Mooney Mooney & Peat Island Planning Proposal

Land Capability Review

12 September 2016

Government Property NSW

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Issue and Revision Record

Revision	Date	Originator	Checker	Approver	Description
A	05.08.2016	J. Taylor	C. Avis	C. Avis	DRAFT for review
B	26.08.2016	J. Taylor	C. Avis	C. Avis	Final Report
C	06.09.2016	J. Taylor	C. Avis	C. Avis	Final Report – Minor Amendments
D	12.09.2016	J. Taylor	C. Avis	C. Avis	Final Report – Minor Amendments

Information class: Standard

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1 Introduction

Mott MacDonald has been engaged to provide engineering services to support the Planning Proposal to rezone State Government owned land at Mooney Mooney and Peat Island (The Site).

1.1 Project Appreciation

A previous planning proposal was submitted to the Department of Planning and Environment (DPE) for consideration in 2014. As part of the proposal a Geotechnical Review was undertaken by Pells Sullivan Meynink Engineering Consultants. Comments from the review by DPE indicated that further examination of site topography needed to be explored and addressed in the planning proposal.

This study aims to address previous concerns and incorporate as part of the updated planning proposal.

1.2 Objectives of this Report

This report has been prepared in order to:

- Examine existing geology across The Site and provide recommendations to facilitate development;
- Review existing topography and provide input to the concept plan; and
- Review proposal to fill an area of The Site to alleviate flooding and provide recommendations on suitability of filling potential considerations.

2 The Site

The Site is situated on the north bank of the Hawkesbury River, adjacent to the Pacific Highway and is located within the Central Coast Council LGA. The Site location is shown in Figure 1

The Site covers an area of 38ha and is currently made up of 17 existing lots. The Site is generally bound by the Popran National Park to the north and the Hawkesbury River to the south, east and west. It is currently zoned a mixture of RE1 Public Recreation and SP2 Special Infrastructure.

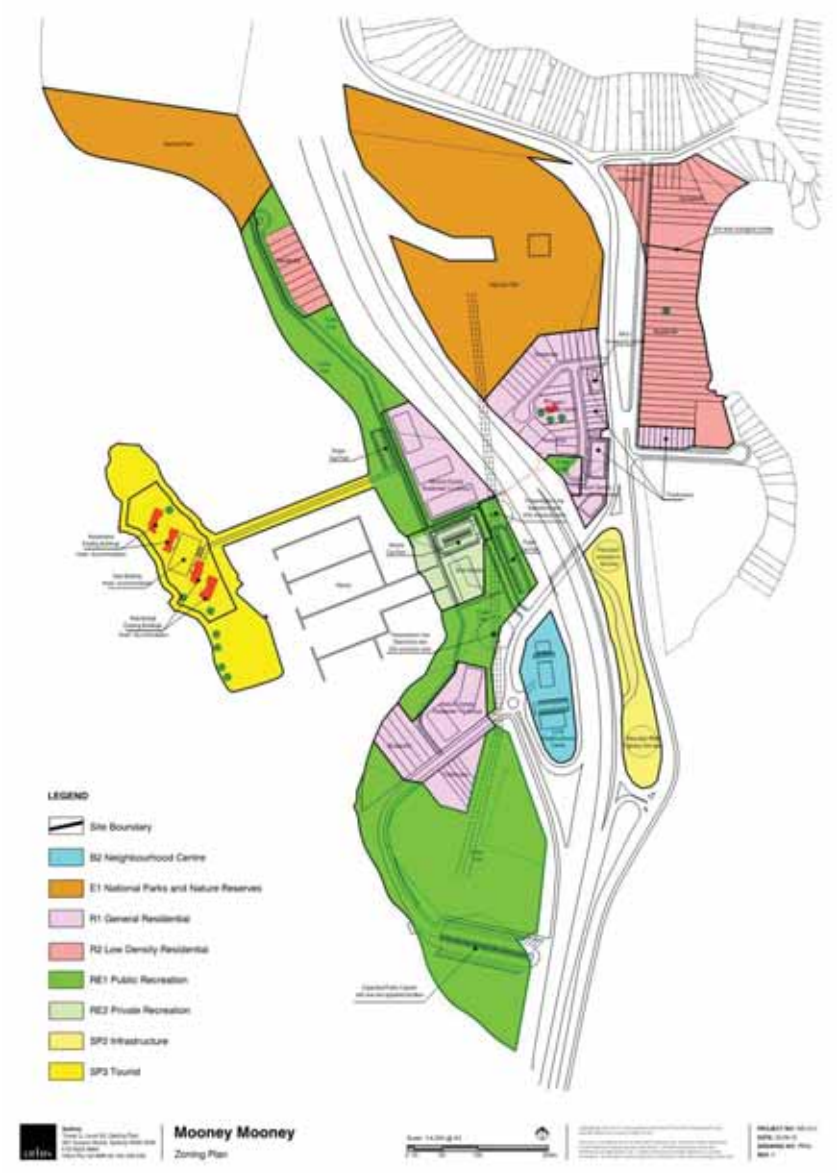
Figure 1: The Site

Source: Image: Google Earth 2016

3 Proposed Rezoning

The proposed rezoning would provide a mix of community, residential and employment generating uses, as shown below in Figure 2. This report identifies potential issues associated with geology and topography with consideration being given to each in the concept plan.

Figure 2: Proposed Rezoning



Source: Urbis 2016

4 Reference Documents

Project reference documents considered for development of this report include:

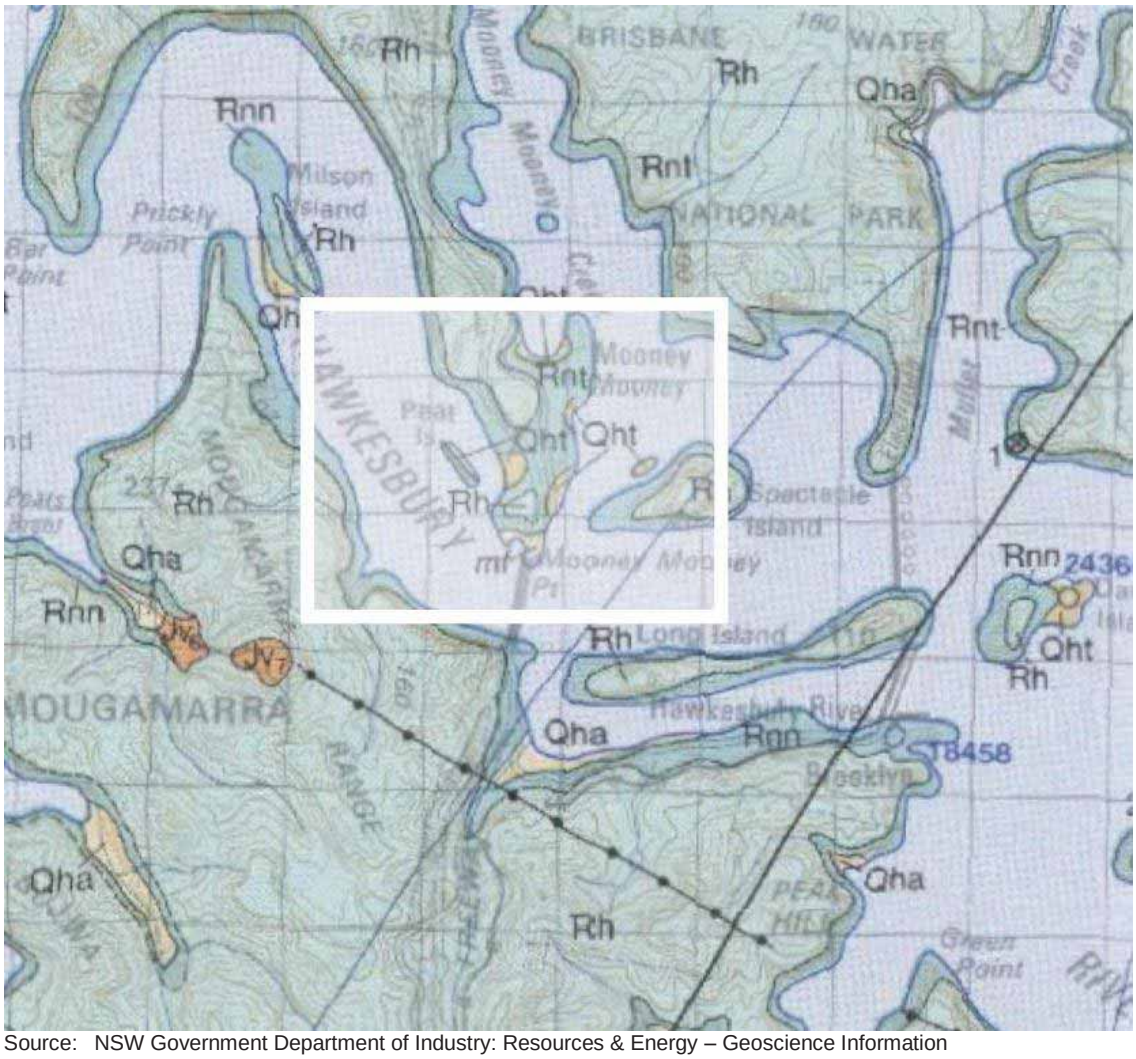
- Sydney 1:100 000 Geological Map, Geological Survey of NSW, Department of Mineral Resources, 1983;
- Civil Works Specification, Gosford City Council, April 2016; and
- Relevant Australian Standards including but not limited to:
  - AS3798 – 2007 Guidelines on Earthworks for Commercial and Residential Developments;
  - AS3600 – 2009 Concrete Structures;
  - AS2159 – 2009 Piling - Design and Installation; and
  - AS2870 – 2011 Residential Slabs and Footings.

5 Regional Geology

5.1 Geological Survey

A review of the Sydney 1:100,000 Geological Map reveals that Mooney Mooney is predominately made up of interbedded laminate, shale, and quartz to lithic-quartz sandstone: minor red claystone (Rnt), with a patch of medium to coarse-grained quartz sandstone, very minor shale and laminate lenses (Rh) which also makes up part of Peat Island. An area south of the causeway consists of sandy mud and muddy sand (Qht) which is also observed on the eastern side of Mooney Mooney and the remainder of Peat Island. The southernmost point of Mooney Mooney, abutting the motorway is an area of reclaimed land and is noted on the map by (mf).

Figure 3: Site Geology



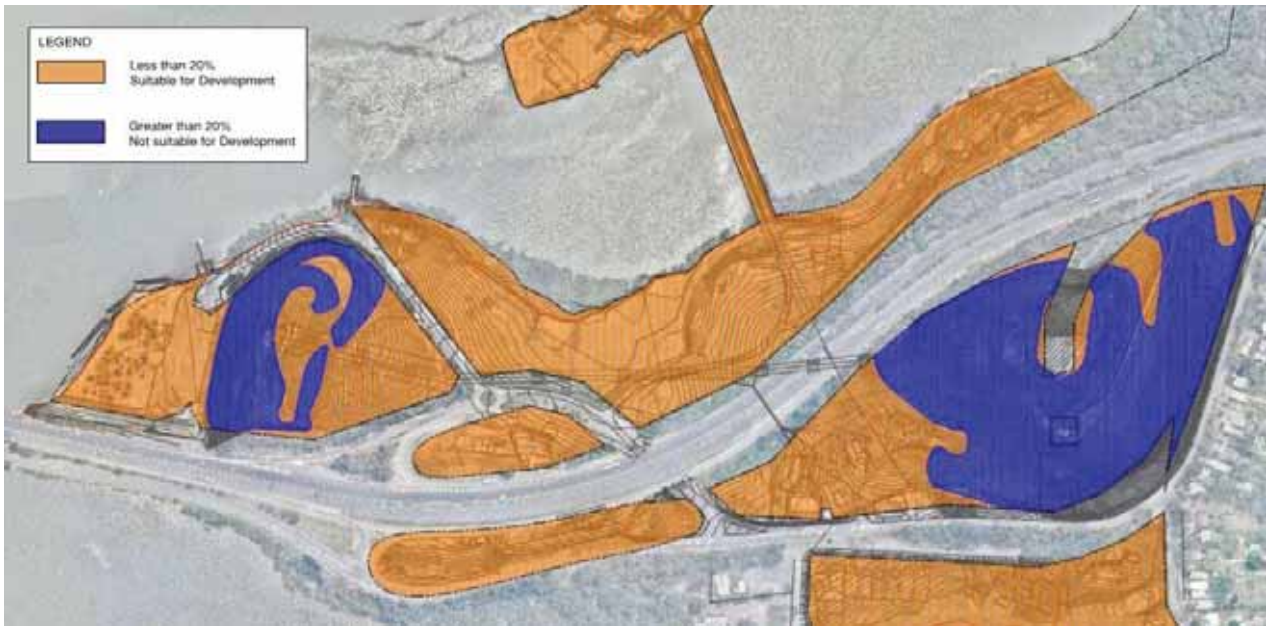
Source: NSW Government Department of Industry: Resources & Energy – Geoscience Information

6 Site Topography

6.1 Slope Analysis

The topographic survey undertaken by Chase Burke Harvey for The Site was used to prepare a slope analysis. Councils engineering guidelines on road design stipulates a maximum gradient of 16% for a local road. When considering earthworks costs to reduce grades of existing land to achieve this and other potential constraints, common engineering practice generally finds land greater 20% (1v: 5h) to be cost prohibitive for development. The below extract summarises the analysis of the site where areas generally steeper than 20% have been highlighted in blue.

Figure 4: Gradients in excess of 20%



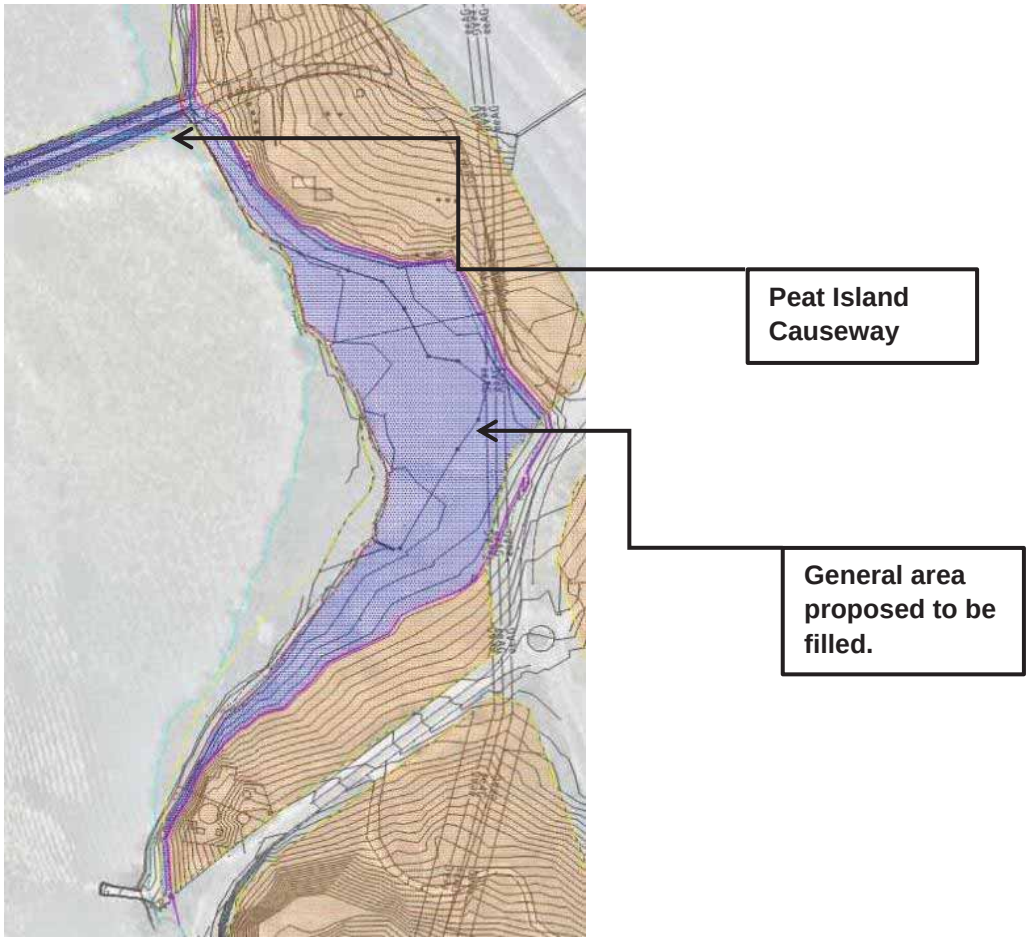
7 Earthworks

7.1 Proposed Filling

To rationalise flood affectation, an area of the mainland south of the Peat Island Causeway is to be raised above the proposed flood planning level. Whilst this proposal is reasonable, any future detailed development proposal in this area would need to give consideration to:

- Settlement of existing material beneath the fill material;
- Subgrade improvement measures;
- Boundary treatment to match existing levels, i.e. retaining walls or batters; and
- Specification of fill material relative to the proposed land use, i.e. open space may have less stringent requirements in comparison to residential use or commercial use.

Figure 5: Proposed Fill Area



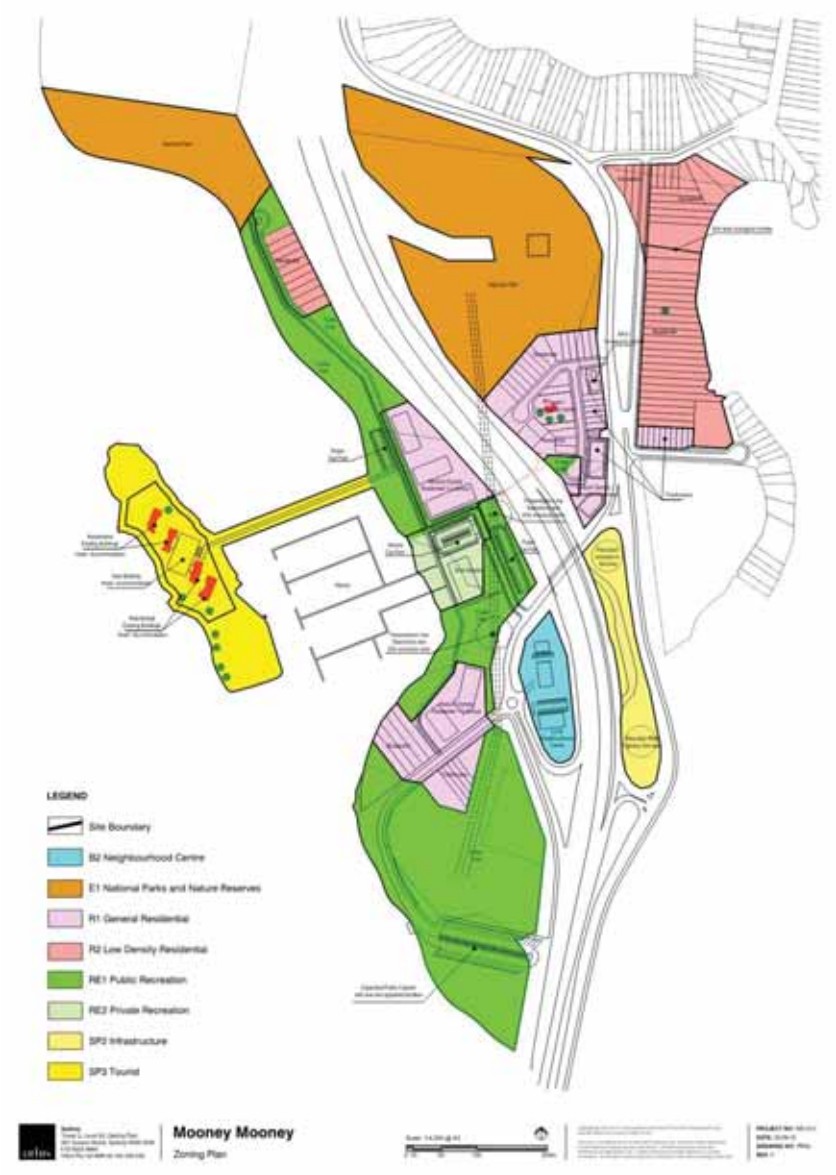
8 Concept and Rezoning Plans

As noted in Section 6.1, a significant cost to any development project is the bulk earthworks. Generally, significant amounts of earthworks can affect a developments economic feasibility. As such, areas which have an average slope greater than 20% (1v: 5h) have been excluded from the Proposal. This is reflected in the concept and zoning plans below:

Figure 6: Concept Plan

Source: Urbis 2016

Figure 7: Proposed Rezoning



Source: Urbis 2016

9 Recommendations

9.1 Existing Geology

Any future development would require detailed analysis of appropriate footing and foundation structures which would be undertaken as part of the Development Application. Notwithstanding the existing geology identified in Section 5.1, a detailed analysis would include field testing of the surface, subsurface and underlying bedrock to determine exact make up and strength characteristics.

It is expected that any development with structures of substantial size beyond a typical residential dwelling (i.e. multi-level residential, commercial buildings etc.) would need to be founded on bedrock. Future public roads and carparks would likely require subgrade rehabilitation measures, which could include removing and replacing unsuitable materials, or lime stabilization of existing materials.

9.2 Proposed Filling

The area south of the Peat Island Causeway to be filled would need to be done so in a controlled manner to achieve an ‘engineered fill’ classification. This is expected to require the same level of investigation noted above, with the addition of appropriate supervision and testing during placement of any fill material.

10 Conclusion

10.1 Appropriateness for Development

Considering the above mentioned findings and recommendations, The Site is deemed appropriate for developments including but not limited to residential and commercial use as indicated on the concept and zoning plans.

Appendices

A. Plans