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# ALTON PROPERTY GROUP PTY LTD

# Acid Sulfate Soil Management Plan

93-107 Cecil Avenue & 9-10 Roger Avenue, Castle Hill, NSW

E26536.E14_Rev1
06 December 2024

# Document Control

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# APPENDIX B – PROPOSED DEVELOPMENT PLANS

# 1. INTRODUCTION

## 1.1 Overview

EI Australia (EI) was engaged by Alton Property Group Pty Ltd to prepare an Acid Sulfate Soil Management Plan (ASSMP) for the property located at 93-107 Cecil Avenue & 9-10 Roger Avenue, Castle Hill, NSW (henceforth referred to as 'the site').

The site is located within the local government area (LGA) of The Hills Shire Council (**Figure 1**, **Appendix A**). It comprises eighteen, adjoining properties, identified as Lot 27 in Deposited Plan (DP) 15399, Lots 21-22 of DP778595, Lots 5-6 of DP705913, Lots 1-4 of DP5812933, Lots 1-2 of DP547897, Lots 1-2 of DP591676, Lot 20 of DP15399, Lots 4-6 of DP29141, and Lot 1 of DP531559. The site covers an approximate area of 1.762 ha, fronting Cecil Avenue on the north-eastern boundary and Roger Avenue on the southern boundary (**Figure 2**, **Appendix A**). At the time of drafting this plan, each property had residential type structures.

The site was rezoned to *MU1 Mixed Use* under *The Hills Local Environmental Plan 2019*, followed by commercial and residential (apartment) redevelopment. This report has been prepared to assist with the management of acid sulfate soils (ASS), should it be encountered during the proposed redevelopment of the site and will be in support of a State Significant Development (SSD) Application to The Hills Shire Council.

## 1.2 Proposed Development

Based on the supplied plans (**Appendix B**), the proposed development involves demolition of the existing structure, followed by the construction of four, mixed commercial (retail) and residential (apartment) buildings, overlying multi-level basement facilities (accessible via driveway from Cecil Avenue). The development would be delivered in three stages, being (as per the plans in **Appendix B**):

- Stage 1: Buildings A and B, plus a public through-site link;
- Stage 2: Building C; and
- Stage 3: Building D.

## 1.3 Objective

The objective of this plan is to provide a framework for the identification and management of any ASSs that may be encountered during the proposed development works.

## 1.4 Scope of Works

In order to achieve the project objective, the scope of works is as follows:

- Identification of the site investigation requirements, to establish if and where ASSs are present;
- Description of the soil management procedures to be undertaken on-site, which when implemented will prevent, or control, the generation of acid leachate; and
- Description of the contingency measures to be implemented in the case of failure of management procedures.

## 1.5 Regulatory Framework

This plan was completed with reference to the following guidelines:

- EPA (1995) Assessing and Managing Acid Sulfate Soils - Guidelines for Land Management in NSW Coastal Areas;

- Ahern et al. (1998) Acid Sulfate Soil Manual; and
- Sullivan et al. (2018) National Acid Sulfate Soils Guidance.

# 2. SITE DESCRIPTION

## 2.1 Property Identification, Location and Physical Setting

The site identification details and associated information are presented in **Table 2-1**. Refer to **Appendices A** and **B** for site plans.

**Table 2-1 Site Identification and Zoning**

| Information | Detail |
|---|---|
| Street Address | 93-107 Cecil Avenue & 9-10 Roger Avenue, Castle Hill, NSW |
| Lot and DP | Lot 27 of DP15399;<br>Lots 21-22 of DP778595;<br>Lots 5-6 of DP705913;<br>Lots 1-4 of DP5812933;<br>Lots 1-2 of DP547897;<br>Lots 1-2 of DP591676;<br>Lot 20 of DP15399;<br>Lots 4-6 of DP29141; and<br>Lot 1 of DP531559. |
| LGA | The Hills Shire Council |
| Current Zoning | MU1: Mixed Use<br>(The Hills Local Environmental Plan 2019) |
| Land Use | The site is currently occupied by eighteen, adjoining residential properties. |
| Site Area | 1.762 ha |

## 2.2 Regional Setting

Local topography, (hydro)geology and soil landscape information is summarised in **Table 2-2**.

**Table 2-2 Regional Setting Information**

| Attribute | Description |
|---|---|
| Topography | The site displays a moderate slope from the northern to southern boundary, from 132.61m Australian Height Datum (AHD) to 113.5m AHD (**Appendix B**). |
| Drainage | It is expected that drainage will be consistent with the site topography, flowing in the southerly direction towards the Excelsior Creek. |
| Geology | According to the Department of Mineral Resources *Sydney 1:100,000 Geological Series Sheet 9130* (DMR, 1983), the site is underlain by Bringelly Shale (*Rwb*), consisting of shale, carbonaceous claystone, laminate, fine to medium-grained lithic sandstone and rare coal. |
| Soil Landscape | The NSW Government Department of Planning, Industry and Environment *eSPADE v2.0* website indicates that the site overlies a Glenorie (*gn*) erosional landscape. This landscape type comprises gently undulating to rolling low hills on Wianamatta Group shales. Soils are shallow to moderately deep on upper slopes, with red and brown podzols on crests, grading to yellow and gleyed podzols along drainage lines. |
| Depth to Groundwater | Based on a review of the nearest groundwater bores registered with WaterNSW, it is understood that the groundwater was between 4.3-5.0 mBGL. |
| Nearest Surface Water Feature | Excelsior Creek, located approximately 550m south of the site. |

# 3. DESKTOP REVIEW

## 3.1 Definition of Acid Sulfate Soils

Acid sulfate soils are naturally occurring sediments containing iron sulphides, usually deposited in estuarine environments. As ASSs comprise natural geological materials, their occurrence is not related to site boundaries or anthropogenic contamination; rather, they extend across regions suitable for their deposition.

When ASSs are exposed to air (e.g. due to bulk excavation or dewatering), oxygen reacts with the iron sulphides, producing sulphuric acid (and iron oxides). The acid can 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 be classified as either:

- Actual acid sulphate soil (AASS), within which are materials that have already reacted with oxygen to produce acid; or
- Potential acid sulfate soil (PASS), within which are materials that contain iron sulphides, but have not been exposed to oxygen (e.g. soils below the water table) and therefore have not produced sulphuric acid (though they have the capacity to do so).

Aquatic organisms are very sensitive to acid drainage. Impacts from ASS leachates include:

- Dissolved metals (aluminium in particular) can be toxic to aquatic life forms;
- Dissolved sulfate salts can increase the salinity of freshwater; and
- Acidic sediment may “fix” phosphates and other nutrients, preventing their uptake by plants.

## 3.2 Acid Sulfate Soil Planning and Risk Maps

With reference to the *The Hills Local Environmental Plan 2019,* the site is located in an area of *No Known Occurrence*, whereby ASSs are not known or expected to occur and “land management activities are not likely to be affected”.


Figure 3-1 - Acid Sulfate Soil Zones

## 3.3 Geomorphic Characteristics of Acid Sulfate Soils

The likelihood of ASS occurrence on-site should be considered against various geomorphic indicators given in Ahern *et al.* (1998) *Acid Sulfate Soil Manual*. These considerations are presented in **Table 3-1**.

Table 3-1 Consideration of Geomorphic Indicators

| Geomorphic Feature | Site Presence of Feature |
|---|---|
| Holocene sediments | Not present, based on the available maps |
| Soil horizons less than 5m AHD | Not Present, site elevations are 132.61-113.5m AHD (**Appendix B**) |
| Marine / estuarine sediments or tidal lakes | Not present, based on the available maps |
| Coastal wetland; backwater swamps; waterlogged or scaled areas; inter-dune swales or coastal sand dunes. | Not present, based on the available maps and site inspection |
| Dominant vegetation is mangroves, reeds, rushes and other swamp or marine tolerant species | Not present, based on site inspection |
| Geologies containing sulphide bearing material | Unlikely, based on the available maps |
| Deep older (Pleistocene) estuarine sediments | Not present, based on the available maps |

## 3.4 Likelihood of ASS Occurrence

Based on these preliminary findings, the site was situated within a relatively sloped, 132.61-113.5m AHD, shale environment. It displayed none of the geomorphic indicators of ASS presence, suggesting that the occurrence of ASS was unlikely.

Nevertheless, as the proposed development involved bulk soil excavations to depths of 12-13m BGL, intrusive investigation, involving soil sampling and laboratory analysis, was not needed prior to excavation to confirm the presence or absence of ASS. This requirement was consistent with the *The Hills Local Environmental Plan 2019,* as well as Schedule 3 of the NSW *Environmental Planning and Assessment Regulation 1994*.

# 4. ACID SULFATE SOIL MANAGEMENT

## 4.1 Intrusive Investigation

Investigation is to be performed prior to any soil disturbance (i.e. excavation) being undertaken at the site. It must include soil profiling, sampling and analysis, to confirm the presence / absence of ASSs. If groundwater is intercepted during the intrusive works, it is recommended that representative samples be collected for appropriate analysis.

Based on the site area (1.758 ha) and predicted total volume of soils to be disturbed during bulk excavation (at least 210,000$m^3$), then in accordance with Ahern *et al.* (1998) and Sullivan *et al*. (2018), the investigation is to comprise:

- Soil profiling at a minimum of six boreholes / test pits, each extended to at least 14m BGL;
- The collection of soil samples from each distinguishable layer and/or at 0.5m increments, ensuring each horizon is represented by the sampling program;
- The collection of a groundwater sample from at least one of the bores / pits, should sufficient inflow be encountered;
- Laboratory analysis of selected soil and groundwater samples for ASS parameters; and
- Data interpretation against the adopted assessment criteria.

***Soil Description***

Examined soils are to be described in-field with respect to lithological characteristics, based on the Unified Soil Classification System (USCS) and Australian Standard AS1726:2017 *Geotechnical Site Investigations* (Standards Australia, 2017). They are to be evaluated on a qualitative basis for odour (hydrogen sulfide) and visual signs of ASS (pale yellow deposits / coatings of jarosite, dark (blue/green) grey to black soils and/or marine shell grit).

***Sample Handling Procedures***

A stainless steel trowel should be used to transfer soil aliquots from the auger drill flights / excavator bucket into laboratory-supplied, zip-lock bags (the sampler wearing dedicated nitrile gloves). The headspace air is to be expelled before sealing the bag.

Groundwater samples are to be collected in high-density, polyethylene bottles.

Upon sealing the bag / bottle, the sample shall be immediately stored in an insulated chest (containing ice packs), before transportation to the designated NATA-accredited analytical laboratory under strict chain-of-custody (COC) procedures.

***Laboratory Analysis***

To confirm the presence/absence of ASSs, representative samples will be assigned for analysis of the parameters recommended in Section 2 *ASSs Assessment Guidelines* of Ahern *et al.* (1998) *Acid Sulfate Soil Manual*, Australian Standard AS4969:2009 *Analysis of Acid Sulfate Soil* (Standards Australia, 2009) and Section 6 *Chemical Analysis for Acidity Hazards* of Sullivan *et al*. (2018) *National Acid Sulfate Soils Guidance - National Acid Sulfate Soils Identification and Laboratory Methods Manual*:

- field pH ($pH_f$);
- field peroxide oxidation pH ($pH_{fox}$);
- electrical conductivity (EC);
- suspension peroxide oxidation combined acidity and sulphate (SPOCAS) suite, for estimation of peroxide oxidisable sulfur ($S_{pos}$); and
- Chromium suite, for estimation of chromium reducible sulfur ($S_{Cr}$), which reflects the inorganic sulfide content of a sample, that being more closely correlated with potential acid sulfates compared with $S_{pos}$.

All laboratory analyses are to be conducted on discrete (un-composited) samples using NATA-registered methods. They shall determine the ASS risk and establish required rates of liming for neutralisation purpose (if ASS are confirmed).

***Assessment Criteria***

The soil analytical results are to be interpreted with respect to the indicators (screening and action criteria) for ASS presented in Tables 2.3 and 4.4 from Section 2 *ASSs Assessment Guidelines* of Ahern *et al*. (1998) *Acid Sulfate Soil Manual*. Since more than 1000m$^3$ / 1000 tonnes of soils will be disturbed, the corresponding criteria are:

- field pH ($pH_f$): 4
- field peroxide oxidation pH ($pH_{fox}$): 3

***SPOCAS / Chromium Suite Sulfur Trail***

- peroxide oxidisable sulfur ($S_{pos}$): 0.03% w/w as sulphur
- chromium reducible sulfur ($S_{Cr}$): 0.03% w/w as sulphur

***SPOCAS Acid Trail***

- total potential acidity (TPA): 18 moles $H^+$ / tonne
- total sulfidic acidity (TSA): 18 moles $H^+$ / tonne.

## 4.2 Preliminary Management Considerations

Assuming ASSs are present on-site, the following activities may intercept and disturb them, thus creating associated environmental impacts via acid leachates:

- Excavation for the basement;
- Piling;
- Excavations for crane pads, lift overrun pits, building footings and service trenches; and
- Dewatering for basement construction (if groundwater inflow and/or heavy rains occur).

The extent of any adverse impacts associated with ASS will depend on the following factors:

- Volume of disturbed / exposed soil identified as being ASS;
- Physical characteristics of the ASS, such as grain size and natural buffering capacity;
- Time that ASS are exposed to air; and
- Rate of oxidation and transport of the oxidation products.

In order to minimise environmental impacts associated with oxidised ASSs, the management options commonly adopted are (WA DER, 2015):

- Avoidance, or minimisation of ASS disturbance;
- Soil neutralisation (typically with lime);
- Strategic reburial under water; and/or
- Off-site treatment and disposal.

Effective identification and monitoring, combined with a planned treatment program that includes appropriate contingencies, will ensure there is no incremental contribution of acid leachates during basement excavation and building construction.

It is understood that all excavated materials will be disposed off-site to landfill. It is recommended that all ASSs be assessed and/or treated (limed) on-site immediately upon disturbance. No such soil should be used for structural or general filling above the groundwater table.

The shortest possible time of air exposure will be permitted, to minimise the extent of oxidation and transport of reaction products. Ideally, stockpiled ASSs will be treated on the same day that they are excavated (and covered by sheets of builder's plastic), while remaining surface soils will be exposed for less than thirty days.

## 4.3 Management of Disturbed Acid Sulfate Soils

It is proposed that excavated ASSs will be stockpiled separately within a designated (bunded) area, in preparation for lime treatment. More specifically, the management procedures are:

1) Prior to work commencement, the proposed excavation area will be isolated and appropriate bunding put in place.

2) ASS will be stockpiled on-site, with temporary bunding placed around each mound. Alternatively, it can be deposited into a skip bin. Lime will be spread evenly throughout the excavated material.

3) For every day a stockpile / skip bin remains on-site, representative samples will be monitored for pH. Where pH is below 5.5, (additional) lime will be applied for neutralisation.

4) On-site neutralisation of potential ASS will be carried out with granulated, agricultural lime.

It is recommended that stockpile(s) containing ASSs be formed on an area where no development works are proposed. The designated treatment area may be subject to change, depending on (modified) plans of the proposed development and access needs. If lime treatment on freshly excavated ASS cannot be performed immediately, plastic sheeting shall be placed over the stockpile to reduce the oxidation rate.

***Determination of Lime Requirement***

The liming rate of identified ASS shall be determined by the investigation (SPOCAS / chromium suite) data. Given the large-scale excavation proposed (at least 35,000m$^3$ site soils), a *Very High Treatment* category is predicted, should ASS be identified (Ahern *et al.*, 1998).

***Method of Neutralisation***

In order to facilitate mixing, the soil should be thinly spread (<0.5m thickness) within the bunded, stockpiling area, or skip bin. Lime should be added by hand and/or excavator bucket, followed by mixing using light-weight rotavators and/or shovels.

Field pH testing on representative samples should be performed to ensure that sufficient neutralisation has occurred (i.e. pH>5.5), prior to disposal.

***Alternative Procedure (Lime Treatment Not Required for PASS)***

In accordance with the EPA (2014) *Waste Classification Guidelines - Part 4: Acid Sulfate Soils*, PASS may be disposed at a licensed landfill without prior treatment, provided the following conditions are met:

- The landfill facility is licensed by the EPA to accept untreated PASS;
- Disposal occurs within 24 hours of excavation (disturbance);
- The PASS is buried at least 2m below the lowest historical level of the permanent water table (at the designated landfill facility); and
- The PASS otherwise meets the definition of *virgin excavated natural material* (VENM) under the *Protection of the Environment Operations Act 1997*, even though it has sulfidic ores / soils.

***Methodology***

When clearance is granted for PASS disposal without treatment, PASS shall be excavated to the required depth and stockpiled in a suitable (bunded) location. Alternatively (preferably), it can be loaded directly onto waiting trucks. Each stockpile / truckload shall be inspected and verification testing for pH shall be carried out to confirm soil $pH_f$ does not fall below 5.5 prior to leaving the site.

Verification testing is required to demonstrate that materials with existing acidity are not being reburied. Should field $pH_f$ fall below pH 5.5, the materials from that stockpile / truck are to remain on-site and lime neutralisation techniques are to be implemented, as described previously.

Stockpiled, non-treated PASS shall be covered if immediate disposal is not possible. Such soil must leave the site within 16 hours of excavation, otherwise lime neutralisation techniques shall proceed as described previously. The PASS must be kept wet at all times and buried below the permanent water table within 8 hours of their receipt at the designated landfill.

**Notes:**
The large basement excavation area and depth may preclude the ability to stockpile PASS on-site and/or create a suitable treatment pad. Hence, it may be prudent to adopt the *Alternative Procedure* described above (without stockpiling), in which case an agreement (approval) with the designated landfill facility should be sought prior to works commencement.
The designated landfill facility must be licensed for the certified waste category. Documentation (tipping dockets) must be collated, accounting for each truck load of soil disposed off-site.

## 4.4 Management of *In Situ* Acid Sulfate Soils

Potential ASSs which become exposed on an excavated pit surface may produce acid. This will apply to any wall and base surfaces of the basement shell containing ASS.

For every day that an excavated pit surface comprised of *in situ* ASS is in an exposed state, representative samples will be monitored for pH; where soil pH falls below 5.5, lime will be applied to the potential ASS horizon(s). Plastic sheeting can be placed over the corresponding surface (where possible) to reduce the oxidation rate.

## 4.5 Dewatering (Groundwater) Issues

If groundwater is encountered during the bulk excavation phase, the removal (pumping) of seepage water from the basement excavation area may be necessary. The proposed excavation work and/or pumping is unlikely to cause significant alterations to the existing (local) groundwater table, at least in the long term. Nevertheless, any required dewatering must be performed in accordance with Sullivan *et al*. (2018) *National Acid Sulfate Soils Guidance: Guidance for the Dewatering of Acid Sulfate Soils in Shallow Groundwater Environments*.

Specific measures that must be implemented are as follows:

1) The civil and dewatering works program will be undertaken in a staged manner, to minimise their duration and the magnitude of water volume.
2) Active management of civil works and dewatering operations is required to minimise potential impacts on the environment and other groundwater users. The use of shoring to physically confine the cone of depression (in the pit), or temporarily slow down groundwater flow, should be considered. Specifications for shoring are to be determined by the appointed structural engineer.
3) Excavation areas will be left open for the shortest possible time.
4) Water to be discharged to Council's stormwater system must:
   - be pumped to an agreed discharge point;
   - not contain a concentration of suspended sediment exceeding 50 mg/L;
   - have a pH of between 6-8; and
   - comply with the ANZG (2018) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (specifically the criteria for the protection of 95% of species in freshwater ecosystems), as well as the criteria included in Landcom (2004) *Managing Urban Stormwater: Soils and Construction*.
5) Should acidic water (pH<6) be encountered during the works, it will be treated with lime to display a pH level of 6-8. The treatment system should include a settlement tank of suitable capacity, with dosing pump to neutralise any acidic water, prior to controlled off-site release. A flow meter is to be located on the discharge line, to record volumes of treated effluent.

6) Granulated lime should be added to the water by hand and/or excavator bucket, then mixed. Field pH testing on representative samples should be performed to ensure that sufficient neutralisation has occurred, prior to disposal.

7) Water testing shall be carried out to ensure groundwater is appropriate for discharge. This testing must be undertaken by a suitably qualified environmental consultant and results provided to Council upon request.

8) Results of water testing must be provided in a certification report. Water that does not comply with the above standards must not be discharged off-site. A permit may be required to discharge such water. It is recommended that consultation with Council be undertaken prior to discharge into the stormwater network.

9) No water containing any suspended matter or contaminants is to leave the site in a manner which could significantly pollute a receiving waterway. Sediment retention traps will be used to control any runoff water.

## 4.6 Risk Management

This management plan is based on the assumption that more than 1000m$^3$ / 1000 tonnes of potential ASSs from within the proposed basement area will be disturbed and exposed (on wall and base surfaces) as a consequence of the corresponding excavation. Should the actual amounts of ASSs significantly differ from those in this report, management techniques may need to be revised. Indeed, management may not necessarily be required at all, depending on investigation findings.

Prior to the commencement of any excavation works, the applicant shall nominate an appropriately qualified environmental scientist to complete the investigation phase and supervise the management of ASSs (if necessary). The scientist shall:

a) Provide an acceptance in writing to supervise the aforementioned works and ensure compliance with this management plan and conditions of consent. This must be provided to the *Director - Environmental Services* of Parramatta Council prior to works commencing.

b) On completion of all ASS management, certify that the aforementioned works were conducted in compliance with the approved plan(s), specifications and conditions of consent. This certification shall be submitted to the *Director - Environmental Services* of Parramatta Council within 30 days of the completion of works.

During the proposed basement excavation, site inspection is to be conducted by the appointed environmental consultant, in order to check that the assumptions made in this plan are consistent with field evidence and practices. The consultant will be responsible for ensuring that:

- actual and/or potential ASSs are kept separate from other soils; and
- testing of excavated and exposed ASSs is performed.

All contractors must employ best practices in managing any off-site water and soil quality impacts during site redevelopment. All waste materials must be contained and disposed at appropriate landfill facilities, in accordance with the EPA (2014) *Waste Classification Guidelines*. Any soils to be imported onto the site for the purpose of back-filling or landscaping will require some form of validation, to confirm their suitability for the proposed land use.

If parts of the basement are to be set on ASS horizons, it is suggested that acid-resistant concrete be considered for the concrete shell. The specifications for acid-resistant concrete will be determined by the appointed structural engineer.

**Notes:**
All demolition activities must be managed in accordance with Australian Standard AS 2601 *The Demolition of Structures* (Standards Australia, 2001). The overriding objective will be the minimization of soil disturbance. During demolition, each structure is to be maintained in a stable and safe condition. Best practices must be employed in managing any off-site water and soil quality impacts. No water containing any suspended matter is to leave the site in a manner which could significantly pollute a receiving waterbody.

## 4.7 Contingency Measures

A list of potential events that may arise during the development and the corresponding contingency actions to be undertaken is provided in **Table 4-1**.

**Table 4-1 Contingency Plan**

| Condition | Action |
|---|---|
| Potential ASS identified at unexpected depths | Stop excavation.<br>Have material assessed by an environmental consultant for the presence of ASS.<br>Follow management procedures adopted in the ASSMP. |
| Neutralisation of ASS was not effective | Re-assess liming rates and add additional lime to material.<br>Re-test material to check neutralisation. |
| Neutralisation of ASS indicates that too much lime has been added and soils are alkaline | Remediate soils before use.<br>Remediation comprises mixing additional ASS with the material (i.e. use excess lime to neutralise more ASS).<br>Re-test material to check neutralisation. |
| Bunded ASS treatment area is damaged | Repair bund as soon as practicable.<br>Clean-up any ASS that escaped the treatment area and place back into the treatment area.<br>Check surrounding area for impact from the ASS or leachate, and undertake remedial action as required. |
| Groundwater level falls below the upper limit of soil horizon identified as containing PASS | Pause / adjust the rate of dewatering to restore groundwater level to above soil horizon defined as containing PASS.<br>Review PASS exposure by checking the ASS and non-ASS interface in the affected area.<br>Determine potential causes by reviewing construction practises, weather, baseline groundwater monitoring data, and performing additional groundwater monitoring as necessary on groundwater monitoring present at the site.<br>Review and confirm mitigation measures to be implemented, including:<br>Maintaining PASS soil moisture levels through targeted groundwater recharge;<br>Adjusting the construction activities or schedule; and<br>Treatment of additional PASS in treatment area.<br>The pH of water should be monitored. |
| Extended rainfall generating excessive water | The control procedures detailed in the plan will accommodate this contingency.<br>The timeframe needed to recover the excessive water may extend the period during which the trench or excavation is open increasing the potential for acid generation and therefore requiring management. |
| Extended delays due to equipment failure, leaving excavated materials open to oxidation | Addition of lime sufficient to neutralise the total potential acidity of the excavated waste.<br>A safety factor of 1.5 is included in the calculation of lime required which should ensure sufficient neutralising capacity should the excavation be open for greater than the planned period.<br>The oxidation of the walls and base of the excavation should also be considered in regards to engineering design. |
| Spillage of ASS | Spillage of ASS should be collected and transferred to the acid soil storage facility as soon as practicable to ensure that surface soil or groundwater is not adversely impacted. |

# 5. CONSULTATION AND RECORDS

During the development and any ASS management, the following authorities may require consultation:

- New South Wales Environment Protection Authority (EPA), concerning pollution incident and response issues, including off-site migration of acid leachates from ASS;
- WaterNSW, for a dewatering permit and associated conditions; and
- The Hills Shire Council, regarding development compliance and environmental issues.

The party responsible for the implementation of this ASSMP should maintain a portfolio documenting all records associated with on-site ASS management. Such records will comprise, though not necessarily be limited to:

- ASS investigation results;
- Field records of ASS monitoring, such as daily field pH screening results on stockpiled materials, excavation surfaces, application of lime, groundwater level and pH level monitoring;
- Records of ASS transportation, including truck registers and waste (tipping) dockets issued by the receiving land fill facility; and
- Environmental incident reports, in cases of non-conformance and subsequent mitigation measures adopted.

All analysis and monitoring information will be stored electronically to permit ease of access and data interpretation.

# 6. STATEMENT OF LIMITATIONS

This plan has been prepared for the exclusive use of Alton Property Group Pty Ltd, whom is the only intended beneficiary of EI's work. The scope of this plan was limited to that agreed with the client.

No warranties are made as to the information provided in this plan. All recommendations and procedures are of the professional opinions of EI personnel involved with the project and while normal checking of the accuracy of data has been conducted, any circumstances outside the scope of this report or which are not made known to EI personnel and which may impact on those opinions are not the responsibilities of EI.

This plan was prepared for the above named client and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

This plan and associated documents remain the property of EI subject to payment of all fees due for the corresponding reporting. The report shall not be reproduced except in full and with prior written permission by EI.

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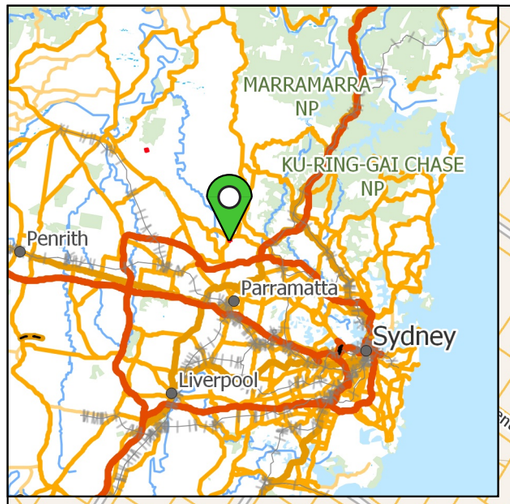
WA DER (2015) *Treatment and Management of Soil And Water in Acid Sulfate Soil Landscapes*, Government of Western Australia, Department of Environment Regulation, version Final, June 2015.

# Appendix A – Figures




uniting church
CASTLE HILL POLICE STATION
CASTLE TOWERS SHOPPING CENTRE
CASTLE HILL SENIOR CITIZENS CENTRE
CASTLE HILL BUS INTERCHANGE
ARTHUR WHITLING PARK RESERVE
CASTLE HILL LIBRARY
Castle Street
CASTLE HILL
Old Northern Road
ST BERNADETTE'S PRIMARY SCHOOL
Primary School
catholic church
Showground Road
Pennant Street
CASTLE HILL POST OFFICE
CASTLE HILL COMMUNITY CENTRE
CASTLE HILL RAILWAY STATION
Old Northern Road
parking area
baptist church
MERCER STREET RESERVE
Mercer Street
Brisbane Road
Dan Crescent
Shopping Centre
CASTLE MALL
Mcdougall Lane
parking area
Terminus Street
SHERWIN AVENUE RESERVE
PARSONAGE ROAD RESERVE
Parsonage Road
Pursser Avenue
ORANGE GROVE RESERVE
Orange Grove
CASTLE HILL HOSPITAL
Crane Road
OLOLA AVENUE RESERVE
HILLS ADVENTIST COLLEGE CASTLE HILL CAMPUS
Olola Avenue
presbyterian church
christadelphian church
cemetery
seventh day adventist church
Parsonage Road
Kerrs Road
Wills Avenue
Cecil Avenue
CRANE ROAD RESERVE
GREENUP PARK
Timothy Avenue
Freeman Avenue
Marie Street
Marie Street
GILROY CATHOLIC High School
ASPECT WESTERN SYDNEY SCHOOL
ST GABRIEL'S SCHOOL FOR STUDENTS WITH SPECIAL NEEDS
Church Street
Gary Street
Francis Street
TIMOTHY AVENUE RESERVE
Walsh Avenue
Darcey Road

0 80 160 240 320 m

**LEGEND. Note: All locations are approximate**

Site Boundary

eiaustralia
Practical Solutions for Built Environments
Suite 6.01, 55 Miller Street, PYRMONT 2009
Ph (02) 9516 0722 Fax (02) 9518 5088

| | |
|---|---|
| Drawn: | T.Y. |
| Approved: | |
| Date: | 30/10/2024 |

**Alton Property Pty Ltd**

Acid Sulfate Soil Management Plan

93-107 Cecil Avenue & 9-10 Roger Avenue, Castle Hill, NSW

Site Locality Plan

Figure: 1

Project: E26536.E14


Map Source:
NearMap, dated 30/10/24

**LEGEND. Note: all locations are approximate**

Site Boundary

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**Alton Property Pty Ltd**

Acid Sulfate Soil Management Plan

93-107 Cevil Avenue & 9-10 Roger Avenue, Castle Hill, NSW

Site Layout Plan

Figure:
2

Project: E26536.E14

# Appendix B – Proposed Development Plans


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|---|---|---|
| A | SSDA | 2024-12-04 |

Project Name

93-107 Cecil Avenue and 9-10 Roger Ave, Castle Hill

Drawing Title
BASEMENT 2

SCALE 1:750 @ A3

Drawing no: A201

Project No. A24033

ISSUE A


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Drawing Title
BASEMENT 1

Project No.
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SCALE 1:750 @ A3

Drawing no:
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Drawing Title
LOWER GROUND

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Drawing Title
GROUND

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A24033

SCALE 1:750 @ A3

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Project Name

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Drawing Title
UPPER GROUND

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Project Name

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Drawing Title
LEVEL 1

Project No.
A24033

SCALE 1:750 @ A3

Drawing no:
A206

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