



ENVIRONMENTAL INVESTIGATION SERVICES

12 May 2010
Ref: E23302Kadd2

Capital Insight Pty Ltd
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Level 6, 77 Berry Street
North Sydney NSW 2060

Attention: Mr Michael Jenkin

ADDENDUM TO PHASE 1/PHASE 2 ENVIRONMENTAL SITE ASSESSMENT REPORT
PROPOSED NEW INGHAM HEALTH RESEARCH BUILDING
1 CAMPBELL STREET, LIVERPOOL, NSW

This letter forms an addendum to the EIS report titled '*Report to Ingham Health Research Unit on Phase 1 and 2 Environmental Site Assessment for Proposed New Ingham health research Institute Building at 1 Campbell Street, Liverpool*' (Ref: E23302Krpt, dated November 2009) and should be read in conjunction with and attached to the above report. This letter addresses the issue of potential Acid Sulphate Soil

Acid sulphate soil (ASS) is the common term for naturally occurring soil and sediment that contains iron sulphides which, when exposed to oxygen generate sulphuric acid. These soils are formed from iron rich sediment and sulphate (found in seawater) in the presence of sulphate reducing bacteria and plentiful organic matter. These conditions are generally found in mangroves, salt marsh vegetation or tidal areas and at the bottom of coastal rivers and lakes. Disturbance and exposure to air of these sulphides, commonly through drainage or excavation, causes oxidation and the eventual production of sulfuric acid. This sulphuric acid can then drain into waterways through groundwater and surface flows. The impacts of acid drainage can include fish kills and cause disease, oyster damage and mortality, adverse impacts on soil structure and stability and damage to steel and concrete structures including bridge and building footings and corrosion of underground pipes. Acid Sulphate soils are generally found at soil horizons less than 5m AHD (Australian Height Datum).

The NSW government formed the Acid Sulphate Soils Management Advisory Committee (ASSMAC) in 1994 to coordinate a response to acid sulphate soil issues. In 1998 this group released the Acid Sulphate Soil Manual providing best practice advice for planning, assessment, management, laboratory methods, drainage, groundwater and the preparation of acid sulphate soil management plans.



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In 1997 the Department of Land and Soil Conservation now part of Department of Environment and Climate Change - DECC) developed two series of maps with respect to acid sulfate soils for use by council and technical staff implementing the Acid Sulfate Soil Manual:

- Acid Sulfate Soils Planning Maps – issued to councils and government units;
- Acid Sulfate Soils Risk Maps – issued to interested parties.

The acid sulfate soil planning maps provide an indication of the relative potential for disturbance of acid sulfate soils to occur at locations within the council area. These maps do not provide an indication of the actual occurrence of acid sulfate soils at a site or the likely severity of the conditions. The maps are divided into five classes dependent upon the type of activities/works that if undertaken, may represent an environmental risk through the development of acidic conditions associated with acid sulfate soils:

- Class 1: all works;
- Class 2: all works below existing ground level and works by which the watertable is likely to be lowered;
- Class 3: Works at depths beyond 1m below existing ground level or works by which the water table is likely to be lowered beyond one metre below existing ground level;
- Class 4: Works at depths beyond 2m below existing ground level or works by which the water table is likely to be lowered beyond 2m below existing ground level; and
- Class 5: Works within 500m of adjacent Class 1,2,3,4 land which are likely to lower the water table below 1m AHD on the adjacent land.

The acid sulfate soil planning map for the Liverpool area indicates that the site is located within a Class 5 area.

We have assessed the risk posed to the environment of acid sulphate soil by this development as low for the following reasons:

- The acid sulphate soil risk maps indicate areas of high risk, low risk and no known occurrence of acid sulphate soils. The acid sulphate soil risk map (Liverpool, Acid Sulphate Soil Risk Map 9030S2 - edition 2, 1997, 1:25000, Department of Land and Soil Conservation) indicates that Campbell Parade is located within an area of no known occurrence of acid sulphate soil. The map indicates that the closest areas with a risk of acid sulphate soil are the bottom sediments of the Georges River (approximately 500m to the south) and an estuarine swamp (located approximately 1km to the east.) The inclusion of this site in the Class 5 area on the Council's acid sulfate soil planning map is most likely due to the site being within 500m of the Georges River.
- The 1:100,000 geological map of Penrith (Map 9030, 1:100,000 Department of Mineral Resources [now the Department of Primary Industries] – 1991) indicates the site to be underlain by Bringelly Shale of the Wianamatta Group, which typically



consists of shale, carbonaceous claystone, claystone, laminite, fine to medium grained lithic sandstone, rare coal and tuff. This indicates the site is not located within an estuarine, tidal or swampy environment.

- The borehole logs for the investigation indicated that the site was underlain by residual silty clays (to a depth of approximately 1m to 4m) over shale bedrock. Acid sulphate soils are usually associated with alluvial estuarine soils not residual soils derived from weathered bedrock.
- The site level is approximately 11m to 12m AHD. Acid sulphate soils are usually associated with alluvial soil horizons less than 5m AHD.
- The borehole logs indicate that the deep geotechnical boreholes were dry on completion of augering (to a maximum depth of approximately 4m below ground or approximately 8mAHD). Therefore excavation for the basement to 3m below ground (or approximately 9m AHD) is unlikely to lower the water table below 1m AHD on the adjacent land (as stipulated for Class 5 sites).

No acid sulphate management plan is considered necessary for this development. In our opinion this data satisfies the requirements of a preliminary acid sulphate assessment for a development of this nature and size.

The findings presented in this letter are based on site conditions that existed at the time of the assessment. This letter has been prepared for the particular project described and no responsibility is accepted for the use of any part of this letter in any other context or for any other purpose. Copyright in this letter is the property of EIS. EIS has used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this letter.

Should you require any further information regarding the above please do not hesitate to contact the undersigned.

Yours faithfully

For and on behalf of

ENVIRONMENTAL INVESTIGATION SERVICES

A handwritten signature in black ink, appearing to read 'Adrian Kingswell', is written over a horizontal dotted line.

Adrian Kingswell

Senior Associate