

29 September 2016
File No. E23125 CC

EI Australia
Suite 6.01, 55 Miller Street,
Pyrmont, NSW 2009

Mr Aras Labutis
Coronation Property Co Pty Ltd
Level 2, 66 Wentworth Avenue,
SURRY HILLS NSW 2010

E service@eiaustralia.com.au
www.eiaustralia.com.au

T 02 9516 0722

ABN 42 909 129 957

RE: Acid Sulfate Soils and Contamination Assessments 20, 26, 28, 32-34 and 31-33 Shepherd Street, Liverpool, NSW

EI Australia (EI) is pleased to provide this letter report on the environmental status in relation to Acid Sulfate Soils and Contamination Assessments at the above site.

It is understood that properties at 20, 26, 28, 32-34 and 31-33 Shepherd Street, Liverpool, NSW are earmarked for rezoning and subsequent development into residential apartments with 2-3 levels of basement car parking. 20 Shepherd Street is the first property in this series which is currently under development with bulk excavation works completed in April 2016.

The properties are located adjacent to the Georges River and the elevation of the properties is also noted to be greater than the banks of the river by 1.5-2.5m.

ACID SULFATE SOILS

Background

Acid Sulfate Soils (ASS) are naturally occurring sediments containing iron sulphides. Sediments containing ASS have often been deposited in estuarine conditions, previously existing in a specific area. As ASS comprise natural geological materials, their occurrence is not related to site boundaries or anthropogenic contamination, but rather extends across areas/regions previously suitable for their deposition.

When ASS are exposed to air (e.g. due to bulk excavation or dewatering), the oxygen reacts with iron sulphides in the sediment, producing sulphuric acid. This acid can sometimes be produced in large quantities and drain into waterways causing severe short and long term socio-economic and environmental impacts, including damage to manmade structures and natural ecosystems.

ASS can either be classified as actual acid sulphate soils (AASS) which are soils that have already reacted with oxygen to produce acid, or potential acid sulfate soils (PASS) which are soils that contain iron sulphide, but have not been exposed to oxygen (e.g. soils below the water table) and therefore have not produced sulphuric acid (although they have the potential to do so).

Acid Sulfate Soil Risk Map

The *Liverpool Bay Acid Sulfate Soil Risk Map* (1:25,000 scale; Murphy, 1997), was supplied by the Sydney South Coast, Geographical Information Systems Unit of the NSW Department of Land and Water Conservation. Review of this map, in conjunction with the *Guidelines for the Use of Acid Sulfate Soil Risk Maps* (Naylor et al., 1998), indicated that the site lies within the Class Description of *Low Probability – Greater than 3m below the ground surface*. The majority of these landforms are not expected to contain ASS materials and land management is generally not affected by ASS.

Liverpool Local Environmental Plan 2008 Acid Sulfate Soils Map (Sheet ASS-012) indicated that the properties are located within *Class 5*. The class description comprises *Works within 500m of adjacent Class 1, 2, 3 or 4 land which are likely to lower the watertable below 1m AHD on adjacent Class 1, 2, 3 or 4 land*.

Acid Sulfate Soil Assessments

EI conducted an Acid Sulfate Soil Assessment at 20 Shepherd Street, Liverpool, NSW in March 2016 (Report Ref. E22322 AF Rev0) after the removal fill and during bulk excavation works. Geomorphic characteristics of the site for ASS were largely absent. A total of 21 soil samples were collected from four test pit locations across the excavation area down to 1m below proposed excavation or refusal on bedrock, whichever occurred first in accordance with the ASSMAC guidelines. All samples were analysed for suspended peroxide oxidation combined acidity and sulfate (sPOCAS) by a NATA-accredited laboratory.

The results of the laboratory analysis indicated that the tested soils to depths of up to 5m below fill were unlikely to be affected by actual acid sulfate soils (AASS) or potential acid sulfate soils (PASS). The risk posed by ASS was considered to be low.

Asset Geotechnical Engineering Pty Ltd (Asset Geotechnical) conducted a Geotechnical Investigation, Preliminary Salinity and Acid Sulfate Soil Assessment at 28 Shepherd Street, Liverpool, NSW in April 2015 (Report Ref. 2936-R1). A total of 24 soil samples were collected from two bore locations across the proposed excavation area down to 1m below proposed excavation or refusal on bedrock, whichever occurred first in accordance with the ASSMAC guidelines. All samples were analysed for pH and pH in H₂O₂ (hydrogen peroxide). All pH samples were greater than 4 and pH in H₂O₂ were greater than 3.5 and therefore not indicative of acid sulfate soils (both actual and potential).

CONTAMINATION ASSESSMENTS

State Environmental Planning Policy No 55 – Remediation of Land states in clause 6(1)(c) *“if the land requires remediation to be made suitable for any purpose for which land in that zone is permitted to be used, the planning authority is satisfied that the land will be so remediated before the land is used for that purpose.”*

A number of contamination assessments have been conducted across all properties as well as remediation and validation works at 20 Shepherd Street. Based on the historical uses of the properties, the majority have been for heavy commercial / industrial which is typical of the area. Known sources of contaminants have largely been underground storage tanks for fuels and mechanical and manufacturing related uses.

The primary sources (such as underground storage tanks) have been removed (in the case of 20 Shepherd Street) with secondary sources (ie. impacted soil / groundwater) successfully remediated through removal and offsite disposal. Post-remedial works at 20 Shepherd Street have deemed the site suitable for the proposed mixed use with soils and groundwater managed in the bulk excavation area and groundwater assessed as no longer impacted by the former use.

Undisturbed areas (such as the heritage building at 20 Shepherd Street) can also be managed through SEPP 55 under a management plan to ensure the integrity of the concrete capping layer. The management plan also takes into consideration potential impacts to offsite receptors and maintenance works (eg. upgrade of underground infrastructure) for the safety of site occupiers and contractors.

Environmental assessment of 28 Shepherd Street was conducted in 2014 by Environmental Strategies Pty Ltd (ES) which identified two underground storage tanks at the central-western part and impacted fill at the northern part of the property. Assessment of the groundwater by ES showed no impact with levels within background ranges. A remediation action plan has been prepared by EI in 2015 which outlines the remediation strategy which involves removal of the underground storage tanks, localised impacted soil and shallow impacted fill soils. On completion of remediation and validation of the site during site redevelopment would render the site suitable for the proposed development.

The properties can generally be made suitable during the redevelopment process which provides optimal opportunity for the removal of both primary and secondary sources of contamination, mainly through the excavation process. All remedial works would be completed prior to reuse of the properties.

Closure

Based on the investigations conducted previously, the likelihood of ASS being present on these properties to the depths tested were assessed as being unlikely.

However, in the event localised ASS conditions are encountered during future redevelopment, then such conditions can be managed under an appropriate acid sulfate soil management plan.

Assessment of contamination has been extensively conducted and is ongoing. Site redevelopment allows optimal opportunity for removal on known sources of contamination and can be managed under SEPP 55 – Remediation of Land allowing the properties to become suitable for the proposed residential apartment and mixed use. This would therefore allow the planning proposal to proceed since the land will be remediated prior to reuse.

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

For and on behalf of
EI AUSTRALIA



TONY GUIRGUIS
Senior Engineer

References

Asset Geotechnical Engineering Pty Ltd (2015) *“Geotechnical Investigation, Preliminary Salinity and Acid Sulfate Soil Assessment, 28 Shepherd Street, Liverpool* (Report No. 2936-R1 dated 15 April, 2015)

EI Australia (2015) *“Remediation Action Plan, 28 Shepherd Street, Liverpool, NSW* (Report No. E22480 AA dated 15 April, 2015)

EI Australia (2016) *“Acid Sulfate Soils Assessment, 20 Shepherd Street, Liverpool, NSW* (Report No. E22322 AF Rev0 dated 11 March, 2016)