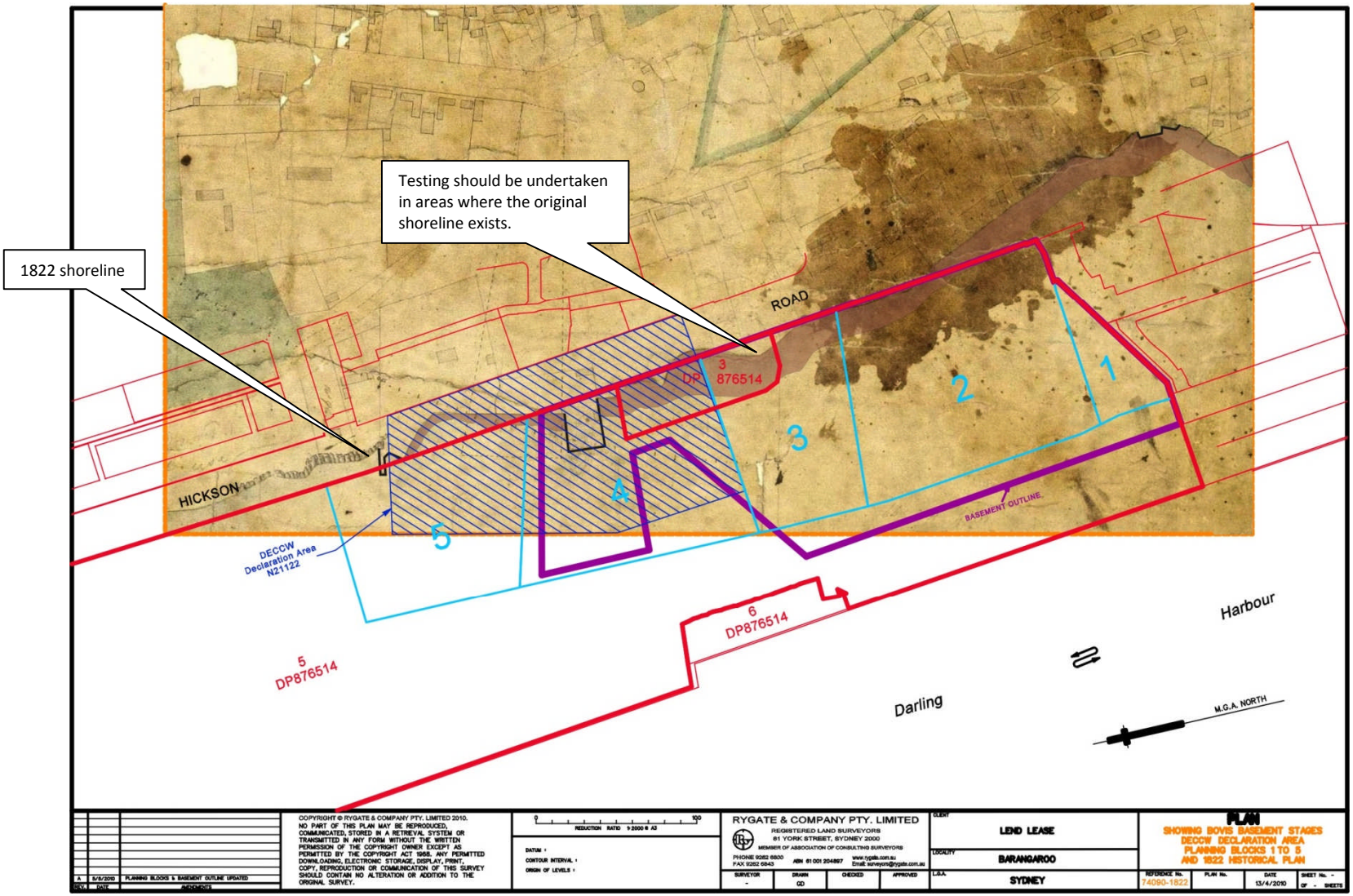

Figure 7: Showing the development plans for Barangaroo Stage 1 overlaid on the 1822 map indicating where the original shoreline exists
(courtesy Casey & Lowe)

6.0 Legislation

6.1 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 (NPW Act) provides statutory protection for all Aboriginal artefacts or "Aboriginal objects" within New South Wales. The Department of Environment, Climate Change and Water (DECCW) is the State Government agency responsible for the implementation and management of this Act.

Part 6 of the NPW Act provides provision for the protection of all "Aboriginal objects" which are defined as "any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of ... New South Wales...".

In particular, Section 90 (Part 6 of the NPW Act) states that it is illegal to knowingly destroy, deface, or damage an Aboriginal object without first obtaining the written consent of the Director-General.

Section 87 (Part 6 of the NPW Act) details the provisions for the issue of written consent to impact upon an Aboriginal object. According to DECCW policies, such permission may be issued for research or other purposes, once a detailed assessment of the object has been undertaken which clearly outlines the justification for such disturbance and once satisfactory consultation has been undertaken with the relevant Aboriginal community or people.

As it is possible that Aboriginal "objects" may be disturbed during the redevelopment of Barangaroo, it would normally be necessary to apply for a permit under Part 6 of the Act. However, the proponent has advised that this is a "Part 3A" project and therefore it will not be necessary to apply for a S87 or S90 permit from DECCW. However, the proponent will be undertaking consultation with DECCW.

6.2 Part 3A, Environmental Planning and Assessment Act, 1979

This project will be assessed under Part 3A of the *Environmental Planning and Assessment Act 1979*. Part 3A consolidates the assessment and approval regime for all major projects and provides a streamlined process. The Minister for Planning is the consent authority for the site under Part 3A. A separate approval from DECCW is not required.

The Barangaroo development site currently has a Part 3A concept plan approval. This Aboriginal archaeological assessment report forms part of the Environmental Assessment Lend Lease is completing for the Project Approval under Part 3A.

While Aboriginal archaeology has not been specifically identified in the Director-General's Requirements or the commitments, excavations undertaken by Comber Consultants at the nearby Darling Walk site where the remains of a midden were located, suggest that this site may also contain Aboriginal "objects" as defined by the *National Parks and Wildlife Act 1974*. To ensure that these Aboriginal objects are covered by the Part 3A Project Approval, a research design and management plan will be undertaken.

7.0 Recommendations

The following recommendations are made on the basis of:

- Legal requirements under the terms of the *National Parks and Wildlife Act 1974* (as amended) which states it is an offence to damage or destroy an Aboriginal object without first gaining the consent of the Director of the NSW National Parks and Wildlife Service or obtaining planning approval under Part 3A of the *Environmental Planning and Assessment Act 1979*;

- Discussions with representatives of the Metropolitan Local Aboriginal Land Council;

- Research into the archaeological record for the general area and the Barangaroo site in particular;

- Results of the assessment as outlined in this report.

IT IS THEREFORE RECOMMENDED THAT:

1. A program of Aboriginal archaeological sub-surface testing should be undertaken prior to the redevelopment of Barangaroo Stage 1. Prior to commencement of the testing, a research design and archaeological management plan should be prepared which clearly sets out the methodology to be followed. This document should also consider issues of contaminated soils, the impact of remediation on the archaeological resource and mitigation measures.

2. Such a program of sub-surface testing should be undertaken in partnership with the Metropolitan Local Aboriginal Land Council.

3. If any Aboriginal "objects" (as defined under the *National Parks and Wildlife Act 1974*) are located during the course of the testing program, the Metropolitan Local Aboriginal Land Council should apply for a Care Agreement with the Department of Environment, Climate Change and Water to enable them to keep the objects.

4. The program of sub-surface testing should be coordinated with Casey & Lowe, the archaeologists undertaking testing in respect of the historical archaeology.

5. If, during the course of the redevelopment, any previously undetected Aboriginal "objects", artefacts or sites are uncovered, work must cease in the vicinity of that object, artefact or site and further advice sought from the archaeologist who undertook the program of sub-surface testing.

6. Interpretation of the Aboriginal history of the site should be included in the redevelopment proposals.

8.0 References

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Photographs

Photograph 1:
Looking east within the northern portion of Barangaroo at the area within the original shoreline, indicated by the red arrow.

Photograph 2:
Looking south within the northern portion of Barangaroo. The area is the foreground and surrounding the sandstone outcrop is within the original shoreline. The area is the background is the location of Stage 1. The locations of areas within the original shoreline are approximately indicated by the red arrows.

Photograph 3:
Facing east looking across Barangaroo towards Hickson Road. The location of the original shoreline is approximately indicated by the red arrow.

Photograph 4:
Facing south looking across the area designated for Stage 1 of development. The approximate area of the original shoreline is indicated by the red arrow.

Photograph 5:
Facing east looking across Barangaroo towards Hickson Road. The approximate area of the original shoreline is indicated by the red arrows.

Photograph 6:
Looking south east across Barangaroo towards Hickson Road and the CBD. The area where the original shoreline was is indicated by the arrow.

Photograph 7:
Looking north east across Barangaroo. The location of the area within the original shoreline is indicated by the red arrow.

Photograph 8:
Looking south east towards the southern boundary of Barangaroo.

Photograph 9:
Looking north east at the northern section of Barangaroo. The sandstone outcrop seen in the middle left of the photo is in the region where the original shoreline is located, indicated by the red arrow. This is the area where the public domain and parkland will be created.

Appendix A

Response from:

Metropolitan Local Aboriginal Land Council

(to be included in final report)

Appendix B

Report from:

AECOM

dated 18 May 2010

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18 May 2010

Mr Warwick Bowyer

Lend Lease (Millers Point) Pty Ltd
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Dear Warwick,

Barangaroo Stage 1- Archaeological Assessment : Environmental conditions encountered during Data Gap Investigations within VMP and PDA Remediation Works Area and Other Remediation Works (South) Area

AECOM Australia Pty Ltd (AECOM) has been engaged by Lend Lease (Millers Point) Pty Ltd (LL) to undertake Data Gap Investigations (DGIs) and remediation design works for the Stage 1 Barangaroo project in accordance with the Professional Services Agreement (PSA) between the parties dated 20 November 2009.

LL has requested that AECOM provide information regarding encountered Site conditions within the Voluntary Management Proposal (VMP) and Project Delivery Agreement (PDA) Remediation Works Area and Other Remediation Works (South) Area (refer attached figure) for provision to the LL appointed archaeologists (Casey and Lowe) in order that they can:

- Determine a preferred, and where appropriate, approach to the undertaking of preliminary test pit exploratory works, subsequent archaeological excavation, recovery and recording of potential archaeological deposits (both of a European and Indigenous nature) during the proposed ex-situ remediation works, noting that the remediation area is likely to be contaminated; and
- Document the preferred approach in the Archaeological Assessment and Research Design reports associated with Barangaroo Stage 1.

Relevant information relating to the above considerations is provided in the following sections.

1.0 VMP and PDA Remediation Works Area

In May 2009, the NSW Environment Protection Authority (EPA) determined that the land encompassed by the former Millers Point gasworks was contaminated in such a way as to present a **significant risk of harm (SROH) to human health and the environment**. As a consequence the EPA declared the Site to be a remediation site (Declaration Number 21122; Area Number 3221) under section 9 of the Contaminated Land Management Act 1997.

The land to which the declaration applies is described as:

- Part Lot 5 and Part Lot 3 in Deposited Plan (DP) 876514, Hickson Road, Millers Point.
- The part of Hickson Road adjacent to:
  - 30-34 Hickson Road being Lot 11, DP 1065410;
  - 36 Hickson Road being Lot 5, DP 873158 and Lot12, DP 1065410; and
  - 38 Hickson Road being SP72797, Millers Point in the City of Sydney Local Government Area.

1.1 Nature of contamination

The EPA declaration notes that the VMP and PDA Remediation Works Area is contaminated with gasworks waste and particularly waste tar resulting from the historical use of the land as a gasworks plant. The chemical composition of gasworks waste includes the following contaminants of potential concern (CoPC):

- polycyclic aromatic hydrocarbons (PAHs);
- benzene,
- toluene, ethylbenzene and xylenes (BTEX);

- total petroleum hydrocarbons (TPHs);
- ammonia;
- phenol; and
- cyanide.

Groundwater has been found to be contaminated by TPHs, PAHs, BTEX, ammonia, phenol and cyanide at concentrations exceeding the relevant trigger values for the protection of human health and aquatic ecosystems in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000).

1.2 Data Gap Investigation

AECOM is currently completing a DGI within the VMP and PDA Remediation Works Area, which has considered information obtained during previous investigations. As a result, the nature, distribution and concentrations of contamination within this area are well documented.

The DGI has identified concentrations of CoPC including lead, TPH (C6-C9 and C10-C36), BTEX compounds, PAHs (including benzo(a)pyrene) and sulfate within soil and fill materials variably exceeding the adopted Site Investigation Criteria. Concentrations of some semi-volatile organic compounds (SVOCs) exceeding the laboratory limit of reporting (LOR) were also reported. The reported results are generally consistent with the findings of previous investigations with respect to the identified CoPC.

Dissolved-phase concentrations of contaminants were variably reported above the Site investigation criteria (e.g. lead, cadmium, chromium, cobalt, copper, mercury nickel, zinc, benzene, naphthalene and phenol) in groundwater.

Reported soil vapour results indicated some gasworks-derived impacts in locations closest to the former gasworks area and low concentrations of toluene, chloroform and tetrachloroethene (below soil vapour guidelines) in some locations. The reported results were below the Site investigation criteria with the exception of naphthalene which reported soil vapour concentrations exceeding the ambient air screening criteria (3.7 $\mu g/m^3$) in eight locations and the adopted soil vapour screening criteria (37 $\mu g/m^3$) in five locations.

The highest concentrations of soil, soil vapour and groundwater contamination were identified in the immediate vicinity of the former gasworks infrastructure.

1.3 General description of Encountered Conditions

Fill and Soil

Encountered stratigraphic conditions were variable across the VMP and PDA Area, but generally comprised fill material overlying natural weathered sandstone with clay components. Sandstone bedrock was generally present underlying natural weathered bedrock materials or in some instances directly underneath fill materials. Observations of odours, staining and sheen were generally more common in the overlying fill materials, although they were also noted within a number of locations within the natural soil and bedrock present on the Site.

Fill materials were generally shallower in the eastern portion of the Site closest to Hickson Road and deeper in the western portion of the Site. The thickness of fill material generally increased from east to west across the Site.

Observations during the test pitting works identified the presence of unconsolidated, highly variable fill materials, which generally comprised unconsolidated gravels, sand, bricks, sandstone, timber, slag and steel. Visual signs of contamination including black staining, tar and surface sheen (where groundwater was present) were noted in several test pits, predominantly located in the footprint of the former Retort House and Purifying Beds within Block 4.

Natural soils encountered across the Site comprised silty sands, gravelly sands, clays, weathered sandstone and sand with components of clay.

Tar was generally (but not exclusively) encountered within fill materials and was characterised by a strong naphthalene odour, black colour and a viscous consistency. Where hydrocarbon impact was detected in groundwater a surface sheen and odour were also identified. Tar mixed with groundwater was identified in the tar tank, located underlying Hickson Road. The material within the tar tank was black, odorous and unspadeable.

Groundwater

Groundwater was encountered within the fill materials and underlying natural material. Groundwater was encountered at depths ranging from 1.38 to 2.92 m below ground surface (bgs) and is subject to tidal fluctuation. Water level monitoring within selected wells over a three day period confirmed that groundwater at the Site is tidally influenced, with the influence extending as far east (inland) as Hickson Road, although the degree of fluctuation is much less on the eastern portion of the Site towards Hickson Road.

Free phase tar was reported in several wells located within the footprint of the former gasworks site. Tar was observed within wells installed at varied depths throughout the profile, indicating dense non aqueous phase liquid (DNAPL) is present at the Site within the fill materials, natural sediments and bedrock.

1.4 OH&S Considerations

The nature of the contamination within the VMP and PDA Remediation Works Area is likely to prohibit the type of detailed excavation and recording practices associated with conventional archaeological excavations. It would also likely prohibit the specific requirements for the investigation of Indigenous archaeology, which AECOM understands may involve hand excavation, machine excavation and wet sieving of natural sands to collect artefacts, within the DECCW declared area.

AECOM understands it is proposed that a limited program of archaeological photographic recording/mapping is being considered within the VMP and PDA Remediation Works Area associated with Stage 1, and that the timing of these works is such that they will be undertaken in parallel with the proposed remedial works. The proposed archaeological works are associated with the former gasworks that once occupied the site.

Based on the nature and concentrations of reported contamination, AECOM notes that specific Occupational Health and Safety (OH&S) considerations will apply to the remediation works being undertaken. The remediation of gasworks waste is complex and requires appropriate consideration and management of chemical and other hazards. Remediation activities will only be undertaken following the completion of a rigorous OH&S plan incorporating a risk assessment and development of detailed management protocols for the proposed works.

AECOM notes that remediation works will likely be undertaken within an exclusion zone that will require additional protective measures to be taken. These measures may include the use of specialist equipment including respirators, air monitors and coveralls and will require adherence to appropriate decontamination practises.

The remediation works will entail the use of heavy machinery which will present a potential risk to the safety of Site workers. As such, the number of workers within the exclusion at any one time will be kept to a minimum to reduce the potential for health and safety incidents

The preferred approach to risk management would be to minimise the number of archaeological practitioners accessing the remediation area and for the archaeological works within this area to be restricted to photographic recording and associated mapping only, which is considered more appropriate given the nature of the hazardous environment expected during the remedial works within the Stage 1 VMP and PDA Remediation Works Area. Following the completion of appropriate inductions and subject to careful planning and management, limited archaeological works such as photographic recording and limited mapping in parallel with remedial works might be appropriate. Such works will need to be undertaken under the direct supervision of a specialist remediation contractor, and on the proviso that the archaeological practitioners are adequately trained and strictly conform to the appropriate health and safety management systems and practices implemented by the specialist remedial contractor. Only authorised personnel and equipment will be allowed into the exclusion zones and other areas associated with the remediation works.

2.0 Other Remediation Works (South) Area

The Other Remediation Works (South) Area (ORWS Area) is located to the south and west of the VMP and PDA Remediation Works Area and is outside the footprint of the former gasworks area. Consequently, concentrations of CoPC, although still present, were generally reported at concentrations below that identified within the VMP and PDA Area.

Encountered soil and fill conditions were generally similar to the VMP and PDA Area, although no evidence of liquid tar was identified.

AECOM considers that as reported concentrations of CoPC are not as high as the VMP and PDA Area, the ORWS Area will not require the same level of OH&S management. As such, a reduced level of personal protective equipment (PPE) than is considered necessary for the VMP and PDA Remediation Works Area may be adequate for works in this area. This will be subject to verification of the actual conditions encountered during archaeological excavation works.