

Crown Resorts Limited
Attention: Mr Daniel Prince
36 Clarke Street
Southbank Victoria 3006

Our reference: 8A0341/PA1047
Date: 13 April 2015

**Subject: Potential Marine Ecology Impacts Relating to
Stage 1C Remediation and Earthworks**

Dear Daniel,

1 BACKGROUND

The Stage 1C Remediation and Earthworks are proposed to be located near Darling Harbour (with a public walkway between the works and harbour), within the Barangaroo South development area. Crown Resorts Limited engaged Haskoning Australia (a company of Royal HaskoningDHV) to provide comment on marine ecology impacts associated with the Stage 1C Remediation and Earthworks, as set out herein.

The location of the Stage 1C Remediation and Earthworks in relation to the overall approved Barangaroo site, and Mod 6 Concept Plan Amendment Barangaroo South development area, is provided in Figure 1. Client supplied information on the Stage 1C Remediation and Earthworks is provided in Section 2.

2 STAGE 1C REMEDIATION AND EARTHWORKS

2.1 Site Location and Context

Barangaroo is located on the north western edge of the Sydney Central Business District (CBD), bounded by Sydney Harbour to the west and north; the historic precinct of Millers Point (for the northern half), The Rocks and the Sydney Harbour Bridge approach to the east; and a range of new development dominated by large CBD commercial tenants and the King Street Wharf/Cockle Bay precinct to the south.

The 22ha Barangaroo site is generally rectangular in shape and has a 1.4 kilometre harbour foreshore frontage, with an eastern street frontage to Hickson Road. The site has been divided into three distinct redevelopment areas (from north to south) – the Headland Park, Barangaroo Central and Barangaroo South, and has been subject to multiple investigations that detail the physical and natural characteristics of the site.

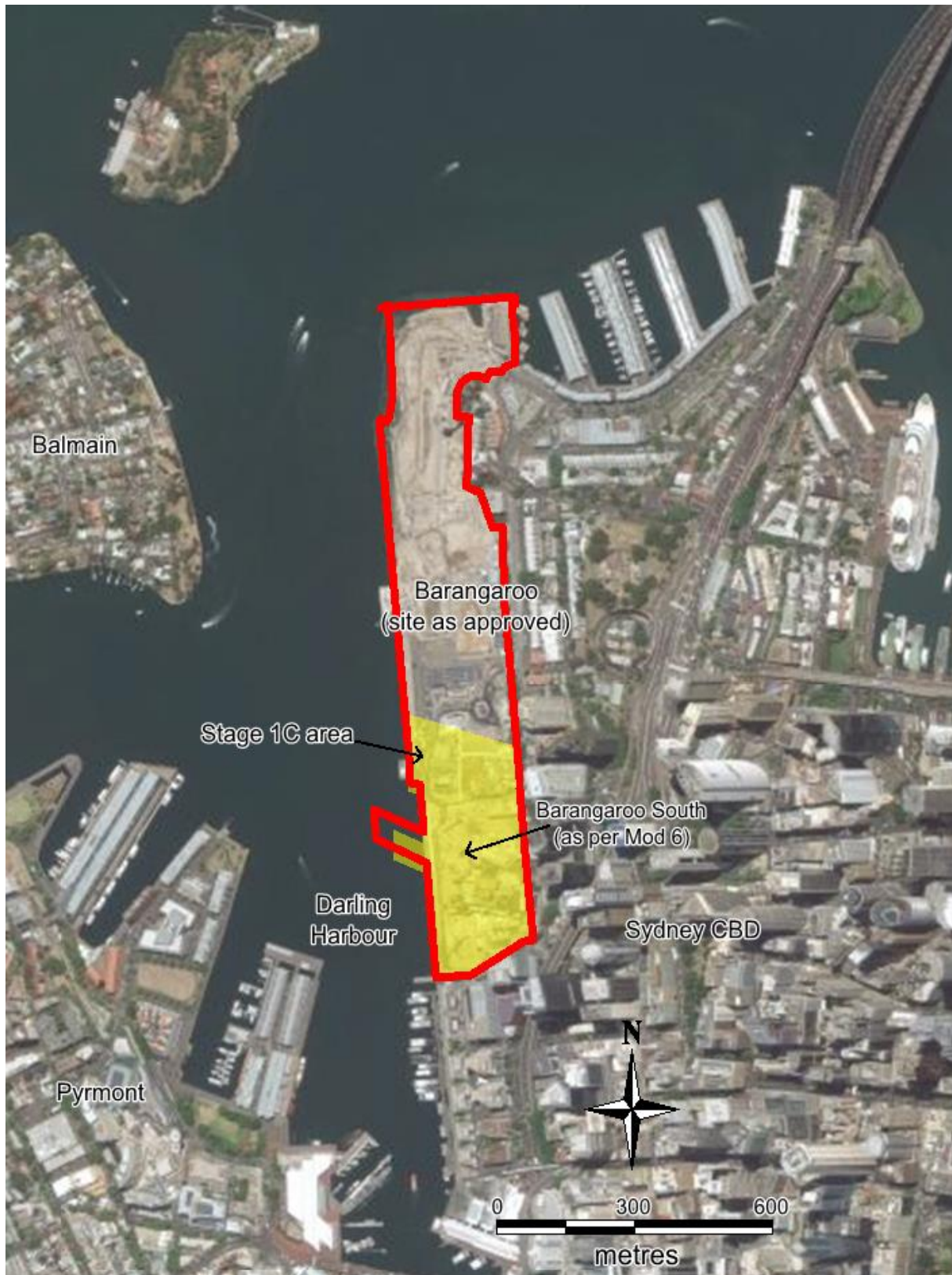


Figure 1: Location of Stage 1C Remediation and Earthworks area in relation to approved Barangaroo site and Mod 6 Barangaroo South development area

2.2 Purpose of Report

This report has been prepared on behalf of Crown Resorts Limited to accompany a State Significant Development Application (SSDA) for remediation and earthworks at Barangaroo South.

2.3 Stage 1C Remediation and Earthworks

The works that are the subject of the SSDA are termed the Stage 1C Remediation and Earthworks.

The land which is the subject of the Stage 1C Remediation and Earthworks SSDA is located in the north-western corner of Barangaroo South. With reference to the Barangaroo 'development blocks', as identified within the approved Concept Plan Urban Design Controls (MP06_0162 MOD 6), the Stage 1C remediation and earthworks area is located to the west of Blocks 4A, 4B and 4C and incorporates part of Globe Harbour.

The Stage 1C remediation and earthworks are described as follows:

- carrying out of remediation and validation within the Stage 1C remediation and earthworks area to ensure it is suitable for the intended future uses of the land;
- construction of a perimeter retention wall system and internal stabilising walls (called the 'Stage 1C groundwater retention wall system') to the west of Block 4B and Block 4C. The Stage 1C groundwater retention wall system would be fully integrated with the Stage 1B retention wall system (as specified by Lend Lease in the EIS for SSD 5897-2013), with direct connections to create a unified groundwater retention wall system across Stage 1B and Stage 1C; and
- bulk excavation within the perimeter of the Stage 1C groundwater retention wall, and the installation of lateral restraining structures to support the perimeter retention wall system.

3 INFORMATION PROVIDED

Haskoning Australia was provided with a WilkinsonEyre Architects drawing issued on 4 March 2015, entitled "Permanent Retaining Wall Plan, Stage 1C Subject to this Application", reference 00915-P-0001-TP. Also, a stormwater management report by Cardno (2015) was provided.

4 PROPOSED DEVELOPMENT AND POTENTIAL MARINE ECOLOGY IMPACTS

The Stage 1C perimeter retention system is to comprise a concrete diaphragm wall, completely surrounded by land. That is, harbour waters are not proposed to directly interface with the perimeter retention system. Therefore, no long term impacts on marine ecology would be expected as a result of the Stage 1C Remediation and Earthworks.

Construction works may cause short term impacts on water quality and thus marine ecology. By employing appropriate industry standard mitigation measures, the proposed Stage 1C Remediation and Earthworks would be unlikely to have any significant impacts on the marine environment (including water quality impacts and impacts on flora and fauna), with any impacts being short-term in nature and highly localised. Mitigation measures should include:

- disposing of waste materials appropriately, with all waste managed in accordance with NSW EPA Waste Classification Guidelines;
- limiting the dispersion of turbid plumes generated into the marine environment through construction activities by utilising appropriately designed and positioned silt curtains adjacent to the Barangaroo foreshore during the works;
- developing and implementing a Water & Stormwater Management Plan (including a Construction Environment Management Plan and Construction Water Quality Monitoring Plan) in which erosion and sediment management are addressed;
- water quality monitoring surrounding the development, to ensure that water quality conditions are maintained beyond the silt curtains and in the broader area (Lend Lease is currently undertaking water quality monitoring and it is expected that the existing monitoring system could be utilised for this purpose);
- having site spillage equipment available at the site to absorb any spills that may enter the water; and
- the silt curtain should remain in place following construction until turbidity levels within the curtain return to background conditions, reflective of levels outside of the silt curtain and at nominated reference locations.

If these mitigation measures are employed, any impacts of the proposed development on water quality within Darling Harbour are expected to be negligible, localised and short-term in nature.

The Stage 1C Remediation and Earthworks has the benefit that the existing land/water interface would not be altered. This reduces the risk of releasing any land-based sediments, soils and groundwater into the marine environment. Also, construction work would be undertaken from land, minimising the potential for suspension of bed sediments due to boat use and anchoring.

It is understood that all stormwater and wastewater onsite would be contained, collected, decontaminated / treated (at an onsite water treatment plant) and discharged to either the sewage network (under a trade waste agreement) or the stormwater system.

Noise has the potential to impact on marine and terrestrial biota over the duration of the works (such as from engines, generators, and construction equipment). However, mobile marine and terrestrial fauna have the ability to relocate to other areas during construction and no significant impacts are expected. Noise should be managed in accordance with the *Interim Construction Noise Guideline* (DECC, 2009).

5 CONCLUSIONS

By employing appropriate industry standard mitigation measures, the proposed Stage 1C Remediation and Earthworks would be unlikely to have any significant impacts on the marine environment (including water quality impacts and impacts on flora and fauna).

6 REFERENCES

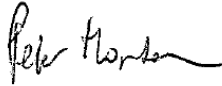
Cardno (2015), *Barangaroo South Stage 1C Remediation and Earthworks, Stormwater Management and Infrastructure Assessment Project Application*, Version D, 11 March

DECC (2009), *Interim Construction Noise Guideline*, Department of Environment and Climate Change NSW, DECC 2009/265, ISBN 978 1 74232 217 9, July

7 SALUTATION

If you have any further queries, please do not hesitate to contact the undersigned on 8854 5110.

Yours faithfully
HASKONING AUSTRALIA



Peter Horton
Principal Engineer

Review / Verification by Date



.....13/4/15
Greg Britton, Director