Preliminary Site Investigation

1020 Melia Court, Castle Hill NSW

Castle Hill Glen Pty Ltd

Reference: 754-SYDGE321033-AB

17 November 2023

PRELIMINARY SITE INVESTIGATION

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EXECUTIVE SUMMARY[1]

Tetra Tech Coffey Pty Ltd (Coffey) was engaged by Castle Hill Glen Pty Ltd to prepare a Preliminary Site Investigation (PSI) for the property located at 2 Glen Road, Castle Hill, NSW ('the site') which is now to be identified as 1020 Melia Court, Castle Hill.

It is understood that the site is proposed to be developed for medium to high-density residential uses, which includes townhouses and a number of 3 to 6 level unit blocks with basement carparking. The site is currently vacant.

The objective of this PSI was to identify potential contamination issues which may pose a constraint to site development and to determine whether additional site investigation or assessment would be required to support the DA process by providing an opinion on whether the site is suitable for the proposed development as required by State Environmental Planning Policy (SEPP) (Resilience and Hazards) 2021.

To meet the above objective, Coffey has prepared this PSI in general accordance with relevant guidelines including the Guidelines for Consultants Reporting on Contaminated Land (NSW EPA, 2020), and Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (the 'ASC NEPM') (NEPC, 2013).

The scope of works completed for the PSI included a review of readily available information to describe the environmental setting and recent historical uses of the site. An inspection was also completed to observe the current condition of the site. Available historical aerial photography images indicate that the site was occupied in 1943 with what appears to be agricultural activity with several small buildings, a larger building structure, an access road and paddocks over the site. There is a large gap in timing of the available aerial photography, with the next available photograph from 1970, where the buildings and paddocks are no longer visible. The site is observed from this time until present to have remained vacant and covered with vegetation.

The site walkover did not identify significant indications of contamination.

A search of public records and maps maintained and provided by various government departments, indicated that the site was not listed on public records regarding contamination.

The review of available records, and observations made during a site walkover has identified the following potential contamination sources within the site:

- Fill material of unknown origin or quality expected locally on site in areas of the former buildings.
- Application and use of herbicides and pesticides.

These potential sources of contamination do not pose unacceptable risks to human health or environmental receptors in the current use of the site. In the context of the proposed development, these potential sources of contamination have the potential to pose potentially unacceptable risks. Based on this assessment, it is assessed that the site can be made suitable for the proposed development as per SEPP (Resilience and Hazards) 2021.

It is recommended that a detailed site investigation (DSI) is carried out, which targets areas of former structures and shallow fill which may be associated with these structures and a broad screen to check for pesticide/herbicide residues. A further walkover should be undertaken to access areas of the site which were previously inaccessible (where possible).

This report should be read in conjunction with the attached Important Information about your Coffey Environmental Report.

[1] This executive summary must be read in the context of the full report and the attached limitations.

CONTENTS

APPENDICES

ACRONYMS

Acronyms	Definition
AEC	Areas of Environmental Concern
AHD	Australian Height Datum
ASC NEPM	National Environment Protection (Assessment of Site Contamination) Measure 1999
ASS	Acid Sulfate Soil
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
COPC	Contaminant of Potential Concern
NSW EPA	Environment Protection Authority of New South Wales
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PFAS	Per- and Poly-fluoroalkyl substances
PSI	Preliminary Site Investigation
TfNSW	Transport for New South Wales
TRH	Total Recoverable Hydrocarbons

1. INTRODUCTION

1.1 GENERAL

Tetra Tech Coffey Pty Ltd (Coffey) was engaged by Castle Hill Glen Pty Ltd to prepare a Preliminary Site Investigation (PSI) for the property located at 2 Glen Road, Castle Hill, NSW ('the site') which is now to be identified as 1020 Melia Court, Castle Hill. The site location and boundary and illustrated in Figure 1 and Figure 2, Appendix A.

It is understood that the site is proposed to be developed for medium-high-density residential uses, which includes townhouses and a number of 3 to 6 level unit blocks with basement carparking. The site is currently vacant. Proposed development plans are also included in Appendix A.

A preliminary geotechnical report was also undertaken concurrently by Coffey and has been reported under a separate cover.

The PSI was prepared in accordance with Coffey's fee proposal dated 23 March 2023 (ref SYDGE318xxx).

1.2 OBJECTIVES

The objective of this PSI was to identify potential contamination issues which may pose a constraint to site development and to determine whether additional site investigation or assessment would be required to support the Development Application (DA) process.

1.3 SCOPE OF WORK

To meet the above objective, Coffey has prepared this PSI in general accordance with relevant guidelines including the Guidelines for Consultants Reporting on Contaminated Land (NSW EPA, 2020), and Schedule B2 of the National Environment Protection (Assessment of Site Contamination) Measure 1999 (the 'ASC NEPM') (NEPC, 2013).

In accordance with NSW EPA guidance and current industry good practice, Coffey carried out a review of the following information:

- Local geology, hydrogeology, topography and acid sulfate soil risk maps;
- A selection of relevant historical aerial photographs covering the site and the surrounds;
- Registered groundwater bore information in the public register held by NSW Office of Water;
- Contaminated land records and environmental protection licence information in the public registers held by the NSW Environment Protection Authority.

To corroborate the findings of the review of the above information, a walkover was undertaken to observe current activities and conditions within the site, and adjacent properties.

2. SITE INFORMATION AND DESCRIPTION

2.1 SITE LOCATION

Site identification details are summarised in Table 2.1. The location and boundary of the site is shown on Figure 1, Appendix A.

Table 2.1: Site Information

Item	Description
Site Address	2 Glen Road, Castle Hill, NSW / 1020 Melia Court, Castle Hill, NSW
Coordinates (centre of site)	Latitude: 33°44'01" S, Longitude: 151°01'17"E (Approximate centre of site; Source: Google Earth)
Site Area	Approximately 44,500m^2 (4.45ha)
Title Identification	Lots 1020 and 1021 DP876671 and Lot 2 DP 576 773
Current Land Zoning	The Hills Local Environmental Plan 2019: C4 – Environmental Living
Local Government Authority	The Hills Shire Council
Site Owner	Castle Hill Glen Pty Ltd
Current Land Use	At the time of the inspection the site was vacant.

2.2 SITE DESCRIPTION

An experienced environmental consultant from Coffey completed a walkover of accessible portions of the site on the 4th of May 2023. The consultant has received training and holds experience in the identification of asbestos containing materials. Observations made during this walkover are summarised below. Selected photographs are provided in Appendix B.

The site currently comprises vacant, vegetated land with established trees, that has recently been cleared in the central portion.

The northern portion of the site (Lot 1020) comprised very steep, heavily vegetated land. The site sloped down in a southerly direction from the northern boundary which runs adjacent to Melia Court. The northern portion was inaccessible for inspection, due to heavy vegetation and steep incline. The central portion of the site (Lot 1021) had been recently cleared of surficial vegetation to allow inspection of the site. Anthropogenic wastes (such as plastic and bricks) were observed; however, these were in very small, scattered quantities, in two areas observed along the southern boundary of Lot 1020. From the landform, evidence of significant filling was not observed. Stockpiles of vegetation and surface soil were present around the site from the recent clearing. The southern portion of the site was heavily vegetated and sloped to the south and was also difficult to access for inspection due to heavy vegetation coverage, however the consultant was able to walk around the south-eastern boundary.

There was some evidence of dumping of building materials over the fences along the eastern boundary from the residential properties such as glass, solar pool heating piping and metal. No other evidence of fly-tipped wastes was observed. No indications of heavily stained or odorous soil were noted. Similarly, no evidence of current or former fuel/chemical storage areas were observed. Building debris suspected to contain asbestos

was not observed during the walkover. Vegetation and trees on-site did not indicate visible signs of stress or discolouration.

2.3 SURROUNDING LAND USES

The following uses of surrounding land were noted based on observations made from accessible areas within the site and site boundary during the walkover, and a review of recent, web-based aerial imagery.

Table 2.2: Surrounding Land Uses

Direction	Description
North	Residential housing was located along the northern boundary, along Melia Court. Castle Hill Road and further residential housing is located beyond.
East	Residential housing.
South	Bushland and residential housing.
West	Glen Road, NSW Water Rogan's Hill Reservoir to the south-west and its associated infrastructure, bushland and residential housing.

3. ENVIRONMENTAL SETTING

3.1 TOPOGRAPHY

Available topographic information from Google Earth Pro indicates that the site topographic profile slopes down from 190m Australian Height Datum (AHD) from Melia Court (northern boundary) down to approximately 135m (AHD) in the southern boundary (adjacent to the Reservoir).

3.2 GEOLOGY AND SOIL LANDSCAPE

Published geological records[2] indicates the site is underlain by Middle Triassic Ashfield Shale with some sandstone beds. Ashfield Shale comprises dark grey to black coloured shale and laminite.

Records available via the eSpade website[3] indicates the northern portion of the site comprises soil landscapes of Glenorie erosional soils which comprises friable dark brown loam, underlain by hard setting brown clay loam. The southern portion of the site indicates that it comprises West Pennant Hills Colluvial soils which comprise friable dark brown clay loam underlain by whole coloured strongly pedal clay.

The colluvial soils are recorded to generally occur on steep, narrow, generally south-west facing hill slopes on the Hornsby Plateau. The topography is often steep side slopes with mass movement derived landforms. It is recorded that perched water tables are often associated with colluvial deposits.

The site is located within an area described as having no known occurrence of Acid Sulfate Soil (ASS).

The site has been the subject of several previous geotechnical investigations. A detailed summary of these investigations and inferred geological sections extracted from the Geotechnical Desk Study (Coffey, 2023) is presented in Appendix D. In summary, the site comprises a large creep landslide of between 8-10m depth, extending down through the upper layers of weathered shale bedrock to the top of sound shale bedrock (i.e., medium to high strength, slightly weathered to fresh shale and laminate). In the central part of the site, the ground profile comprises three strata as follows;

- Residual clays soils of 4m to 5m thickness, over
- Extremely to highly weathered and fractured shales of between 3m to 5m thickness, over
- Slightly weathered to fresh, medium to high strength, sub horizontally bedded shale and laminite.

Groundwater levels across the site are typically between 1m to 5mbgl but following high rainfall events these levels can rapidly rise.

3.3 HYDROGEOLOGY AND HYDROLOGY

Based on the topographical setting of the site, groundwater is anticipated to flow in a southerly direction toward Excelsior Creek which runs along the southern boundary of the site, in a south-easterly direction.

Runoff will infiltrate unsurfaced, permeable ground or flow overland in a southerly direction

A Coffey Geotechnical engineer also attending during the site inspection dipped three of the groundwater wells (understood to be constructed by Douglas Partners in 2015) and indicated that standing water was measured at 1.5m to 4.5m below ground level (bgl).

One registered groundwater well was located 400m to the east of the site – GW105750 (listed as a Private Domestic bore) to a depth of 126.5m. Review of the associated log indicated a soil profile of brown grey clay

[2] MinView Seamless Geological Maps Available: https://minview.geoscience.nsw.gov.au/#/?lon=151.2145&lat=-33.92586&z=17&l= (accessed 23 April 2023)
[3] Available: https://www.environment.nsw.gov.au/eSpade2Webapp (accessed 23 April 2023)

to 8.5m, brown to grey shale from depths of 8.5 to 29.5m, grey sandstone from depths of 29.5-54.5m with sandstone with some shale lenses to depth. The water bearing zone where this bore abstracts water from is recorded at 54.5m bgl.

4. SITE HISTORY

4.1 INFORMATION SOURCES

Coffey reviewed the following sources of information to understand previous uses of the site and surrounding land:

- Aerial photographs accessible via the NSW Government Historical Imagery Viewer[4]
- Various public records and registers.

4.2 HISTORICAL AERIAL PHOTOGRAPHS

Table 4.1 presents a summary from the review of available aerial photographs. Aerial photographs are presented in Appendix A as Figures 2 to 11.

Table 4.1: Summary of Aerial Photograph Review

Date	Site	Surrounding Land
1943	The northern portion of the site is vegetated (Lot 1020). The central portion of the site (Lot 1021) comprises cleared land which appears to be a large building with several paddocks with small sheds/animal shelters. The southern portion of the site is vegetated.	Glen Road is observed in its current position to the western boundary. Orchards appear to be present to the west and south of the site. A large homestead is observed to the north and Castle Hill Road is present to the further north. Cleared land is located to the east with some building structures. Orchards are also present to the further north of the site.
1970	Buildings and paddocks are no longer observed on the site. Trees have revegetated the site.	Orchards are not observed in this photograph. Several buildings have been constructed to the west of the site. The orchards to the south have been revegetated. Large buildings have been constructed to the north of Castle Hill Road.
1974	The site remains similar to the previous photograph except it appears that the trees have been covered, potentially landslip (?) This photograph is not as clear as the 1970 photograph, however the site remains covered with vegetation with no structures present.	Residential housing has been constructed to the west. Orchards/farming present to some areas to the south-east. Remaining areas are observed to be similar to the previous photograph.
1978	Review of this photograph does show some sort of disturbance or potentially overgrowth of vegetation. It is harder to see the outline of the trees in the site area.	Surrounding areas remain broadly the same as the previous photographs.
1982	The site area remains heavily vegetated.	The reservoir to the south-western boundary is in the process of being constructed. Surrounding areas remain broadly the same as the previous photographs.
1989	The site area remains heavily vegetated.	The reservoir has now been constructed.
1991	The site areas appears to have been cleared of heavy vegetation to the two southern lots (Lots 1021 and Lot 2) with some large trees remaining on site.	Surrounding areas remain broadly the same as the previous photographs.

[4] Available: https://portal.spatial.nsw.gov.au/portal/apps/sites/#/homepage (Accessed 23 April 2023)

Date	Site	Surrounding Land
1994	The site remains vegetated, however some large areas of exposed soil are present to the central portion of Lot 1021.	Surrounding areas remain broadly the same as the previous photographs.
1996	The areas of exposed soil are observed to be becoming overgrown with vegetation (i.e. no further disturbance on-site is visible since the previous photograph).	Surrounding areas remain broadly the same as the previous photographs.
1998	Large areas of exposed soils are present again in this photograph. An additional exposed portion of soil is observed at the head of the cul-de-sac along the western site boundary, likely due to the construction of the road.	Residential housing has commenced construction to the northern boundary along Melia Court. Further residential development is evident to the north of Castle Hill Road. To the east of the site a large area has been cleared (likely for further residential development).
2004	The exposed soils are no longer present on-site and the site remains vegetated.	Further construction of residential housing on Melia Court has occurred. Construction of residential housing to the east of site has occurred.
2005	The site remains similar to previous photograph.	Minimal changes are observed in areas surrounding the site.
2018 (Google Earth image)	The site remains heavily vegetated to the northern and southern portions of the site. The central portion remains vegetated/grassed. Minimal trees are present in this section. Cleared paths are observed in this section of the site.	Further construction of residential housing to the east of site has occurred.

5. PUBLIC RECORDS AND REGISTERS

5.1 REVIEW OF PUBLIC RECORDS AND REGISTERS

A review of public records and registers maintained by various government departments was undertaken to understand if any contaminating activities have occurred on the site or surrounding areas.

5.1.1 List of Contaminated Sites Notified to the EPA

A search of the List of NSW Contaminated Sites Notified to NSW EPA[5] was carried out on 23 April 2023. The search indicates that that site, had not been notified to the NSW EPA under Section 60 of the Contaminated Land Management Act 1997.

The search results are included in Appendix C.

5.1.2 NSW EPA Contaminated Land Public Record

A search of the List of NSW Contaminated Sites Notified to NSW EPA was carried out on 23 April 2023. The search did not identify the site.

The search results are included in Appendix C.

5.1.3 Section 10.7 Planning Certificate

This certificate was not available for review at the time of this study.

However, the Hills LEP was reviewed, and it was stated that the site is currently zoned as C4 Environmental Living. The objectives of this zone area to provide for *'low impact residential areas with special ecological, scientific or aesthetic values'.*

The LEP also indicates that the selected site is affected by Landslide Risk.

5.1.4 Protection of the Environment Operation Public Registers

A search of the NSW EPA POEO Public Registers[6,7] was undertaken on 23 April 2023 for:

- Activities licensed by the NSW EPA under Schedule 1 of the POEO Act 1997.
- Unlicensed premises regulated by the EPA.

The site was not identified in a search of these registers.

There were no sites on the register within a 1km radius of the site.

5.1.5 Former Gasworks

A search of NSW EPA List of Former Gasworks[8] was undertaken on 23 April 2023. The search indicated that there are no known gasworks at or within 500m of the site.

[5] https://www.epa.nsw.gov.au/your-environment/contaminated-land/notified-and-regulated-contaminated-land/list-of-notified-sites
[6] https://apps.epa.nsw.gov.au/prpoeoapp/
[7] https://www.epa.nsw.gov.au/licensing-and-regulation/public-registers/about-prpoeo/unlicensed-premises-epa-reg
[8] https://www.epa.nsw.gov.au/your-environment/contaminated-land/other-contamination-issues/former-gasworks-sites

5.1.6 Waste Management Facilities

A search of the National Waste Reporting Mapping Tool[9] on 23 April 2023 did not identify the site or any properties within 500m of the site as being listed as a waste management facility.

5.1.7 NSW Government PFAS Investigation Program

The NSW EPA is leading an investigation program to assess the legacy of Per- and poly-fluoroalkyl substances (PFAS) use across NSW. Current investigations are focused on sites where it is likely that large quantities of PFAS have been used. Investigations are currently being carried out at numerous properties within NSW. A search of the NSW EPA website[10] on 5 April 2023 did not identify properties within 500m of the site which are being investigated for PFAS use under the NSW Government PFAS Investigation Program.

5.1.8 Known James Hardie Waste Disposal Sites

The NSW EPA published a summary project report titled *Regulation Project – James Hardie Asbestos Waste Contamination Legacy*[11] in 2012. This report presented a summary of asbestos impacted sites resulting from former operations of James Hardie Industries and related entities (James Hardie). A review of the report indicates that the site is not listed as a known James Hardie Waste Disposal Site.

5.2 SUMMARY OF SITE HISTORY

Available aerial photography images indicate that the site was occupied in 1943 with what appears to be agricultural activity with several small buildings, a larger building structure, an access road and paddocks over the site. There is a large gap in available aerial photography, with the next available photograph from 1970, where the buildings and paddocks are no longer visible. The site is observed from this time until present to have remained vacant and covered with vegetation.

Two aerial photographs (1994 and 1998) show indications of clearance or disturbance of the vegetated ground surface. Due to the known landslip hazard on the site, this could potentially be evidence of landslip.

A search of public records and maps maintained and provided by various government departments, indicated that the site was not located on any public record regarding contamination.

Land to the east and south appear to have historically been used for orchards or agricultural use. Residential housing commenced construction to the north (along Melia Court at the northern boundary) from 1998. Residential housing and vacant bushland have been present to the north and west from around the 1970's. The Rogan's Hill Reservoir is located to the south-western boundary of the site was constructed circa 1982.

Overall, from available records, site history indicates that the site has been vacant since approximately 1970, with surrounding areas generally surrounded by bushland and residential land uses, with the reservoir located to the south-western boundary.

[9] http://www.environment.gov.au/webgis-framework/apps/nwr-wide/nwr-wide.jsf
[10] https://www.epa.nsw.gov.au/your-environment/contaminated-land/pfas-investigation-program
[11] https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/clm/james-hardie/120919jameshardiereport.pdf.

6. INTEGRITY OF INFORMATION REVIEWED

The following sources of data were relied upon for this assessment:

- Public records and maps maintained and provided by various government departments.
- Observations and information garnered during the site walkover.
- Search of publicly available site history.
- Aerial photographs (approximately two per decade between 1970 and 2018) from the public records; (However, it should be noted that there were no aerial photographs available between 1943 to 1970)

The observations made during the site walkover were generally consistent with the recent aerial photographs, however some portions of the site (Lot 1020 – northern portion of the site and the majority of Lot 2- southern portion of the site) were not able to be accessed safely due to steep incline or heavy vegetation, which limited the opportunity to observe ground/surface conditions. The period between aerial photographs reviewed ranged between 1 and 27 years, however in consideration that the site remained relatively consistent and being vacant since 1970, this is not considered to present a significant data gap in the understanding of recent historic uses. However, a large gap in aerial photographs between 1943 and 1970 does overlap the period when structures observed were demolished and thus it is not clear to what extent these works covered across the site.

7. CONCEPTUAL SITE MODEL

7.1 AREAS OF ENVIRONMENTAL CONCERN

The following areas of environmental concern (AEC) have been identified based on the findings of the desk-based research and site walkover.

Table 7.1: Summary of AECs

Potential Contaminating Activity / AEC	Contaminants of Potential Concern (COPC)	Comments
Localised fill or stockpiled material of unknown origin or quality on site.	• Heavy metals • Asbestos • Total Recoverable Hydrocarbons (TRH) • Polycyclic Aromatic Hydrocarbons (PAH) • Monoaromatic Hydrocarbons incl. Benzene, Toluene, Ethylbenzene and Xylene (BTEX) • Organic Pesticides (OCP & OPP) • Polychlorinated Biphenyls (PCB)	Fill is likely to be present in localised areas where historical structures were removed, or small stockpiles. Site clearance had created soil mounds on the site, but these are likely to be disturbed natural soil material.
Former and current buildings on site	• Heavy metals including lead • Asbestos • Metallic and pesticides/herbicides	Whilst these uses are unlikely to have resulted in significant or widespread contamination, weathering of hazardous building products such as lead-based paints and pesticides/herbicides may have left residues in the soil. The buildings on the site were demolished between 1943 and 1970 as indicated from the aerial photographs. Poor historic demolition practices may have spread these materials over a wider area

Potential Contaminating Activity / AEC	Contaminants of Potential Concern (COPC)	Comments
Use and storage of pesticides/ herbicides	• Organic Pesticides (OCP & OPP) • Phenoxy herbicides • Heavy metals	Small amounts of crops/paddocks/animal shelters are evident in the 1943 aerial photograph. There is the potential for herbicides/pesticides to have been used in the past to assist in the management of weeds/pests.

7.2 RECEPTORS, POTENTIAL TRANSPORT MECHANISMS & EXPOSURE PATHWAYS

Table 7.2 summarises the potentially affected media, key potential receptors and transport mechanisms assuming continued use as a public recreation space/community facility.

Table 7.2: Summary of potentially affected media, receptors, transport mechanisms and exposure routes

Consideration	Information
Potentially Affected Media	**Soil** – fill material and potentially the upper layers of natural soil. **Groundwater** – secondary contamination source via infiltration (dissolution/leaching) through potentially impacted fill/natural soil.
Potential Transport Mechanisms & Exposure Pathways	• Dermal contact with contaminated soil and water • Incidental ingestion of contaminated soil • Inhalation of airborne dusts, vapours and fibres • Consumption of home grown produce • Lateral and vertical water migration • Surface water flow including suspended solids • Preferential flows via overland flow/open drainage channels • Ecological uptake mechanisms
Potential Receptors & Discussion of Pollutant Linkages	***Site Users – Site Worker & Visitor (Current Site Use)*** • Potential for exposure via dermal contact, and ingestion/inhalation of soil/fibres to be low/negligible where dense vegetation is maintained given site visit are typically infrequent and short duration. • Potential for contact with perched water or surface water is considered to be low/negligible. ***Future Construction/Maintenance Workers*** • Potential exposure to impacted soil via dermal contact, ingestion and inhalation of soil, vapours and fibres considered possible during future site redevelopment and subsurface maintenance activities. • Direct contact with perched water or groundwater that accumulates in deeper excavations established during construction of the proposed development. ***Future Residential Site User*** • Potential exposure to impacted soil via dermal contact, ingestion and inhalation of soil, vapours and fibres considered possible. Consumption of homegrown vegetables is also plausible in townhouses with private garden areas. • Potential for exposure via inhalation of dust/fibres or vapours in indoor air. • Potential exposure to groundwater considered unlikely given reticulated potable water supply exists in the area, negating the need for groundwater abstraction.

Consideration	Information
	Neighbouring Site Users • Potential for exposure via inhalation of dust/fibres to be to be low/negligible in the context of the current site use. The potential for exposure increases during future site development activities. • Contact with water is considered unlikely given the distance of residential housing from the site and the flow of water to the south that is intercepted by Excelsior Creek. • Surface water unlikely to convey potential contaminated soil onto neighbouring sites. ***Groundwater*** • Soluble contaminants can leach from permeable soil into groundwater. • It is expected that contamination (if present) dissolved within groundwater will attenuate with distance via the mechanisms including dispersion, sorption and dilution. It is assessed that groundwater within the site is not hydraulically connected to the water bearing zone the licensed groundwater abstraction bore given it is located 400m east which is cross gradient with the inferred southerly gradient expected on site, and the depth of abstraction is approximately 55mbgl, before discharging into Excelsior Creek. Surface water runoff will infiltrate the ground where permeable surfaces exist, or flow overland and either be intercepted by open drainage channels (preferential pathway), or discharge direct into surface water such as the creek. ***Terrestrial Ecology – Mature trees landscaping on site*** • Mature trees and established vegetation on site may be exposed to potential contamination via plant uptake mechanisms, where they are in direct contact with potentially contaminated soils. A plausible pollutant linkage is considered to be low/negligible for the current site use given that existing vegetation did not appear to exhibit visible signs of stress during the site walkover, however contamination (if present) may pose unacceptable risks to new plants/trees should the site be redeveloped.

7.3 POTENTIAL AND COMPLETE EXPOSURE PATHWAYS

Table 7.3 summarises the identified key potential human exposure pathways in the context of the current use of the site as a public recreation space/community facility.

Table 7.3: Summary of potentially complete pathways – Human Health

Human Receptor	Exposure Pathways Potentially Complete?					
	Dermal Contact	Ingestion of Soil	Inhalation of Dust/Fibres	Indoor Inhalation of Gases/Vapours	Groundwater Use	Consumption of Homegrown Produce
Site Visitor (Current Use)	✓?	✓?	✓?	×	×	NA
Construction/Maintenance Worker	✓	✓	✓	✓?	×	NA
Future Residential Site User	✓?	✓?	✓?	✓?	×	✓?
Neighbouring Site Users	×	×	✓?	×	×	NA

Notes: ✓ - Complete Pathway, ✓? – Potentially Complete Pathway (dependant on site conditions), × - Incomplete Pathway, NA Pathway not applicable

Table 7.4 summarises the identified key potential exposure pathways for environmental receptors in the context of the current land use.

Table 7.4: Summary of potentially complete pathways – Environmental Receptors

Environmental Receptor	Exposure Pathways Potentially Complete?				
	Soil Leaching	Lateral/Vertical Groundwater Migration	Preferential Pathway	Surface Water Runoff	Plant Uptake Mechanisms
Groundwater (On Site)	✓?	✓	✓?	✓	✓?
Surface Water / Aquatic Receptors (Off Site)	✓?	✓?	✓?	✓?	✓?
Terrestrial Ecology (On Site)	✓?	×	×	×	✓?

Notes: ✓ - Complete Pathway, ✓? – Potentially Complete Pathway (dependant on site conditions), × - Incomplete Pathway, NA Pathway not applicable

8. CONCLUSIONS AND RECOMMENDATIONS

Tetra Tech Coffey Pty Ltd (Coffey) was engaged Castle Hill Glen Pty Ltd to prepare a Preliminary Site Investigation (PSI) for the property identified as 1020 Melia Court, Castle Hill, NSW ('the site').

It is understood that the site is proposed to be developed for medium to high-density residential land uses, which will include townhouses and a number of 3 to 6 level unit blocks with basement carparking. The site is currently vacant.

The objective of this PSI was to identify potential contamination issues which may pose a constraint to site development and to determine whether additional site investigation or assessment would be required to support the DA process.

A review of publicly available records and maps maintained and provided by various government departments were reviewed as well as historical aerial photography, and a site walkover was undertaken to observe signs of contamination.

Available historical aerial photography images indicate that the site was occupied in 1943 with what appears to be agricultural activity with several small buildings, a larger building structure, an access road and paddocks over the site. There is a large gap in available aerial photography, with the next available photograph from 1970, where the buildings and paddocks are no longer visible. The site is observed from this time until present to have remained vacant and covered with vegetation.

Two aerial photographs (1994 and 1998) show indications of clearance or disturbance of the vegetated ground surface. Due to the known landslip hazard on the site, this could potentially be evidence of landslip. Areas surrounding the site are generally residential or bushland properties, with the Reservoir located to the south-eastern boundary of the site.

A search of public records and maps maintained and provided by various government departments, indicated that the site was not located on public records regarding contamination.

The review of available records, and observations made during a site walkover has identified the following potential contamination sources within the site:

The review of available records, and observations made during a site walkover has identified the following potential contamination sources within the site:

- Fill material of unknown origin or quality expected locally on site in areas of the former buildings.
- Application and use of herbicides and pesticides.

These potential sources of contamination do not pose unacceptable risks to human health or environmental receptors in the current use of the site. In the context of the proposed development, these potential sources of contamination have the potential to pose potentially unacceptable risks. Based on this assessment, it is assessed that the site can be made suitable for the proposed development as per SEPP (Resilience and Hazards) 2021.

It is recommended that a detailed site investigation (DSI) is carried out, which targets areas of former structures and shallow fill which may be associated with these structures and a broad screen to check for pesticide/herbicide residues. A further walkover should be undertaken to access areas of the site which were previously inaccessible (where possible).

This report should be read in conjunction with the attached Important Information about your Coffey Environmental Report.

9. REFERENCES

- Geological Survey of NSW (1983) *Geological Series Sheet 9130 'Sydney'* (1:100,000 scale; Edition 1)
- NEPC (2013); *National Environment Protection (Assessment of Site Contamination) Measure 1999* (the 'ASC NEPM')
- NSW EPA (2020); *Guidelines for Consultants Reporting on Contaminated Land,*
- NSW Work Health and Safety Act 2011 (WHS Act 2011)
- NSW Work Health and Safety Regulation 2011 (WHS Regulation 2017)
- Contaminated Land Management (CLM) Act, 1997 (CLM Act 1997)
- Protection of the Environment Operations (POEO) Act 1997 (POEO Act 1997)
- Tetra Tech Coffey (2023) Initial Geotechnical Assessment, 2 Glen Road, Castle Hill (SYDGE321033-AA, dated 17 May 2023)

10. LIMITATIONS

This report should be read in conjunction with the attached Important Information about your Coffey Environmental Report.

IMPORTANT INFORMATION ABOUT YOUR TETRA TECH COFFEY ENVIRONMENTAL REPORT

Introduction

This report has been prepared by Tetra Tech Coffey for you, as Tetra Tech Coffey's client, in accordance with our agreed purpose, scope, schedule and budget.

The report has been prepared using accepted procedures and practices of the consulting profession at the time it was prepared, and the opinions, recommendations and conclusions set out in the report are made in accordance with generally accepted principles and practices of that profession.

The report is based on information gained from environmental conditions (including assessment of some or all of soil, groundwater, vapour and surface water) and supplemented by reported data of the local area and professional experience. Assessment has been scoped with consideration to industry standards, regulations, guidelines and your specific requirements, including budget and timing. The characterisation of site conditions is an interpretation of information collected during assessment, in accordance with industry practice.

This interpretation is not a complete description of all material on or in the vicinity of the site, due to the inherent variation in spatial and temporal patterns of contaminant presence and impact in the natural environment. Tetra Tech Coffey may have also relied on data and other information provided by you and other qualified individuals in preparing this report. Tetra Tech Coffey has not verified the accuracy or completeness of such data or information except as otherwise stated in the report. For these reasons the report must be regarded as interpretative, in accordance with industry standards and practice, rather than being a definitive record.

Your report has been written for a specific purpose

Your report has been developed for a specific purpose as agreed by us and applies only to the site or area investigated. Unless otherwise stated in the report, this report cannot be applied to an adjacent site or area, nor can it be used when the nature of the specific purpose changes from that which we agreed.

For each purpose, a tailored approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible quantify, risks that both recognised and potential contamination pose in the context of the agreed purpose. Such risks may be financial (for example, clean up costs or constraints on site use) and/or physical (for example, potential health risks to users of the site or the general public).

Limitations of the Report

The work was conducted, and the report has been prepared, in response to an agreed purpose and scope, within time and budgetary constraints, and in reliance on certain data and information made available to Tetra Tech Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on that purpose and scope, requirements, data or information, and they could change if such requirements or data are inaccurate or incomplete.

This report is valid as of the date of preparation. The condition of the site (including subsurface conditions) and extent or nature of contamination or other environmental hazards can change over time, as a result of either natural processes or human influence. Tetra Tech Coffey should be kept appraised of any such events and should be consulted for further investigations if any changes are noted, particularly during construction activities where excavations often reveal subsurface conditions.

In addition, advancements in professional practice regarding contaminated land and changes in applicable statues and/or guidelines may affect the validity of this report. Consequently, the currency of conclusions and recommendations in this report should be verified if you propose to use this report more than 6 months after its date of issue.

The report does not include the evaluation or assessment of potential geotechnical engineering constraints of the site.

Interpretation of factual data

Environmental site assessments identify actual conditions only at those points where samples are taken and on the date collected. Data derived from indirect field measurements, and sometimes other reports on the site, are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Variations in soil and groundwater conditions may occur between test or sample locations and actual conditions may differ from those inferred to exist. No environmental assessment program, no matter how comprehensive, can reveal all subsurface details and anomalies. Similarly, no professional, no matter how well qualified, can reveal what is hidden by earth, rock or changed through time.

The actual interface between different materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of a suitably qualified and experienced environmental consultant through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other unrecognised features encountered on site. Tetra Tech Coffey would be pleased to assist with any investigation or advice in such circumstances.

Recommendations in this report

This report assumes, in accordance with industry practice, that the site conditions recognised through discrete sampling are representative of actual conditions throughout the investigation area. Recommendations are based on the resulting interpretation.

Should further data be obtained that differs from the data on which the report recommendations are based (such as through excavation or other additional assessment), then the recommendations would need to be reviewed and may need to be revised.

Report for benefit of client

Unless otherwise agreed between us, the report has been prepared for your benefit and no other party. Other parties should not rely upon the report or the accuracy or completeness of any recommendation and should make their own enquiries and obtain independent advice in relation to such matters.

Tetra Tech Coffey assumes no responsibility and will not be liable to any other person or organisation for, or in relation to, any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report.

To avoid misuse of the information presented in your report, we recommend that Tetra Tech Coffey be consulted before the report is provided to another party who may not be familiar with the background and the purpose of the report. In particular, an environmental disclosure report for a property vendor may not be suitable for satisfying the needs of that property's purchaser. This report should not be applied for any purpose other than that stated in the report.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, a suitably qualified and experienced environmental consultant should be retained to explain the implications of the report to other professionals referring to the report and then review plans and specifications produced to see how other professionals have incorporated the report findings.

Given Tetra Tech Coffey prepared the report and has familiarity with the site, Tetra Tech Coffey is well placed to provide such assistance. If another party is engaged to interpret the recommendations of the report, there is a risk that the contents of the report may be misinterpreted and Tetra Tech Coffey disowns any responsibility for such misinterpretation.

Data should not be separated from the report

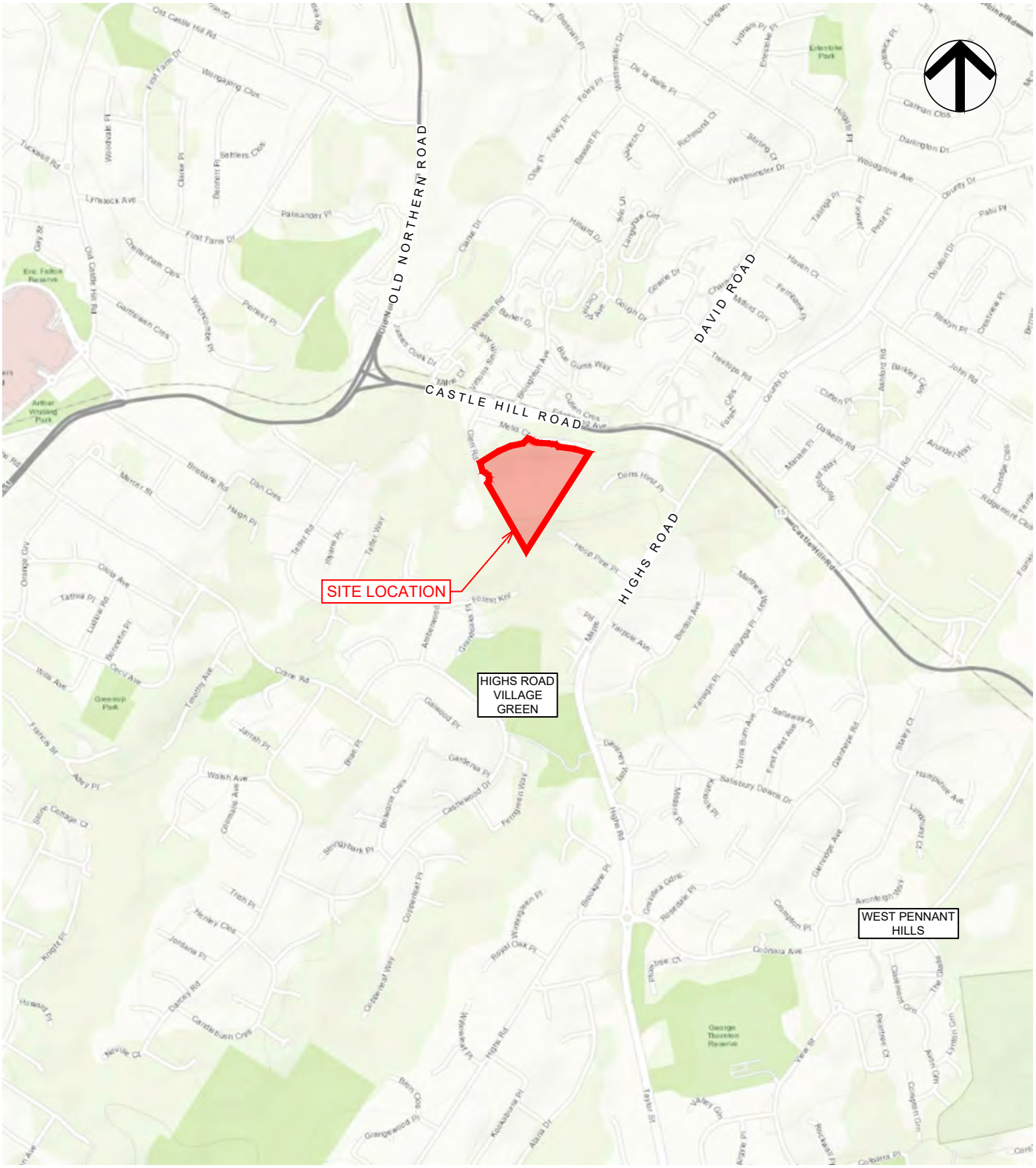
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists or engineers based on their interpretation of field logs, field testing and laboratory evaluation of samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

This report should be reproduced in full. No responsibility is accepted for use of any part of this report in any other context or for any other purpose or by third parties.

Responsibility

Environmental reporting relies on interpretation of factual information using professional judgement and opinion and has a level of uncertainty attached to it, which is much less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. As noted earlier, the recommendations and findings set out in this report should only be regarded as interpretive and should not be taken as accurate and complete information about all environmental media at all depths and locations across the site.

APPENDIX A: FIGURES AND CONCEPT PLANS



MAP PROJECTION: GDA2020 MGA ZONE 56

200 0 200 400 600 800

Scale (metres) 1:15000

IMAGERY SOURCE: WORLD TOPOGRAPHIC MAP
SOURCES: ESRI, HERE, GARMIN, INTERMAP, INCREMENT P CORP., GEBCO, USGS, FAO, NPS, NRCAN, GEOBASE, IGN, KADASTER NL, ORDNANCE SURVEY, ESRI JAPAN, METI, ESRI CHINA (HONG KONG), (C) OPENSTREETMAP CONTRIBUTORS, AND THE GIS USER COMMUNITY

PRELIMINARY NOT FOR DESIGN

drawn	SP / DR
approved	S.P.
date	8-11-2023
scale	AS SHOWN
original size	A4

TETRA TECH COFFEY

client: CASTLE HILL GLEN PTY LTD

project: Rogans Hill Park
1020 Melia Court
CASTLE HILL, NSW

title: SITE LOCATION PLAN

project no: 754-SYDGE321033 | figure no: FIGURE 2 | rev: A

PLOT DATE: 17/9/2023 11:16:00 AM DWG FILE: F:\1. PROJECTS\4. SYD-GEOTECHNICS\16. SYDGE320000\SYDGE321033 2 GLEN RD CASTLEHILL\12. CAD\DWG SVEN\754-SYDGE321033.DWG

01 SITE

DKO

DKO Architecture (NSW) Pty Ltd
42 Davies Street
Surry Hills, NSW 2010
ABN: 81956706590

T +61 2 8346 4500
info@DKO.com.au
www.DKO.com.au

PRELIMINARY

Project Name	Melia Gardens
Project Number	13294
Date	11/13/2023
Scale	@A3

Drawing Name	Site Plan
Drawing Number	**SD16.9**
Revision	

MASTER PLAN SCHEME 12 - Basement

1 Basement

Rev	Date	By	Chk	Description

DKO Architecture (NSW) Pty Ltd
42 Davies Street
Surry Hills, NSW 2010
T +61 2 8346 4500
info@DKO.com.au
www.DKO.com.au
ABN: 81956706590

DKO

Project Name	Melia Gardens
Project Address	Glen Road, Castle Hill, NSW 2154
Client	[CLIENT COMPANY]
Project Number	13294
Drawing Name	Scheme 12 - Basement
Scale	1:500@A3
Date	11/13/2023
Drawing Number	SD16.1
Revision	

MASTER PLAN SCHEME 12 - Ground Floor

1 Ground

Rev	Date	By	Chk	Description

DKO Architecture (NSW) Pty Ltd
42 Davies Street
Surry Hills, NSW 2010
T +61 2 8346 4500
info@DKO.com.au
www.DKO.com.au
ABN: 81956706590

DKO

Project Name	Melia Gardens	Project Number	13294
Project Address	Glen Road, Castle Hill, NSW 2154	Drawing Name	Scheme 12 - Ground
		Scale	1:500@A3
		Date	11/13/2023
Client	[CLIENT COMPANY]	Drawing Number	SD16.2
		Revision	

APPENDIX B: SITE PHOTOGRAPHS

Photograph 1

04.05.2023 – Site looking east

Photograph 2

04.05.2023 – Site looking south-east

Photograph 3

04.05.2023 – Site looking east, showing eastern boundary fence with residential properties beyond, and sloping to the north

Photograph 4

04.05.2023 – Site showing eastern boundary fence with residential properties beyond

Photograph 5

04.05.2023 – Looking north along eastern boundary fence

Photograph 6

04.05.2023 – Looking south along eastern boundary

Photograph 7

04.05.2023 – Large concrete block, looking south – along the southern boundary of Lot 1021

Photograph 8

04.05.2023 – Small collection of rubbish along southern boundary of Lot 1021

Photograph 9

04.05.2023 – Looking south, incline into Lot 2

Photograph 10

04.05.2023 – Looking west towards Glen Road from the east of the site

Photograph 41

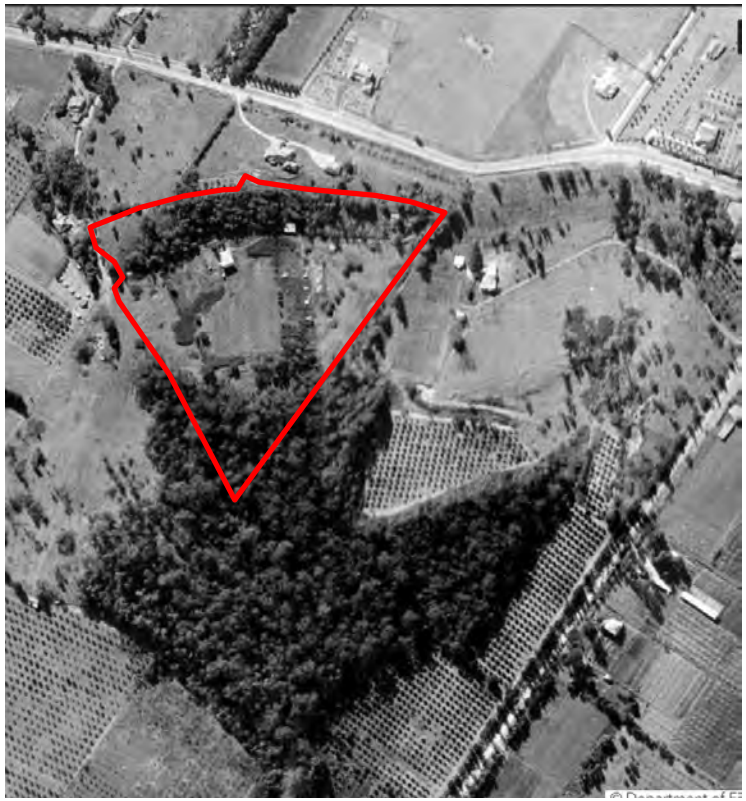
04.05.2023 – Looking north towards northern boundary

Photograph 12

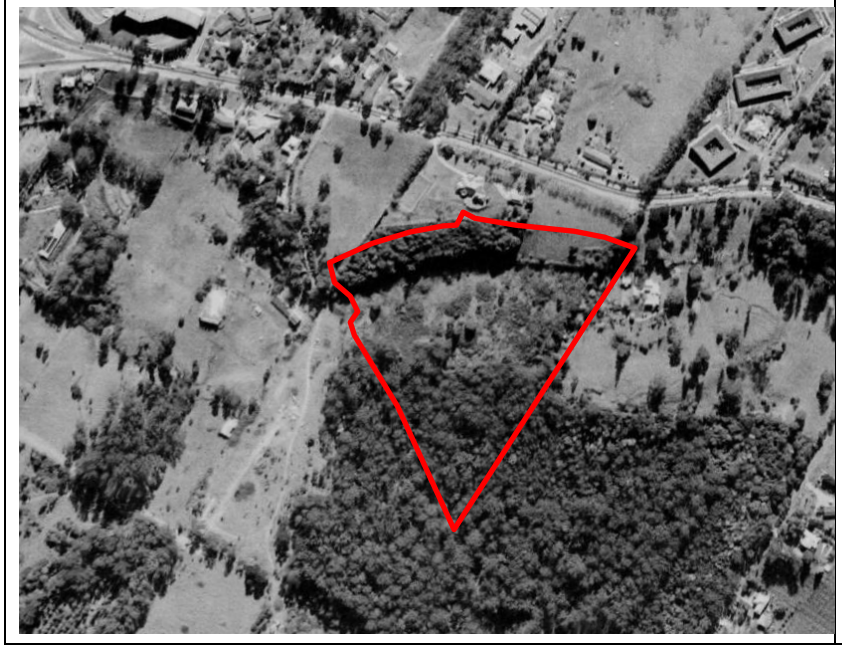
04.05.2023 – Looking west along the northern boundary (Melia Court)

APPENDIX C: SITE HISTORY INFORMATION

Photograph 1: 1943



Photograph 2: 1970

Photograph 3: 1975	Photograph 4: 1978
	

Photograph 5: 1982

Photograph 6: 1991

Photograph 7: 1994

Photograph 8: 1996

Photograph 9: 1998	Photograph 10: 2004
	

Photograph 11: 2005	Photograph 12: 2018
	

Public registers

+ POEO Public Register
– Contaminated land record of notices
  - About the record of notices
  - List of notified sites
  - Tips for searching
  - Disclaimer
Dangerous goods licences
Pesticide licences
Radiation licences

Home | Public registers | Contaminated land record of notices

Search results

Your search for: Suburb: CASTLE HILL

Search Again | Refine Search

did not find any records in our database.

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

... more search tips

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the planning process.

More information about particular sites may be available from:

- The POEO public register
- The appropriate planning authority: for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act.

See What's in the record and What's not in the record.

If you want to know whether a specific site has been the subject of notices issued by the EPA under the CLM Act, we suggest that you search by Local Government Area only and carefully review the sites that are listed.
This public record provides information about sites regulated by the EPA under the Contaminated Land Management Act 1997, including sites currently and previously regulated under the Environmentally Hazardous Chemicals Act 1985. Your inquiry using the above search criteria has not matched any record of current or former regulation. You should consider searching again using different criteria. The fact that a site does not appear on the record does not necessarily mean that it is not affected by contamination. The site may have been notified to the EPA but not yet assessed, or contamination may be present but the site is not yet being regulated by the EPA. Further information about particular sites may be available from the appropriate planning authority, for example, on a planning certificate issued by the local council under section 149 of the Environmental Planning and Assessment Act. In addition the EPA may be regulating contamination at the site through a licence under the Protection of the Environment Operations Act 1997. You may wish to search the POEO public register.POEO public register

26 April 2023

Public registers

- POEO Public Register
  - Licences, applications and notices search
  - Penalty notices search
  - Enforceable undertakings search
  - Enforceable undertakings media releases
  - Exemptions and approvals search
  - Prosecutions or civil proceedings search
  - Terms of use: POEO public register
  - Licensing FAQs
  - List of licences
  - Unlicensed premises regulated by the EPA
- Contaminated land record of notices
- Dangerous goods licences
- Pesticide licences
- Radiation licences

Home Public registers POEO Public Register Licences, applications and notices search

Search results

Your search for: **General Search** with the following criteria

Suburb - castle hill

returned 57 results

Export to excel 1 of 3 Pages Search Again

Number	Name	Location	Type	Status	Issued date
11895	CRC INDUSTRIES (AUST) PTY LIMITED	9 GLADSTONE ROAD, CASTLE HILL, NSW 2154	POEO licence	Issued	23 May 2003
1050943	CRC INDUSTRIES (AUST) PTY LIMITED	9 GLADSTONE ROAD, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	02 Sep 2005
1095155	CRC INDUSTRIES (AUST) PTY LIMITED	9 GLADSTONE ROAD, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	23 Jun 2009
1526962	CRC INDUSTRIES (AUST) PTY LIMITED	9 GLADSTONE ROAD, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	28 Apr 2015
1534373	CRC INDUSTRIES (AUST) PTY LIMITED	9 GLADSTONE ROAD, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	06 Oct 2015
6735	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	POEO licence	No longer in force	09 Aug 2000
1002798	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.91 Clean Up Notice	Issued	17 Nov 2000
1002799	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	20 Nov 2000
1002832	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.91 Clean Up Notice	Issued	20 Nov 2000
1018151	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	19 Jun 2002
1027226	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	19 May 2003
1034230	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	29 Jan 2004
1049632	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	28 Jul 2005
1051833	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	12 Sep 2005
1076458	ECOLAB PTY LTD	6 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	08 Nov 2007
5968	HOBSON ENGINEERING CO PTY LTD	14 VICTORIA AVE, CASTLE HILL, NSW 2154	POEO licence	No longer in force	04 Feb 2000
1044241	HOBSON ENGINEERING CO PTY LTD	14 VICTORIA AVE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	03 Feb 2005
2872	HOLT LLOYD AUSTRALASIA PTY LTD	15 HUDSON AVE, CASTLE HILL, NSW 2154	POEO licence	Surrendered	24 May 2000
1024463	HOLT LLOYD AUSTRALASIA PTY LTD	15 HUDSON AVE, CASTLE HILL, NSW 2154	s.80 Surrender of a Licence	Issued	24 Jan 2003
2847	PARKER HANNIFIN (AUSTRALIA) PTY. LIMITED	9 CARRINGTON ROAD, CASTLE HILL, NSW 2154	POEO licence	Surrendered	01 May 2000

Search results

Your search for: **General Search** with the following criteria

Suburb - castle hill

returned 57 results

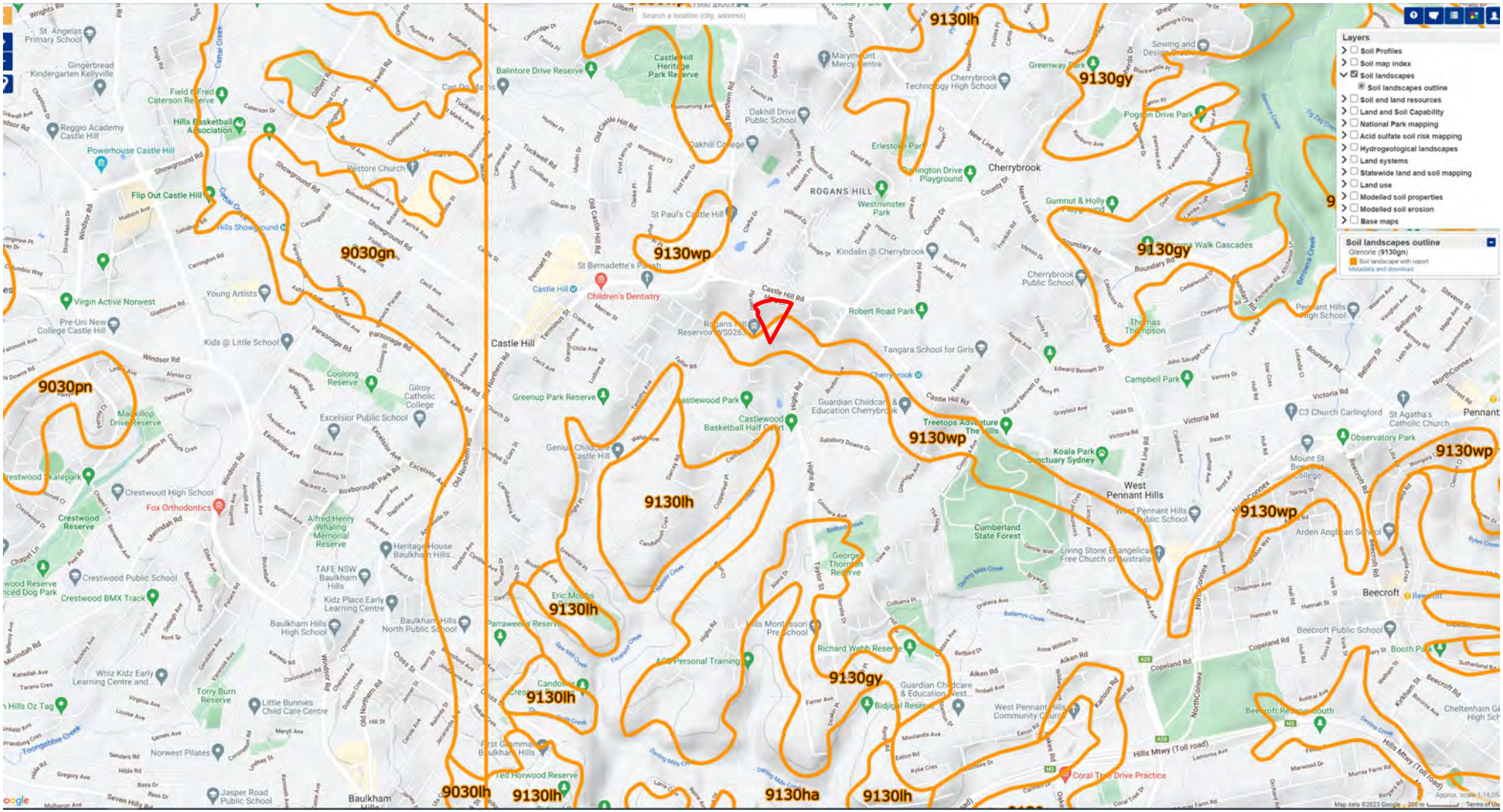
Export to excel

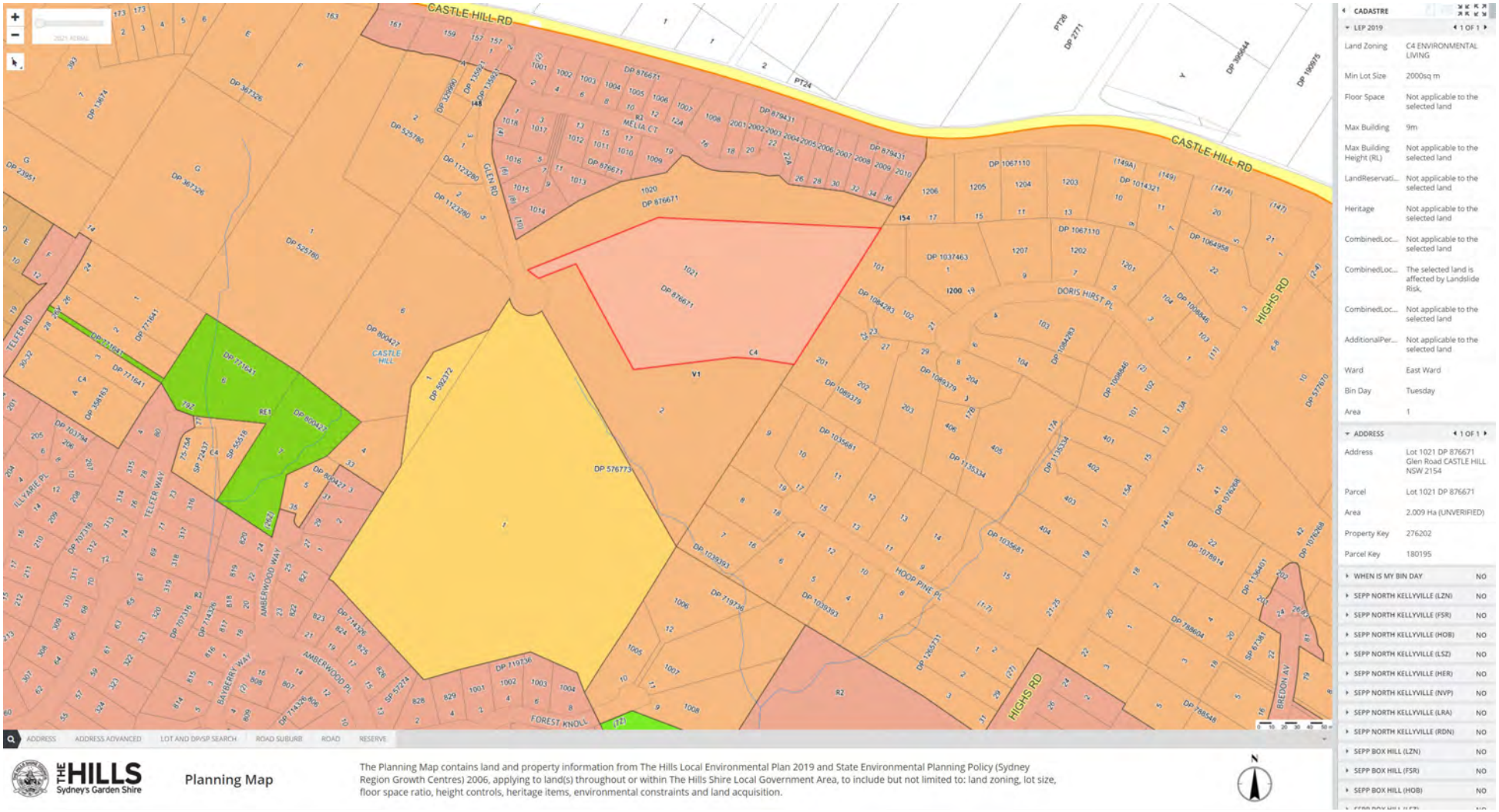
2 of 3 Pages

Search Again

Number	Name	Location	Type	Status	Issued date
1044239	PARKER HANNIFIN (AUSTRALIA) PTY. LIMITED	9 CARRINGTON ROAD, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	06 Feb 2005
1073465	PARKER HANNIFIN (AUSTRALIA) PTY. LIMITED	9 CARRINGTON ROAD, CASTLE HILL, NSW 2154	s.80 Surrender of a Licence	Issued	23 May 2007
12202	SIGMA-ALDRICH PTY. LIMITED	12 ANELLA AVENUE, CASTLE HILL, NSW 1765	POEO licence	Surrendered	23 Nov 2004
1074288	SIGMA-ALDRICH PTY. LIMITED	12 ANELLA AVENUE, CASTLE HILL, NSW 1765	s.58 Licence Variation	Issued	06 Nov 2007
1121925	SIGMA-ALDRICH PTY. LIMITED	12 ANELLA AVENUE, CASTLE HILL, NSW 1765	s.80 Surrender of a Licence	Issued	03 Dec 2010
6701	SMC CORPORATION (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	POEO licence	Issued	19 May 2000
1046359	SMC CORPORATION (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	11 Apr 2005
1096759	SMC CORPORATION (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	22 Jan 2009
1097956	SMC CORPORATION (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	14 May 2009
1109342	SMC CORPORATION (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	16 Dec 2009
1529568	SMC CORPORATION (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	01 Jun 2015
1576491	SMC CORPORATION (AUSTRALIA) PTY LTD	14-18 HUDSON AVENUE, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	11 Mar 2019
20319	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	POEO licence	Surrendered	30 Sep 2013
1517520	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	11 Nov 2013
1518596	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	29 Nov 2013
1519019	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	19 Dec 2013
1519320	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	09 Jan 2014
1521159	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	31 Mar 2014
1521476	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	14 Apr 2014
1521774	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW	s.58 Licence Variation	Issued	09 May 2014

Number	Name	Location	Type	Status	Issued date
1522873	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	20 Jun 2014
1523337	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	14 Jul 2014
1523570	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	21 Jul 2014
1525214	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	30 Sep 2014
1525680	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	17 Oct 2014
1526354	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	17 Nov 2014
1529472	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	27 Mar 2015
1530676	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	15 May 2015
1531229	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	10 Jun 2015
1531910	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	06 Jul 2015
1532871	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	13 Aug 2015
1533757	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	07 Sep 2015
1534633	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	16 Oct 2015
1535892	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.58 Licence Variation	Issued	23 Nov 2015
1541770	THIESS PTY LTD	Between Balmoral Road Bella Vista and Epping Railway Station, CASTLE HILL, NSW 2154	s.80 Surrender of a Licence	Issued	12 Jul 2016
11782	WALTER SCHELLANDER	40/5 ANELLA AVENUE, CASTLE HILL, NSW 2154	POEO licence	No longer in force	04 Nov 2002
1048341	WALTER SCHELLANDER	40/5 ANELLA AVENUE, CASTLE	s.58 Licence	Issued	31 May 2005


9030gn
9030pn
9130wp
9130lh
9130gy
9130ha
9030lh
Castle Hill
ROGANS HILL
Cherrybrook
West Pennant Hills
Beecroft
Layers
Soil Profiles
Soil map index
Soil landscapes
Soil landscapes outline
Soil and land resources
Land and Soil Capability
National Park mapping
Acid sulfate soil risk mapping
Hydrogeological landscapes
Land systems
Statewide land and soil mapping
Land use
Modelled soil properties
Modelled soil erosion
Base maps
Soil landscapes outline
Glenorie (9130gn)



THE HILLS Sydney's Garden Shire

Planning Map

The Planning Map contains land and property information from The Hills Local Environmental Plan 2019 and State Environmental Planning Policy (Sydney Region Growth Centres) 2006, applying to land(s) throughout or within The Hills Shire Local Government Area, to include but not limited to: land zoning, lot size, floor space ratio, height controls, heritage items, environmental constraints and land acquisition.

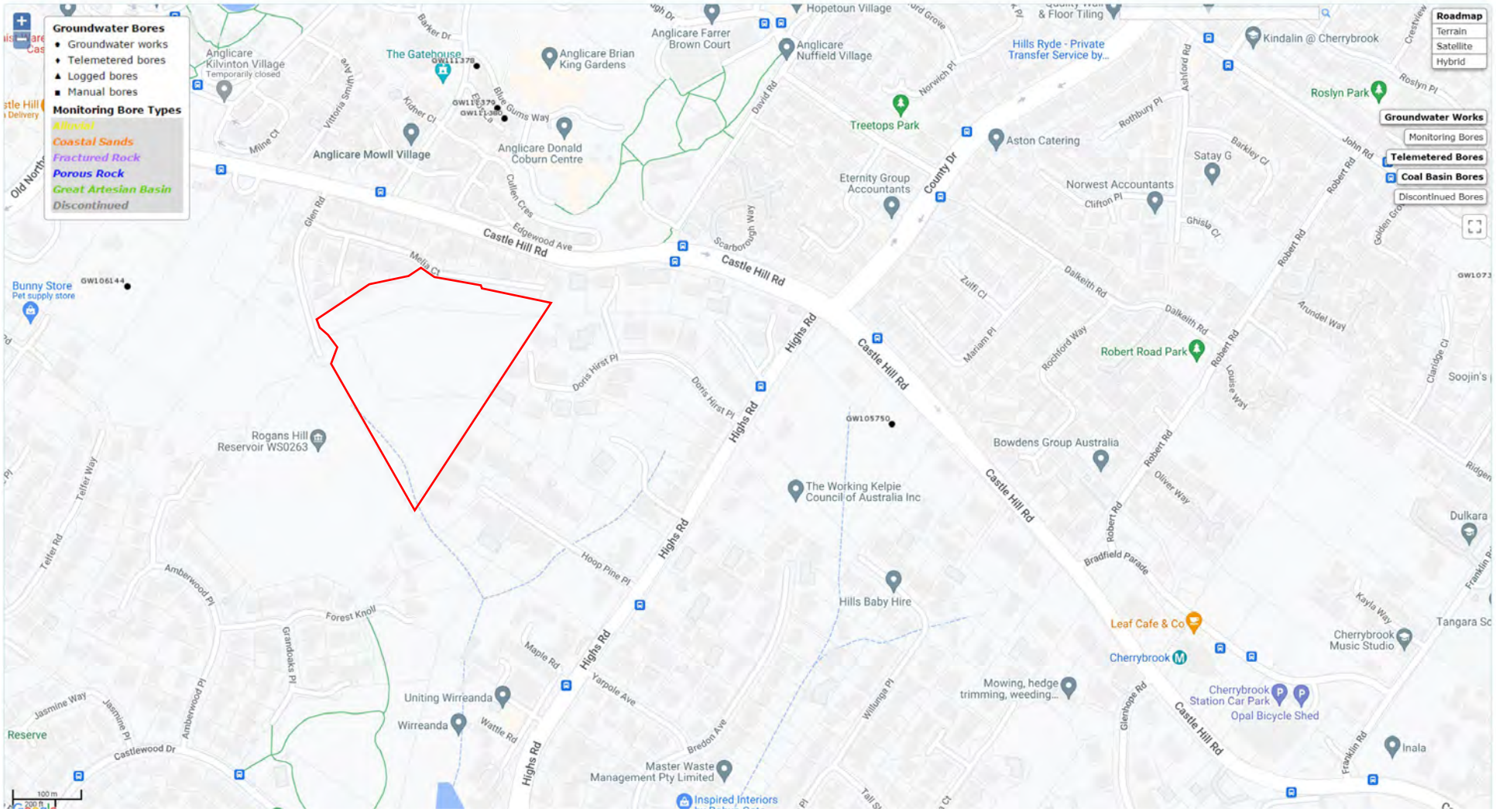
All Groundwater Site Details

ALL GROUNDWATER MAP

bookmark this page

All data times are Eastern Standard Time

Map | Info




Glen Rd
Forest Knoll
Hoop Pine Pl
Hights Rd
Maple Rd
Yarpole Ave
Amberwood Pl
Grandoaks Pl
Matthew Way
Google Ear
1985
Imagery Date: 12/3/2018
33°44'01.66" S 151°01'17.06" E elev 0 m eye alt
Graph: Min, Avg, Max Elevation: 141, 161, 191 m
Range Totals: Distance: 330 m Elev Gain/Loss: 3.13 m, -52.4 m Max Slope: 15.0%, -78.7% Avg Slope: 4.4%, -15.5%
155 m
13.6%

WaterNSW
Work Summary

GW105750

Licence: 10WA108568 **Licence Status:** CURRENT

Authorised Purpose(s): DOMESTIC
Intended Purpose(s): DOMESTIC

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Down Hole Hamm
Owner Type: Private

Commenced Date:
Completion Date: 23/01/2004

Final Depth: 126.50 m
Drilled Depth: 126.50 m

Contractor Name: INTERTEC DRILLING SERVICES
Driller: Damian Paranihi
Assistant Driller:

Property: Kirby Projects Pty Ltd 139-141 Castle Hill Rd WEST PENNANT HILLS 2125 NSW
GWMA: -
GW Zone: -

Standing Water Level (m): 70.000
Salinity Description:
Yield (L/s): 6.000

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBERLAND	FIELD OF	A//153486
Licensed:	CUMBERLAND	FIELD OF MARS	Whole Lot A//153486

Region: 10 - Sydney South Coast
River Basin: 213 - SYDNEY COAST - GEORGES RIVER
Area/District:

CMA Map: 9130-4S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)

Northing: 6265582.000
Easting: 317299.000

Latitude: 33°44'02.7"S
Longitude: 151°01'40.4"E

GS Map: -
MGA Zone: 56
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	5.60	207			Down Hole Hammer
1		Hole	Hole	5.60	126.50	163			Down Hole Hammer
1		Annulus	Concrete	0.00	5.60	207	163		
1	1	Casing	Pvc Class 9	-0.40	83.60	140			Suspended in Clamps, Screwed and Glued
1	1	Casing	Steel	-0.40	5.60	168	158		Driven into Hole

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
54.50	58.50	4.00	Unknown		60.50	0.15			1740.00
113.00	114.50	1.50	Unknown		114.50	2.05			3200.00
115.20	116.70	1.50	Unknown		120.50	1.40			3170.00
123.50	123.70	0.20	Unknown	70.00	126.50	2.40			3140.00

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	8.50	8.50	clay, brown grey	Clay	
8.50	29.50	21.00	shale, brown to grey	Shale	
29.50	54.50	25.00	sandstone, grey	Sandstone	
54.50	58.50	4.00	quartz	Quartz	
58.50	66.50	8.00	sandstone, grey	Sandstone	
66.50	67.00	0.50	shale	Shale	
67.00	74.00	7.00	sandstone, grey light grey	Sandstone	
74.00	76.00	2.00	sandstone, grey dark grey	Sandstone	
76.00	104.70	28.70	sandstone, grey light brown	Sandstone	
104.70	106.50	1.80	shale	Shale	
106.50	113.00	6.50	sandstone, grey	Sandstone	
113.00	114.00	1.00	sandstone, grey	Sandstone	
114.00	115.20	1.20	sandstone, grey	Sandstone	
115.20	116.70	1.50	sandstone, grey	Sandstone	
116.70	123.50	6.80	sandstone, grey and quartz	Sandstone	
123.50	123.70	0.20	sandstone, grey	Sandstone	
123.70	126.50	2.80	sandstone grey & quartz	Sandstone	

Remarks

11/11/2009: updated from original form A

*** End of GW105750 ***

APPENDIX D: GEOTECHNICAL REPORT EXTRACT

1. BACKGROUND GEOTECHNICAL INFORMATION

1.1 MECHANISM OF CREEP LANDSLIDE

The 100;000 scale geological map for Sydney indicates that site is underlain by Residual Soils and Ashfield Shale bedrock. However, we also note that there may be some remanent Bringelly Shale bedrock along the crest of the hill/ridge line up slope immediately to the north of the site. Hawkesbury Sandstone is also likely to be present at lower elevations in the creek gully below, i.e. down slope to the south of the site.

Where the full sequence exists, Ashfield Shale is about 60 m to 70 m in thickness and consists of four siltstone and laminite sub-group members, comprising both siltstone and Siltstone laminite with fine-grained sandstone laminae. Fresh Ashfield Shale is typically of high and very high strength, however where it is located close to the ground surface, it can weather to depths of at least 6m to 10 into extremely weathered very low strength rock and Residual Silty and Shaley Clays of medium to high plasticity, and medium to high reactivity.

In the Castle Hill area, deep creep landslides like the one present on the subject site, are known to be present at numerous locations within the steeper western and southern facing slopes of the ridge lines along which Castle Hill Road, and Old Northern Road have been built. The mechanism of creep landslide is slow movement of the soil mass usually on relatively flat slope angles. The movements are triggered by cumulative rainfall that infiltrates into the bedrock from the uphill catchment, and then causes hydrostatic groundwater pressure at the interface between bedrock and the lower permeability clay soil above. The movements thus occur slowly and cumulatively over thousands of years and a slickenside surface then develops (i.e., polishing of the slide plane surface) thereby lowering the internal friction angle of the soil to residual values.

1.2 PREVIOUS GEOTECHNICAL INVESTIGATIONS AND PROPOSED LANDSLIDE MITIGATION MEASURES

At the subject site over the last 37 years several episodes of geotechnical investigations, geotechnical monitoring, and geotechnical modelling/design have been carried out by others as follows:

- 1986-1995, Golder Associates carried out a number of site investigation, geotechnical monitoring and site trial of trench drainage.
- 2003 to 2004, Douglas Partners carried out site investigation, geotechnical monitoring, and landslide back analysis for the design of network of deep trench drains across the site to stabilise the landslide.
- The Douglas Partners design solution comprised the construction of a deep trench drainage system through the central part of the site. The trench drains were to be spaced 15m apart and excavated to a minimum depth of 7m. After the construction of this drainages system, 5 years of site geotechnical monitoring was required to confirm that no future groundwater levels rise, or ground movement was occurring prior to any further site development works.
- 2015, Douglas Partners carried out additional site investigation and monitoring for the reassessment and revision their drainage design solution.
- 2017, Taylor Geotechnical Engineering carried out a geotechnical review of Douglas Partners 2015 site investigation and drainage design tother with drilling their own site investigation pile holes around the site. from this they proposed site stabilisation using a two-tiered pile retaining wall together with the removal and replacement of the landslide material in the central part of the site.

- The Taylor Geotechnical design solution comprised the construction of a two-tiered pile retained wall along the toe of the northern site hillside. Both walls were to be socketed into sound bedrock and anchored for lateral restraint following this the central part of site was then to be excavated to the slightly weather to fresh shale and then filled with Engineered Fill.

1.2.1 Summary

For our assessment, we were only able to source some of the above documentation. However, in summary from the available information we note the following about the site:

- The site comprises a large creep landslide of between 8-10m depth, extending down through the upper layers of weathered shale bedrock to the top of sound shale bedrock, i.e., medium to high strength, slightly weathered to fresh shale and laminite.
- In the central part of the site, the ground profile comprises three strata as follows;
  - Clays soils of 4m to 5m thickness, over
  - Extremely to highly weathered and fractured shales of between 3m to 5m thickness, over
  - Slightly weathered to fresh, medium to high strength, sub horizontally bedded shale and laminite.
- Groundwater levels across the site are typically between 1m to 5m below ground surface levels but following high/extreme rainfall events these levels/pressures can rapidly rise to ground surface levels.
- It has not been possible to identify an exact location for a single slide plane within the soil profile. However, it is anticipated that the landslide actually comprises combination of slide planes within the residual soil and weathered shale, together with a large number of fractures zones, clay seams and clay filled or smooth joints, along which the soil mass is sliding.
- Even during extended dry periods there were areas of constant seepage at the ground surface, particularly in the western part of site.
- When groundwater levels rise in response to high rainfall levels, between 3m to 10mm of landslide movement was recorded by borehole inclinometers.
- The Douglas Partners 2004 back analysis of the landslide estimated that the failure surface has a friction angle of between 12° to 16°.
- The Taylor Geotechnical Engineering 2017 back analysis of the landslide estimated the failure surface has a friction angle of between 10.5° to 14°.

It is also important to note that all previous site investigation was only carried out in the accessible central part of the site. No geotechnical investigation has been carried out in the steeper northern or southern thirds of the site. All previous design assessments have assumed a shallow uphill bedrock profile with a relatively horizonal groundwater level back into the slope.

2. ANTICIPATED SITE GROUND CONDITIONS

The attached Figures 4, 5 and 6 present our summary sketch long sections through the subject site developed from the available survey, borehole, and test pit information together with our observations on site. These sketch sections show that that there is currently no ground information for both the northern and southern thirds of site. however, in the central third of the site ground conditions are expected to comprise;

Silty clays; 5m (upslope) to 3m (down slope) of silty clays. The investigation to date has not clearly defined whether theses soils are residual or colluvium, it is expected that there will varying degrees of each throughout the site.

Extremely to highly weathered shale, of between 4m to 6m thickness. This material has been assessed to be typically of extremely low to very low strength, and in places high fracture with numerous clays seams and sub horizontal jointing.

Slightly weathered to fresh shale and laminite, underlies the soils and weathered rock at depth of between 8m to 13m across the central part of site, i.e. below an approximate level of RL155m to RL160m AHD dipping east to west across the central section of site. this shale was of medium and high strength.

Groundwater was observed at depths of between 1.5m to 5m west to east across the central porting of site. However, it is noted that during extreme rainfall events groundwater levels/pressures can rapidly rise to ground surfaces level in some parts of the site.

Land slip surface, while the soil and weathered rock may actually contain numerous slide planes, it should be assumed that the overall slide surface exists at the weathered rock/slightly weathered rock interface. Back analysis by others suggest that the friction angle of this slide surface could range from 10.5° to 16°

LEGEND

SITE BOUNDARY

SECTION LINE

PRELIMINARY NOT FOR DESIGN

revision	no.	description	drawn	approved	date
	A	ORIGINAL ISSUE	-	-	-

MAP PROJECTION: GDA2020 MGA ZONE 56

10 0 10 30 50

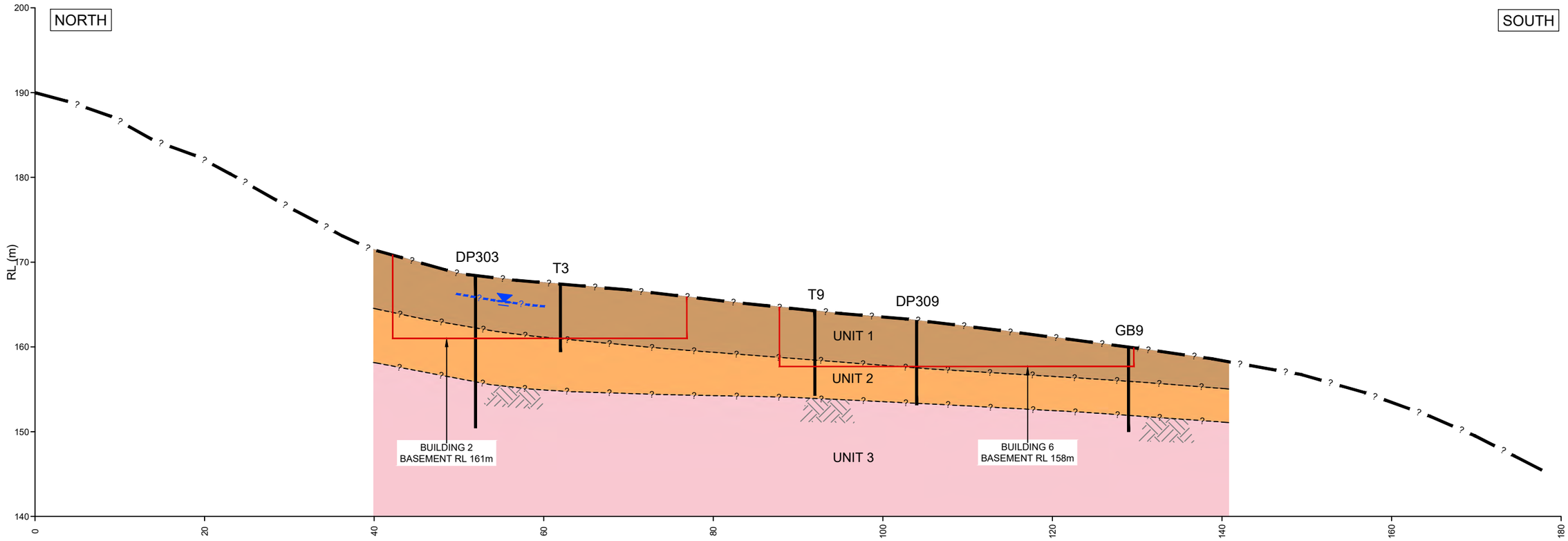
Scale (metres) 1:1500

drawn	SP / DR
approved	S.P.
date	8-11-2023
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client:	CASTLE HILL GLEN PTY LTD
project:	Rogans Hill Park 1020 Melia Court CASTLE HILL, NSW
title:	SITE PLAN
project no:	754-SYDGE321033
figure no:	FIGURE 3
rev:	A

PLOT DATE: 17/9/2023 11:16:15 AM DWG FILE: F:\1. PROJECTS\94. SYD-GEOTECH\NICS\16. SYDGE320000\SYDGE321033 2 GLEN RD CASTLEHILL\12. CAD\DWG SVEN\754-SYDGE321033.DWG



SECTION A-A'

UNIT LEGEND

- UNIT 1 - SILTY CLAYS
- UNIT 2 - EXTREMELY TO HIGHLY WEATHERED SHALE
- UNIT 3 - SLIGHTLY WEATHERED TO FRESH SHALE

SECTION LEGEND

- INFERRED GROUND SURFACE
- INFERRED BASEMENT PROFILE
- INFERRED GEOLOGICAL BOUNDARY
- INFERRED WATER TABLE
- WATER LEVEL

PRELIMINARY NOT FOR DESIGN

revision	no.	description	drawn	approved	date

5 0 5 15 25
Horizontal Scale (metres) 1:500

5 0 5 15 25
Vertical Scale (metres) 1:500

drawn	SP / DR
approved	S.P.
date	02-11-2023
scale	AS SHOWN
original size	A3

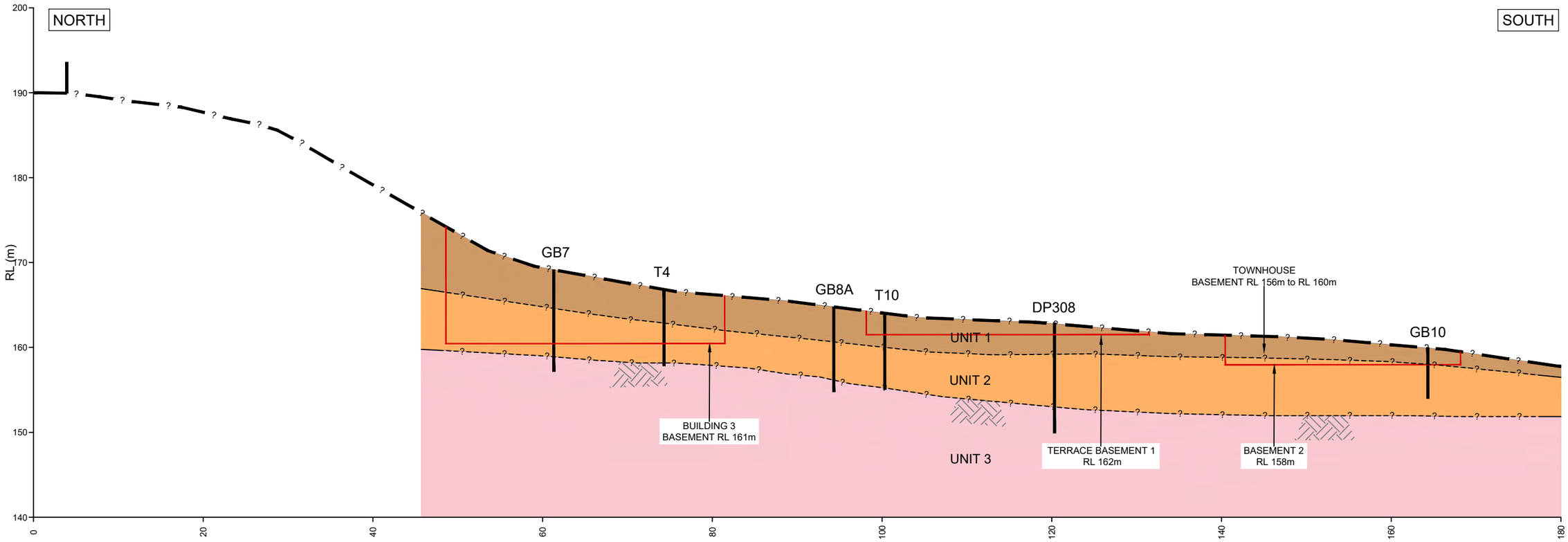
TETRA TECH COFFEY

client: CASTLE HILL GLEN PTY LTD

project: Rogans Hill Park
1020 Melia Court
CASTLE HILL, NSW

title: SKETCH GEOTECHNICAL SECTION A-A'

project no: 754-SYDGE321033 | figure no: FIGURE 4 | rev: A



DISTANCE (m)

SECTION B-B'

UNIT LEGEND

- UNIT 1 - SILTY CLAYS
- UNIT 2 - EXTREMELY TO HIGHLY WEATHERED SHALE
- UNIT 3 - SLIGHTLY WEATHERED TO FRESH SHALE

SECTION LEGEND

- INFERRED GROUND SURFACE
- INFERRED BASEMENT PROFILE
- INFERRED GEOLOGICAL BOUNDARY
- INFERRED WATER TABLE
- WATER LEVEL

PRELIMINARY NOT FOR DESIGN

revision no.	description	drawn	approved	date

5 0 5 15 25

Horizontal Scale (metres) 1:500

5 0 5 15 25

Vertical Scale (metres) 1:500

drawn	SP / DR
approved	S.P.
date	02-11-2023
scale	AS SHOWN
original size	A3

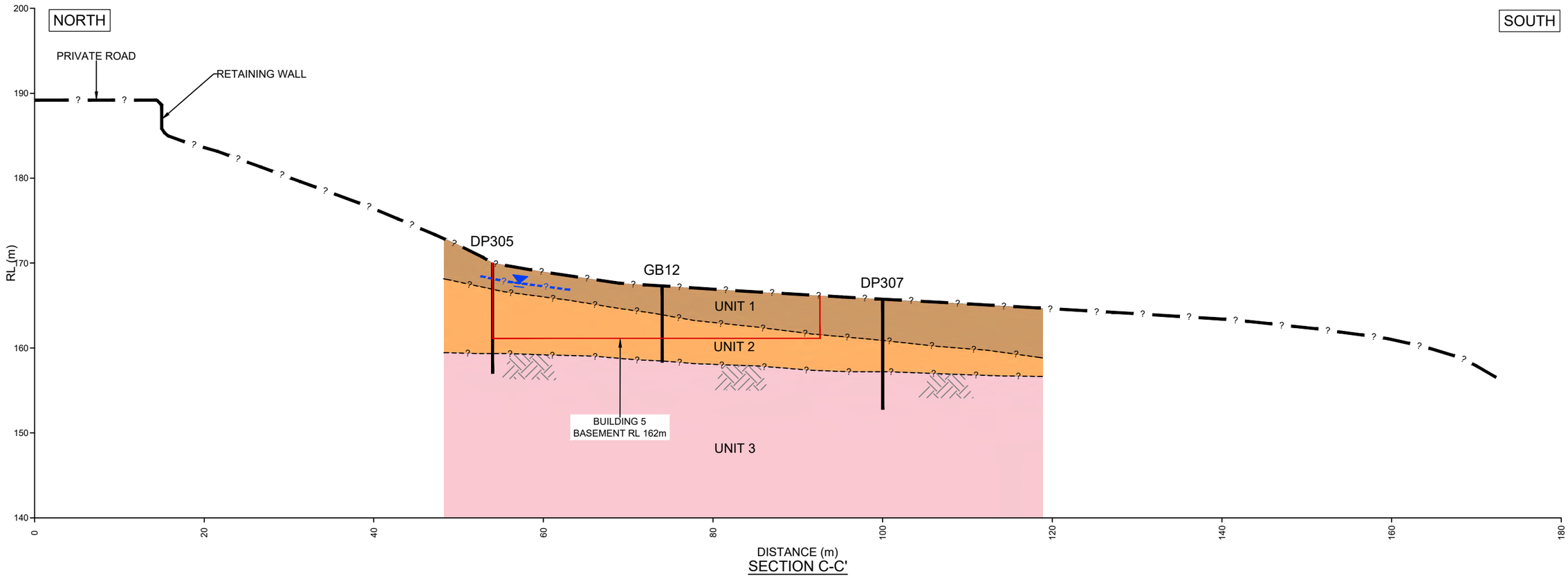
TETRA TECH COFFEY

client: CASTLE HILL GLEN PTY LTD

project: Rogans Hill Park
1020 Melia Court
CASTLE HILL, NSW

title: SKETCH GEOTECHNICAL SECTION B-B'

project no: 754-SYDGE321033 | figure no: FIGURE 5 | rev: A



SECTION C-C'

UNIT LEGEND

- UNIT 1 - SILTY CLAYS
- UNIT 2 - EXTREMELY TO HIGHLY WEATHERED SHALE
- UNIT 3 - SLIGHTLY WEATHERED TO FRESH SHALE

SECTION LEGEND

- INFERRED GROUND SURFACE
- INFERRED BASEMENT PROFILE
- INFERRED GEOLOGICAL BOUNDARY
- INFERRED WATER TABLE
- WATER LEVEL

PRELIMINARY NOT FOR DESIGN

revision no.	description	drawn	approved	date

5 0 5 15 25
Horizontal Scale (metres) 1:500

5 0 5 15 25
Vertical Scale (metres) 1:500

drawn	SP / DR
approved	S.P.
date	02-11-2023
scale	AS SHOWN
original size	A3

TETRA TECH COFFEY

client: CASTLE HILL GLEN PTY LTD

project: Rogans Hill Park
1020 Melia Court
CASTLE HILL, NSW

title: SKETCH GEOTECHNICAL SECTION C-C'

project no: 754-SYDGE321033 | figure no: FIGURE 6 | rev: A