock.

7.6 Chemical description of material

Provide data on the average composition of the material to be disposed of at sea (expressed as percentage of dry weight).

Please refer to Section 3.3 – 3.5 of the SAP Implementation report

In addition, for this application to be considered for a permit, the following sediment quality questions must be answered (refer to section 4.2 of the NAGD). If any of these questions are not applicable due to an exemption being given (refer to 6.0 above) please state 'Exempt'.

7.6.1 Is the concentration of any chemical constituent above the Screening Levels in Table 2 of the NAGD?

Yes No

If 'No', go to question 7.10.

If 'Yes', list the chemical constituents and their levels.

Individual samples exceeding the screening levels for metals are listed in the below table. Detailed information is provided in Section 3.3.1 of the SAP Implementation report.

Parameter	Limit of reporting	NAGD screening level	Individual sample concentration (mg kg ⁻¹)
Arsenic	0.5	20	58
Cadmium	0.1	1.5	2.1
Mercury	0.01	0.15	0.3 and 0.24

TBT exceeded screening levels in dredge areas A and C2 as listed in the table below. Detailed information is provided in Section 3.5.2 of the SAP Implementation report. These dredge areas have been proposed to be placed in land disposal.

Parameter	LoR	NAGD screening level	All areas minus A and C2	A and C2
TBT (µg Sn kg ⁻¹)	<0.5	9	0.9	85.4

7.6.2 Are any of the chemical constituents listed in 7.6.1 (that is, those above Screening Levels) also above the background levels at the disposal site?

Yes No

If 'No', go to question 7.10.

If 'Yes', list the chemical constituents and their background levels at the disposal site.

Yes, TBT concentrations from dredge areas A and C2 are above background levels at the disposal site and are being disposed of to land disposal. Comparisons of metals concentrations in dredge material and at the disposal area is in Section 4.6 of the SAP Implementation report.

7.7 Elutriate testing

If you answered 'Yes' to question 7.6.2, elutriate testing may be required to be carried out. Refer to Section 4.2.3 and Appendix A of the NAGD for further information.

7.7.1 Are all results of elutriate testing below the ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality marine water quality criteria for any chemical parameter after allowable dilution?

Yes No

If 'Yes, go to question 7.8.

Detailed information is provided in Section 3.3.2 (metals) of the SAP Implementation report.

If 'No', you should consult the department on further actions that maybe required. You have the option of carrying out detailed toxicity and bioavailability testing, and evaluating control measures to minimise the impact (such as treatment of the waste or confined disposal). It is important to note that if control measures are unlikely to be effective, the material may be considered unacceptable for sea disposal

Detailed information is provided in Section 3.5.3 (TBT) of the SAP Implementation report and the determination of the land disposal option is discussed in Section 4.7. Due to the presence of TBT in sediments in the dredge areas A and C2 these sediments are proposed to be disposed of on land. This is discussed further in the EIA document.

7.8 Bioavailability testing

7.8.1 Has bioavailability testing been undertaken for all chemical constituents listed at 7.6.2?

Yes No

Bioavailability testing was completed for the metals.

If "No", go to question 7.9.

7.8.2 Are all chemical constituents below relevant bioavailability criteria?

Yes No

If "Yes", go to question 7.10.

Detailed information is provided in Section 3.3.3 of the SAP Implementation report.

7.9 Sediment toxicity testing (refer to 4.2.4 of the NAGD)

If you answered 'No' to question 7.8.1 and/or question 7.8.2, sediment toxicity testing is required to be carried out, unless an exemption has been granted.

Toxicity testing was not required as TBT contaminated sediments have been designated for land disposal.

7.9.1 Are the sediments to be dredged highly toxic? (refer to page 42 of the NAGD)

Yes No

7.9.2 Are the sediments to be dredged significantly toxic? (refer to page 42 of the NAGD)

Yes No

If 'No' to both 7.9.1 and 7.9.2, go to question 7.10.

If Yes to either question, the material is most likely unsuitable for unconfined sea disposal. You should consult the department to discuss further actions, including the investigation of control measures to minimise the impact (such as treatment of the waste or confined disposal). It is important to note that if the control measures are likely to be ineffective, it is likely that the material will not be suitable for sea disposal.

7.10 Biological Assessment

7.10.1 Have any introduced marine organism surveys been undertaken at or near the dredging location.

Yes No

A survey for introduced species in the port and adjacent coast was undertaken in February 1996 as a joint initiative of the Australian Association of Port and Marine Authorities (AAPMA) and the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Centre for Research on Introduced Pests (CRIMP).

More recently, a survey of the Albany marine area (King George Sound, Princess Royal Harbour and Oyster Harbour) for introduced marine species was undertaken by the Department of Fisheries in 2007. Detailed information is provided in Section 4.5 of the EIA report.

If "No", go to question 8.0.

7.10.2 Have any introduced marine organisms (including micro-organisms) been identified at or near the dredging location?

Yes No

If "Yes", please provide details.

A total of 29 organisms have been identified. Detailed information is provided in Section 4.5 of the EIA report.

If "No", go to question 8.0.

7.10.3 Has the potential for these organisms to be transported in the dredged material been assessed?

Yes No

If "Yes", please provide details.

A marine pest survey shall be undertaken on the dredge vessel prior to arrival in Albany. Refer to Section 8.4 of the EIA report.

7.10.4 Has the potential for these organisms to become established at the disposal site been assessed?

Yes No

If "Yes", please provide details.

A marine pest survey shall be undertaken on the dredge vessel prior to arrival in Albany. Refer to Section 8.4 of the EIA report.

8.0 Contamination Management

8.1 Provide details of any recent contamination management audit(s) undertaken to identify the potential source(s) of contamination at or near the dredging or excavation location. Include an evaluation of the:

- types, amounts and cumulative physical impacts of contaminants generated;
- point and diffuse sources of contaminants to which material is exposed; and
- feasibility of strategies to prevent further contamination.

A Waste Management Audit was undertaken in August 2013 to identify potential source (s) of contamination within the waters of the Albany Port.

The audit indicated that the current waste generating activities at the Albany Port have not caused any contamination of the sediment or waters adjacent to the Port. Those areas of the Port (namely Berths 1 and 2) that are known to contain elevated levels of TBT are the result of the historical use of antifouling coatings and paints on vessels and cannot be attributed to present day activities.

The risk of sediment contamination from trade products at the Albany Port is extremely low. This is due to the fact that the Port does not currently handle any mineral-based products or heavy metals such as iron ore. In addition, the Port manages its waste through continuous on-ground or lease/license specified controls and the use of active documents such as the EMP and the Operational Requirements for Fertiliser Discharge.

PART F - DESCRIPTION OF DISPOSAL SITE AND PROCEDURES

9.0 Dredging or loading procedures

Briefly describe the dredging procedure, or for excavation, the loading procedure. In doing so you should provide details of the type of dredger or equipment to be used and the date, time period or stages over which dredging or excavation will take place.

It is anticipated that the Albany Port maintenance dredging works will use a trailer suction hopper dredge. Conservatively assuming that a small dredge will be used (hopper capacity <3,000 m³), the actual works will take approximately one to two weeks to complete with dredging occurring 24 hours day⁻¹ (with allowance of up to three weeks for execution dependent on conditions). Dredging will be completed at the first available date once the required permits have been authorized (estimated to be completed between November 2014 and April 2015). Please refer to Section 2 of the EIA document for further details.

10.0 Description of Proposed Disposal Site

10.1 Location of site

Attach a suitably scaled map of the proposed disposal site, including WGS84 co-ordinates and showing bathymetric contours, the boundaries of the disposal site and distance from land.

A scaled map of the proposed disposal site showing bathymetric contours, the boundaries of the disposal site and distance from land is in Section 4.4 of the EIA document.

Has approval previously been granted for disposal at this site?

Yes No

If "Yes", provide sea disposal permit number(s).

SD2006/0035 – New Ref SD2014/2722.

10.2 Position fixing

Describe method to be used in positioning the disposal vessel.

Position fixing will use a GPS, with an accuracy of ±4 m

10.3 Is the disposal site located within the boundaries of or in the vicinity of a Marine Protected Area?

For the purpose of this application form, 'Marine Protected Area' refers to waters declared to be marine parks, aquatic reserves or any other type of zoning or planning for the purpose of management, protection and development of marine resources or areas including wildlife and their habitats and for scientific, educational, or recreational purposes. Typically, Marine Protected Areas are declared under legislation enacted by the Commonwealth (eg the *Environment Protection and Biodiversity Conservation Act 1999*; *Great Barrier Reef Marine Park Act 1975*), or a State or Territory Government.

Yes No

If "Yes", provide details.

10.4 Describe any sensitive areas in the vicinity of the proposed disposal site. Sensitive areas include, but are not limited to, seabed communities within which algae (e.g. macroalgae, turf and benthic microalgae), seagrass, mangroves, corals or mixtures of these groups are prominent components.

No sensitive areas were identified. Please refer to Section 4.6 of the EIA document which describes the seabed environment.

10.5 Provide information on the physical and any other relevant characteristics of the disposal site. Include the:

- water depth; 35–44 m chart datum
- sea-bed topography; Please refer to Section 4.4 of the EIA document
- sediment characteristics; Please refer to Section 3 of the SAP Implementation report
- biological characteristics; The seabed is flat with fine sand and very sparsely distributed epifauna. Please refer to Section 4.6 of the EIA document.
- information as to whether the site is expected to be dispersive or retentive; and Retentive, please refer to Section 7.2.2 of the EIA document.
- other relevant information.
please refer to Section 3.2.2 and 4.6 of the EIA document

10.6 Describe the history of the disposal site if previously used for sea disposal of dredged, excavated and/or other waste material. If the site is retentive and has been used previously for sea disposal, provide an estimate of the remaining capacity at the disposal site.

This disposal site has not been used before.

11.0 Disposal Procedures

11.1 Describe the anticipated period and frequency of sea disposal operations and the quantities of dredged and/or excavated material involved for each.

Period of Proposed Sea Disposal	Number of Runs	Average quantity of dredged material to be disposed of per Run	Quantity of excavated material to be disposed of per Run
1-2 weeks	31	3000 m ³	None

Note: For the purpose of question 11.1, 'number of runs' means the total number of vessel movements from the loading point to the disposal site.

11.2 Describe the route from loading to the disposal site.

The vessel will utilize the Ports entrance channel and exit to the offshore disposal site in a direct vector as illustrated in Figure 4.1 of the EIA document.

11.3 Provide details of how the material will be disposed of at sea, in doing so you must provide information on the rate and duration of the disposal, the proposed method of disposal, the intended heading and speed of the vessel.

Please refer to Section 2.1 of the EIA document.

PART G - IMPACT HYPOTHESIS

12.0 Projected Impact of Disposal

12.1 Describe the projected physical, chemical and biological impacts on the disposal site and surrounding areas (see Section 4.3 of the NAGD).

- Predict the turbidity levels and dispersal of disposed material in the water column; Turbidity will be increased during disposal, but is expected to be short lived due to low portions of fines in the sediments. Please refer to Section 6.3 and 7.2.2 of the EIA document.
- Delineate the area of sea bed that will be substantially impacted (the zone of impact) and the movement of disposed dredged material; Please refer to Section 7.2.2 of the EIA document.
- Assess physical impacts such as smothering of biota, change in substrate, light attenuation for sea grasses; The majority of sediments (entrance channel sediments) are very similar to the disposal area so there will be very little change to substrate. Due to the limit biota located in the disposal area no significant loss of biota is expected (Section 4.6 EIA document). No seagrass is located near the disposal area.
- Assess the severity of impacts on marine life, including possible translocation of species, increased predation and loss of available habitat. Also consider the existence and cumulative impacts of other disposal at the site or other nearby disposal sites; Please refer to Section 7.6–7.8 of the EIA document
- Assess changes in the concentration of nutrients, oxygen depletion, and any increased bio-availability of contaminants; and Please refer to Section 7.3 of the EIA document
- Assess possible effects on other users of the area. Please refer to Section 7.10 of the EIA document

12.2 Describe and provide details of any intended investigations or studies of the possible impacts on the environment of the proposed action.

None

PART H - MONITORING

13.0 Proposed Monitoring Program

It is essential that monitoring programs have clearly defined and stated objectives.

13.1 Within the predicted zone of impact, describe your proposed monitoring program to determine the actual extent of change. In doing so you must address the specific effect(s) on the benthic community. You must also include boundary measurements that demonstrate the reliability of your impact hypothesis with respect to the impact on the zone of impact.

Your proposed monitoring program(s) should detail both your compliance and effects monitoring programs.

Please refer to Section 8 of the EIA document.

13.2 Outside the predicted zone of impact, describe any proposed monitoring program to determine whether:

- the actual zone of impact is as predicted; and
- the projected extent of change is within the scale projected.

Please refer to Section 8 of the EIA document.

PART I – MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

14.0 Referring Actions under the EPBC Act

14.1 Has the proposed action been referred to the Commonwealth Environment Minister under the EPBC Act?

Yes No

If 'Yes, please provide the EPBC identification number.

EPBC referral is being submitted concurrently with this permit application

14.2 Has a decision on this proposed action been reached?

Yes No

If 'Yes, please provide details of the decision.

14.3 Will the dredging, excavation, disposal or a related activity significantly impact upon:

- a declared World Heritage property
- a declared Ramsar wetland
- a Commonwealth marine area
- Great Barrier Reef Marine Park
- a listed threatened species
- a listed threatened ecological community
- a listed migratory species
- a national heritage place

PART J - CONSULTATION

15.0 Consultation with advisory bodies

Applicants should consult with relevant stakeholders prior to submitting an application. Section 3.6 of the NAGD outlines the guidelines for stakeholder consultation.

15.1 List the organisation or parties that you have consulted with on your proposed sea disposal activity.

Please refer to Section 9 of the EIA document

15.2 Attach any record of consultation and any responses received.

Albany Port Authority continues to present details on the maintenance dredging proposal and the campaign based on the EIA document to the stakeholder members. Stakeholder meetings were held on 16, 17 and 18 June 2014 and the APA CEO discussed the dredging campaign on local ABC radio on 11 June 2014 to raise public awareness.

PART K – DECLARATION

I declare that to the best of my knowledge the information I have given on, or attached to, this form is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signed: 
Name: Rachael Coetzee
Date: 17th June 2014



BMT Oceanica Pty Ltd
PO Box 462 Wembley
WA 6913 Australia
Tel: +61 8 6272 0000
Fax: +61 8 6272 0099

bmtocanica@bmtocanica.com.au
www.bmtocanica.com.au

