
**Report on Preliminary Site Investigation
for Contamination**

**Proposed Tamworth Regional Aquatic
Centre**

Jack Smyth Drive, Hillvue NSW

Prepared for Tamworth Regional Council

Project 226965.00

20 June 2024

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature

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20 June 2024

Reviewer

20 June 2024

Executive Summary

Douglas Partners Pty Ltd (Douglas) has undertaken a preliminary site investigation (PSI) for contamination with limited soil sampling for the proposed Tamworth Regional Aquatic Centre at Jack Smyth Drive, Hillvue.

It is understood that Tamworth Regional Council (TRC) are proposing to construct a new Tamworth Regional Aquatic Centre (TRAC) and Northern Inland Centre of Sport and Health (NICSH) facility at the site. The proposed development will include indoor swimming pool and associated facilities along with administrative / maintenance areas and a Café. The proposed development will cover an area of approximately 24,000 m² with a building footprint of 6,500 m² and 7,000 m² of flexible pavement.

The objective of the PSI is to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. The PSI included limited intrusive investigation at client nominated geotechnical test locations to provide a preliminary assessment of contaminants of potential concern (CoPC) and contaminant concentrations at the site.

The investigation included a desktop / site history review, site inspection, subsurface investigation at twelve geotechnical test pit locations (Pits 8 to 11 and C1 to C8), laboratory testing and preparation of this report.

The results of the PSI with limited soil sampling indicate the following:

- The site history review indicated that the potential for gross contamination from the historic and current land uses is generally considered to be low;
- The limited subsurface investigation indicated the general absence of gross contaminant observations (ie staining or odours) at the test locations and depths assessed based on field observations;
- The subsurface investigation did however confirm the presence of variable fill materials within all bores and pits across the site to depth of 0.75 m to 3.0 m, with some building materials including bricks, concrete and timber which are indicators of potential hazardous building materials (HBM) including asbestos; and
- Contamination concentrations in the limited soil samples analysed were within the adopted human health and ecological based site assessment criteria for recreational land use.

Based on the above the site is considered likely to be suitable for the proposed recreational development with respect to contamination, subject to further assessment of fill materials with reference to (WA DoH, 2021) and (NEPC, 2013) to further assess potential asbestos and other COPC impacts and remediation and/or management of any identified impacts with reference to a site-specific remediation action plan (RAP), where required.

Regardless of the outcomes of further assessment, given the presence of widespread variable fill materials it is recommended as a precautionary measure, that the contractor implements an unexpected finds protocol (UFP) for earthworks for the site. The UFP should outline the appropriate action should suspected contamination be observed during clearing or earthworks, such as potential asbestos containing materials, anthropogenic materials, fill materials not currently identified, or fill/soils with staining/odours.

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Report on Preliminary Site Investigation for Contamination Proposed Tamworth Regional Aquatic Centre Jack Smyth Drive, Hillvue NSW

1. Introduction

Douglas Partners Pty Ltd (Douglas) has been engaged by Tamworth Regional Council (TRC) to prepare this Preliminary Site Investigation for Contamination (PSI) undertaken for a Proposed Tamworth Regional Aquatic Centre for the site at Jack Smyth Drive, Hillvue NSW (the site). The site is shown on Drawing 1, Appendix B.

The investigation was undertaken with reference to Douglas' proposal 226965.00.P.001.Rev0 dated 15 January 2024.

The objective of the PSI is to assess the potential for contamination at the site based on past and present land uses and to comment on the need for further investigation and/or management with regard to the proposed development. It is understood that the report will be used to support a development application for the proposed development.

It is noted that the PSI was undertaken in conjunction with a geotechnical investigation, which will be reported separately.

This report must be read in conjunction with all appendices including the notes provided in Appendix A.

The following key guidelines were consulted in the preparation of this report:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013); and
- NSW EPA *Guidelines for Consultants Reporting on Contaminated Land* (NSW EPA, 2020).

2. Scope of Work

The investigation comprised the following:

- Review of available published information on the site including geological, topographical, acid sulfate soil and soil landscape maps;
- Brief site history review to assess the potential for contamination at the site comprising a review of selected aerial photograph records, search of registered groundwater bores in the area, historic title deed search, review of NSW EPA public registers, review of available Council records for the site;
- Site inspection to identify areas of potential contamination and assess current site condition;
- Preparation of a preliminary conceptual site model (CSM);
- Collection of soil samples from the geotechnical investigation test pits at regular depth intervals for identification and testing purposes, with reference to standard contamination sampling protocols. Test locations 1 to 11 were for assessment of proposed buildings and excavatability, whilst locations C1 to C8 were for pavement thickness design purposes. The locations were nominated by the client;
- Screening of soil samples collected for the presence of volatile organic compounds (VOCs) using a photoionisation detector (PID);
- Laboratory analysis of selected soil samples collected for a suite of relevant contaminants; and
- Preparation of this report presenting the findings of the PSI.

3. Site Information

Table 1 presents site identification details with an aerial image of the site in Figure 1, below.

Table 1: Site Identification

Item	Details
Allotment Identification	Part Lot 102 DP1262475
Street Address	Jack Smyth Drive
Locality	Hillvue, NSW
Investigation Area	24,000 m ² (approximately) refer to Drawing 1 in Appendix A for investigation area
Local Government Area	Tamworth Regional Council (TRC)
Zoning	Tourist (SP3)
Planning Instrument	Tamworth Regional Local Environment Plan 2010
Current Land Use	Vacant
Current Owner	TRC
Surrounding Land Use	North – Recreational (golf Course), commercial and residential East – Recreational (hockey fields) South – Recreational (sporting facilities indoor and outdoor) West – Recreational (golf course), vacant land



Figure 1: Aerial Photo of the investigation area (red outline) (image sourced from Google Earth dated November 2023)

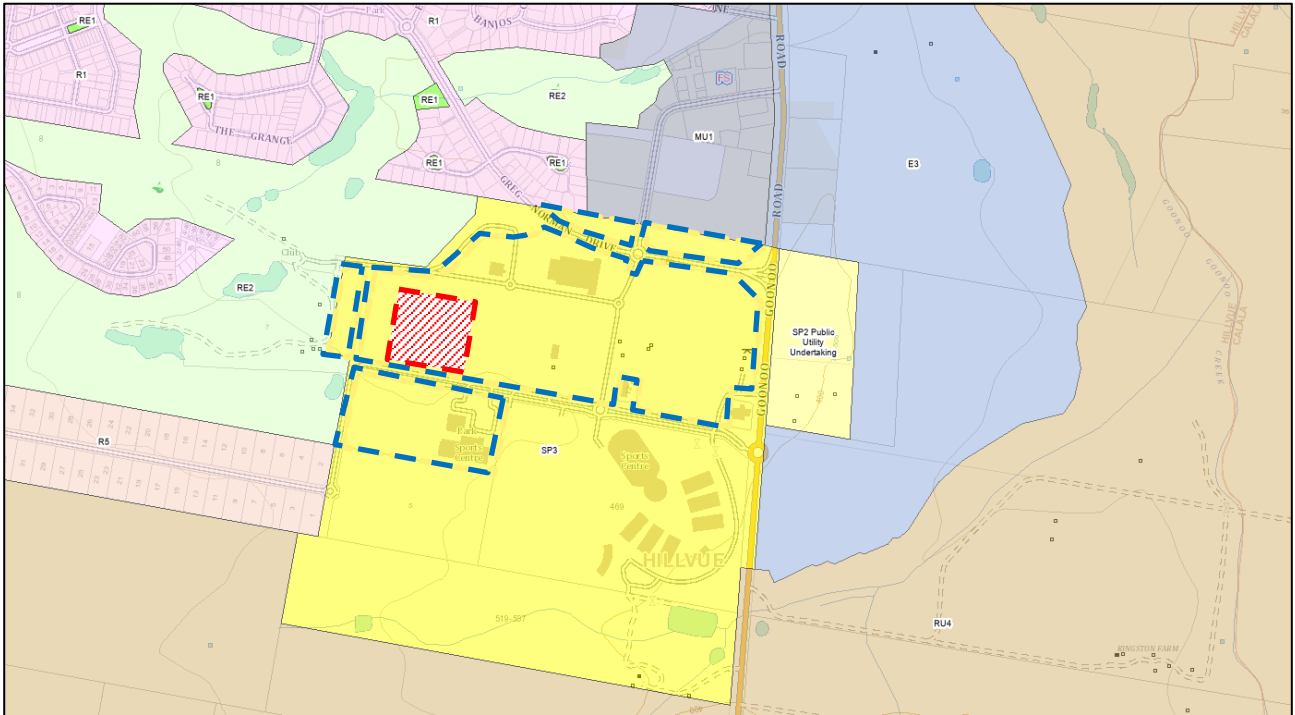


Figure 2: Land Use Zonings – Tamworth Regional Council LEP 2010. Subject lot (blue dashed line) and investigation area (red dashed line and hatched area) (image sourced from NSW Planning Portal Spatial Viewer, May 2024)

4. Proposed Development

We understand that Tamworth Regional Council (TRC) are proposing to construct a new Tamworth Regional Aquatic Centre (TRAC) and Northern Inland Centre of Sport and Health (NICSH) facility at the site. The proposed development will cover an area of approximately 24,000 m² with a building footprint of 6,500 m² and 7,000 m² of flexible pavement.

Based on the supplied sections for the proposed development, included in Appendix B, indicate that minimal cut or fill is proposed for the development. However, excavations are proposed for pool structures and associated infrastructure (i.e. pumps, pipes etc) up to approximately 2.5 m depth with other likely shallow excavations for required for building footings and other services.

It is likely that surplus material will be generated from the excavation of the pool structures and associated infrastructure, however, the volume of material was not known whilst preparing this report.

From the supplied client drawings, which are included in Appendix B with an overlay of the of the ground floor plan shown on Drawing 1, the following features are proposed for the development:

- TRAC facilities:
 - o Ten Lane 50 m indoor pool including spectator seating;
 - o Warm water pool, spa and sauna;
 - o Change rooms and amenities including wet and dry areas;
 - o Administration, offices, store, dry plant rooms and café;
 - o Leisure pool with water play and learn to swim (Stage 2 Extension);
 - o 50 m outdoor swimming pool (Stage 3 Extension);
- NICSH facilities:
 - o Administration, office, teaching and study spaces;
 - o Testing lab and dry amenities;
 - o Strength and conditions gym (Stage 2 Extension); and
 - o Sprint track (Stage 2 Extension).

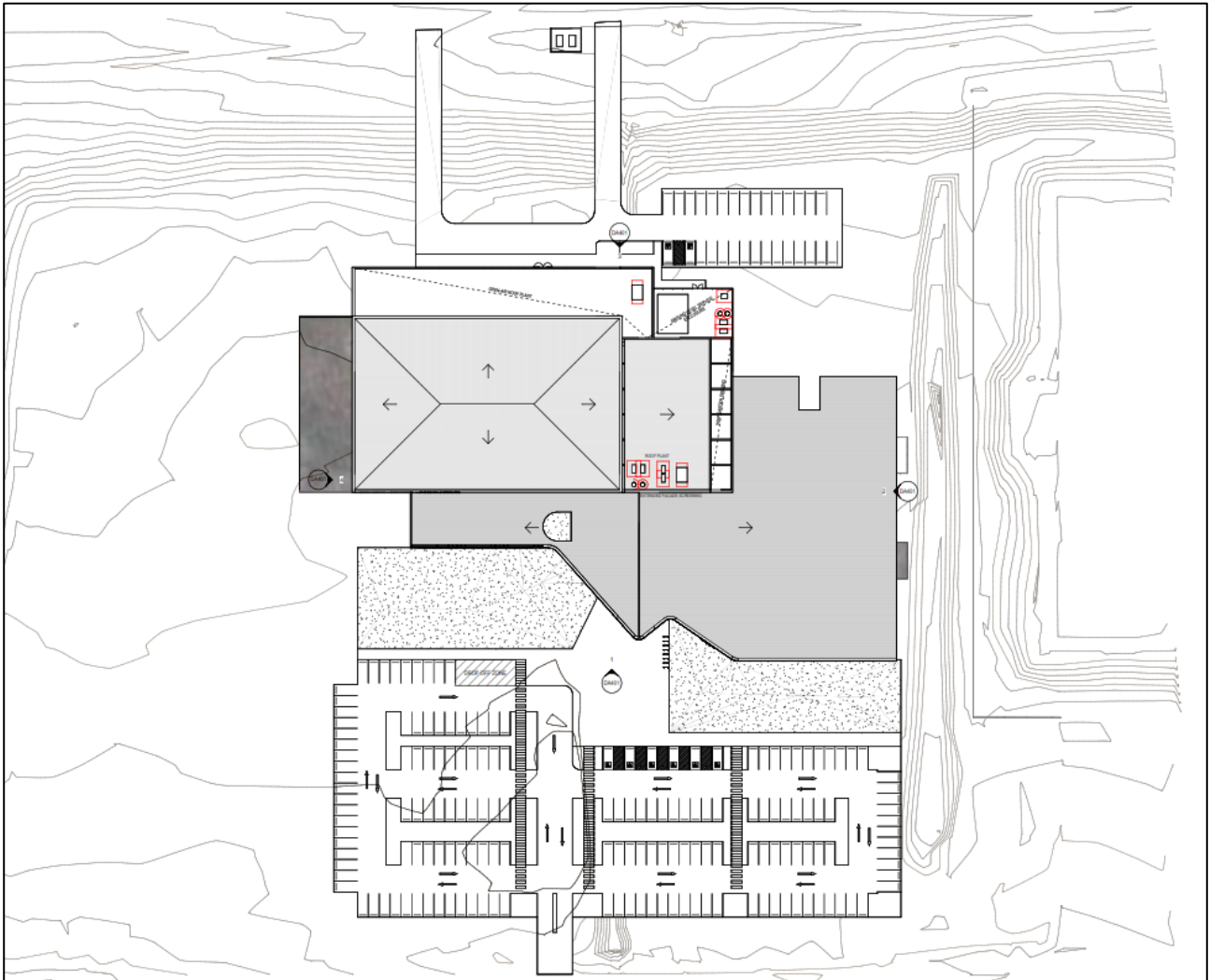


Figure 3: Client provided indicative layout of proposed development

5. Environmental Setting

Regional topography	The general topography of the surrounding area typically comprises rolling residential and flat commercial, recreational or undeveloped areas.
Site topography	The investigation area is relatively flat with a drainage gully up to 1 m depth located through the centre of the investigation area. Based on the supplied site contour plan and survey results of test locations the investigation area had surface levels of approximately 409 m AHD along the northern boundary to approximately 411 m AHD along the southern boundary. Along the northern part of the investigation area is a batter of approximately 2 m in height which slopes down to the north at approximately 20°.
Soil Landscape (refer Figure 4)	Reference to the Tamworth 1:100,000 scale Soil Landscape Sheet indicates the site is located within Residual soils of the Duri landscape, which is characterised by “extensive rolling to undulating hills and low hills. Slopes <10%”. Limitations for this soil landscape include gully erosion risk, sheet erosion risk, localised low wet bearing strength, localised dryland salinity, localised sodicity, localised shallow soils and localised poor drainage, localised permanently high watertables, localised known discharge and recharge areas, localised high run-on.
Geology (refer Figure 5)	Reference to the NSW Seamless Geology dataset made available by the NSW Government Department of Regional New South Wales, indicates that the site is likely to be underlain by either Mandowa Mudstone (purple shading) which typically comprises mudstone with thin siltstone and fine sandstone bands. The site is also mapped within close proximity to areas comprising Keepit Conglomerate (grey shading, which typically comprises conglomerate and sandstone) and Noumea Beds (brown shading, which typically comprises wacke, siltstone and mudstone). A review of NCCA naturally occurring asbestos (NOA) mapping indicates the site is not within a mapped risk area of containing geological units of naturally occurring asbestos.
Acid Sulfate Soils (refer Figure 6)	Reference to the NSW Acid Sulfate Soil Risk Map indicates the site is not located within an area of known potential for acid sulfate soils.
Surface water	The site contained an existing drainage gully through the centre of the site. Water was observed ponded within the southern part of the drain but would likely drain to the northern end of the site. Based on site observations, groundwater would likely flow and discharge to the north towards Barnes Gully (located approximately 300 m southwest of the site) and then into the Peel River.

Groundwater
(refer Figure 7)

A search for registered groundwater bores in the WaterNSW groundwater bore database indicated that there are three bores within 500 m of the site and a further ten within 1 km of the site. A summary of groundwater information including standing water levels (SWL) and water bearing zones (WBZ) recorded have been provided below in Table 2 for bores within 500 m of the site.

Table 2: Registered Groundwater Bore Information

Bore ID Authorised Purpose	Installation Year	Location	Bore Depth (m)	SWL (m)	WBZ (m)
GW003362 Stock	1935	130 m SE	20.1	15.8	17.4 (Rock) 19.2 (Rock)
GW013346 Stock	1956	350 m NW	NR		NR
GW903625 Domestic	2020	380m NW	48.0	2.0	35.0-36.0 (Rock) 42.0-43.0 (Shale)
GW968448 Domestic	2008	450 m NW	36.0	5.0	18.0-20.0 (Shale)

Likely groundwater flow would be to the north to north-west towards Barnes Gully approximately 500 m north of the site.



Figure 4: Soil landscape map with approximate site location (blue outline) and investigation area (red outline)



Figure 5: Seamless geology dataset with approximate site location (blue outline) and investigation area (red outline)



Figure 6: Acid Sulfate soils mapping with approximate site location (blue outline) and investigation area (red outline)

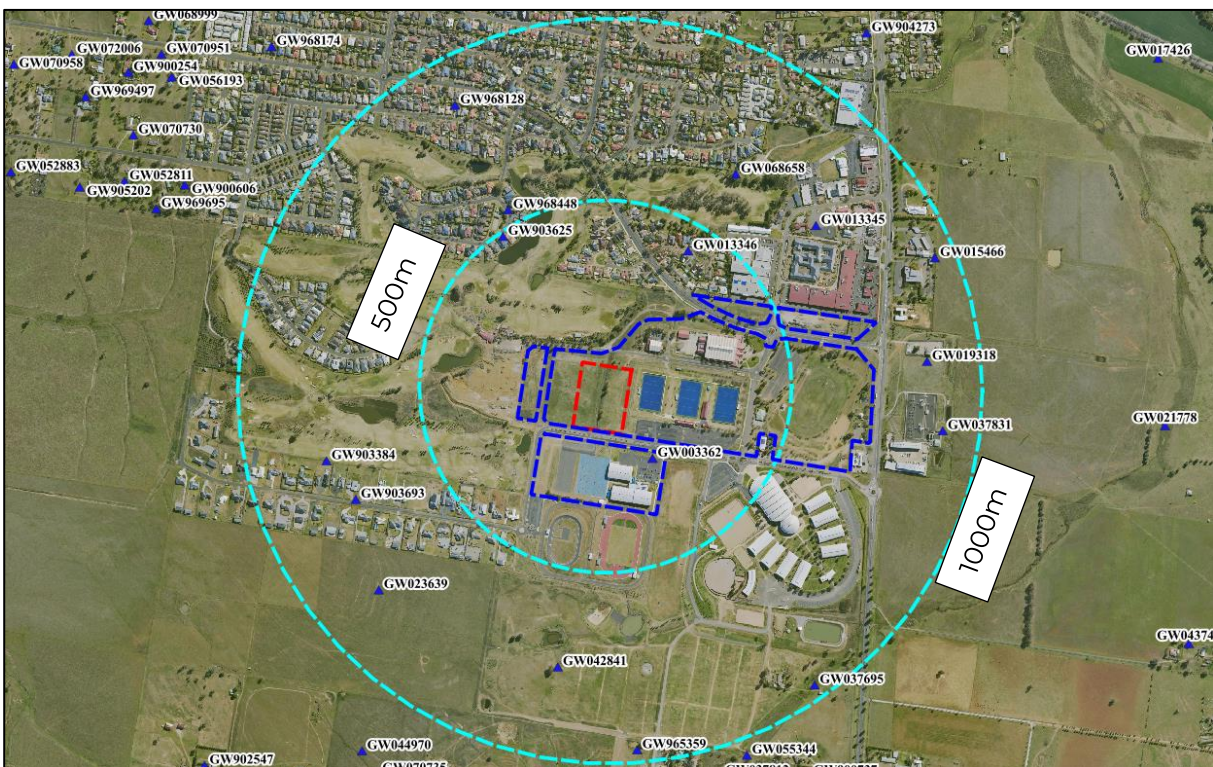


Figure 7: Approximate registered groundwater bore locations with approximate site location (blue outline) and investigation area (red outline)

6. Site History

6.1 Historical aerial photography

Readily available historical aerial photographs were reviewed dating back to the earliest available record (1953) through to 2023 to assess possible changes to the site and surrounding areas during this period.

Table 3 summarises the observations made during the aerial photograph review with relevant aerial images shown on Drawings 3 to 6 in Appendix D with the investigation area outlined in red and the overall lot outlined in blue.

Table 3: Summary of historical aerial photographs

Year	Site	Surrounding land use
1953*	Vacant cleared agricultural land	Vacant cleared agricultural land with evident cropping
1965*	No Significant Changes	No significant changes
1976*	No Significant Changes	- New industrial buildings to the east of the site (east of Goonoo Goonoo Rd) - Dams constructed to north east of site within Barnes Gully
1984*	- No Significant Changes - Access track/unsealed road running east / west through southern third of site, with an additional track running north off this track through the central portion of the site (possibly drain). A few structures / vehicles / trees in northern portion site	No significant changes
1989*	- No Significant Changes - Fill evident on northern boundary site	- Golf course present to the north and north-west of the site, with evidence of additional dams, greens and bunkers, stockpiled fill - An unsealed access track is evident immediately north of the site

Table 3: Summary of historical aerial photographs

Year	Site	Surrounding land use
1993	- No Significant Changes - Gully/drain evident north of access track through site	- Sporting fields present to the east part of the site (west of Goonoo Goonoo Rd) and then commercial/industrial sites including an electrical substation - New roads and housing developments to the north of the site being constructed - Earthworks present to the west of the site (potentially associated with the gold course) - No significant changes to the south of the site
1996	- New track or drain enters site on eastern boundary along unsealed track alignment which is now mostly grassed over - A similar track/drain is evident through north western corner site - End dumped stockpiles of fill are evident on the north eastern boundary of the site, potentially within the northern portion of the site	- A new road (Longyard Drive) is under construction immediately north of the site - Another hockey field has been constructed east of the site, with new access track west of the field - End dumped fill stockpiles covers the grassed paddock immediately east of the northern portion of the site - The Tamworth Regional Entertainment and Conference Centre has been constructed to the north east of the site and disturbed ground/stockpiling is evident where the Tamworth Gymnastics Club is currently located to the north of the site - New roads and additional houses completed or under construction to the north of the site - Expansion of golf course appears completed to the west / south west - No significant changes to the east and south of the site

Table 3: Summary of historical aerial photographs

Year	Site	Surrounding land use
2004	- Drainage swale present within investigation area from northern to southern boundary - Earthworks / surface disturbance (possible fill placement) within western part of the investigation area - Former unsealed track and possible drain in the southern third of the site is no longer evident - Eastern half of the site appears to be part of a grassed rectangular playing field. Fill evident on the north eastern portion of the site and to the east of the site within this field is no longer evident	- Additional buildings to the north east of the site (including Tamworth Gymnastics Club) - Access road to the west of the two hockey fields has now been sealed - A new unsealed track extends along the southern site boundary and extends east/west of the site (current Jack Smyth Dr alignment) - Additional residential developments to the north-west of the site - Additional commercial / industrial building to the north east of the site - No significant changes to the remaining surrounding area
2013-2015	- No significant changes to investigation area - Eastern half of the site is grassed (part playing field – RSC Cricket Oval) - Western side of the site is brown with patches of green (possibly unmaintained grass cover) - Possible disturbed ground west of drain in 2015	- Additional buildings and playing fields to the south of the site (Tamworth Sports Dome) - New agricultural buildings to the south-east of the site (Australian Equine & Livestock Events Centre) - Jack Smyth Dr constructed to south/south west of site - New industrial construction to the north east of the site - Earthworks present to the south-west of the site - No significant changes to the remaining surrounding area
2016-2018	No Significant changes observed	- Residential development to the south-west of the site - Additional buildings/development to the south-east of the site
2019 – 2023	New hockey field under construction to the east of the investigation area	No significant changes Observed

Notes to Table 3:

* - black and white photo

6.2 Title deeds

A historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals. The title information can assist in the identification of previous land uses by the company names or the site owners and can, therefore, assist in establishing whether there were potentially contaminating activities occurring at the site.

A historical title deeds search of the broader Lot 102 D.P. 1262475 was undertaken by InfoTrack Pty Ltd for the period of 1927 to 2024 which is included in Appendix D. The report indicated no leases or easements for the property were found.

A summary of the title deeds and possible land uses (with reference to the aerial photographs and other historical searches) is presented in Table 4.

Table 4: Historical title deeds

Date of acquisition and term held	Registered proprietor(s) / occupations	Inferred land use
11.06.1927 (1927 to 1929)	Joseph Paul Dennis (Agent)	Unknown
29.01.1929 (1929 to 1955)	Norman Charles Ingall (Grazier) John Lamond Smith (Farmer or Grazier)	Grazing
23.12.1955 (1955 to 1957)	Norman Charles Ingall (Grazier)	Grazing
17.05.1957 (1957 to 1968)	Charles Oscar Scott (Retired Agent) Vida Irene Scott (Married Woman)	Unknown
13.05.1968 (1968 to 1974)	A.R. Dickinson Construction Pty. Limited	Commercial?
24.06.1974 (1974 to 1987)	Pacgrove Pty. Limited	Unknown
26.03.1987 (1987 to 1987)	Fanimi Pty. Limited	Unknown
09.11.1987 (1987 to 1990 & 1991)	Long Yard Golf Course Pty Limited	Recreational
20.09.1990 & 31.12.1991 (1990 & 1991 to Date)	# Tamworth City Council Now # Tamworth Regional Council	Recreational / Vacant

Note to Table 4: # - Denotes Current Registered Proprietor

A historical title deeds search was used to obtain ownership and occupancy information including company names and the occupations of individuals. The title information can assist in the identification of previous land uses by the company names or the site owners and can, therefore, assist in establishing whether there were potentially contaminating activities occurring at the site.

A historical title deeds search of the broader Lot 102 D.P. 1262475 was undertaken by InfoTrack Pty Ltd for the period of 1927 to 2024 which is included in Appendix D. The report indicated no leases or easements for the property were found.

6.3 Public registers and planning records

EPA Notices available under Section 58 of the Contaminated Land Management Act (CLM Act) Database searched 2 May 2024	No notices issued under the Protection of Environment Operations Act 1997 (POEO) on the site or within 1 km of the site.
Sites notified to EPA under Section 60 of the CLM Act Database searched 2 May 2024	The site and adjacent sites were not listed as a notified contaminated site.
Licences listed under Section 308 of the Protection of the Environment Operations Act 1997 (POEO Act) Database searched 2 May 2024	There were no records issued to the site and investigation area. There were three records issued to adjacent sites. • Transgrid – Goonoo Goonoo Road (New England Highway), Tamworth, NSW 2340 – POEO Licence 11362, no longer in force 5 April 2001. Licence for Hazardous, industrial or Group A Waste Generation or Storage (73), scale 0-10T • Transgrid – Goonoo Goonoo Road (New England Highway), Tamworth, NSW 2340 – s58 Licence variation, issued 19 August 2003. Changes included: - o Removal of facsimile number - o Change of title of EPA representative • Transgrid – Goonoo Goonoo Road (New England Highway), Tamworth, NSW2340 – s58 Licence variation, issued 23 April 2004. Changes included: - o Scale: >100-500T to 0 – 10T - o Added New England Highway to address - o Removed the following activities: – Electricity Generating Works – Mobile Waste Processor – Petroleum Works - o Removal of 24 waste products that may be stored or generated at the premises - o Removal of noise limits section - o Removal of asbestos section

PFAS Investigation Sites listed on the EPA website	The site was not listed or adjacent to a site listed under: • NSW EPA PFAS Investigation Program; • Defence PFAS Investigation Program; • Defence PFAS Management Program; • Airservices Australia National PFAS Management Program The closest PFAS investigation site is situated approximately 8 km to the north-west of the site at Tamworth Regional Airport.
Planning Certificate(s)	Not provided

6.4 Per and Poly-Fluoroalkyl Substances (PFAS)

Per and Poly-Fluoroalkyl Substances (PFAS) are a group of chemicals that are manufactured for their unique properties. There are numerous PFASs that may be present in the environment. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are two major PFAS, that were originally found as components in products used to provide stain resistance or as fire fighting foam.

Some PFASs have been recognised as highly persistent, potentially bio-accumulative and toxic, and have been detected in the environment, wildlife, people and food.

The potential for gross PFAS contamination to have affected the subject site is considered to be low due to the following:

- No evidence of fire training occurring on the site;
- No evidence of the site and surrounding properties having been used as an airport or as a fire station;
- No evidence of fuel fires having occurred at the site;
- No evidence to suggest PFAS being stored, or used, for manufacturing on site; and
- NSW Government PFAS investigation site approximately 8 km to the north-west of the site at Tamworth Regional Airport.

Potential PFAS impacts were therefore not assessed further as part of this investigation.

6.5 Council Records Search

An online search of TRC development applications (DA) and building application (BA) records on 6 June 2024 indicated the following applications.

Table 5: Summary of TRC Online Records – Lot 102 DP 1262475

Lodgement Date	Application Type	Application No	Development Description	Status
06/04/2018	CC	CC2018-0206	Additions to Existing Sports Dome (Off-site)	Certificate Issued
29/03/2023	DA	DA2023-0329	Alterations and additions to existing Tamworth hockey Centre Inc. Construction of a covered outdoor area, warm up pitch and internal alterations to the existing canteen facilities (Off-site)	Additional Information Requested
23/05/2018	CC	CC2018-0233	Footings, slabs & structural earthworks associated with additions to existing sports dome (Off-site)	Certificate Issued
08/11/2019	CC	CC2020-0087	Tamworth Hockey Centre Amenities Building (Off-site)	Certificate Issued
08/11/2019	DA/CC	DA2020-0228	Administration and Amenities Building for hockey fields (Off-site)	Approved under Delegation
-	MOD	MOD0077/2013	Modification to Development Consent DA0143/2012	To Authorised Officer for Signature

Notes to Table 5:

CC - Construction Certificate

DA - Development Application

MOD - modification to development consent

6.6 Discussion with Site Personnel

Brief discussions were held with Council personnel who indicated that the site had generally been filled with spoil generated from surrounding developments within the nearby area. However, the exact source, timing or method of placement of the fill was unknown.

6.7 Site History Integrity Assessment

The information used to establish the history of the site was sourced from reputable and reliable reference documents, many of which were official records held by Government departments/agencies. The databases maintained by various Government agencies potentially can contain high quality information, but some of these do not contain any data at all.

In particular, aerial photographs can provide high quality information that is generally independent of memory or documentation. They are only available at intervals of several years, so some gaps exist in the information from this source. The observed site features are open to different interpretations and can be affected by the time of day and/or year at which they were taken, as well as specific events, such as flooding. Care has been taken to consider different possible interpretations of aerial photographs and to consider them in conjunction with other lines of evidence.

6.8 Summary of Site History

The site history information suggests that the investigation area (Site) was originally cleared land utilised for grazing or agricultural production between the 1950s to late 1970s/early 1980s. The site remained cleared and undeveloped after this time with evidence of minor potential filling / earthworks for access tracks/roads and possible drainage from the mid 1980s. Following the ownership of the site by TRC in 1990 more evident fill placement was evident in the mid 1990s in the northern portion of the site (potentially associated with adjacent recreational developments and access road construction). Bulk earthworks is evident in mid 2000s with construction of a drainage gully through the site and potentially bulk fill of the site for recreational use (cricket field). The cricket field on the eastern portion of the site was decommissioned around 2019 to make way for a third hockey field immediately east of the site and has remained vacant since.

7. Site Walkover

A site walkover of the investigation area was undertaken by a senior engineer from Douglas on 6 May 2024. The general topography of the investigation area was consistent with that described in Section 5. The layout of the investigation area appears to have remained unchanged from the 2004 aerial photograph. The following key features pertinent to the PSI were observed (refer to photographs in Appendix C) within the investigation area:

- Tall grass was observed along the northern and north-western parts of the investigation area with mown grass observed within the remaining areas;
- Drainage swale up to 1 m deep was observed running south to north through the centre of the investigation area;
- A number of semi-mature to mature trees were observed along the drainage gully;
- A small fill mound of natural quarry single size gravel was observed within the south eastern portion of the site (Photos B20);
- An existing fill mound was observed outside adjacent to the east of the investigation area adjacent to the hockey fields (Photo B4). The mound was approximately 1 m high and 2 m wide and had a good covering of grass;
- Stockpiled concrete rubble was observed at the surface near the drainage gully within the southern part of the site (Photo B6);
- Black polypipe and steel temporary fencing panel was observed (Photo B7);
- Stockpiled soil and a piece of concrete were observed near the drainage gully (Photo B9);
- A large tree limb and a number of smaller branches were observed near the drainage gully at the surface (Photos B10 and B13);
- The site was relatively flat with minimal undulations observed; and
- Exposed soils at the surface (where exposed) generally comprised brown sandy silt or silty clay materials.

8. Potential Contaminants

Based on the available site history information and observations made during the site inspection, the principal sources of contamination at the site are considered to be:

- Imported fill materials (source unknown) which has been placed to level out the investigation area and surrounding areas. Fill materials may be a source of hydrocarbons, pesticides, heavy metals and asbestos, depending on the source;
- Possible storage of vehicles and machinery from adjacent developments and general use of site which may be a source of hydrocarbons and heavy metals;
- Possible former agricultural uses (i.e. cropping, grazing, chemical storage) and recreational use. Agricultural and recreational use may be a source of pesticides, herbicides, hydrocarbons and heavy metals; and
- Possible opportunistic dumping of materials (i.e. concrete, metal, plastic and other waste items). Materials may be a source of hydrocarbons, pesticides, heavy metals and asbestos, depending on the source.

On the basis of the site observations and site history, the potential for gross or extensive contamination from the above potential contaminant sources is generally considered to be low.

The risk of gross contamination from adjacent properties is also considered to be low.

9. Preliminary Conceptual Site Model

A conceptual site model (CSM) is a representation of site-related information regarding contamination sources, receptors and exposure pathways between those sources and receptors. The CSM provides the framework for identifying how the site became contaminated and how potential receptors may be exposed to contamination either in the present or the future i.e. it enables an assessment of the potential source – pathway – receptor linkages (complete pathways).

Based on the current investigation, the following potential sources of contamination and associated contaminants of potential concern (CoPC) have been identified and summarised in Table 6.

Table 6: Summary of potential sources

Potential sources and associated CoPC
On site sources
S1: Imported fill materials and placement at the site (depending on the source): CoPC include metals, total recoverable hydrocarbons (TRH), benzene, toluene, ethylbenzene, xylene (BTEX), polycyclic aromatic hydrocarbons (PAH), polychlorinated biphenyls (PCB), organochlorine pesticides (OCP), organophosphorus pesticides (OPP), phenols, asbestos. S2: Vehicle and machinery parking / storage, possible spills/leaks CoPC include TRH, BTEX, PAH and metals S3: Chemical use, possible use of pesticides and herbicides for weed control and maintenance CoPC include metals, pesticides (OCP/OPP) S4: Opportunistic dumping of materials at the site (i.e. building or construction waste) CoPC include TRH, BTEX, PAH, PCB, OCP, OPP, metals and asbestos

The following potential human and environmental receptors, along with relevant potential pathways, have been identified and summarised in Table 7.

Table 7: Summary of potential receptors and pathways

Potential human receptors
HR1: Current users [recreational users and site workers] HR2: Construction and maintenance workers HR3: End users [recreational users] HR4: Adjacent site users [recreational / commercial land use]
Potential environmental receptors
ER1: Surface water [adjacent waterways to the north and east; likely fresh water] ER2: Groundwater ER3: Terrestrial ecosystems
Potential pathways to human receptors
HP1: Ingestion and dermal contact HP2: Inhalation of dust and/or vapours
Potential pathways to environmental receptors
EP1: Surface water run-off EP2: Leaching of contaminants and vertical migration into groundwater EP3: Lateral migration of groundwater providing base flow to water bodies EP4: Contact with terrestrial ecology

A 'source–pathway–receptor' approach has been used to assess the potential risks of harm being caused to human or environmental receptors from contamination sources on or in the vicinity of the site, via exposure pathways (potential complete pathways). The possible pathways between the above sources (S1 to S4) and receptors are provided in below Table 8.

Table 8: Summary of potentially complete exposure pathways

Source and CoPC	Exposure pathway	Receptor	Risk management action
S1: Fill, metals, TRH, BTEX, PAH, OCP, OPP, PCB, phenols, asbestos. S2: Vehicles, TRH, BTEX, PAH and metals S3: Chemical use, metals, OCP, OPP S4: Opportunistic dumping, metals, TRH, BTEX, PAH, OCP, OPP, PCB, asbestos.	HP1: Ingestion and dermal contact HP2: Inhalation of dust and/or vapours	HR1: Current users [vacant land] HR2: Construction and maintenance workers HR3: End users [recreational] HR4: Adjacent site users [recreational and commercial]	An intrusive investigation is recommended to assess possible contamination including testing of the soils to confirm the contamination status of the site
	EP1: Surface water run-off EP2: Leaching of contaminants and vertical migration into groundwater EP3: Lateral migration of groundwater providing base flow to water bodies EP4: Inhalation, ingestion and absorption	ER1: Surface water ER2: Groundwater ER3: Terrestrial ecosystems	

10. Sampling Plan

10.1 Data Quality Objectives

The PSI was devised with reference to the seven-step data quality objectives (DQO) process which is provided in Appendix B Schedule B2, NEPC (2013). The data quality objective process is outlined in Appendix F.

10.2 Soil Sampling Rationale

The sampling for this preliminary site investigation for contamination were undertaken in the investigation locations for the geotechnical scope of work and were positioned with reference to the proposed development as requested by the client.

Borehole and test pit locations are shown on Drawing 1, in Appendix B.

The preliminary subsurface investigation was undertaken in conjunction with the geotechnical investigation for the site and comprised the excavation of twelve test pits across the investigation area. Boreholes were also drilled as part of the geotechnical scope but no sampling for environmental purposes was undertaken from the boreholes.

Soil samples were collected from each test pit at depths of approximately 0.05 m, 0.5 m, 1.0 m and every 0.5 m thereafter, and changes in lithology or signs of contamination.

The general sampling methods are described in the field work methodology, included in Appendix H.

11. Site Assessment Criteria

The site assessment criteria (SAC) applied in the current investigation are informed by the CSM (Section 9) which identified human and environmental receptors to potential contamination on the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The investigation and screening levels applied in the current investigation comprise levels adopted for a generic recreational land use scenario. It is noted that health screening levels (HSLs) for standard residential land use (HSL A) have been utilised as a conservative measure for the assessment of soil vapour risk from petroleum hydrocarbons given the proposed development includes buildings/structures as per (NEPC, 2013). The derivation of the SAC is included in Appendix G and the adopted SAC are listed on the summary analytical results tables in Appendix E.

12. Results

12.1 Field Work Results

The borehole and test pit logs for this assessment are included in Appendix A. The logs recorded the following general sub-surface profile:

- Fill: generally comprising various mixtures of gravel, sand silt and clay materials with cobbles, asphalt, brick, concrete, metal, bricks, golf balls, timber, plastic barrier board and PVC pipes to depths ranging from 0.75 m to 3.0 m;
- Residual Clay: comprising primarily of stiff to very stiff, grey, yellow, brown silty clay or clay to depths ranging from 1.55 m to 4.4 m;
- Extremely Weathered Material (XWM): comprising hard or dense to very dense, pale yellow, yellow brown, grey, brown, silty clay, sandy clay, gravelly clay, clayey gravel and sandy gravel to depths ranging from 2.1 m to 5.62 m in all bores and Pits 8 to 11 and C2; and
- Bedrock: comprising medium to high strength, highly fractured to fractured, siltstone, sandstone and conglomerate to depths ranging from 4.7 m and 5.2 m in Bores 1 and 5 only.

No visual or olfactory evidence (e.g. staining, odours, free phase product) was observed during the investigations to suggest the presence of gross contamination within the soils at the site.

The PID screening recorded values of less than 1 ppm suggesting the absence, or very low concentrations, of VOC in the samples tested.

No free groundwater was observed during excavation of test pits or drilling of boreholes. Ponded water was observed within the drainage swale within the southern part of the site. It should be noted that groundwater levels are affected by climatic conditions and soil permeability and will therefore vary with time.

12.2 Laboratory analytical results

The results of laboratory analysis are summarised in the following tables in Appendix E:

- Table E1: Summary of Laboratory Results – Metals, PAH, TRH and BTEX; and
- Table E2: Summary of Laboratory Results – OCP, OPP, PCB and Asbestos.

The laboratory certificate of analysis together with the chain of custody and sample receipt information are provided in Appendix E.

13. Discussion

13.1 Soils

A total of eleven soil samples (including 1 QC sample) were analysed to provide a preliminary assessment of contaminant concentrations in soil for the identified contaminant of potential concern (Section 8). The results of laboratory testing indicated the following:

- TRH, BTEX, OPP, OCP and PCB were not detected above the laboratory reporting limits;
- PAH was detected above laboratory reporting limits in Pit 8 at 0.5m but was below the adopted SAC for the site;
- Asbestos was not identified in the tested soils at the laboratory reporting limit;
- Heavy metals were detected in all samples tested at low concentrations and were within the adopted SAC for the site;
- Coal tar was not identified in the tested samples of asphalt from Pits 10 and 11;
- The tested soils were within the following human health guidelines:
 - o NEPC (2013) health investigation levels (HIL) for recreational / open space land use (i.e. HIL C);
 - o NEPC (2013) health screening levels (HSL) for recreational / open space land use (i.e. HSL C and standard residential land use (i.e. HSL A), direct soil contact and intrusive maintenance worker;
 - o NEPC (2013) management limits for residential / parkland / open space land use;
- The tested soils were within the NEPC (2013) ecological investigation and screening limits for urban residential / parkland / public open space land use; and
- The tested soils are suitable to remain on site from a contamination perspective.

Based on the limited total contamination testing conducted, the soils tested would be classified as 'General Solid Waste (non-putrescible)' (CTI) (NSW EPA, 2014a). Based on the limited test results, the soils tested may also be suitable for classification as ENM, subject to appropriate segregation and results of additional testing to comply with the sampling density and testing regime outlined in the ENM RRO (NSW EPA, 2014) including pH, Electrical Conductivity and Foreign Material testing.

The soils would be suitable for disposal at a facility licensed to accept this waste category, if required. The handling, transport and disposal / re-use of the materials should be conducted in accordance with regulatory and statutory requirements.

Analytical results indicate the absence of asbestos containing materials within soils at the locations and depths tested. It is noted that a detailed asbestos assessment (including sieving of bulk soil samples with reference to NEPC (2013)) was not conducted for the current preliminary assessment, however, site observations suggested the general absence of widespread ACM at the exposed areas of the surface and within the limited fill identified and at the depths assessed.

Given the unknown origin of the fill materials at the site and the presence of building materials within the fill materials including concrete, brick, PVC pipe, timber (which are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos), there is a risk that that HBM including asbestos may be present within the fill materials. Asbestos impacted fill materials (if present) would be classified as "Special Waste" in addition to the chemical waste classification with reference to (NSW EPA, 2014). The presence of asbestos would also preclude the materials being classified as ENM or being re-used off-site under another resource recovery order or specific exemption.

Based on (WA DoH, 2021) due to the uncontrolled fill with building waste identified at the site, the site would be categorised as "Suspect" in terms of its likelihood for asbestos contamination. Sites classified as "Suspect" require sampling densities commensurate with Table 5 (WA DoH, 2021), which for the current site area of approximately 2.4ha would equate to approximately 35 test locations. This sampling density is also commensurate with the minimum in-situ sampling density for ENM assessment (NSW EPA, 2014) and the recommended minimum sampling density for systematic sampling based on NSW EPA sampling design guidelines (NSW EPA, 2022).

Based on the above and experience on similar fill sites, further assessment including sieving of bulk 10L fill samples for ACM would be recommended to further characterise fill materials across the site and confirm the suitability of the fill materials to remain on-site and confirm re-use / disposal options for the material.

13.2 Data quality assurance and quality control

The data quality assurance and quality control (QA/QC) results are included in Appendix E. Based on the results of the field QA and field and laboratory QC, and evaluation against the data quality indicators (DQI) it is concluded that the field and laboratory test data obtained are reliable and useable for this assessment.

14. Revised Conceptual Site Model

The data collected for this PSI has generally confirmed that certain potential contaminant sources outlined in the CSM outlined in Section 9 pose a potentially complete pathway to the identified receptor(s) whilst others do not. No other sources of contamination have been identified as a result of the testing results. This is summarised in Table 9.

Table 9: Updated summary of potentially complete exposure pathways (proposed land use)

Source and CoPC	Exposure pathway	Receptor	Risk management action
S1: Fill, metals, TRH, BTEX, PAH, OCP, OPP, PCB, phenols, asbestos. S2: Vehicles, TRH, BTEX, PAH and metals S3: Chemical use, metals, OCP, OPP S4: Opportunistic dumping, metals, TRH, BTEX, PAH, OCP, OPP, PCB, asbestos.	HP1: Ingestion and dermal contact HP2: Inhalation of dust and/or vapours	HR1: Current users [vacant land] HR2: Construction and maintenance workers HR3: End users [vacant land / recreational] HR4: Adjacent site users [recreational and residential]	No exceedances found within the samples tested from the geotechnical pits however only limited testing has been completed across site to date. Some building materials (i.e. bricks, concrete and asphalt) were observed within fill materials across the site which could be indicators of the presence of HBM, including asbestos and would trigger further investigation with reference to (WA DoH, 2021) and (NEPC, 2013).
	EP1: Surface water run-off EP2: Leaching of contaminants and vertical migration into groundwater EP3: Lateral migration of groundwater providing base flow to water bodies EP4: Inhalation, ingestion and absorption	ER1: Surface water ER2: Groundwater ER3: Terrestrial ecosystems	CoPC could therefore still exist across the site and further sampling and testing to characterise the site is recommended. Regardless of the outcomes of further assessment unexpected finds protocols (UFP) should be included in the contractors construction environmental management plan (CEMP) to manage potential unexpected finds encountered during development due the variable nature of filling.

15. Conclusions and recommendations

The results of the PSI with limited soil sampling indicate the following:

- The site history review indicated that the potential for gross contamination from the historic and current land uses is generally considered to be low;
- The limited subsurface investigation indicated the general absence of gross contaminant observations (ie staining or odours) at the test locations and depths assessed based on field observations;
- The subsurface investigation did however confirm the presence of variable fill materials within all bores and pits across the site to depth of 0.75 m to 3.0 m, with some building materials including bricks, concrete and timber which are indicators of potential HBM including asbestos; and
- Contamination concentrations in the limited soil samples analysed were within the adopted human health and ecological based site assessment criteria for recreational land use.

Based on the above the site is considered likely to be suitable for the proposed recreational development with respect to contamination, subject to further assessment of fill materials with reference to (WA DoH, 2021) and (NEPC, 2013) to further assess potential asbestos and other COPC impacts and remediation and/or management of any identified impacts with reference to a site-specific remediation action plan (RAP), where required.

The preliminary waste classification is not to be used for waste disposal. Further work is required before a formal classification suitable for waste disposal can be provided. The final waste classification is to be confirmed by a qualified environmental consultant including visual and analytical assessments.

Regardless of the outcomes of further assessment, given the presence of widespread variable fill materials it is recommended as a precautionary measure, that the contractor implements an unexpected finds protocol (UFP) for earthworks for the site. The UFP should outline the appropriate action should suspected contamination be observed during clearing or earthworks, such as potential asbestos containing materials, anthropogenic materials, fill materials not currently identified, or fill/soils with staining/odours.

16. References

CRC CARE. (2017). *Risk-based Management and Remediation Guidance for Benzo(a)pyrene*. Technical Report no. 39: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2014). *Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014, The excavated natural material order 2014*. NSW Environment Protection Authority.

NSW EPA. (2014). *Waste Classification Guidelines, Part 1: Classifying Waste*. NSW Environment Protection Authority.

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

NSW EPA. (2022). *Contaminated Sites, Sampling Design Guidelines*. NSW Environment Protection Authority.

NSW EPA. (2022). *Sampling Design, Part 1: Application; Part 2: Interpretation*. NSW Environment Protection Authority.

WA DoH. (2021). *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. WA Department of Health.

17. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Jack Smyth Drive, Hillvue NSW with reference to Douglas' proposal 226965.00.P.001.Rev0 dated 15 January 2024 and acceptance received from Callum Fletcher of Tamworth Regional Council dated 19 January 2024. The work was carried out under Local Government Procurement Master Agreement. This report is provided for the exclusive use of Tamworth Regional Council for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the environmental components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Asbestos has not been detected by observation or by laboratory analysis, either on the surface of the site, or in fill materials at the test locations sampled and analysed. Building demolition materials, such as concrete, brick, timber, PVC piping etc, were, however, located in previous below-ground fill, and these are considered as indicative of the possible presence of hazardous building materials (HBM), including asbestos.

Although the sampling plan adopted for this investigation is considered appropriate to achieve the stated project objectives, there are necessarily parts of the site that have not been sampled and analysed. This is either due to undetected variations in ground conditions or to budget constraints (as discussed above), or to parts of the site being inaccessible and not available for inspection/sampling, or to vegetation preventing visual inspection and reasonable access. It is therefore considered possible that HBM, including asbestos, may be present in unobserved or untested parts of the site, between and beyond sampling locations, and hence no warranty can be given that asbestos is not present.

Appendix A

About This Report

Terminology, Symbols and Abbreviations

Soil Descriptions

Rock Descriptions

Sampling, Testing and Excavation Methodology

Borehole Logs (Bores 1 to 7)

Test Pit Logs (Pits 8 to 11, C1 to C8)

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

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This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at

the time of construction as are indicated in the report; and

- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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Introduction to Terminology, Symbols and Abbreviations

Douglas Partners' reports, investigation logs, and other correspondence may use terminology which has quantitative or qualitative connotations. To remove ambiguity or uncertainty surrounding the use of such terms, the following sets of notes pages may be attached Douglas Partners' reports, depending on the work performed and conditions encountered:

- Soil Descriptions;
- Rock Descriptions; and
- Sampling, insitu testing, and drilling methodologies

In addition to these pages, the following notes generally apply to most documents.

Abbreviation Codes

Site conditions may also be presented in a number of different formats, such as investigation logs, field mapping, or as a written summary. In some of these formats textual or symbolic terminology may be presented using textual abbreviation codes or graphic symbols, and, where commonly used, these are listed alongside the terminology definition. For ease of identification in these note pages, textual codes are presented in these notes in the following style **XW**. Code usage conforms with the following guidelines:

- Textual codes are case insensitive, although herein they are generally presented in upper case; and
- Textual codes are contextual (i.e. the same or similar combinations of characters may be used in different contexts with different meanings (for example `PL` is used for plastic limit in the context of soil moisture condition, as well as in `PL(A)` for point load test result in the testing results column)).

Data Integrity Codes

Subsurface investigation data recorded by Douglas Partners is generally managed in a highly structured database environment, where records "span" between a top and bottom depth interval. Depth interval "gaps" between records are considered to introduce ambiguity, and, where appropriate, our practice guidelines may require contiguous data sets. Recording meaningful data is not always appropriate (for example assigning a "strength" to a concrete pavement) and the following codes may be used to maintain contiguity in such circumstances.

Term	Description	Abbreviation Code
Core loss	No core recovery	KL
Unknown	Information was not available to allow classification of the property. For example, when auguring in loose, saturated sand auger cuttings may not be returned.	UK
No data	Information required to allow classification of the property was not available. For example if drilling is commenced from the base of a hole predrilled by others	ND
Not Applicable	Derivation of the properties not appropriate or beyond the scope of the investigation. For example providing a description of the strength of a concrete pavement	NA

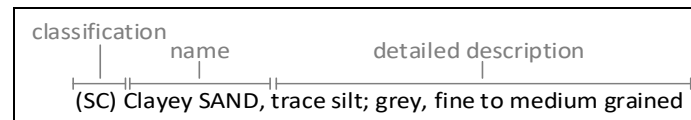
Graphic Symbols

Douglas Partners' logs contain a "graphic" column which provides a pictorial representation of the basic composition of the material. The symbols used are directly representing the material name stated in the adjacent "Description of Strata" column, and as such no specific graphic symbology legend has been provided in these notes.

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Introduction

All materials which are not considered to be “in-situ rock” are described in general accordance with the soil description model of AS 1726-2017 Part 6.1.3, and can be broken down into the following description structure:



The “classification” comprises a two character “group symbol” providing a general summary of dominant soil characteristics. The “name” summarises the particle sizes within the soil which most influence its behaviour. The detailed description presents more information about composition, condition, structure, and origin of the soil.

Classification, naming and description of soils require the relative proportion of particles of different sizes within the whole soil mixture to be considered.

Particle size designation and Behaviour Model

Solid particles within a soil are differentiated on the basis of size.

The engineering behaviour properties of a soil can subsequently be modelled to be either “fine grained” (also known as “cohesive” behaviour) or “coarse grained” (“non cohesive” behaviour), depending on the relative proportion of fine or coarse fractions in the soil mixture.

Particle Size Designation	Particle Size (mm)	Behaviour Model	
		Behaviour	Approximate Dry Mass
Boulder	>200	Excluded from particle behaviour model as “oversize”	
Cobble	63 - 200		
Gravel ¹	2.36 - 63	Coarse	>65%
Sand ¹	0.075 - 2.36		
Silt	0.002 - 0.075	Fine	>35%
Clay	<0.002		

¹ – refer grain size subdivision descriptions below

The behaviour model boundaries defined above are not precise, and the material behaviour should be assumed from the name given to the material (which considers the particle fraction which dominates the behaviour, refer “component proportions” below), rather than strict observance of the proportions of particle sizes. For example, if a material is named a “Sandy CLAY”, this is indicative that the material exhibits fine grained behaviour, even if the dry mass of coarse grained material may exceed 65%.

Component proportions

The relative proportion of the dry mass of each particle size fraction is assessed to be a “primary”, “secondary”, or “minor” component of the soil mixture, depending on its influence over the soil behaviour.

Component Proportion Designation	Definition ¹	Relative Proportion	
		In Fine Grained Soil	In Coarse Grained Soil
Primary	The component (particle size designation, refer above) which dominates the engineering behaviour of the soil	The clay/silt component with the greater proportion	The sand/gravel component with the greater proportion
Secondary	Any component which is not the primary, but is significant to the engineering properties of the soil	Any component with greater than 30% proportion	Any granular component with greater than 30%; or Any fine component with greater than 12%
Minor ²	Present in the soil, but not significant to its engineering properties	All other components	All other components

¹ As defined in AS1726-2017 6.1.4.4

² In the detailed material description, minor components are split into two further sub-categories. Refer “identification of minor components” below.

Composite Materials

In certain situations, a lithology description may describe more than one material, for example, collectively describing a layer of interbedded sand and clay. In such a scenario, the two materials would be described independently, with the names preceded or followed by a statement describing the arrangement by which the materials co-exist. For example, “INTERBEDDED Silty CLAY AND SAND”.

Classification

The soil classification comprises a two character group symbol. The first character identifies the primary component. The second character identifies either the grading or presence of fines in a coarse grained soil, or the plasticity in a fine grained soil. Refer AS1726-2017 6.1.6 for further clarification.

Soil Name

For most soils, the name is derived with the primary component included as the noun (in upper case), preceded by any secondary components stated in an adjective form. In this way, the soil name also describes the general composition and indicates the dominant behaviour of the material.

Component ¹	Prominence in Soil Name
Primary	Noun (eg "CLAY")
Secondary	Adjective modifier (eg "Sandy")
Minor	No influence

¹ – for determination of component proportions, refer component proportions on previous page

For materials which cannot be disaggregated, or which are not comprised of rock or mineral fragments, the names "ORGANIC MATTER" or "ARTIFICIAL MATERIAL" may be used, in accordance with AS1726-2017 Table 14.

Commercial or colloquial names are not used for the soil name where a component derived name is possible (for example "Gravelly SAND" rather than "CRACKER DUST").

Materials of "fill" or "topsoil" origin are generally assigned a name derived from the primary/secondary component (where appropriate). In log descriptions this is preceded by uppercase "FILL" or "TOPSOIL". Origin uncertainty is indicated in the description by the characters (?), with the degree of uncertainty described (using the terms "probably" or "possibly" in the origin column, or at the end of the description).

Identification of minor components

Minor components are identified in the soil description immediately following the soil name. The minor component fraction is usually preceded with a term indicating the relative proportion of the component.

Minor Component Proportion Term	Relative Proportion	
	In Fine Grained Soil	In Coarse Grained Soil
With	All fractions: 15-30%	Clay/silt: 5-12% sand/gravel: 15-30%
Trace	All fractions: 0-15%	Clay/silt: 0-5% sand/gravel: 0-15%

The terms "with" and "trace" generally apply only to gravel or fine particle fractions. Where cobbles/boulders are encountered in minor proportions (generally less than about 12%) the term "occasional" may be used. This term describes the sporadic distribution of the material within the confines of the investigation excavation only, and there may be considerable variation in proportion over a wider area which is difficult to factually characterise due to the relative size of the particles and the investigation methods.

Soil Composition

Plasticity

Descriptive Term	Laboratory liquid limit range	
	Silt	Clay
Non-plastic materials	Not applicable	Not applicable
Low plasticity	≤50	≤35
Medium plasticity	Not applicable	>35 and ≤50
High plasticity	>50	>50

Note, Plasticity descriptions generally describe the plasticity behaviour of the whole of the fine grained soil, not individual fine grained fractions.

Grain Size

Type	Particle size (mm)	
	Gravel	Sand
Gravel	Coarse	19 - 63
	Medium	6.7 - 19
	Fine	2.36 - 6.7
Sand	Coarse	0.6 - 2.36
	Medium	0.21 - 0.6
	Fine	0.075 - 0.21

Grading

Grading Term	Particle size (mm)
Well	A good representation of all particle sizes
Poorly	An excess or deficiency of particular sizes within the specified range
Uniformly	Essentially of one size
Gap	A deficiency of a particular size or size range within the total range

Note, AS1726-2017 provides terminology for additional attributes not listed here.

Soil Condition

Moisture

The moisture condition of soils is assessed relative to the plastic limit for fine grained soils, while for coarse grained soils it is assessed based on the appearance and feel of the material. The moisture condition of a material is considered to be independent of stratigraphy (although commonly these are related), and this data is presented in its own column on logs.

Applicability	Term	Tactile Assessment	Abbreviation code
Fine	Dry of plastic limit	Hard and friable or powdery	w<PL
	Near plastic limit	Can be moulded	w=PL
	Wet of plastic limit	Water residue remains on hands when handling	w>PL
	Near liquid limit	"oozes" when agitated	w=LL
	Wet of liquid limit	"oozes"	w>LL
Coarse	Dry	Non-cohesive and free running	D
	Moist	Feels cool, darkened in colour, particles may stick together	M
	Wet	Feels cool, darkened in colour, particles may stick together, free water forms when handling	W

The abbreviation code **NDF**, meaning "not-assessable due to drilling fluid use" may also be used.

Note, observations relating to free ground water or drilling fluids are provided independent of soil moisture condition.

Consistency/Density/Compaction/Cementation/Extremely Weathered Material

These concepts give an indication of how the material may respond to applied forces (when considered in conjunction with other attributes of the soil). This behaviour can vary independent of the composition of the material, and on logs these are described in an independent column and are generally mutually exclusive (i.e it is inappropriate to describe both consistency and compaction at the same time). The method by which the behaviour is described depends on the behaviour model and other characteristics of the soil as follows:

- In fine grained soils, the "consistency" describes the ease with which the soil can be remoulded, and is generally correlated against the materials undrained shear strength;
- In granular materials, the relative density describes how tightly packed the particles are, and is generally correlated against the density index;
- In anthropogenically modified materials, the compaction of the material is described qualitatively;
- In cemented soils (both natural and anthropogenic), the cemented "strength" is described qualitatively, relative to the difficulty with which the material is disaggregated; and
- In soils of extremely weathered material origin, the engineering behaviour may be governed by relic rock features, and expected behaviour needs to be assessed based the overall material description.

Quantitative engineering performance of these materials may be determined by laboratory testing or estimated by correlated field tests (for example penetration or shear vane testing). In some cases, performance may be assessed by tactile or other subjective methods, in which case investigation logs will show the estimated value enclosed in round brackets, for example **(VS)**.

Consistency (fine grained soils)

Consistency Term	Tactile Assessment	Undrained Shear Strength (kPa)	Abbreviation Code
Very soft	Extrudes between fingers when squeezed	<12	VS
Soft	Mouldable with light finger pressure	>12 - ≤25	S
Firm	Mouldable with strong finger pressure	>25 - ≤50	F
Stiff	Cannot be moulded by fingers	>50 - ≤100	St
Very stiff	Indented by thumbnail	>100 - ≤200	VSt
Hard	Indented by thumbnail with difficulty	>200	H
Friable	Easily crumbled or broken into small pieces by hand	-	Fr

Relative Density (coarse grained soils)

Relative Density Term	Density Index	Abbreviation Code
Very loose	<15	VL
Loose	>15 - ≤35	L
Medium dense	>35 - ≤65	MD
Dense	>65 - ≤85	D
Very dense	>85	VD

Note, tactile assessment of relative density is difficult, and generally requires penetration testing, hence a tactile assessment guide is not provided.

Compaction (anthropogenically modified soil)

Compaction Term	Abbreviation Code
Well compacted	WC
Poorly compacted	PC
Moderately compacted	MC
Variably compacted	VC

Cementation (natural and anthropogenic)

Cementation Term	Abbreviation Code
Moderately cemented	MOD
Weakly cemented	WEK

Extremely Weathered Material

AS1726-2017 considers weathered material to be soil if the unconfined compressive strength is less than 0.6 MPa (i.e. less than very low strength rock). These materials may be identified as “extremely weathered material” in reports and by the abbreviation code **XWM** on log sheets. This identification is not correlated to any specific qualitative or quantitative behaviour, and the engineering properties of this material must therefore be assessed according to engineering principles with reference to any relic rock structure, fabric, or texture described in the description.

Soil Origin

Term	Description	Abbreviation Code
Residual	Derived from in-situ weathering of the underlying rock	RS
Extremely weathered material	Formed from in-situ weathering of geological formations. Has strength of less than ‘very low’ as per as1726 but retains the structure or fabric of the parent rock.	XWM
Alluvial	Deposited by streams and rivers	ALV
Fluvial	Deposited by channel fill and overbank (natural levee, crevasse splay or flood basin)	FLV
Estuarine	Deposited in coastal estuaries	EST
Marine	Deposited in a marine environment	MAR
Lacustrine	Deposited in freshwater lakes	LAC
Aeolian	Carried and deposited by wind	AEO
Colluvial	Soil and rock debris transported down slopes by gravity	COL
Slopewash	Thin layers of soil and rock debris gradually and slowly deposited by gravity and possibly water	SW
Topsoil	Mantle of surface soil, often with high levels of organic material	TOP
Fill	Any material which has been moved by man	FILL
Littoral	Deposited on the lake or seashore	LIT
Unidentifiable	Not able to be identified	UID

Cobbles and Boulders

The presence of particles considered to be “oversize” may be described using one of the following strategies:

- Oversize encountered in a minor proportion (when considered relative to the wider area) are noted in the soil description; or
- Where a significant proportion of oversize is encountered, the cobbles/boulders are described independent of the soil description, in a similar manner to composite soils (described above) but qualified with “MIXTURE OF”.

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Rock Strength

Rock strength is defined by the unconfined compressive strength, and it refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects.

The Point Load Strength Index $I_{s(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Unconfined Compressive Strength (MPa)	Point Load Index ¹ $I_{s(50)}$ MPa	Abbreviation Code
Very low	0.6 - 2	0.03 - 0.1	VL
Low	2 - 6	0.1 - 0.3	L
Medium	6 - 20	0.3 - 1.0	M
High	20 - 60	1 - 3	H
Very high	60 - 200	3 - 10	VH
Extremely high	>200	>10	EH

¹ Rock strength classification is based on UCS. The UCS to $I_{s(50)}$ ratio varies significantly for different rock types and specific ratios may be required for each site. The point load Index ranges shown above are as suggested in AS1726 and should not be relied upon without supporting evidence.

The following abbreviation codes are used for soil layers or seams of material “within rock” but for which the equivalent UCS strength is less than 0.6 MPa.

Scenario	Abbreviation Code
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The properties of the material encountered over this interval are described in the “Description of Strata” and soil properties columns.	SOIL
The material encountered has an equivalent UCS strength of less than 0.6 MPa, and therefore is considered to be soil (as per Note 1 of Table 20 of AS 1726-2017). The prominence of the material is such that it can be considered to be a seam (as defined in Table 22 of AS1726-2017) and the properties of the material are described in the defect column.	SEAM

Degree of Weathering

The degree of weathering of rock is classified as follows:

Weathering Term	Description	Abbreviation Code
Residual Soil ¹	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.	RS
Extremely weathered ¹	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible	XW
Highly weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching or may be decreased due to deposition of weathering products in pores.	HW
Moderately weathered	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MW
Slightly weathered	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.	SW
Fresh	No signs of decomposition or staining.	FR
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.	DW

¹ The parent rock type, of which the residual/extremely weathered material is a derivative, will be stated in the description (where discernible).

Degree of Alteration

The degree of alteration of the rock material (physical or chemical changes caused by hot gasses or liquids at depth) is classified as follows:

Term	Description	Abbreviation Code
Extremely altered	Material is altered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible.	XA
Highly altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is changed by alteration. Some primary minerals are altered to clay minerals. Porosity may be increased by leaching or may be decreased due to precipitation of secondary materials in pores.	HA
Moderately altered	The whole of the rock material is discoloured, usually by staining or bleaching to the extent that the colour of the original rock is not recognisable but shows little or no change of strength from fresh rock.	MA
Slightly altered	Rock is slightly discoloured but shows little or no change of strength from fresh rock	SA
Note: If HA and MA cannot be differentiated use DA (see below)		
Distinctly altered	Rock strength usually changed by alteration. The rock may be highly discoloured, usually by staining or bleaching. Porosity may be increased by leaching or may be decreased due to precipitation of secondary minerals in pores.	DA

Degree of Fracturing

The following descriptive classification apply to the spacing of natural occurring fractures in the rock mass. It includes bedding plane partings, joints and other defects, but excludes drilling breaks. These terms are generally not required on investigation logs where fracture spacing is presented as a histogram, and where used are presented in an unabbreviated format.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$RQD \% = \frac{\text{cumulative length of 'sound' core sections} > 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e., drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

These terms may be used to describe the spacing of bedding partings in sedimentary rocks. Where used, these terms are generally presented in an unabbreviated format

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Defect Descriptions

Defect Type

Term	Abbreviation Code
Bedding plane	B
Cleavage	CL
Crushed seam	CS
Crushed zone	CZ
Drilling break	DB
Decomposed seam	DS
Drill lift	DL
Extremely Weathered seam	EW
Fault	F
Fracture	FC
Fragmented	FG
Handling break	HB
Infilled seam	IS
Joint	JT
Lamination	LAM
Shear seam	SS
Shear zone	SZ
Vein	VN
Mechanical break	MB
Parting	P
Sheared Surface	S

Rock Defect Orientation

Term	Abbreviation Code
Horizontal	H
Vertical	V
Sub-horizontal	SH
Sub-vertical	SV

Rock Defect Coating

Term	Abbreviation Code
Clean	CN
Coating	CT
Healed	HE
Infilled	INF
Stained	SN
Tight	TI
Veneer	VNR

Rock Defect Infill

Term	Abbreviation Code
Calcite	CA
Carbonaceous	CBS
Clay	CLAY
Iron oxide	FE
Manganese	MN
Pyrite	Py
Secondary material	MS
Silt	M
Quartz	Qz
Unidentified material	MU

Rock Defect Shape/Planarity

Term	Abbreviation Code
Curved	CU
Discontinuous	DIS
Irregular	IR
Planar	PR
Stepped	ST
Undulating	UN

Rock Defect Roughness

Term	Abbreviation Code
Polished	PO
Rough	RF
Smooth	SM
Slickensided	SL
Very rough	VR

Defect Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

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Sampling and Testing

A record of samples retained, and field testing performed is usually shown on a Douglas Partners' log with samples appearing to the left of a depth scale, and selected field and laboratory testing (including results, where relevant) appearing to the right of the scale, as illustrated below:

SAMPLE			DEPTH (m)	TESTING	
SAMPLE REMARKS	TYPE	INTERVAL		TEST TYPE	RESULTS AND REMARKS
	SPT		1.0 1.45	SPT	4,9,11 N=20

Sampling

The type or intended purpose for which a sample was taken is indicated by the following abbreviation codes.

Sample Type	Code
Auger sample	A
Acid Sulfate sample	ASS
Bulk sample	B
Core sample	C
Disturbed sample	D
Environmental sample	ES
Gas sample	G
Piston sample	P
Sample from SPT test	SPT
Undisturbed tube sample	U ¹
Water sample	W
Material Sample	MT
Core sample for unconfined compressive strength testing	UCS

¹ – numeric suffixes indicate tube diameter/width in mm

The above codes only indicate that a sample was retained, and not that testing was scheduled or performed.

Field and Laboratory Testing

A record that field and laboratory testing was performed is indicated by the following abbreviation codes.

Test Type	Code
Pocket penetrometer (kPa)	PP
Photo ionisation detector (ppm)	PID
Standard Penetration Test x/y = x blows for y mm penetration HB = hammer bouncing HW = fell under weight of hammer	SPT
Shear vane (kPa)	V
Unconfined compressive strength, (MPa)	UCS

Field and laboratory testing (continued)

Test Type	Code
Point load test, (MPa), axial (A), diametric (D), irregular (I)	PLT(L)
Dynamic cone penetrometer, followed by blow count penetration increment in mm (cone tip, generally in accordance with AS1289.6.3.2)	DCP/150
Perth sand penetrometer, followed by blow count penetration increment in mm (flat tip, generally in accordance with AS1289.6.3.3)	PSP/150

Groundwater Observations

▷	seepage/inflow
▽	standing or observed water level
NFGWO	no free groundwater observed
OBS	observations obscured by drilling fluids

Drilling or Excavation Methods/Tools

The drilling/excavation methods used to perform the investigation may be shown either in a dedicated column down the left-hand edge of the log, or stated in the log footer. In some circumstances abbreviation codes may be used.

Method	Abbreviation Code
Direct Push	DP
Solid flight auger. Suffixes: /T = tungsten carbide tip, /V = v-shaped tip	AD ¹
Air Track	AT
Diatube	DT ¹
Hand auger	HA ¹
Hand tools (unspecified)	HAND
Existing exposure	X
Hollow flight auger	HSA ¹
HQ coring	HQ3
HMLC series coring	HMLC
NMLC series coring	NMLC
NQ coring	NQ3
PQ coring	PQ3
Predrilled	PD
Push tube	PT ¹
Ripping tyne/ripper	R
Rock roller	RR ¹
Rock breaker/hydraulic hammer	EH
Sonic drilling	SON ¹
Mud/blade bucket	MB ¹
Toothed bucket	TB ¹
Vibrocure	VC ¹
Vacuum excavation	VE
Wash bore (unspecified bit type)	WB ¹

¹ – numeric suffixes indicate tool diameter/width in mm

BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.3 AHD
COORDINATE: E:301347.7, N:6553955.6
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 1
PROJECT No: 226965.00
DATE: 22/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED														SAMPLE		TESTING																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
					ORIGIN (#)	CONSISTENCY ⁽¹⁾ DENSITY ⁽²⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH ⁽¹⁾ RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
22/05/24 No free groundwater observed	409	0.25	FILL / Silty CLAY: brown; low to medium plasticity; abundant organic matter.		FILL	NA	w<PL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

NOTES: (1) Soil origin is "probable" unless otherwise stated. (2) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar

METHOD: Solid Flight Auger to 2.5m, NMLC to 4.7m

CASING: HW to 3.1m

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.1 AHD
COORDINATE: E:301288.1, N:6553998.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 2
PROJECT No: 226965.00
DATE: 22/05/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED						SAMPLE			TESTING AND REMARKS	
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. (°)	DENSITY (°)	MOISTURE	REMARKS	TYPE	INTERVAL
22/05/24 No free groundwater observed	0.20	FILL / Sandy CLAY, trace gravel: brown; low to medium plasticity; fine to medium sand; fine gravel; abundant organic matter.		FILL	NA	w<PL			D	0.10
	0.50	FILL / Silty CLAY, with sand, trace gravel: brown; low to medium plasticity; fine to medium sand; fine to medium gravel; black pvc pipe.		FILL	NA	w<PL			D	0.50
	1.00	FILL / Silty CLAY, with sand, with gravel: brown; low to medium plasticity; fine to medium sand; fine to medium gravel.		FILL	NA	w<PL			D	1.00
	1.45			FILL	NA	w<PL			SPT	7,9,6 N=15
	1.50			FILL	NA	w<PL			D	1.50
	2.00			FILL	NA	w<PL			D	2.00
	2.50			FILL	NA	w<PL			D	2.50
	2.75	Silty CLAY, trace gravel: grey and yellow; medium to high plasticity; fine to medium gravel.		RS	F to St	w=PL			SPT	4,2,3 N=5 90-140kPa
	2.95			RS	F to St	w=PL			D	2.95
	3.00			RS	F to St	w=PL			U50	PP
	3.40			RS	F to St	w=PL			D	3.40
	3.70	Silty CLAY, trace gravel: pale brown; low to medium plasticity; fine gravel.		XWM	H	w<PL			D	3.70
	4.00			XWM	H	w<PL		No sample recovered	SPT	14/10

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2
METHOD: Solid Flight Auger to 5.4m
REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar
CASING: Uncased

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.1 AHD
COORDINATE: E:301288.1, N:6553998.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 2
PROJECT No: 226965.00
DATE: 22/05/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED														SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS				
	404		[CONT] Silty CLAY, trace gravel; pale brown; low to medium plasticity; fine gravel.	X X X X X X X	XWM	H		w<PL										
			Borehole discontinued at 5.40m depth. TC bit refusal.															
	403	6																
	402	7																
	401	8																
	400	9																

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar

METHOD: Solid Flight Auger to 5.4m

CASING: Uncased

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.8 AHD
COORDINATE: E:301202.6, N:6553987.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 3
PROJECT No: 226965.00
DATE: 21/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED							SAMPLE			TESTING AND REMARKS				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS. ^(*) DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
21/05/24: No free groundwater observed	409	0.15	FILL / Sandy GRAVEL: brown; fine to medium; fine sand.		FILL	NA	D		D		0.10			
			FILL / Sandy CLAY, with gravel: brown; low to medium plasticity; fine to medium sand; fine to coarse gravel.							D		0.50		
		1			FILL	NA	w=PL		D		1.00			
									SPT		1.45	SPT	5,5,6 N=11	
		2									2.00			
		2.25	Silty CLAY, trace gravel: brown; medium to high plasticity; fine gravel.						U50		2.40	PP	>400kPa	
											2.50			
									SPT		2.95	SPT	5,7,8 N=15	
		3			RS	St to VSt		w=PL				3.00		
												3.50		
406	4.00	Sandy CLAY, trace gravel: pale yellow; medium to high plasticity; fine to medium sand; fine to medium gravel.		XWM	H	w<PL			SPT		4.00	PP	380->400kPa	
											4.44	SPT	10,20,25/140	
											4.44			
405		Borehole discontinued at 4.50m depth. TC bit refusal.												

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar

METHOD: Solid Flight Auger to 4.5m

CASING: Uncased

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.9 AHD
COORDINATE: E:301252.5, N:6553973.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 4
PROJECT No: 226965.00
DATE: 22/05/24
SHEET: 1 of 2

GROUNDWATER	CONDITIONS ENCOUNTERED						SAMPLE				TESTING AND REMARKS	
	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN ^(*)	CONSIS. ^(†) DENSITY: ^(‡)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
22/06/24 No free groundwater observed	RL (m) DEPTH (m)				FILL CONSIS. ^(†) DENSITY: ^(‡)	w<PL		D		0.10		
	4b9	FILL / Sandy CLAY, with gravel: pale brown; low to medium plasticity; fine to medium sand; fine gravel; with organic matter.	X	FILL	NA	w<PL		D		0.50		
	1	FILL / Silty CLAY, trace gravel: brown; low to medium plasticity.	X	FILL	NA	w<PL		D		1.00		
	4b8		X	FILL	NA	w<PL		SPT		SPT	9,21,22 N=43	
	2		X	FILL	NA	w<PL		D		1.45		
			X	FILL	NA	w<PL		D		1.50		
			X	FILL	NA	w<PL		D		2.00		
	2.50	FILL / Sandy CLAY, with gravel, trace silt: brown; low to medium plasticity; fine to medium sand; fine to medium gravel.	X	FILL	NA	w<PL		D		2.50	PP	100-140kPa
	4b7		X	FILL	NA	w<PL		SPT		SPT	5,5,5 N=10	
	3.00	CLAY, trace silt: dark brown; low to medium plasticity.	V	RS	St to VSt	w<PL		D		2.95		
			V	RS	St to VSt	w<PL		U50		3.00		
			V	RS	St to VSt	w<PL				3.40		
	4.00	Gravelly CLAY, with sand: grey and grey brown; medium plasticity; fine to coarse, sub-angular to angular gravel; fine to medium sand.	G	XWM	H	w<PL		SPT		4.00	SPT	25/70
	4b6		G	XWM	H	w<PL				4.07		
	4b5		G	XWM	H	w<PL						

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(†)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2	OPERATOR: Ground Test (Ellis)	LOGGED: Parmar
METHOD: Solid Flight Auger to 5.2m		CASING: Uncased

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ± 0.1 m



BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.9 AHD
COORDINATE: E:301252.5, N:6553973.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 4
PROJECT No: 226965.00
DATE: 22/05/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED													SAMPLE			TESTING AND REMARKS	
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS			
			[CONT] Gravelly CLAY, with sand: grey and grey brown; medium plasticity; fine to coarse, sub-angular to angular gravel; fine to medium		XWM	H		w<PL									
			Borehole discontinued at 5.20m depth. TC bit refusal.														
		4.04															
		6															
		4.03															
		7															
		4.02															
		8															
		4.01															
		9															
		4.00															

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar

METHOD: Solid Flight Auger to 5.2m

CASING: Uncased

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.4 AHD
COORDINATE: E:301341.4, N:6553909.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 5
PROJECT No: 226965.00
DATE: 22/05/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED														SAMPLE		TESTING				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	SOIL			ROCK							SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
					ORIGIN (#)	CONSISTENCY DENSITY (%)	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
23/06/24 No free groundwater observed	409	0.10	FILL / Silty CLAY, trace gravel: pale brown; low to medium plasticity; fine gravel.		FILL	NA	w<PL													
		0.50																		
		1.00	FILL / Silty Gravelly CLAY: brown; low to medium plasticity; fine to medium gravel.																	
		1.45																		
		1.50																		
		2.00	FILL / Gravelly CLAY, trace silt: pale yellow; low plasticity; fine to medium gravel.																	
		2.40																		
		2.50	Clayey GRAVEL, with sand: brown; fine to coarse, sub-angular to angular; fine to medium sand.																	
		2.87																		
		3.05																		
406	3.05	SILTSTONE: brown and yellow brown, fine grained, laminated		FILL	NA	w<PL														
		3.30m: JT/70°, PR, Fe, RF																		
		3.44m: JT/10°, PR, RF																		
		3.48m: JT/10°, PR, RF																		
		3.51m: JT/60°, PR, Clay, RF																		
		3.54m: JT/20°, PR, RF																		
		3.56m: JT/10°, PR, RF																		
		3.61-4.36m: F																		
		4.44m: JT/70°, PR, Fe, RF																		
		4.55-4.69m: CS																		
405	4.55	4.55m-4.69m: Grey clay seam		XWM	D to VD	D														
		4.69m: Brown																		
		4.69m: Brown																		
		4.69m: Brown																		
		4.69m: Brown																		
		4.69m: Brown																		
		4.69m: Brown																		
		4.69m: Brown																		
		4.69m: Brown																		
		4.69m: Brown																		

NOTES: #Soil origin is "probable" unless otherwise stated. *Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: "F" Soil origin is "probable" unless otherwise stated. "C" Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar

METHOD: Solid Flight Auger to 2.87m, NMLC to 5.20m

CASING: HW to 3m

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.4 AHD
COORDINATE: E:301341.4, N:6553909.8
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 5
PROJECT No: 226965.00
DATE: 22/05/24
SHEET: 2 of 2

GROUNDWATER		DEPTH (m)	CONDITIONS ENCOUNTERED											SAMPLE				TESTING		
RL (m)	DESCRIPTION OF STRATA		GRAPHIC	SOIL			ROCK								SAMPLE REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
				ORIGIN (#)	CONSIS. ⁽¹⁾	DENSITY. ⁽²⁾	MOISTURE	WEATH.	DEPTH (m)	STRENGTH	RECOVERY (%)	RQD	FRACTURE SPACING (m)	DEFECTS & REMARKS						
		[CONT] SILTSTONE: brown and yellow brown, fine grained laminated. Borehole discontinued at 5.20m depth. Limit of investigation.					MW			H	100	43		5.00-5.15m: JT x2/80°, PR, Fe, RF					PLT	PL(I)=2.16MPa
		6																		
		7																		
		8																		
		9																		

NOTES: ⁽¹⁾Soil origin is "probable" unless otherwise stated. ⁽²⁾Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: ⁽¹⁾ Soil origin is "probable" unless otherwise stated. ⁽²⁾ Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2
METHOD: Solid Flight Auger to 2.87m, NMLC to 5.20m
REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

OPERATOR: Ground Test (Ellis)
CASING: HW to 3m

LOGGED: Parmar

Refer to explanatory notes for symbol and abbreviation definitions

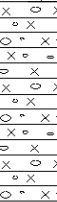
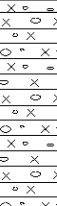
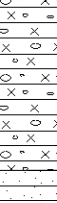
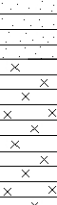
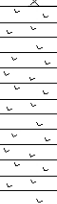
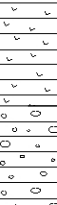
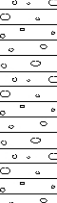


BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.2 AHD
COORDINATE: E:301308.0, N:6553972.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 6
PROJECT No: 226965.00
DATE: 23/05/24
SHEET: 1 of 2

CONDITIONS ENCOUNTERED							SAMPLE			TESTING AND REMARKS				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ⁽¹⁾ DENSITY. ⁽¹⁾	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
22/06/24 No free groundwater observed	403	0.30	FILL / Sandy CLAY, with gravel: brown; medium to high plasticity; fine to medium sand; fine to medium gravel; abundant organics.		FILL	NA	w<PL		D		0.10			
			FILL / Silty Gravelly CLAY, trace sand: brown; medium to high plasticity; fine to coarse gravel.		FILL	NA	w=PL		D		0.50			
		1.00	FILL / Silty Gravelly CLAY, trace sand: pale brown; low to medium plasticity; fine to coarse gravel.		FILL	NA	w<PL		D		1.00			
	408				FILL	NA	w<PL		SPT		1.45	SPT	4,7,7 N=14	
					FILL	NA	w<PL		D		1.50			
		2.20	FILL / Sandy CLAY, trace silt, trace gravel: grey and brown; low to medium plasticity; fine to medium sand; fine to medium gravel.		FILL	NA	w<PL		D		2.00			
	407				RS	F to St	w>PL		D		2.20	SPT	4,3,5 N=8	
		2.50	Silty CLAY, trace sand, trace gravel: grey and brown; low to medium plasticity; fine sand; fine gravel.		RS	F to St	w>PL		SPT		2.50			
					RS	F to St	w>PL		D		2.95			
	406	3.00	CLAY, with gravel: brown; medium to high plasticity; fine to medium gravel.		RS	St to VSt	w>PL			D		3.00		
					RS	St to VSt	w>PL			U50		3.35		
					RS	St to VSt	w>PL			U50		3.75		
	405	4.00	Gravelly CLAY: grey, brown and yellow brown; medium plasticity; fine to medium, sub-angular to angular gravel.		XWM	H	w=PL		D		4.00	SPT	20,25/100	
					XWM	H	w=PL				4.50			
					XWM	H	w=PL				4.85			

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2
METHOD: Solid Flight Auger to 5.62m
REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar
CASING: HW to 3.1m

Refer to explanatory notes for symbol and abbreviation definitions

BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.2 AHD
COORDINATE: E:301308.0, N:6553972.3
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 6
PROJECT No: 226965.00
DATE: 23/05/24
SHEET: 2 of 2

CONDITIONS ENCOUNTERED													SAMPLE			TESTING AND REMARKS		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN(#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS				
	404		[CONT] Gravelly CLAY: grey, brown and yellow brown; medium plasticity; fine to medium, sub-angular to angular gravel.		XWM	H		w=PL										
			Borehole discontinued at 5.62m depth. Limit of investigation.							D SPT		5.50 5.62	SPT	25/120				
	403	6																
	402	7																
	401	8																
	400	9																

NOTES: ^(#)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar

METHOD: Solid Flight Auger to 5.62m

CASING: HW to 3.1m

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



BOREHOLE LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 410.0 AHD
COORDINATE: E:301234.5, N:6553961.5
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 7
PROJECT No: 226965.00
DATE: 21/05/24
SHEET: 1 of 1

		CONDITIONS ENCOUNTERED					SAMPLE			TESTING AND REMARKS					
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ⁽¹⁾	DENSITY. ⁽¹⁾	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS		
RL (m)															
21/06/24 No free groundwater observed	0.10	FILL / Sandy Gravelly CLAY: brown; low to medium plasticity; fine to coarse sand; fine to coarse gravel; abundant organics. FILL / Sandy CLAY, with gravel: pale yellow; low to medium plasticity; fine to medium sand; fine to coarse gravel.		FILL	NA		w<PL		D		0.10		7,8,12 N=20		
									D		0.50				
	0.85	FILL / Silty Gravelly CLAY: brown; low to medium plasticity; fine to coarse gravel.		FILL	NA		w=PL		D		1.00			SPT	
	1								SPT		1.45				
	1.50	FILL / Silty CLAY, with sand, trace gravel: pale brown; low to medium plasticity; fine to medium sand; fine gravel.		FILL	NA		w<PL		D		1.50				
									D		2.00				
	2.00	FILL / Sandy CLAY, trace gravel: dark brown; medium to high plasticity; fine to medium sand; fine gravel.		FILL	NA		w<PL		D		2.00				
									D		2.50				
	2.75	Silty CLAY: dark brown; medium to high plasticity.		RS	St to VSt		w>PL		SPT		2.95			SPT	6,5,5 N=10 250-360kPa
	3								PP		3.10				
3.10	CLAY, trace gravel: dark brown; medium to high plasticity; fine gravel.		RS	St to VSt		w>PL	U50		3.10	PP	180kPa				
									3.50						
4.00	Sandy CLAY, with gravel: pale yellow; low to medium plasticity; fine to medium sand; fine to coarse gravel.		XWM	H		w<PL	D		4.00	SPT	7,10,25/60				
							SPT		4.39						
								D		4.80					
	Borehole discontinued at 4.80m depth. TC bit refusal.														

NOTES: ⁽¹⁾Soil origin is "probable" unless otherwise stated. ⁽²⁾Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Scout 2

OPERATOR: Ground Test (Ellis)

LOGGED: Parmar

METHOD: Solid Flight Auger to 4.8m

CASING: Uncased

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 410.2 AHD
COORDINATE: E:301272.9, N:6553925.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 10
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED						SAMPLE			TESTING AND REMARKS				
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS.(*) DENSITY.(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	410	0.25	FILL / Silty CLAY: brown; low to medium plasticity; abundant organics.		FILL		w=PL		D		0.10	PID	<1ppm
			FILL / Sandy CLAY, trace gravel: pale brown; medium to high plasticity; fine to medium sand; fine to medium, sub-angular to sub-rounded gravel; with reinforced concrete and house bricks.		FILL				D		0.50	PID	<1ppm
		0.70	FILL / Silty CLAY, with sand, trace gravel: grey white and pale brown; medium to high plasticity; fine to medium sand; fine to medium, sub-angular to sub-rounded gravel.		FILL		w<PL				1		
	409				FILL	NA							
		1.50	FILL / Sandy CLAY, with gravel: brown; medium to high plasticity; fine to medium sand; fine to coarse, sub-angular to sub-rounded gravel; with asphalt.		FILL		w>PL						
		2			FILL				D		2.00	PID PP	<1ppm <25-350kPa
	408	2.30	CLAY, trace silt: brown; medium to high plasticity.		RS	St to VSt	w=PL					PP	150-250kPa
		3.00	Sandy GRAVEL, with cobbles: grey; fine to coarse, sub-angular to angular; fine to coarse sand; angular to sub-angular, fine to medium cobbles.		XWM	D to VD	D				3		
	407												
		4									4		
	406		Test Pit discontinued at 4.10m depth. Refusal.										

NOTES: (*)Soil origin is "probable" unless otherwise stated. (**)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide toothed bucket, from 3.3m with single tyne ripper. Approx 10min to excavate 400mm

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.8 AHD
COORDINATE: E:301275.0, N:6553965.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 11
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED										SAMPLE			TESTING AND REMARKS		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
Seepage 07/05/24	4b9	0.30	FILL / Clayey SILT, trace sand, trace gravel: brown; low to medium plasticity; fine to coarse sand; fine to medium, angular to sub-angular gravel; abundant organics.		FILL			w=PL						DCP9/150 5 10 15 25 400kPa	
			FILL / Clayey SILT, with sand: grey brown; low plasticity; fine sand.		FILL					D	0.80	PID	<1ppm		
		1.20	FILL / Silty CLAY, with sand, with gravel: brown; medium plasticity; fine to coarse sand; fine to coarse, angular to sub-angular gravel; with asphalt with concrete, traffic barrier board.		NA										
		2.00			FILL			w<PL		D	2.00	PID	<1ppm		
		2.70	CLAY, trace sand: grey brown; medium to high plasticity; fine to medium sand.		RS	H									PP
	4b6	4.20	Sandy GRAVEL: grey and grey brown; fine to coarse, angular to sub-angular.		XWM	VD		D							
	4b5		Test Pit discontinued at 4.60m depth. Refusal.												
NOTES: ^(*) Soil origin is "probable" unless otherwise stated. ^(*) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.															

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions

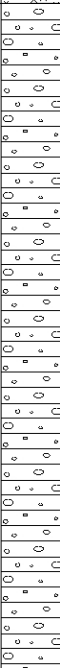
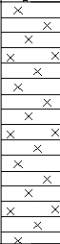


TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.4 AHD
COORDINATE: E:301245.3, N:6554006.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 8
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED														SAMPLE				TESTING AND REMARKS			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS							
	4b9	0.60	FILL / Clayey SILT, with sand: brown; low plasticity; fine to medium sand; abundant organics.		FILL																
		1	FILL / Gravelly CLAY, with cobbles, trace sand: brown and grey brown; medium to high plasticity; fine to coarse, angular to sub-angular gravel; angular to sub-angular, fine to medium cobbles; fine to coarse sand; with asphalt and pvc pipe.		FILL			NA	w<PL												
	4b8	2																			
	4b7	2.80	Silty CLAY: dark brown; medium to high plasticity.		RS			VSt to H	w=PL												
	4b6	3.60	CLAY: yellow brown and grey brown; medium to high plasticity.		RS																
	4b5	4.40	Sandy GRAVEL, with cobbles: yellow brown; fine to coarse, angular to sub-angular; fine to coarse sand; fine to coarse cobbles.		XWM			D to VD	D												
			Test Pit discontinued at 4.70m depth. Refusal.																		

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.6 AHD
COORDINATE: E:301315.2, N:6553938.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: 9
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED						SAMPLE			TESTING AND REMARKS					
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. (°)	DENSITY. (°)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
								</						

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: Bucket refusal at 3.4m, single tyne ripper to 3.9m

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

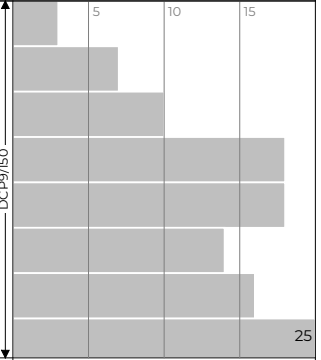
CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 410.0 AHD
COORDINATE: E:301247.6, N:6553906.0
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C1
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED														SAMPLE				TESTING AND REMARKS			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*) DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS								
4b9		0.40	FILL / Silty CLAY, with gravel: brown; low to medium plasticity; fine to coarse gravel; with organics.		FILL	NA	w<PL				1	PP									
		0.70	FILL / Silty CLAY, with gravel, trace sand: orange brown; low to medium plasticity; fine to medium, angular to sub-angular gravel; fine to medium sand.		FILL																
		1	FILL / Sandy SILT: brown; low plasticity; fine to medium sand; with organics.		FILL																
		1.10	FILL / Clayey SILT: grey brown; low plasticity.		FILL																
	4b8		1.50	CLAY, with silt, trace sand: brown; medium to high plasticity; fine sand.		RS	VSt to H					2		>400kPa							
		2	Test Pit discontinued at 2.30m depth. Limit of investigation.																		
4b7		3																			
		4																			
4b6																					

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.



DCP9/150

PP → >400kPa

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330
METHOD: 1.4m wide bucket with teeth
REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

OPERATOR: TPE Civil (Peter)
LOGGED: Cowan

Refer to explanatory notes for symbol and abbreviation definitions

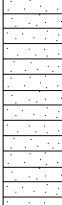


TEST PIT LOG

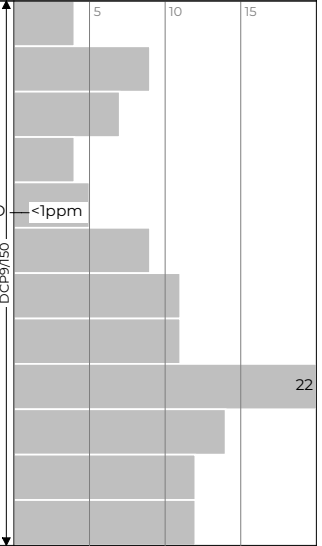
CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.6 AHD
COORDINATE: E:301317.7, N:6553886.1
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C2
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED										SAMPLE			TESTING AND REMARKS		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*) DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS		
			FILL / Clayey SILT: brown; low to medium plasticity; abundant organics.		FILL										
	4b9	0.30	FILL / Gravelly CLAY, with sand: brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel; fine to medium sand.		FILL	NA									
		1					w<PL		B						
		1.20	Sandy CLAY: grey brown; low to medium plasticity; fine to medium sand.		RS	VSt to H									
	4b8														
		1.90	Sandy CLAY, trace gravel: yellow brown; low plasticity; fine to medium sand; fine to medium, angular to sub-angular gravel.		XWM										
		2	Test Pit discontinued at 2.10m depth. Limit of investigation.												
	4b7														
		3													
	4b6														
		4													
	4b5														

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.



NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.7 AHD
COORDINATE: E:301312.7, N:6553862.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C3
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED						SAMPLE			TESTING AND REMARKS			
GROUNDWATER	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSISTENCY (°)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS
	0.15	FILL / Sandy SILT: brown; low plasticity; fine to medium sand; abundant organics.		FILL								
	0.75	FILL / Gravelly CLAY, trace sand: brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel; fine to coarse sand.		FILL	NA							
	1.00	Sandy SILT, trace clay: grey white; low plasticity; fine to medium sand.		RS	VSt to H	w<PL		B				
	1.20	Silty CLAY, trace sand: brown; low plasticity; fine to medium sand.		RS								
	1.65	Test Pit discontinued at 1.65m depth. Refusal.										
	2.00											
	3.00											
	4.00											
	4.50											

NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 410.2 AHD
COORDINATE: E:301255.4, N:6553855.7
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C4
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE				TESTING AND REMARKS								
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. (%)		DENSITY (g/cm³)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS										
	40	0.20	FILL / Silty CLAY, with gravel: brown; low to medium plasticity; fine to medium, angular to sub-angular gravel; abundant organics.		FILL				w>PL						PID		5	10	15	24	24	24	24	25	
			FILL / Silty CLAY, with gravel, trace sand: brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel; fine to coarse sand; with concrete, golf balls.		FILL	NA		w<PL		D		0.50	<1ppm												
	40.9	1.00	Silty CLAY: brown; medium to high plasticity.		RS	VSt to H							1		PP	>400kPa									
Test Pit discontinued at 1.55m depth. Refusal.																									
	40.8	2																							
	40.7	3																							
	40.6	4																							

NOTES: ¹Soil origin is "probable" unless otherwise stated. ²Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 410.3 AHD
COORDINATE: E:301222.8, N:6553883.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C5
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED														SAMPLE				TESTING AND REMARKS			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS							
	410	0.30	FILL / Silty CLAY: brown; low plasticity; abundant organics.		FILL								PID		5	10	15				
			FILL / Silty CLAY, with gravel, trace sand: brown; low to medium plasticity; fine to coarse, sub-angular to sub-rounded gravel.		FILL	NA	w<PL				0.20	0.50	DCP9/150								
	1											PID									
	409	1.30	CLAY: brown; medium to high plasticity.		RS	VSt to H							PP								
			Test Pit discontinued at 1.65m depth. Limit of investigation.																		
		2																			
	408																				
		3																			
	407																				
		4																			
	406																				

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions

TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.2 AHD
COORDINATE: E:301329.5, N:6554002.9
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C6
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED														SAMPLE				TESTING AND REMARKS			
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. (1)	DENSITY. (1)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS							
4b9	0.25	0.25	FILL / Silty CLAY, trace gravel: brown; low plasticity; fine to coarse, angular to sub-angular gravel; abundant organics.		FILL	NA		w<PL				0.50	B	DCP9/150		5	10	15	24	25	
			FILL / Sandy CLAY, with gravel: brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel; with concrete and asphalt.		FILL																
			FILL / Silty CLAY, with gravel: red brown; medium to high plasticity; fine to coarse, angular to sub-angular gravel.		FILL																
			FILL / Silty CLAY, with gravel: grey; low to medium plasticity; fine to coarse, angular to sub-angular gravel.		FILL																
4b7	1.10	1.10	FILL / Silty CLAY, with gravel: red brown; medium to high plasticity; fine to coarse, angular to sub-angular gravel.		FILL	NA		w<PL				1.00	D	PID	<1ppm						
			FILL / Silty CLAY, with gravel: grey; low to medium plasticity; fine to coarse, angular to sub-angular gravel.		FILL																
4b6	2.00	2.00	Test Pit discontinued at 2.30m depth. Limit of investigation.									2.00									
4b5	3.00	3.00																			

NOTES: (1) Soil origin is "probable" unless otherwise stated. (2) Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions

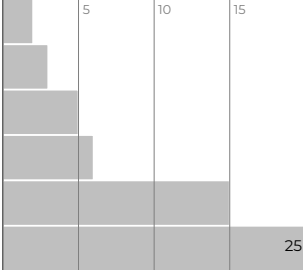
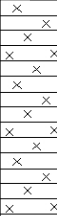
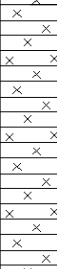
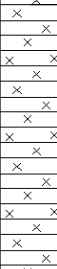


TEST PIT LOG

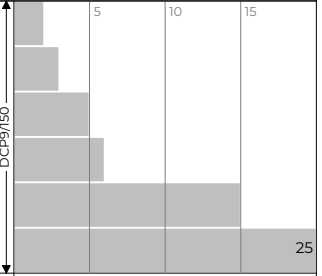
CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.3 AHD
COORDINATE: E:301289.6, N:6554011.4
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C7
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED										SAMPLE			TESTING AND REMARKS		
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)	DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS	
	409	0.35	FILL / Sandy CLAY, with gravel: brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel; abundant organics.		FILL										
			FILL / Silty CLAY, with gravel: brown; medium to high plasticity; fine to coarse, angular to sub-angular gravel.		FILL					B		0.50			
		1	FILL / Silty CLAY, with gravel: grey brown; medium to high plasticity; fine to coarse, angular to sub-angular gravel; pvc pipe, timber, poly pipe, concrete.		FILL	NA		w<PL				1.00			
	408	1.10	FILL / Silty CLAY, with gravel: grey brown; medium to high plasticity; fine to coarse, angular to sub-angular gravel; pvc pipe, timber, poly pipe, concrete.		FILL										
		2.00	FILL / Gravelly CLAY, trace cobbles: brown; medium to high plasticity; fine to coarse, angular to sub-angular gravel; angular to sub-angular, fine to medium cobbles.		FILL							2			
	407		Test Pit discontinued at 2.40m depth. Limit of investigation.												
		3													
	406														
		4													
	405														

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.



NOTES: #Soil origin is "probable" unless otherwise stated. °Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

Refer to explanatory notes for symbol and abbreviation definitions



TEST PIT LOG

CLIENT: Tamworth Regional Council
PROJECT: Proposed Tamworth Regional Aquatic Centre
LOCATION: Jack Smyth Drive, Hillvue

SURFACE LEVEL: 409.1 AHD
COORDINATE: E:301262.0, N:6554020.2
DATUM/GRID: MGA2020 Zone 56
DIP/AZIMUTH: 90°/---°

LOCATION ID: C8
PROJECT No: 226965.00
DATE: 07/05/24
SHEET: 1 of 1

CONDITIONS ENCOUNTERED													SAMPLE			TESTING AND REMARKS											
GROUNDWATER	RL (m)	DEPTH (m)	DESCRIPTION OF STRATA	GRAPHIC	ORIGIN (#)	CONSIS. ^(*)		DENSITY. ^(*)	MOISTURE	REMARKS	TYPE	INTERVAL	DEPTH (m)	TEST TYPE	RESULTS AND REMARKS												
	409		FILL / Silty CLAY: brown; low to medium plasticity; abundant organics.		FILL	NA		w<PL					1	DCP9/150		5	10	15									
	0.25	FILL / Silty CLAY, with gravel: yellow brown and brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel; with concrete.		FILL	25																						
	1.00	FILL / Silty CLAY: brown; medium to high plasticity.		FILL																							
	1.60	FILL / Silty CLAY, with gravel: grey brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel.		FILL																							
	1.90	FILL / Silty CLAY, with gravel: red brown; low to medium plasticity; fine to coarse, angular to sub-angular gravel.		FILL																							
	2	Test Pit discontinued at 2.10m depth. Limit of investigation.																									
	3																										
	4																										
	5																										
	6																										

NOTES: ^(*)Soil origin is "probable" unless otherwise stated. ^(*)Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

NOTES: #Soil origin is "probable" unless otherwise stated. %Consistency/Relative density shading is for visual reference only - no correlation between cohesive and granular materials is implied.

PLANT: Kobelco SK330

OPERATOR: TPE Civil (Peter)

LOGGED: Cowan

METHOD: 1.4m wide bucket with teeth

REMARKS: Coordinates and surface level recorded using dGPS in "fix" mode which has typical accuracy of ±0.1 m

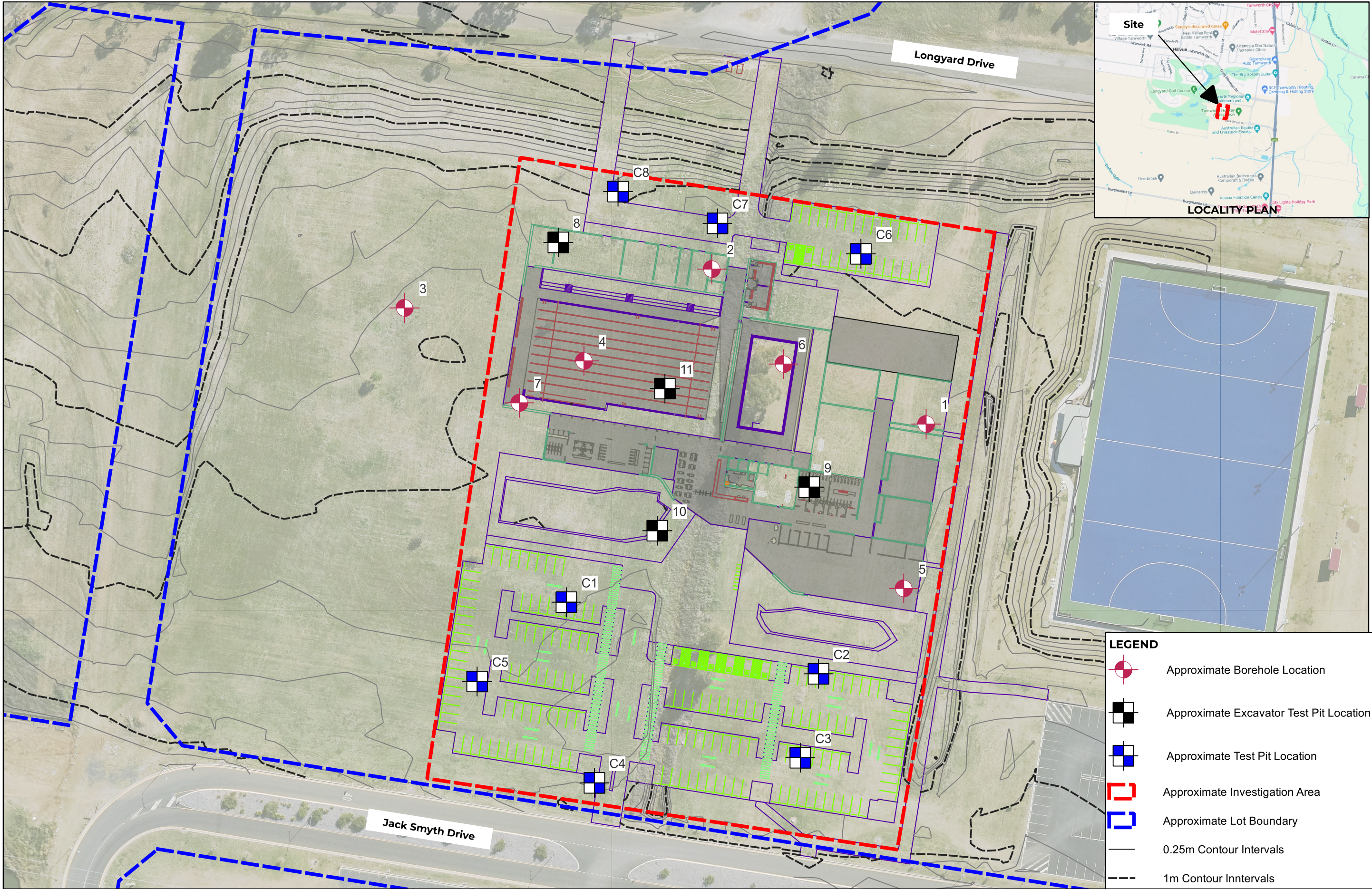
Refer to explanatory notes for symbol and abbreviation definitions



Appendix B

Drawing 1 – Test Location Plan

Client Supplied Drawings



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	Original Issue	18.06.2024	JRC
SCALE: 0 10 20 30 40 m 1:1000 @ A3			



Douglas
PARTNERS
OFFICE: PORT MACQUARIE
Unit 2, 32 Ceebung Drive, Port Macquarie
NSW 2444 Ph: (02) 6581 5992

CLIENT:



Tamworth Regional Council

NOTE:

1: Basemap from MetroMap (Dated 21 August 2023)
2: Base Plan from CO.OP Studio, Reference 240502, Revision 1 (Dated 02.05.2024)
3: 0.25m Contour intervals supplied by client

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
Proposed Tamworth Regional Aquatic Centre

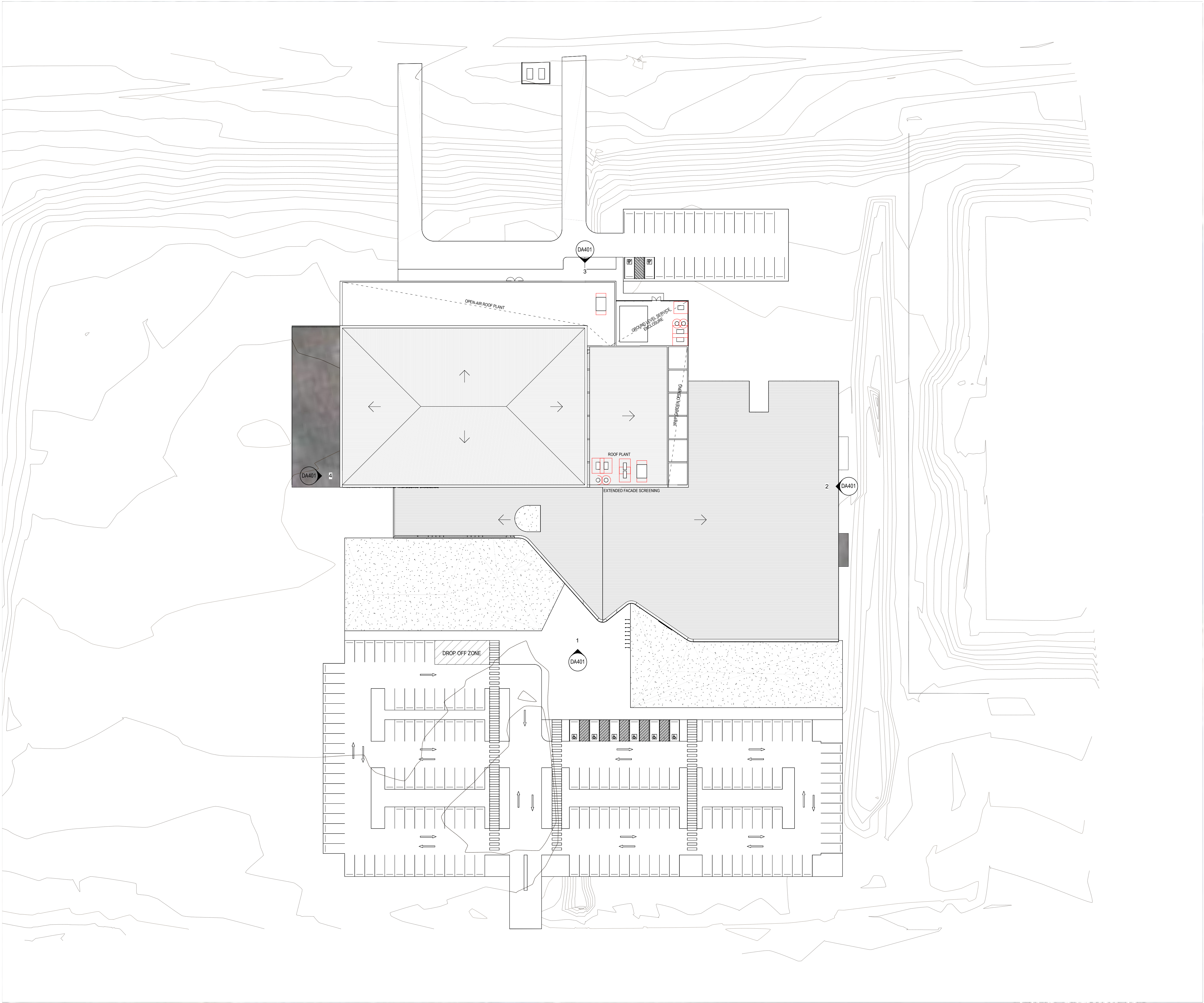
PROJECT ADDRESS:
Jack Smyth Drive, Hillvue, NSW

DRAWING TITLE:
Test Location Plan

PROJECT NO:
226965.00

DRAWING NO:
1

REVISION:
0



REV	DESCRIPTION	DATE	APP
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CLIENT

FOR INFORMATION
02.05.24

CO.OP
CO-OP STUDIO
Level 6, 54 Wellington Street, Collingwood, 3066
Office: +61 3 932 201 614
admin@co-opstudio.com.au

PROJECT

Tamworth RAC

PROJECT NUMBER

100358

DRAWING

SITE PLAN

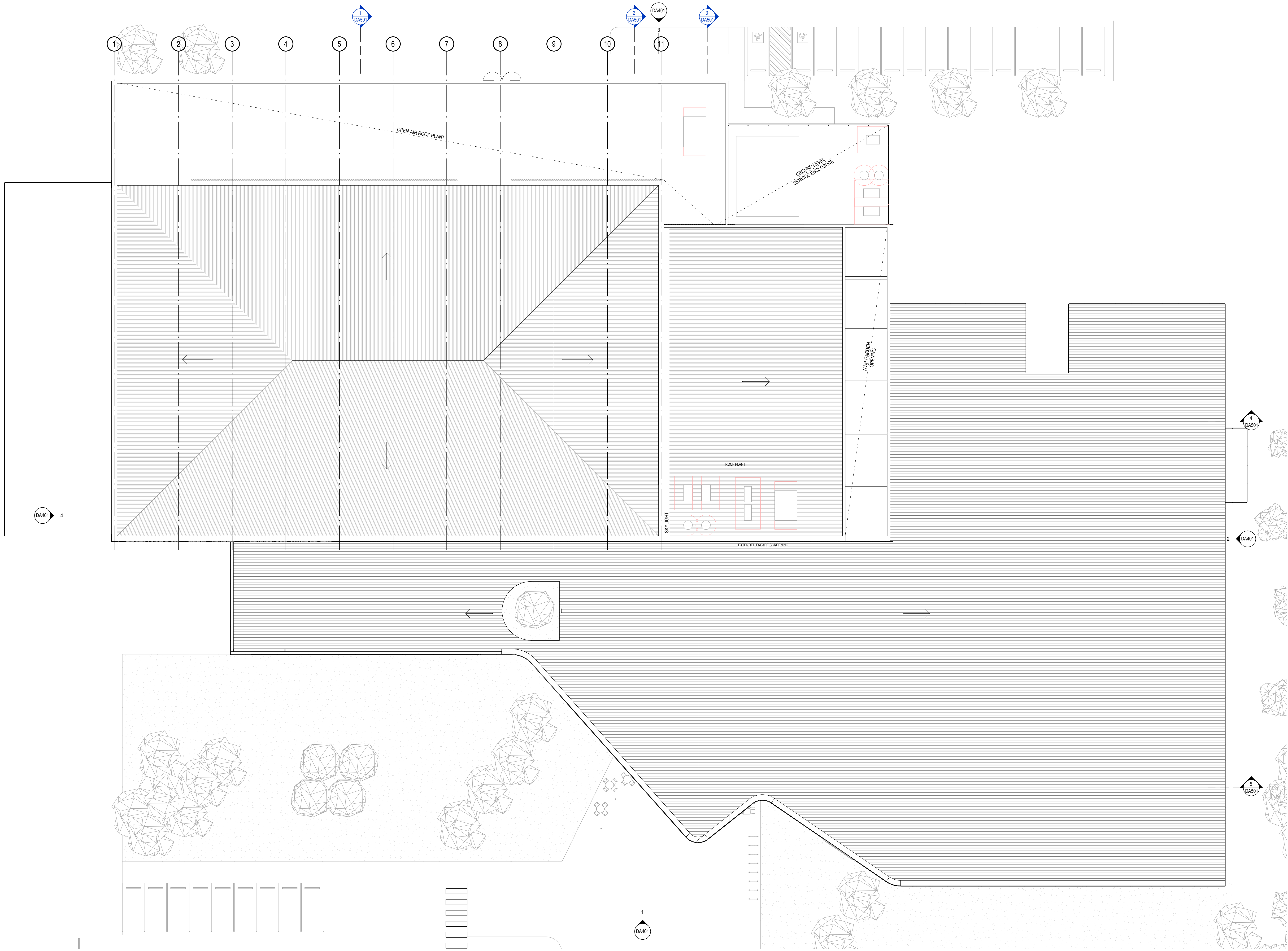
SCALE 1 : 500 @ A0

DRAWN BY Author

PRELIMINARY
NOT TO BE USED DURING CONSTRUCTION

DRAWING NO. REVISION

DA101



REV	DESCRIPTION	DATE	APP
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CLIENT			
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FOR INFORMATION 02.05.24			
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CO.OP
CO-OP STUDIO
Level 6, 54 Wellington Street, Collingwood, 3066
Office: +61 3 932 201 614
admin@co-opstudio.com.au

PROJECT

Tamworth RAC

PROJECT NUMBER

100358

DRAWING

ROOF PLAN

SCALE 1:200 @ A0

DRAWN BY Author

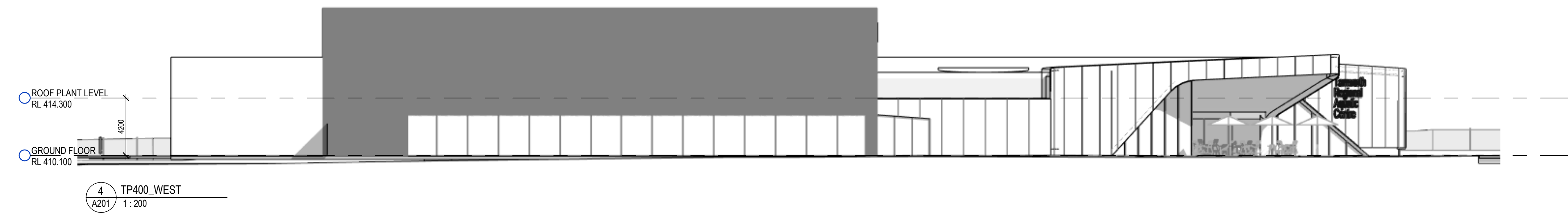
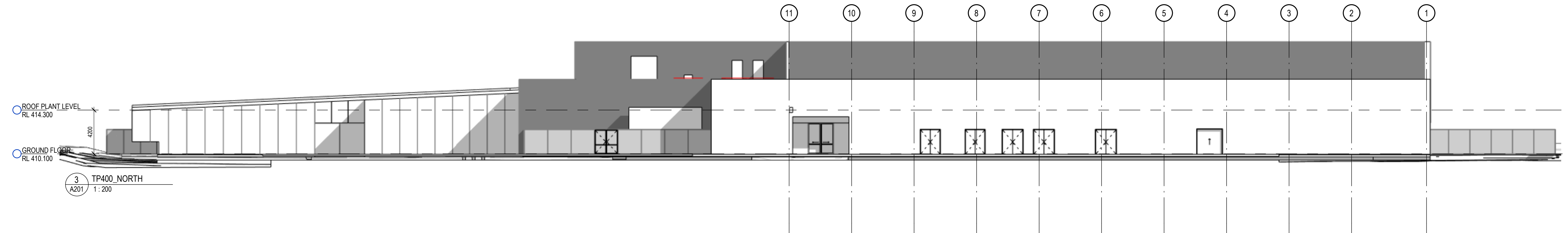
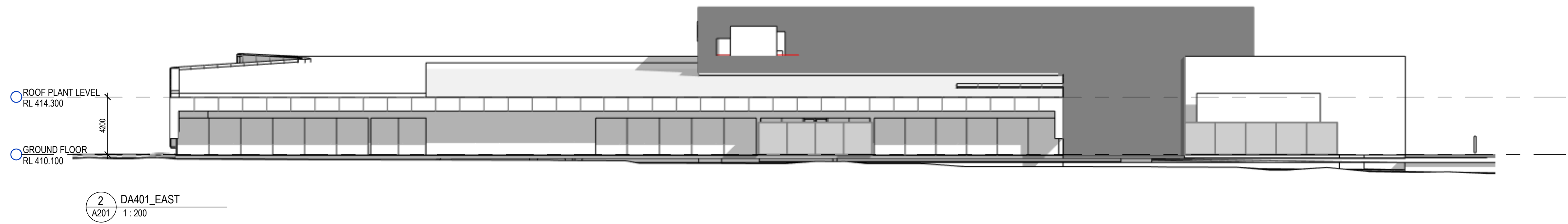
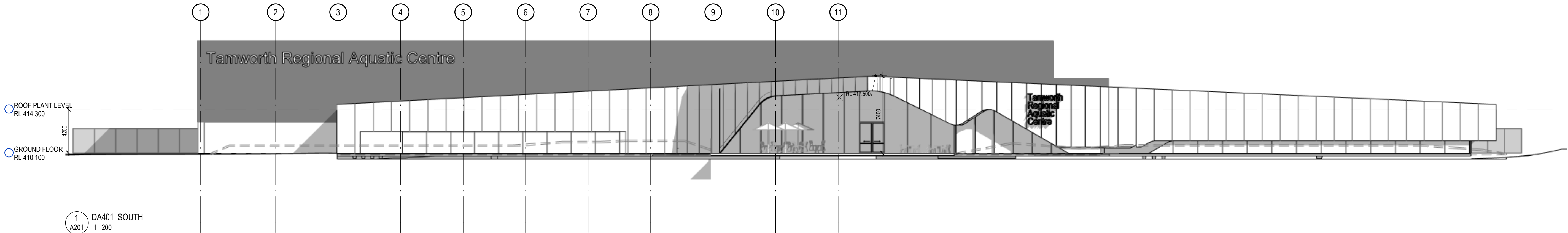
PRELIMINARY
NOT TO BE USED DURING CONSTRUCTION

DRAWING NO. REVISION

DA202

DATE PRINTED 2025/05/14 11:55 PM

FILE NAME Autodesk User/Tamworth RAC/100358_Tamworth RAC_F02_2601.rvt



REV	DESCRIPTION	DATE	APP
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CLIENT			
FOR INFORMATION 02.05.24			

CO.OP
CO-OP STUDIO
Level 6, 54 Wellington Street, Collingwood, 3066
Office +61 3 932 201 614
admin@co-opstudio.com.au

PROJECT

Tamworth RAC

PROJECT NUMBER
100358

DRAWING

ELEVATIONS

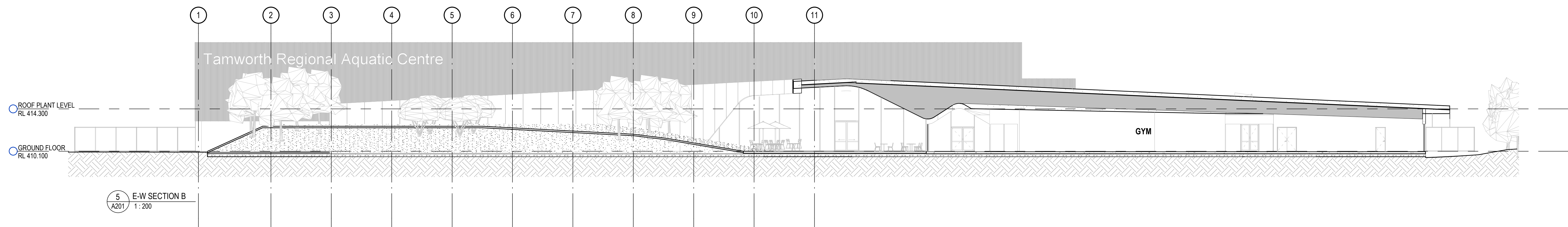
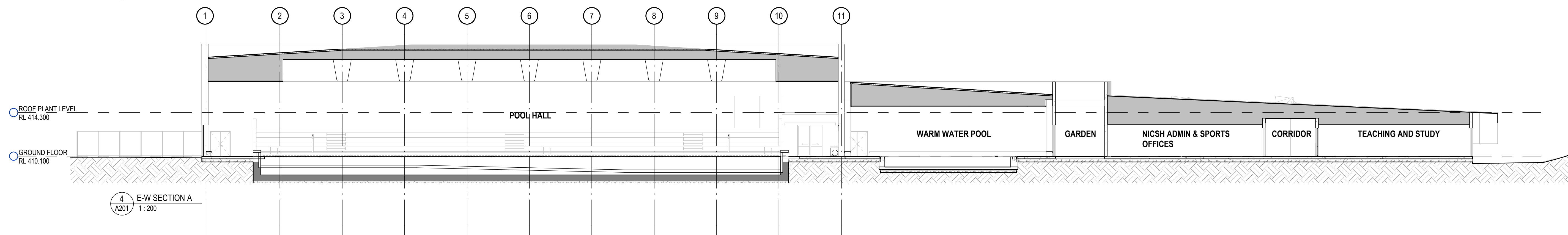
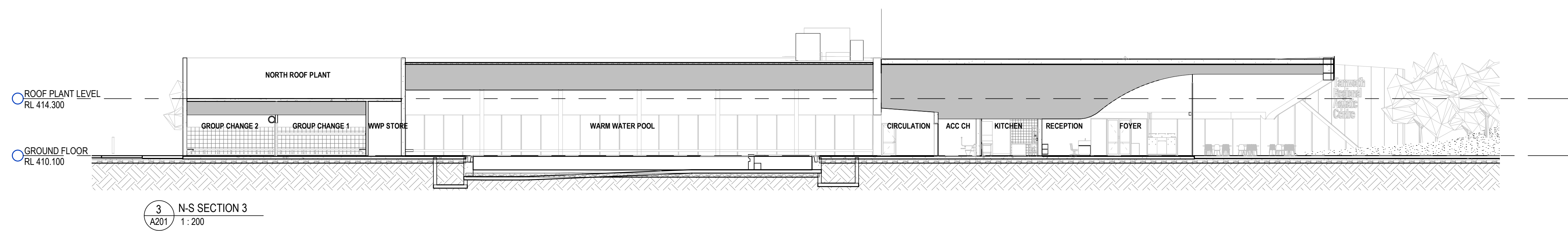
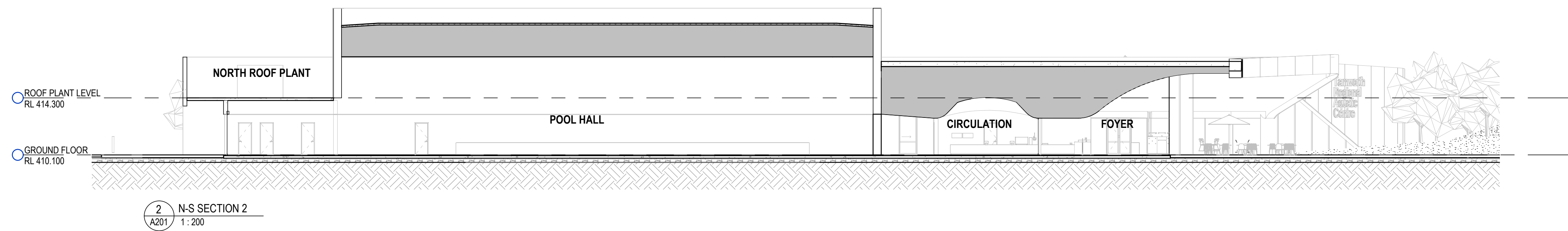
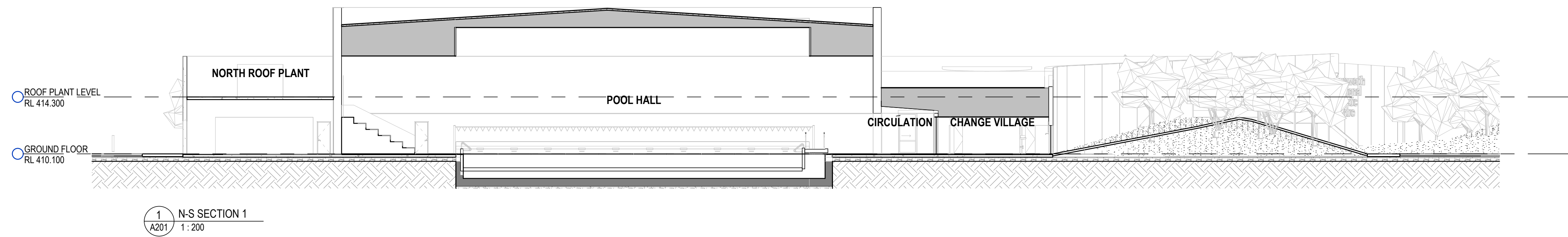
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DRAWING NO. REVISION

DA401



REV	DESCRIPTION	DATE	APP
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CO.OP
CO-OP STUDIO
Level 6, 54 Wellington Street, Collingwood, 3066
Office: +61 3 932 201 614
admin@co-opstudio.com.au

PROJECT	
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Tamworth RAC

PROJECT NUMBER	100358
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DRAWING	
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SECTIONS

SCALE	1:200 @ A0
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DRAWN BY	Author
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PRELIMINARY
NOT TO BE USED DURING CONSTRUCTION

DRAWING NO.	REVISION
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DA501

Appendix C

Drawing 2 – Site Observations and Photo Location Plan

Site Photographs



Photo B1: View north from approximate south-eastern corner of the investigation area



Photo B2: View west from approximate south-eastern corner of the investigation area



Photo B3: View south-east from approximate western boundary of investigation area



Photo B4: View east towards adjacent mound and hockey fields



Photo B5: View south towards existing sports dome building



Photo B6: View of stockpiled concrete rubble adjacent to existing drainage swale



Photo B7: View of polypipe and steel temporary fence panel adjacent to drainage swale



Photo B8: View north-west towards trees adjacent to drainage swale



Photo B9: View towards piece of concrete and stockpiled vegetation and tall grass



Photo B10: View north along drainage swale



Photo B11: View south along drainage swale



Photo B12: View west from drainage swale



Photo B13: View of discarded tree branches within drainage swale



Photo B14: View north-east towards adjacent steel buildings



Photo B15: View south-east from approximate Bore 6 location



Photo B16: View north towards adjacent road and drainage point for drainage swale (covered with tall grass)



Photo B17: View north-east towards adjacent development



Photo B18: View north from approximate extent of investigation area with rutted access tracks present down slope



Photo B19: View south from approximate northern extent of investigation area



Photo 20: View of stockpiled gravel material near Test Pit C2



Photo 21: View of ponded water within southern extent of drainage swale



Photo 22: View North to south-east from approximate Test Pit 8 location



Photo 23: View north-east to the south-east from approximate Test Pit C5 location

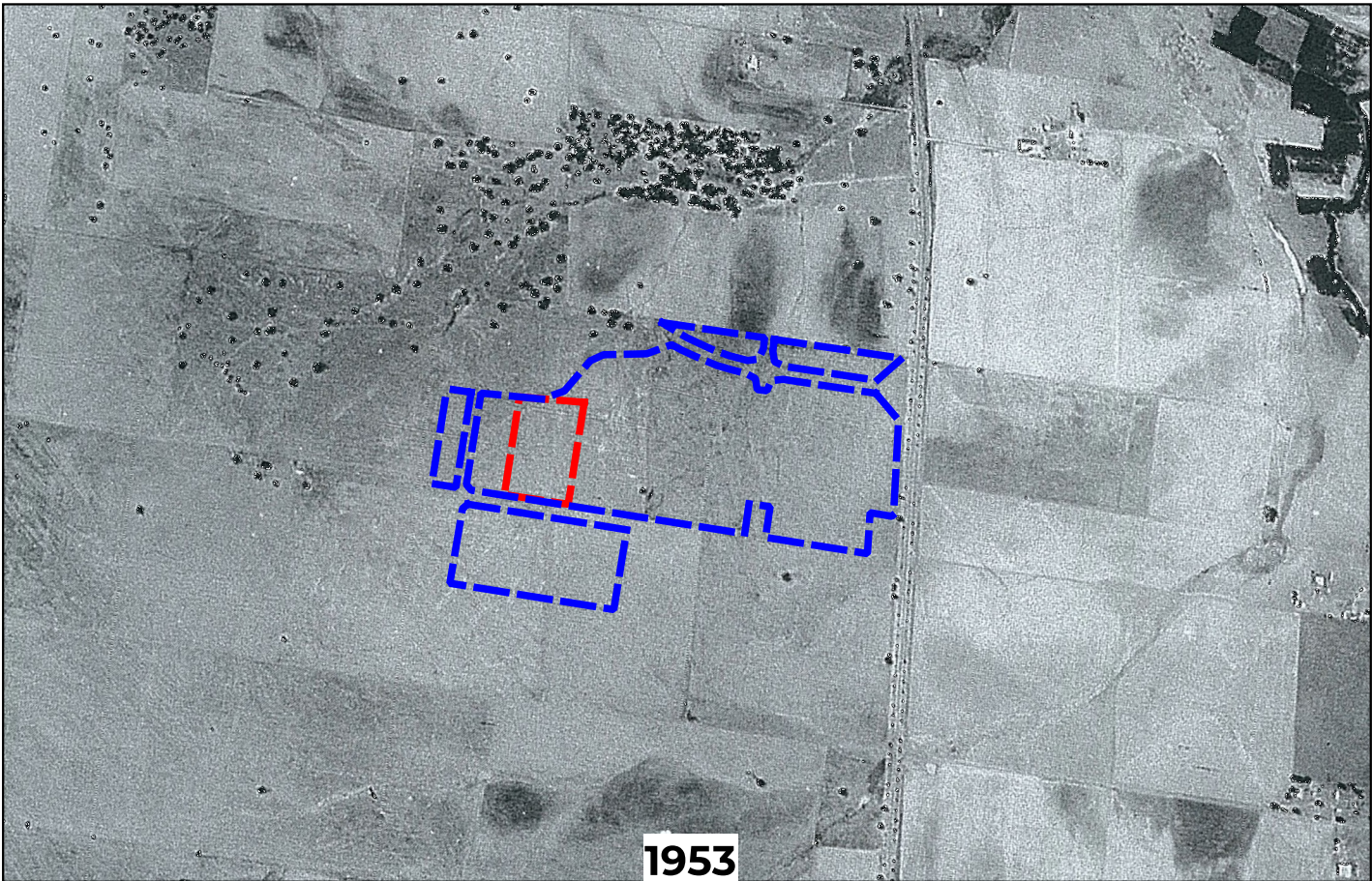


Photo 24: View north-west to north-east from southern extent of swale drain

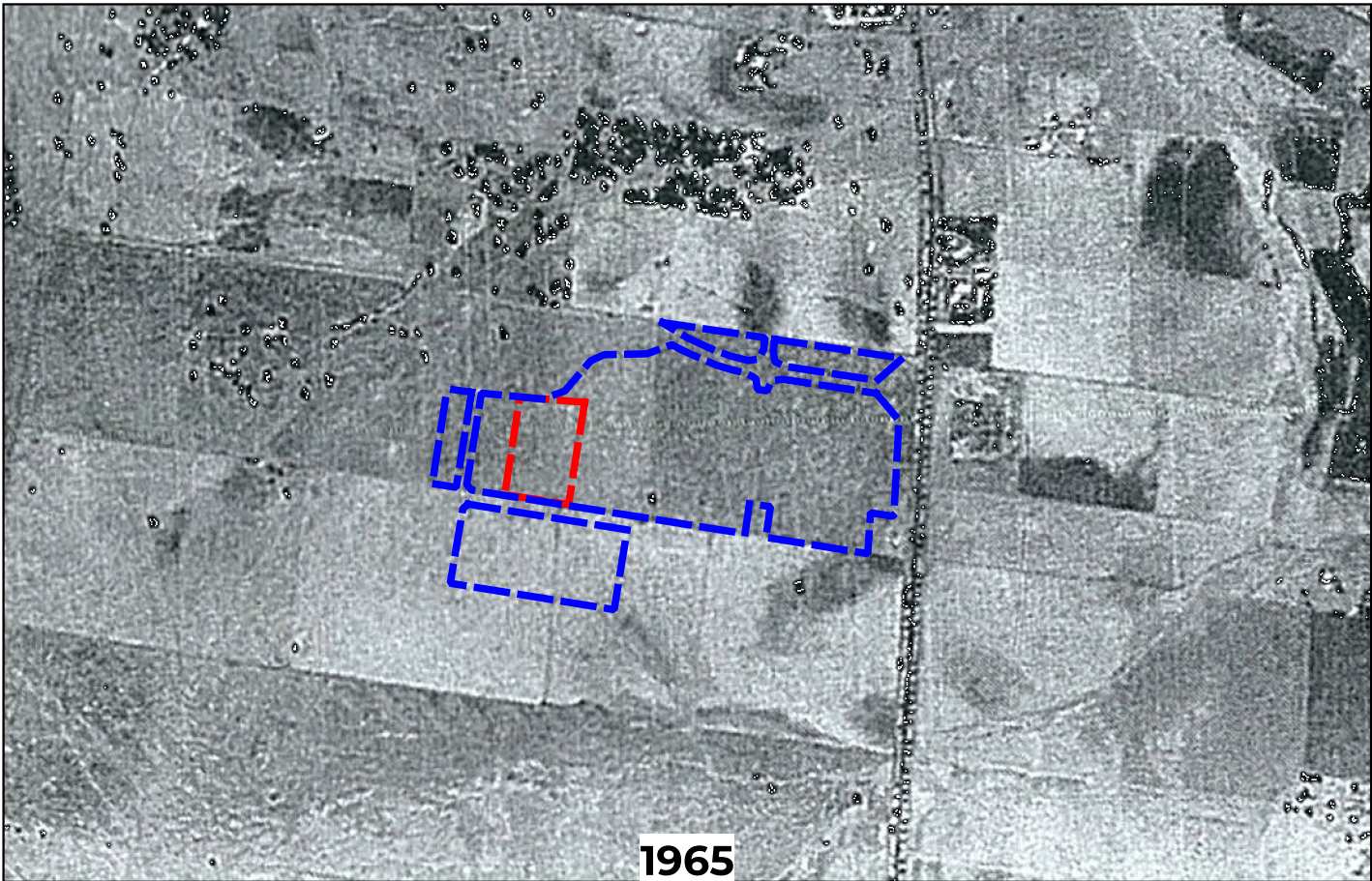
Appendix D

Drawings 3 to 6 – Historical Aerial Photographs

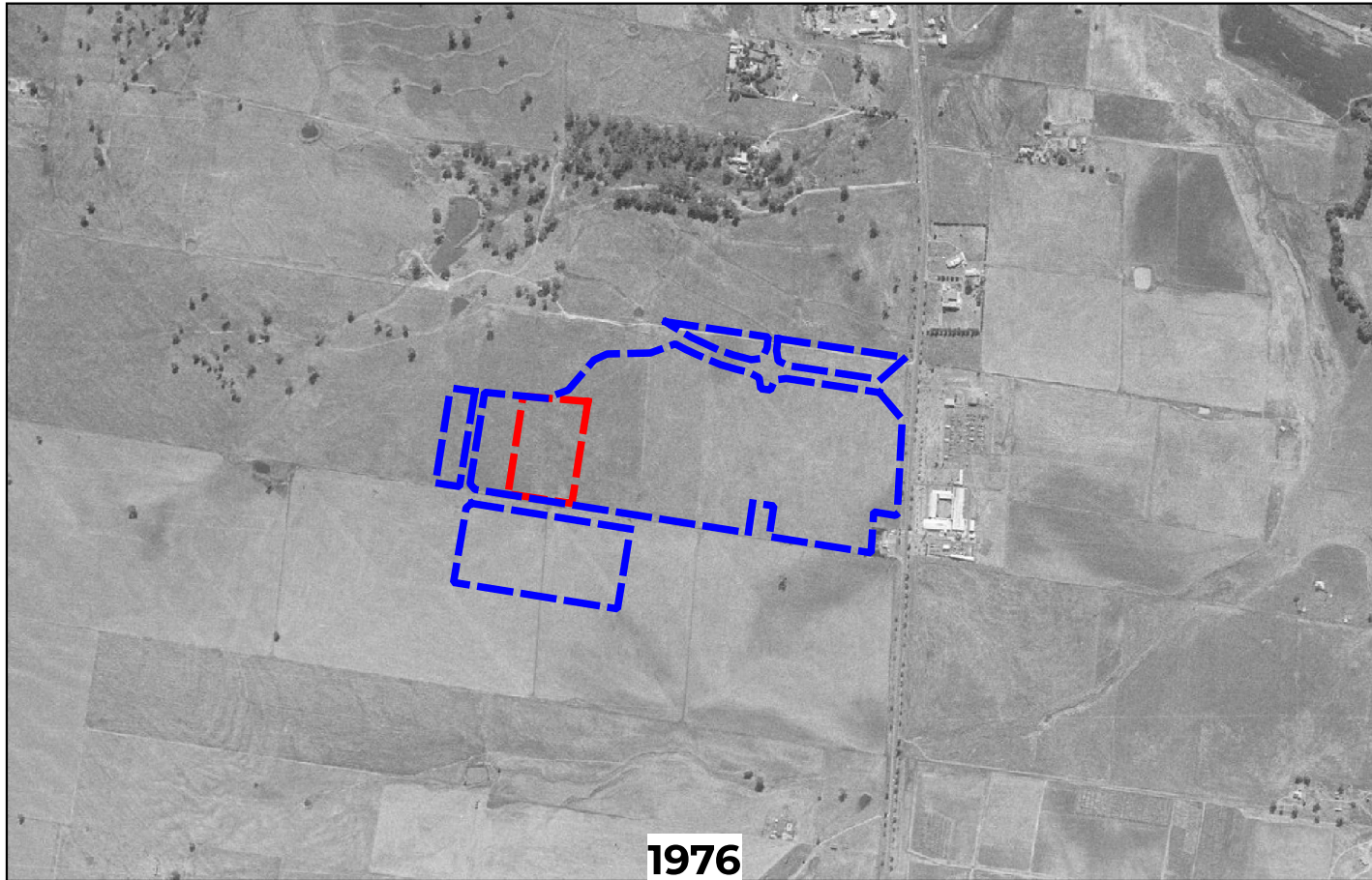
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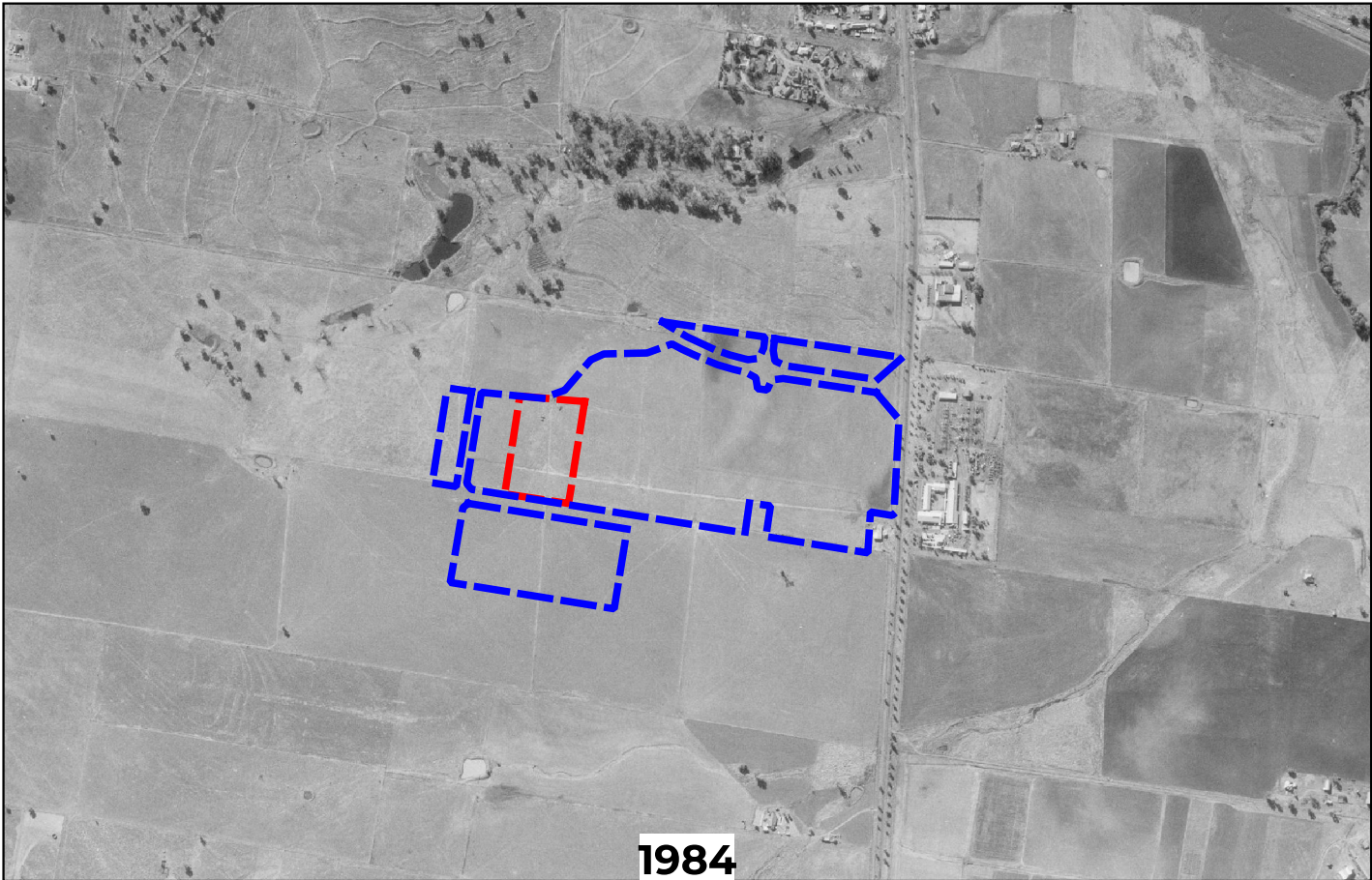
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1965



1976



1984

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PARTNERS
OFFICE: PORT MACQUARIE
Unit 2, 32 Geebung Drive, Port Macquarie
NSW, 2444 Ph: (02) 6581 5992

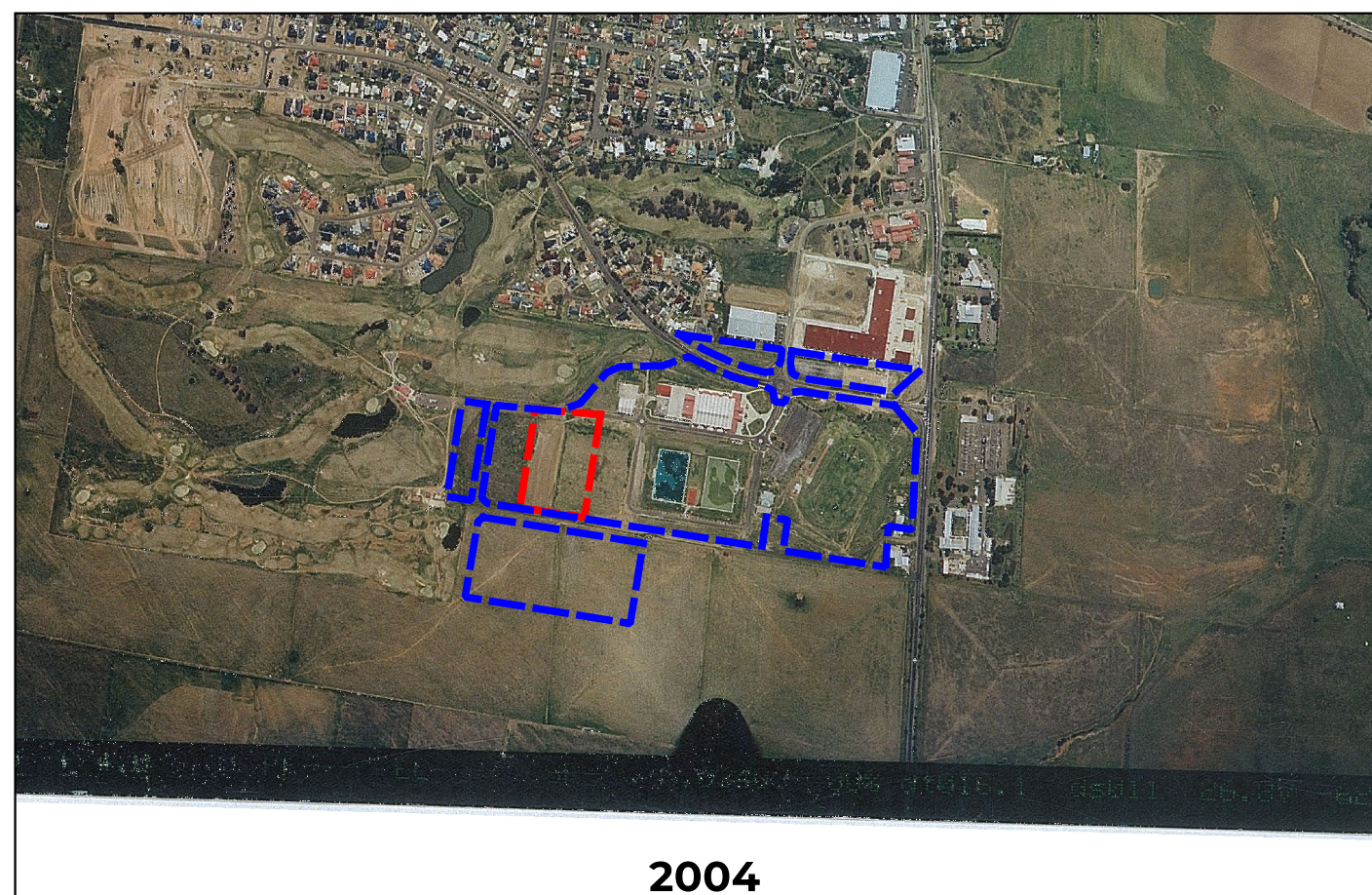
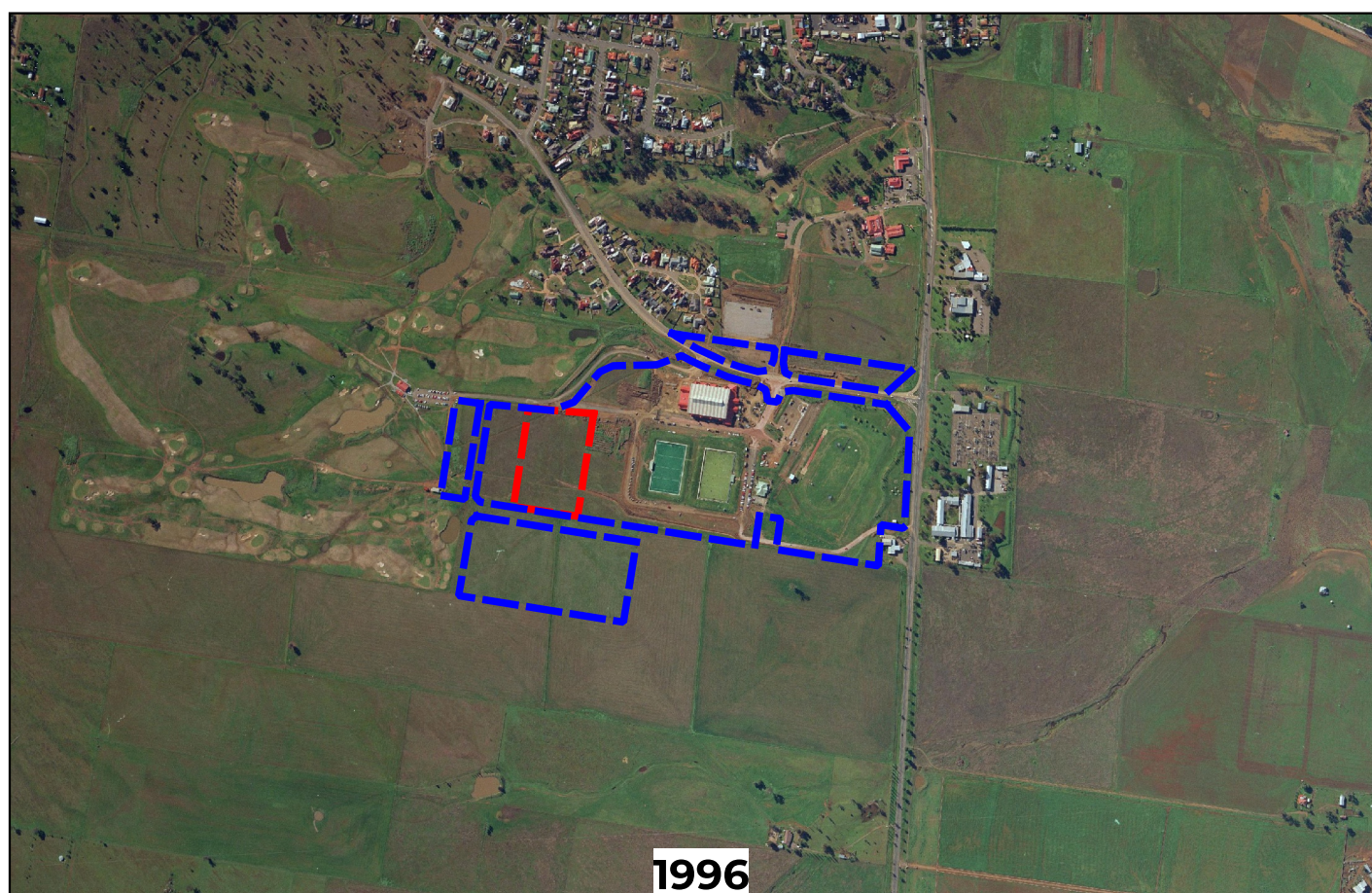
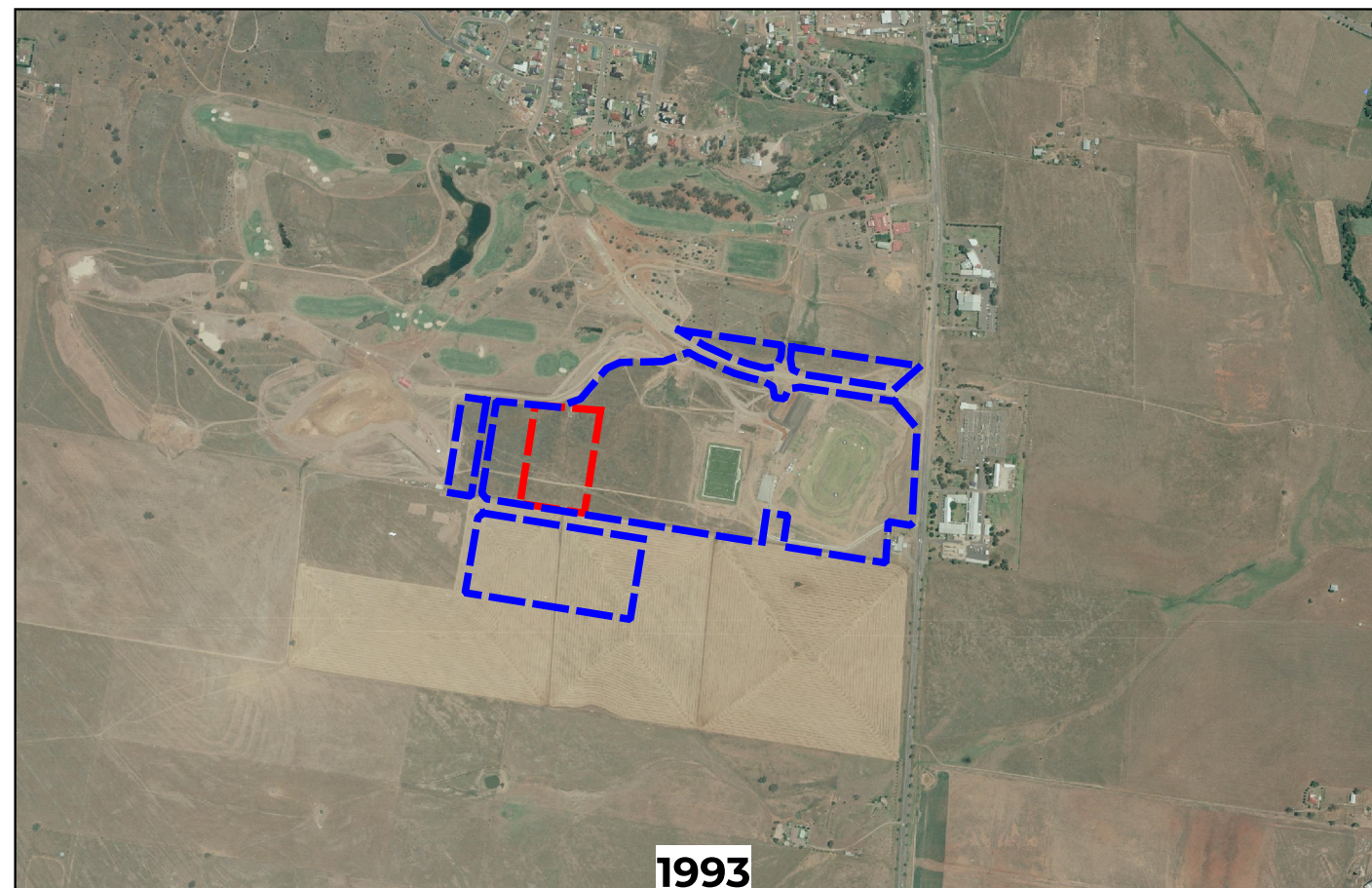
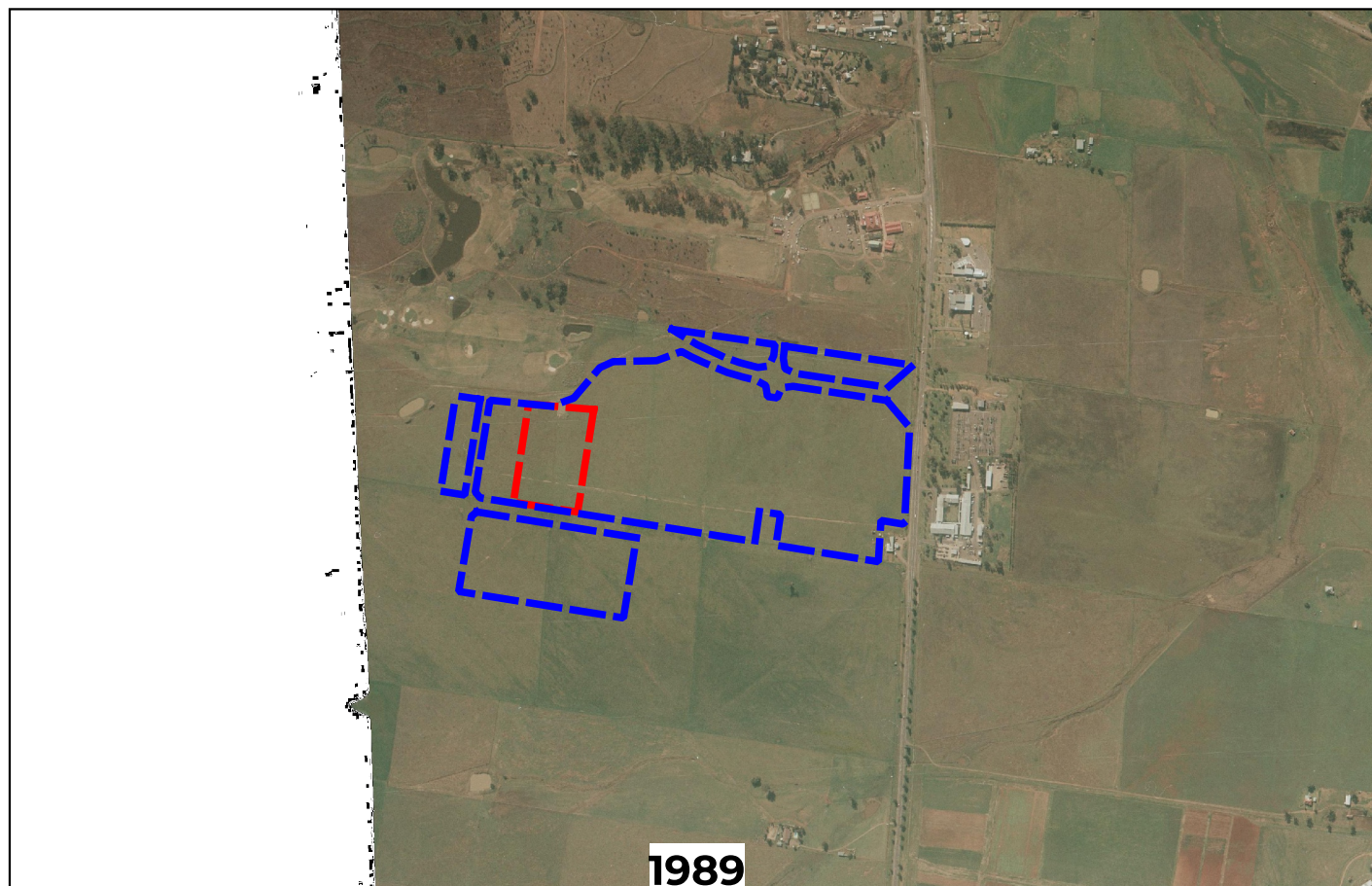
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Tamworth Regional Council

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

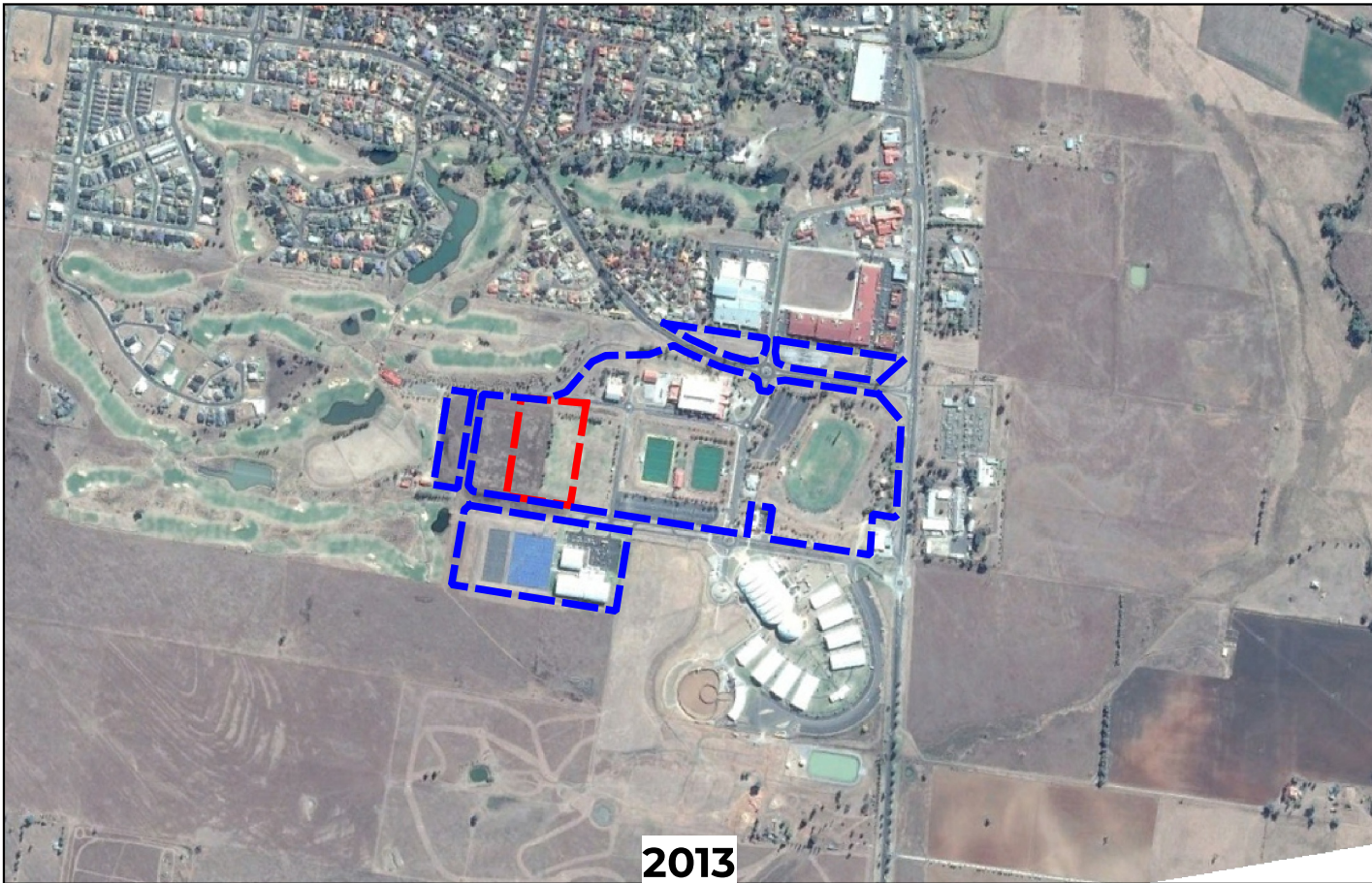
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Proposed Tamworth Regional Aquatic Centre
PROJECT ADDRESS:
Jack Smyth Drive, Hillvue, NSW

DRAWING TITLE:
Historical Aerial Photos

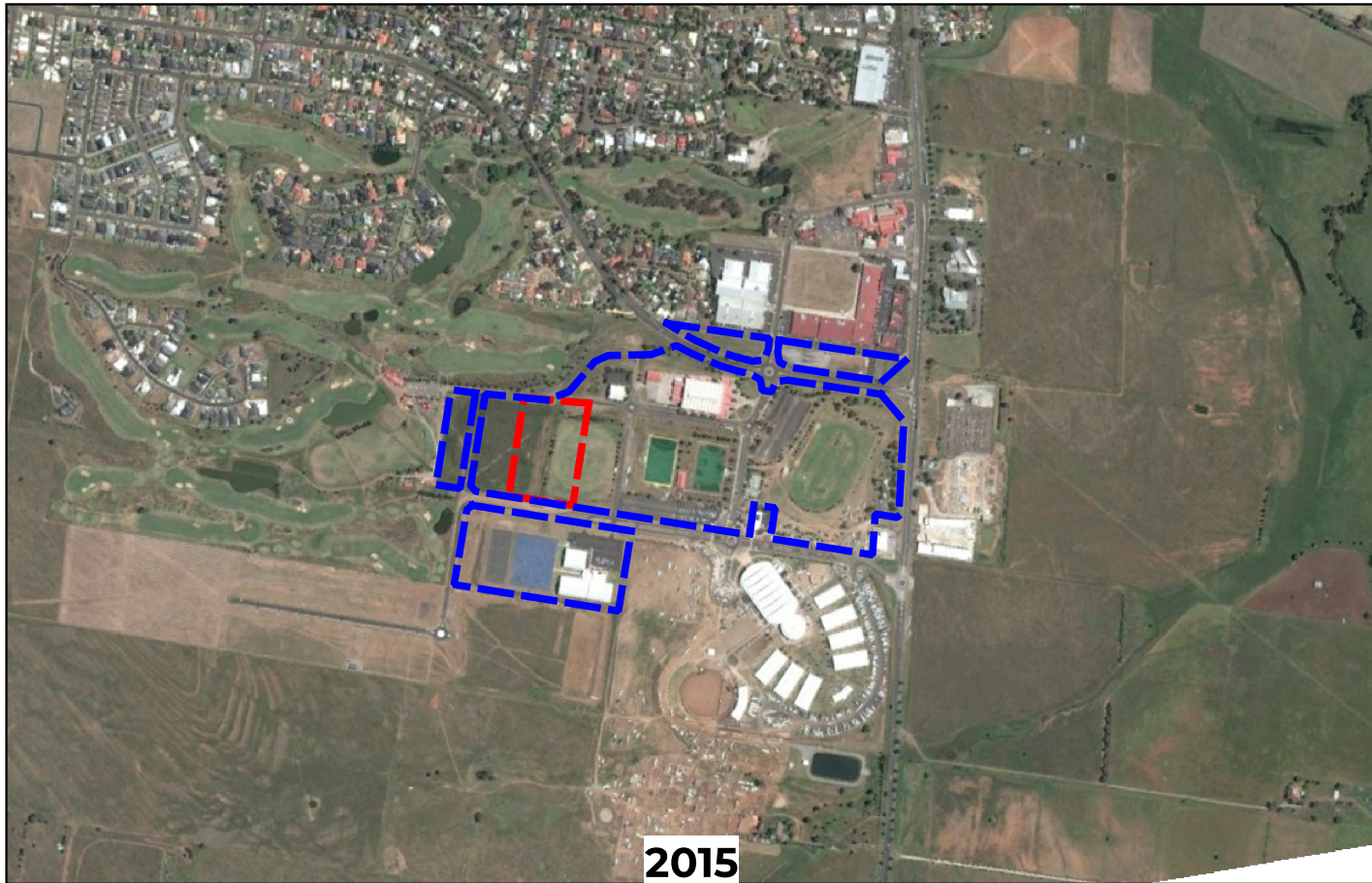
PROJECT NO:
226965.00
DRAWING NO:
3
REVISION:
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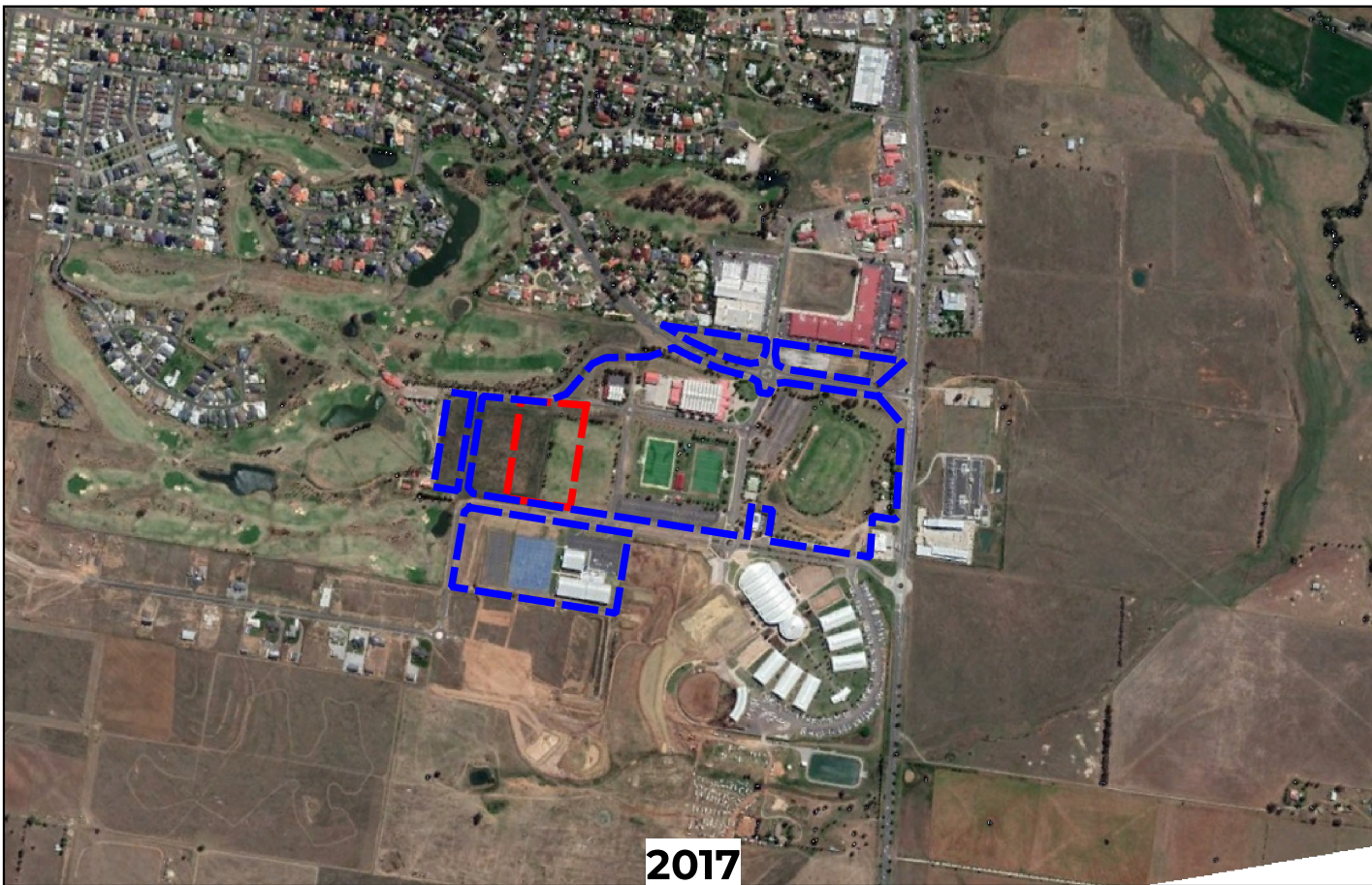
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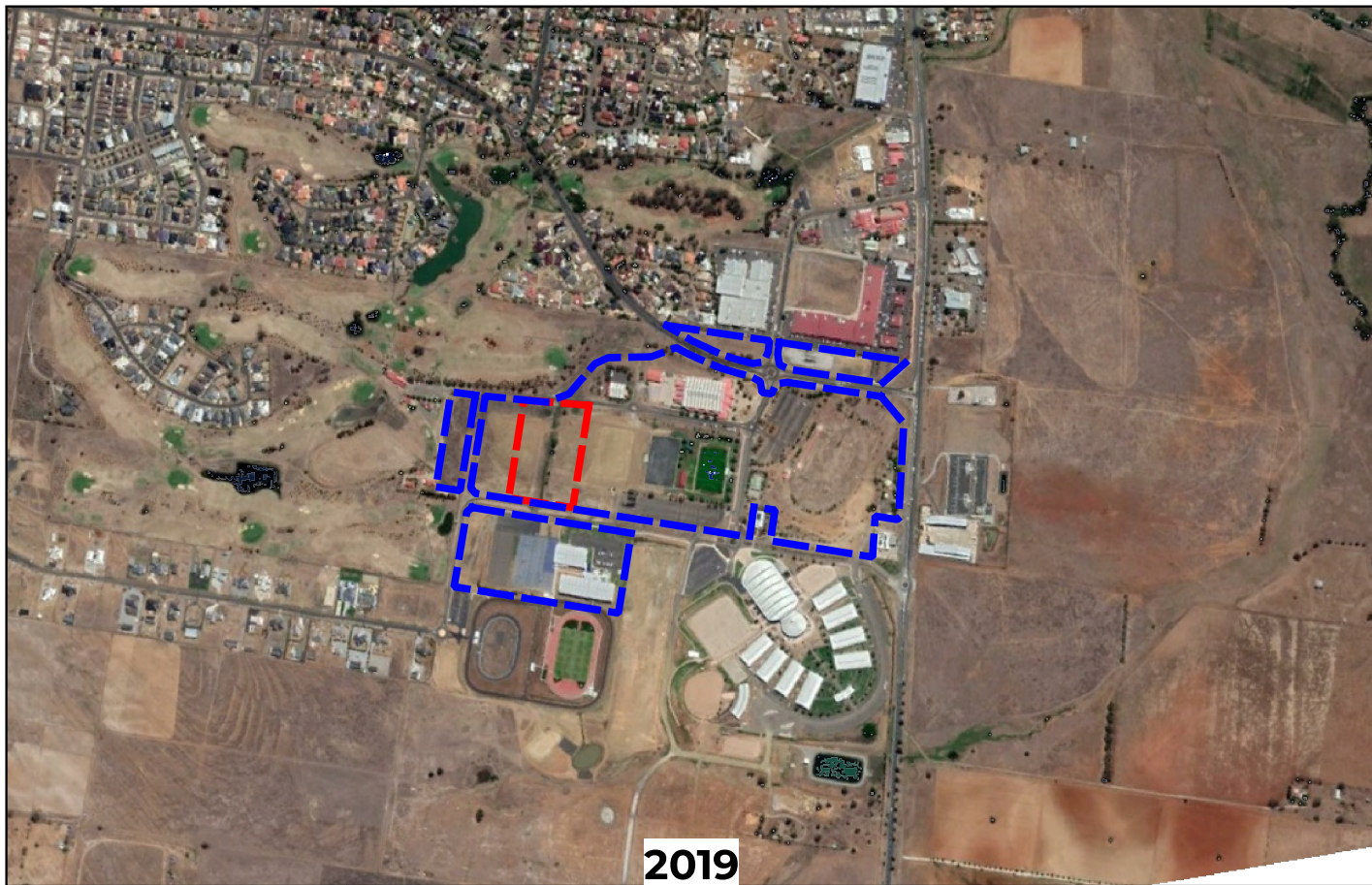
2013



2015



2017



2019

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SCALE: 0 200 400 600 800 m 1:15000 @ A3			

Douglas
PARTNERS
OFFICE: PORT MACQUARIE
Unit 2, 32 Ceebung Drive, Port Macquarie
NSW, 2444 Ph: (02) 6581 5992

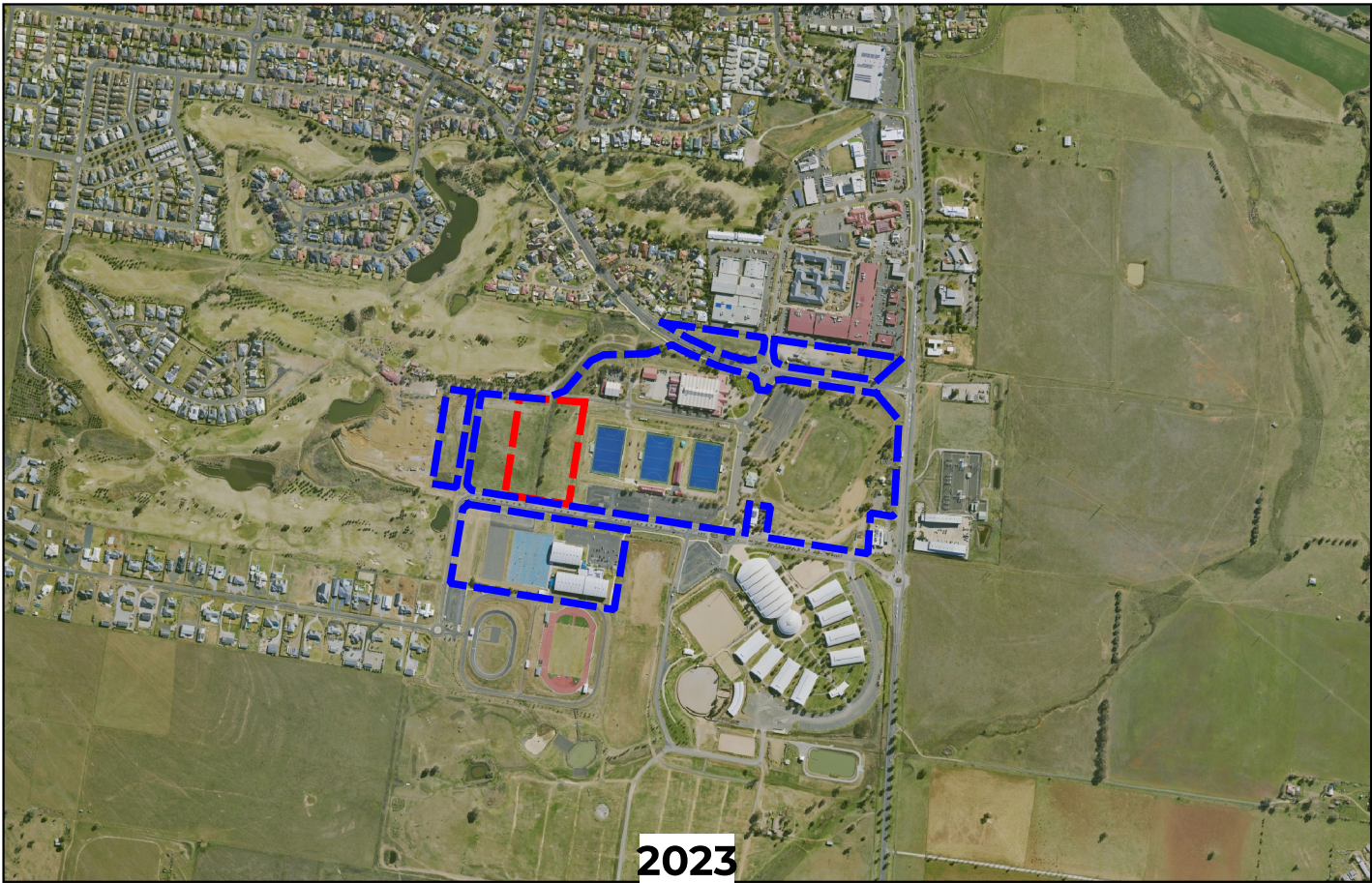
CLIENT:
Tamworth
REGIONAL COUNCIL
Tamworth Regional Council

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME:
**Proposed Tamworth
Regional Aquatic Centre**
PROJECT ADDRESS:
**Jack Smyth Drive, Hillvue,
NSW**

DRAWING TITLE:
Historical Aerial Photos

PROJECT NO:
226965.00
DRAWING NO:
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REVISION:
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										REVISION: 0
SCALE:  1:15000 @ A3										



ABN: 36 092 724 251
Ph: 02 9099 7400
(Ph: 0412 199 304)

Level 14, 135 King Street, Sydney
Sydney 2000
GPO Box 4103 Sydney NSW 2001
DX 967 Sydney

Summary of Owners Report

Address: - Jack Smyth Drive, Hillvue, NSW

Description: - Lot 102 D.P. 1262475

<u>Date of Acquisition and term held</u>	<u>Registered Proprietor(s) & Occupations where available</u>	<u>Reference to Title at Acquisition and sale</u>
11.06.1927 (1927 to 1929)	Joseph Paul Dennis (Agent)	Book 1475 No. 349
29.01.1929 (1929 to 1955)	Norman Charles Ingall (Grazier) John Lamond Smith (Farmer or Grazier)	Book 1547 No. 301
23.12.1955 (1955 to 1957)	Norman Charles Ingall (Grazier)	Book 2357 No. 367
17.05.1957 (1957 to 1968)	Charles Oscar Scott (Retired Agent) Vida Irene Scott (Married Woman)	Book 2406 No. 231
13.05.1968 (1968 to 1974)	A.R. Dickinson Construction Pty. Limited	Book 2886 No. 680
24.06.1974 (1974 to 1987)	Pacgrove Pty. Limited	Book 3171 No. 66 (Book 3179 No. 270 – Confirmatory Conveyance) Now Volume 12750 Folio 74
26.03.1987 (1987 to 1987)	Fanimi Pty. Limited	Volume 12750 Folio 74
09.11.1987 (1987 to 1990 & 1991)	Long Yard Golf Course Pty Limited	Volume 12750 Folio 74 Then 18/547774 Now 11/804191 & 12/804191
20.09.1990 & 31.12.1991 (1990 & 1991 to Date)	# Tamworth City Council Now # Tamworth Regional Council	11/804191 & 12/804191 Then Intervening Titles Now 102/1262475

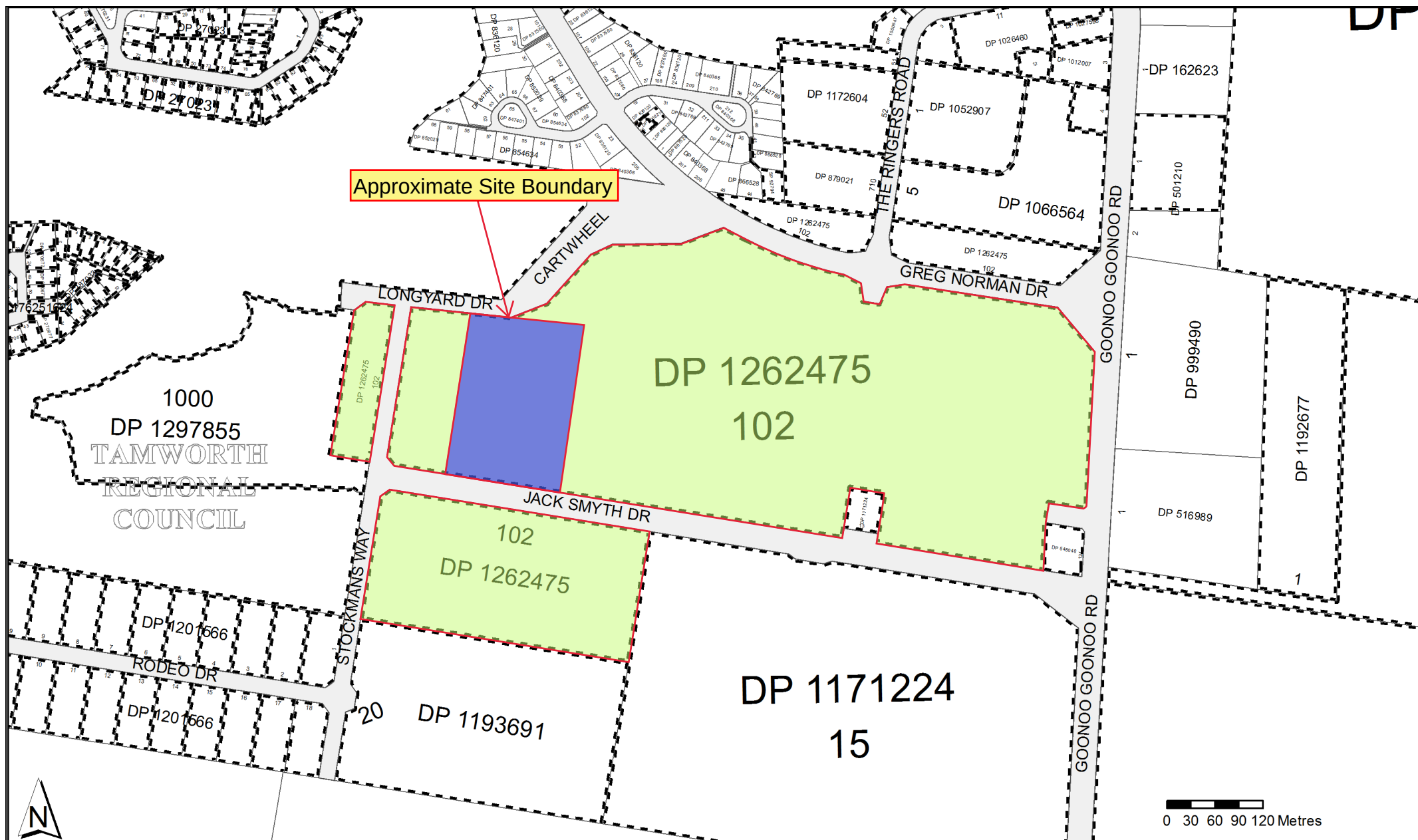
Denotes current registered proprietor

Leases: - NIL

Easements: - NIL

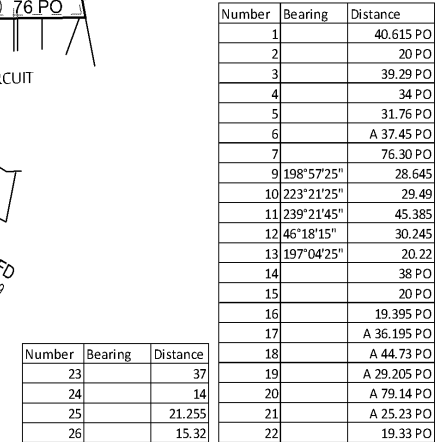
Yours Sincerely
Taylor Wilson
1st May 2024

Email: SpecialisedServices@InfoTrack.com.au





InfoTrack



CO-ORDINATE SCHEDULE					
MARK	MGA CO-ORDINATES		CLASS	POS. UNC.	ORIGIN
	EASTING	NORTHING			
SSM 31970	301 805.214	6 553 759.800	A	0.02	SCIMS
SSM 57179	301 357.428	6 554 607.651	C		SCIMS
SSM 57185	301 230.604	6 554 622.680	C		SCIMS
PM 77046	300 323.959	6 554 176.746	A	0.02	SCIMS
SSM 77526	301 328.490	6 554 423.920	C		SCIMS
SSM 85575	301 013.235	6 554 478.555	C		SCIMS
SSM 85581	300 782.736	6 554 403.700	C		SCIMS
SSM 85594	300 960.175	6 554 342.026	C		SCIMS
SSM 177581	301 075	6 553 576	U		SCIMS
DATE OF SCIMS COORDINATES: 04.09.2020 MGA ZONE: 56 MGA DATUM: GDA2020					
COMBINED SCALE FACTOR: 1.000018 DATUM PM 77046 - SSM31970					

PERMANENT MARK CONNECTIONS SCHEDULE				
From	To	Bearing	Distance	Method
PM77046	SSM31970	105°43'15"	1538.800	Survey
		105°43'15"	1538.790	SCIMS
SSM31970	SSM57179	332°09'30"	958.820	Survey
		332°09'34"	958.817	SCIMS
SSM57179	SSM57185	276°46'05"	127.705	Survey
		276°45'29"	127.709	SCIMS
SSM57185	SSM85575	236°27'20"	260.780	Survey
		236°27'14"	260.804	SCIMS
SSM85575	SSM85594	201°13'30"	146.485	Survey
		201°14'16"	146.474	SCIMS
SSM85594	SSM85581	289°09'40"	187.845	Survey
		289°09'59"	187.848	SCIMS
SSM85581	PM77046	243°40'50"	511.870	Survey
		243°40'43"	511.835	SCIMS
SSM177581	PM169748	280°34'20"	402.820	Survey
PM169748	PM77046	326°05'00"	635.245	Survey

All permanent marks
depicted in these plans
have been found by survey

PO DENOTES DP1105753
PO2 DENOTES DP864981

DATUM LINE

SSM31970	PM77046	285°43'15"	1538.800	Survey
		285°43'15"	1538.790	SCIMS

Surveyor : John Bruce Herdegen
Date of Survey : 08.09.2020
Surveyor's Ref : 19377

PLAN OF SUBDIVISION OF
LOT 2 DP864981 LOT 120 DP1105753
AND LOT 14 DP1171224

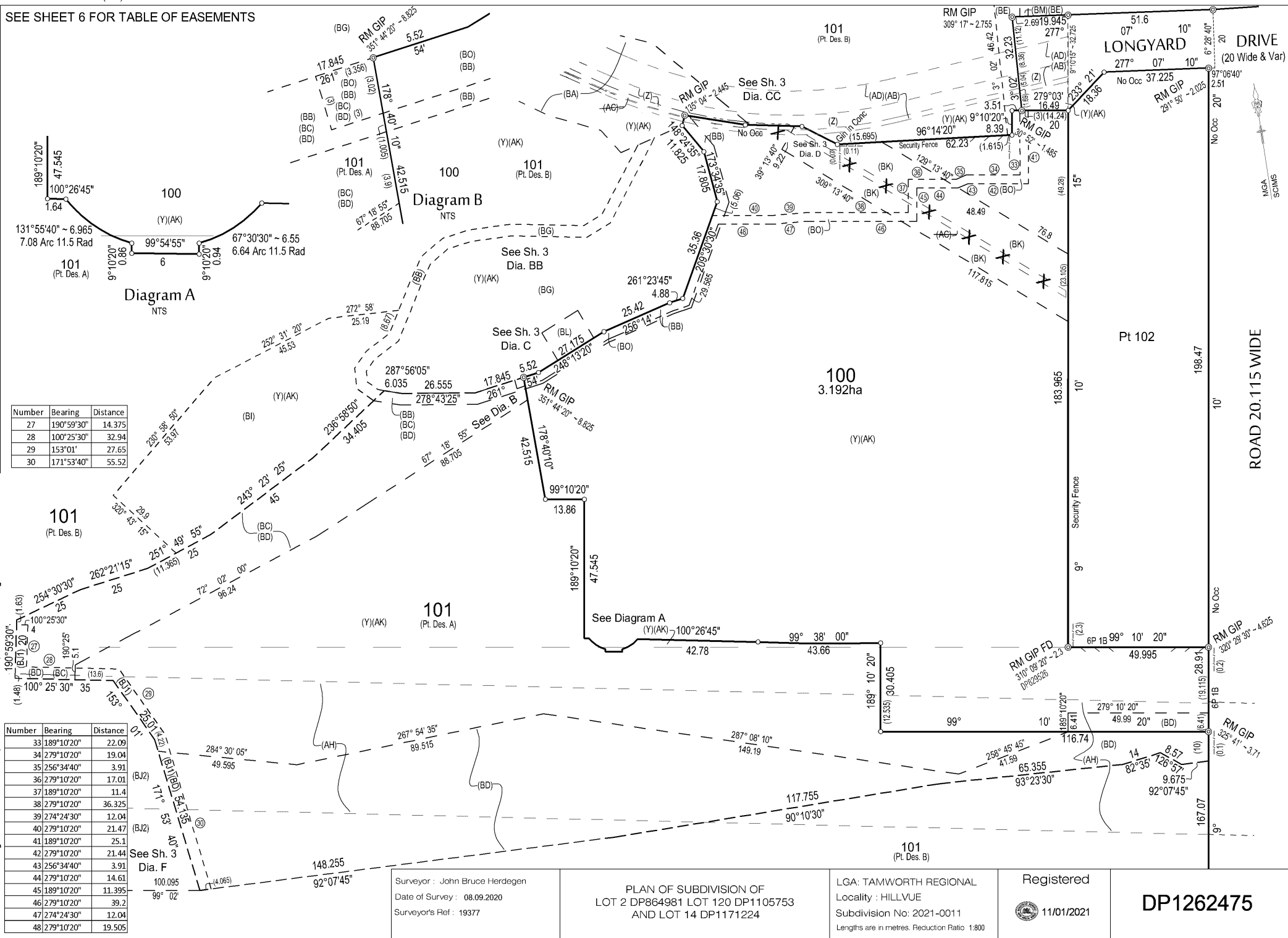
LGA: TAMWORTH REGIONAL
Locality : HILLVUE
Subdivision No: 2021-0011
Lengths are in metres. Reduction Ratio 1:3000

Registered

 11/01/2021

DP1262475

SEE SHEET 6 FOR TABLE OF EASEMENTS



Surveyor : John Bruce Herdegen
Date of Survey : 08.09.2020
Surveyor's Ref : 19377

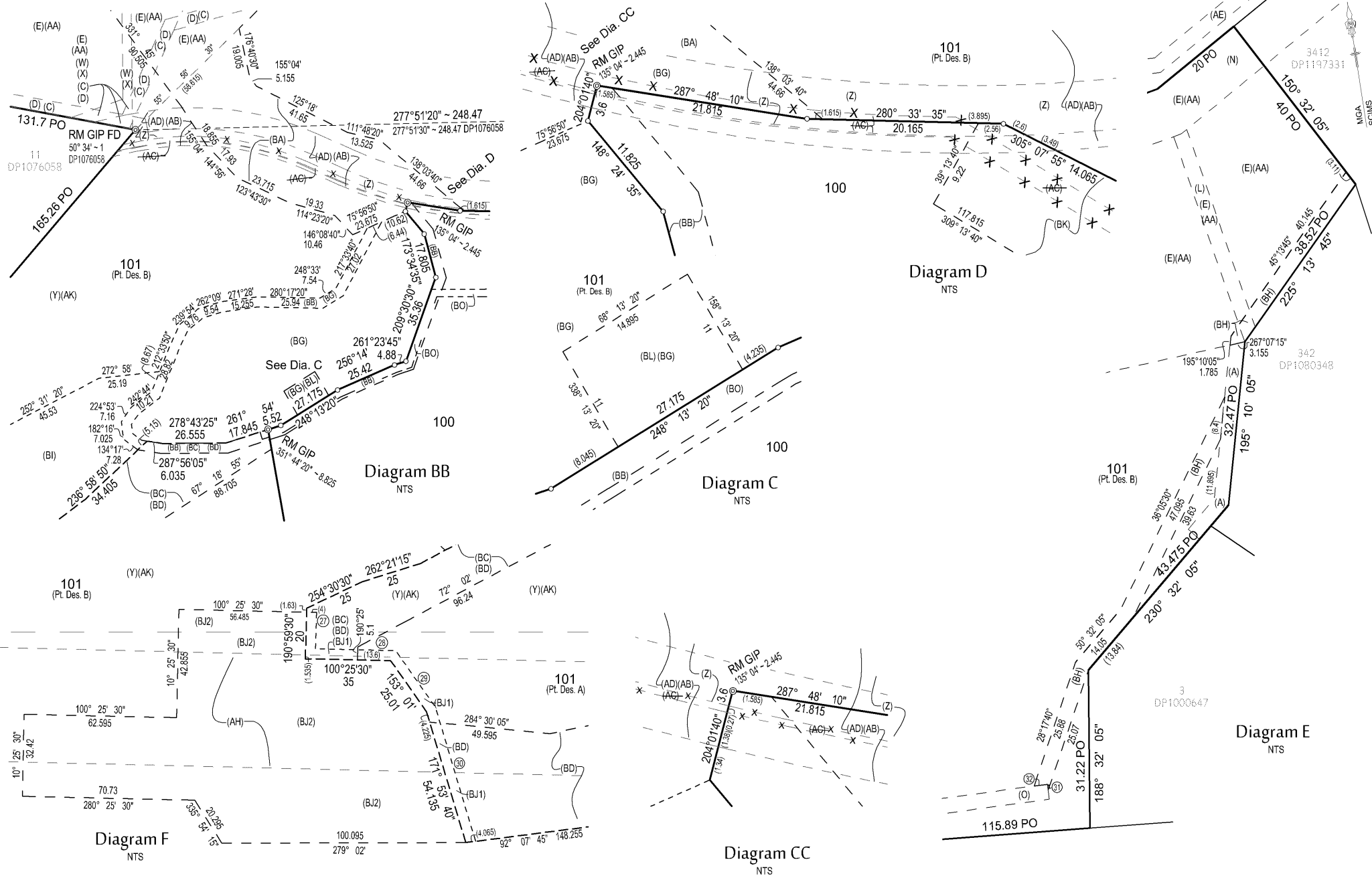
PLAN OF SUBDIVISION OF
LOT 2 DP864981 LOT 120 DP1105753
AND LOT 14 DP1171224

LGA: TAMWORTH REGIONAL
Locality : HILLVUE
Subdivision No: 2021-0011
Lengths are in metres, Reduction Ratio 1:800

Registered
11/01/2021

DP1262475

SEE SHEET 6 FOR TABLE OF EASEMENTS



Number	Bearing	Distance
27	190°59'30"	14.375
28	100°25'30"	32.94
29	153°01'	27.65
30	171°53'40"	55.52
31	1°41'	1.145
32	271°41'	2.78

Surveyor : John Bruce Herdegen
Date of Survey : 08.09.2020
Surveyor's Ref : 19377

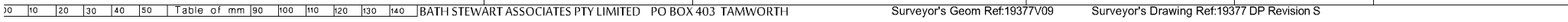
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LOT 2 DP864981 LOT 120 DP1105753
AND LOT 14 DP1171224

LGA: TAMWORTH REGIONAL
Locality : HILLVUE
Subdivision No: 2021-0011
Lengths are in metres. Reduction Ratio

Registered
11/01/2021

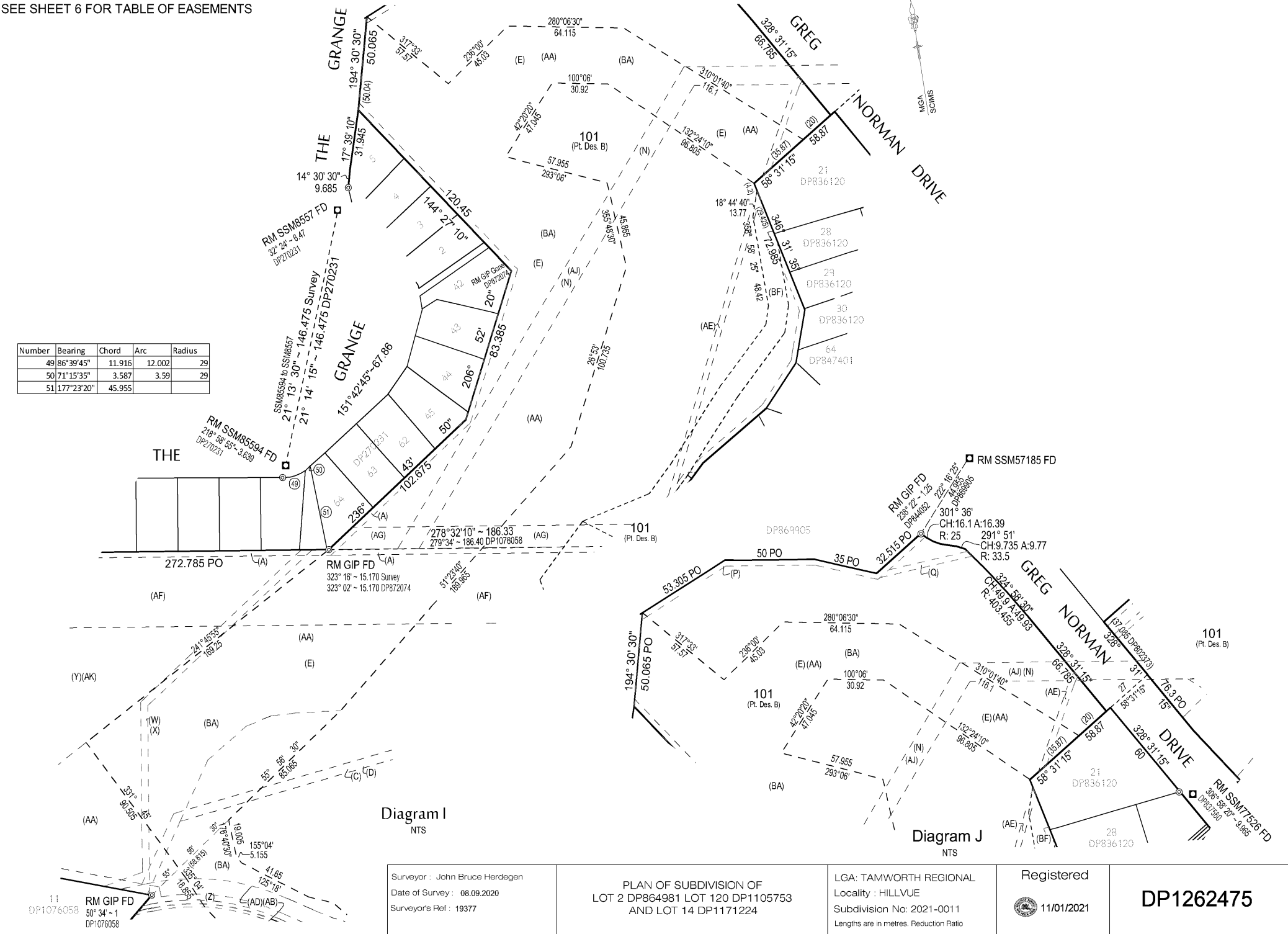
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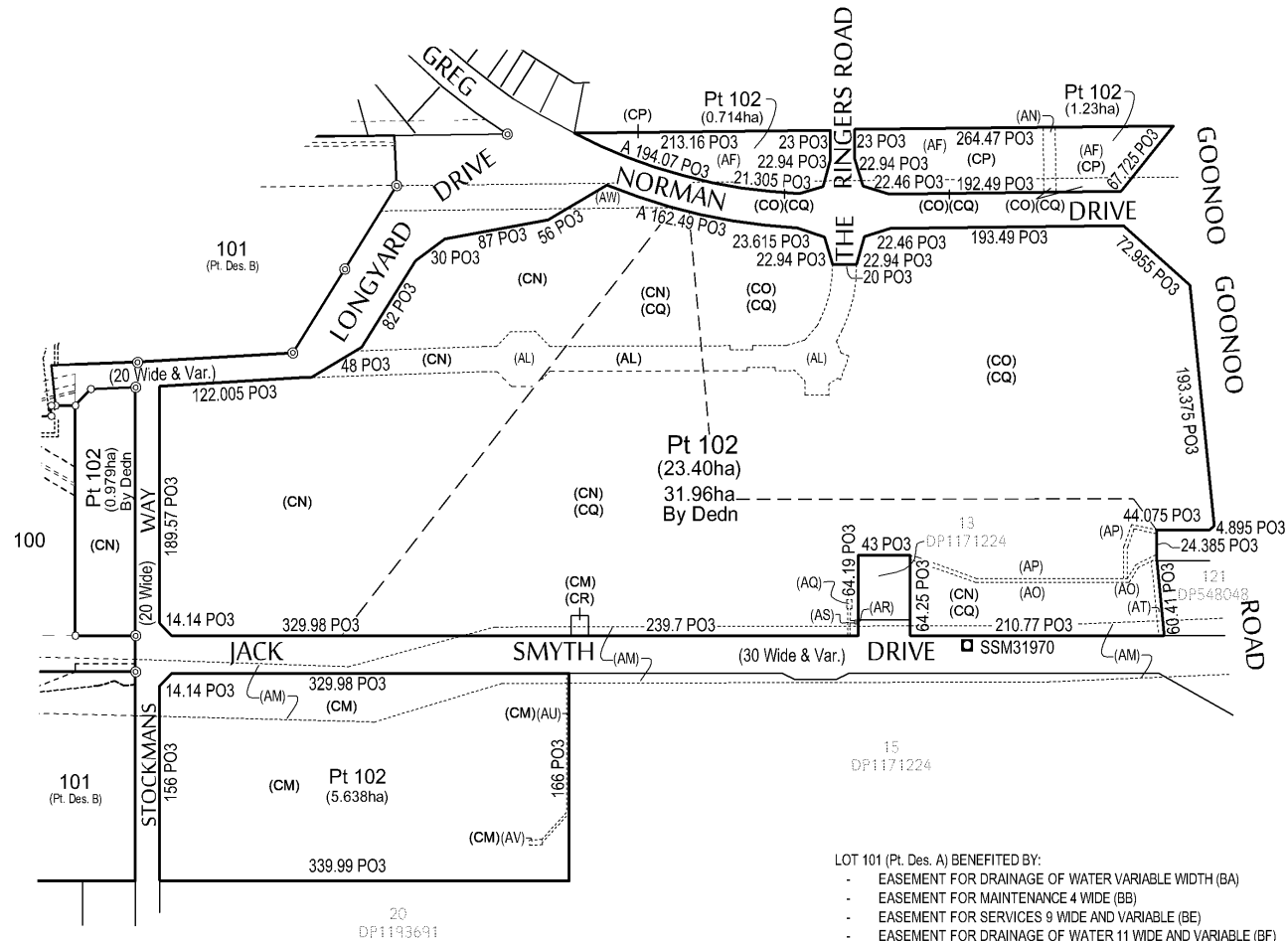
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SEE SHEET 6 FOR TABLE OF EASEMENTS

Number	Bearing	Chord	Arc	Radius
49	86°39'45"	11.916	12.002	29
50	71°15'35"	3.587	3.59	29
51	177°23'20"	45.955		





(CM) COVENANT (2840780)
(CN) BENEFITED BY EASEMENT TO DRAIN WATER 10 WIDE (DP629408)
(CO) COVENANT (BK3012 NO.128)
(CP) COVENANT (BK2626 NO.404)
(CQ) COVENANT (Z224815)
(CR) RESTRICTION(S) SON THE USE OF LAND (DP1092556)

- LOT 101 (Pt. Des. A) BENEFITED BY:
- EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH (BA)
 - EASEMENT FOR MAINTENANCE 4 WIDE (BB)
 - EASEMENT FOR SERVICES 9 WIDE AND VARIABLE (BE)
 - EASEMENT FOR DRAINAGE OF WATER 11 WIDE AND VARIABLE (BF)
 - EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH (BG)
 - EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH (BI)
 - EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH (BJ2)
 - EASEMENT FOR DECK 11 WIDE (BL)
 - EASEMENT FOR SOLE USE OF WATER VARIABLE WIDTH (BN)
- LOT 101 (Pt. Des. B) BENEFITED BY:
- EASEMENT FOR MAINTENANCE 4 WIDE (BB)
 - EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH (BC)
 - EASEMENT FOR SHARED GOLF ZONE VARIABLE WIDTH (BD)
 - EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH (BJ1)

- (BA) EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH
(BB) EASEMENT FOR MAINTENANCE 4 WIDE
(BC) EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH
(BD) EASEMENT FOR SHARED GOLF ZONE VARIABLE WIDTH
(BE) EASEMENT FOR SERVICES 9 WIDE AND VARIABLE
(BF) EASEMENT FOR DRAINAGE OF WATER 11 WIDE AND VARIABLE
(BG) EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH
(BH) EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE
(BI) EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH
(BJ1) EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH
(BJ2) EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH
(BK) EASEMENT FOR OVERHEAD POWER LINES 20 WIDE AND VARIABLE
(BL) EASEMENT FOR DECK 11 WIDE
(BM) EASEMENT FOR DRAINAGE OF SEWERAGE 3 WIDE
(BN) EASEMENT FOR SOLE USE OF WATER VARIABLE WIDTH
(BO) EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE
- (A) EASEMENT TO DRAIN WATER & SEWAGE 3 WIDE DP872074
(B) EASEMENT TO DRAIN SEWAGE 3 WIDE DP872074
(C) EASEMENT TO DRAIN SEWAGE 5 WIDE DP872074
(D) EASEMENT FOR WATER SUPPLY 5 WIDE DP872074
(E) EASEMENT TO DRAIN WATER VARIABLE WIDTH DP872074
(F) EASEMENT TO DRAIN WATER VARIABLE WIDTH DP648772
(G) EASEMENT TO DRAIN WATER 25 WIDE & VARIABLE DP872074
(H) EASEMENT TO DRAIN WATER 3 WIDE DP802373
(J) EASEMENT TO DRAIN SEWAGE 3 WIDE DP802373
(L) EASEMENT TO DRAIN WATER 3 WIDE DP788290
(M) EASEMENT TO DRAIN WATER 3 WIDE DP836120
(N) EASEMENT TO DRAIN WATER 10 WIDE DP788290
(O) EASEMENT TO DRAIN SEWAGE 3 WIDE DP836120
(P) EASEMENT TO DRAIN WATER & SEWAGE 3 WIDE DP869905
(Q) EASEMENT TO DRAIN SEWAGE 3 WIDE DP869905
(R) EASEMENT TO DRAIN WATER 3 WIDE DP1097972
(S) EASEMENT TO DRAIN SEWAGE 3 WIDE DP1097972
(T) EASEMENT TO DRAIN WATER 4 WIDE DP1097972
(U) EASEMENT TO DRAIN WATER VARIABLE WIDTH DP1105753
(V) EASEMENT TO DRAIN SEWAGE 3 WIDE DP1105753
(W) EASEMENT TO DRAIN SEWAGE 5 WIDE AND VARIABLE DP1105753
(X) EASEMENT FOR WATER SUPPLY 5 WIDE AND VARIABLE DP1105753
(Y) RIGHT OF FOOTWAY VARIABLE WIDTH DP1105753
(Z) EASEMENT FOR WATER SUPPLY 5 WIDE AND VARIABLE DP1105753
(AA) EASEMENT TO DRAIN WATER VARIABLE WIDTH DP1163198
(AB) RIGHT OF CARRIAGEWAY 15 WIDE DP1163198
(AC) EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE DP1163198
(AD) EASEMENT FOR SERVICES 15 WIDE DP1163198
(AE) EASEMENT FOR WATER SUPPLY 3 WIDE AG749807
(AF) EASEMENT FOR TRANSMISSION LINE 40.06 WIDE & VARIABLE X146153
(AG) EASEMENT FOR TRANSMISSION LINE 11.58 WIDE VIDE GOV. FOL. 2098 OF 3-7-1964
(AH) EASEMENT FOR TRANSMISSION LINE 45 WIDE AF417007
(AJ) EASEMENT TO DRAIN WATER 10 WIDE DP629408
(AK) RIGHT TO ENTER VARIABLE WIDTH DP1105753
(AL) RIGHT OF CARRIAGEWAY 20 WIDE & VARIABLE DP1076058
(AM) EASEMENT FOR ENERGY TRANSMISSION 45 WIDE AND VARIABLE AG420677
(AN) RIGHT OF CARRIAGEWAY 10 WIDE AA357601
(AO) EASEMENT TO DRAIN WATER 3 WIDE DP1171224
(AP) EASEMENT TO DRAIN SEWAGE 3 WIDE DP1171224
(AQ) EASEMENT FOR MULTI-PURPOSE ELECTRICAL INSTALLATION 4.2 WIDE DP1171224
(AR) EASEMENT FOR MULTI-PURPOSE ELECTRICAL INSTALLATION 3 WIDE DP1171224
(AS) EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE DP1171224
(AT) EASEMENT TO DRAIN SEWAGE 4.5 WIDE DP1171224
(AU) EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE DP1179138
(AV) EASEMENT FOR MULTI-PURPOSE ELECTRICAL INSTALLATION 4.2 WIDE DP1179138
(AW) RIGHT OF CARRIAGEWAY 20 WIDE & VARIABLE DP829526

Surveyor : John Bruce Herdegen
Date of Survey : 08.09.2020
Surveyor's Ref : 19377

PLAN OF SUBDIVISION OF
LOT 2 DP864981 LOT 120 DP1105753
AND LOT 14 DP1171224

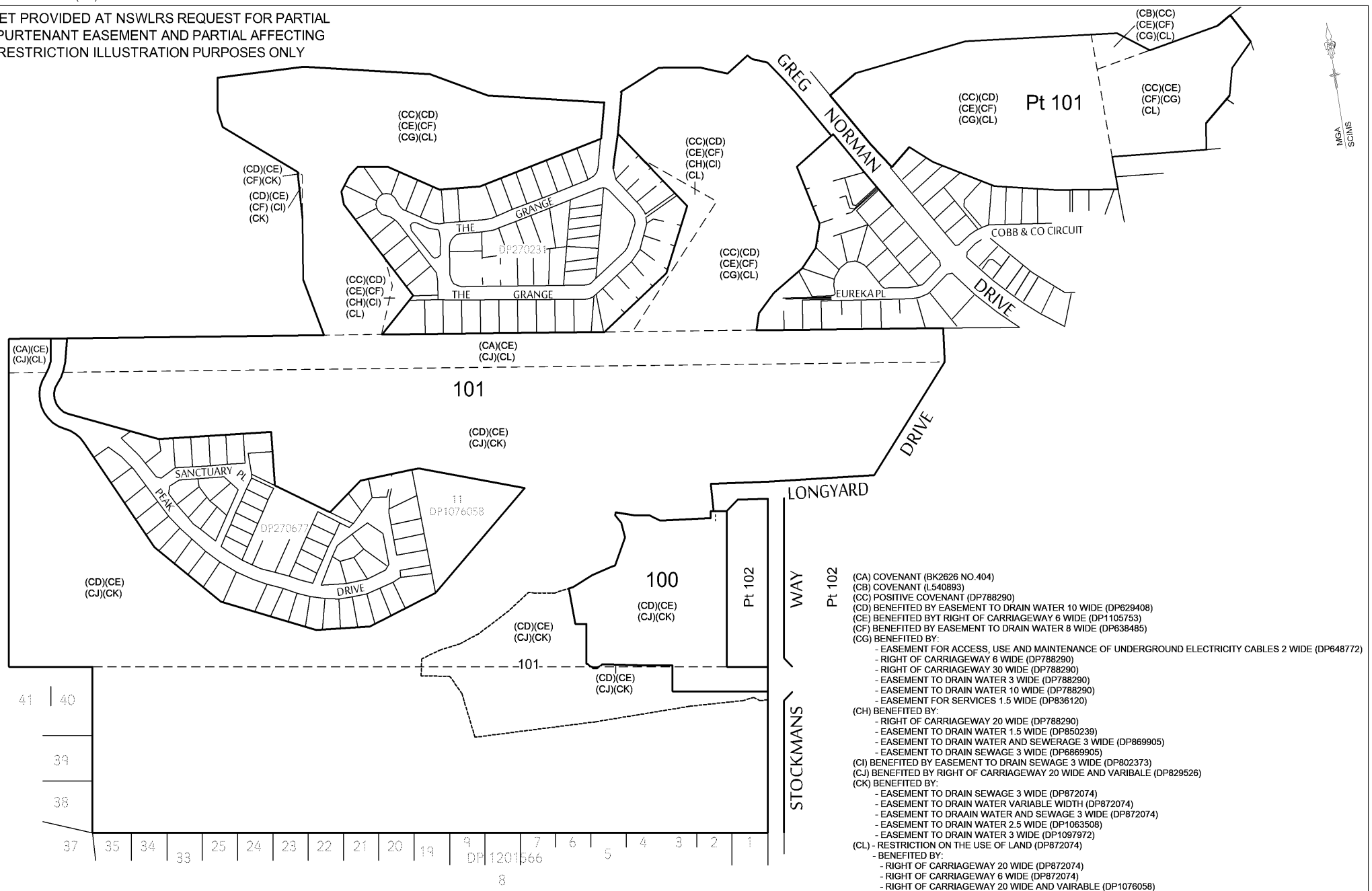
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Locality : HILLVUE
Subdivision No: 2021-0011
Lengths are in metres. Reduction Ratio 1:3000

Registered
11/01/2021

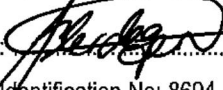
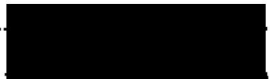
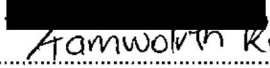
DP1262475

PO 3 DENOTES DP1171224

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© Office of the Registrar-General /Src:InfoTrack /Ref:Jack Smyth Drive? Hallvue



DP1262475

PLAN FORM 6 (2017)	DEPOSITED PLAN ADMINISTRATION SHEET	Sheet 1 of 5 sheet(s)												
Registered:  11/01/2021 Title System: TORRENS PLAN OF SUBDIVISION OF LOT 2 DP864981 LOT 120 DP1105753 AND LOT 14 DP1171224 Office Use Only DP1262475		Office Use Only												
Survey Certificate I, JOHN BRUCE HERDEGEN Of BATH STEWART ASSOCIATES PTY LTD a surveyor registered under the <i>Surveying and Spatial Information Act 2002</i>, certify that: *(a) The land shown in the plan was surveyed in accordance with the Surveying and Spatial Information Regulation 2017, is accurate and the survey was completed on 08th September 2020, or *(b) The part of the land shown in the plan (*being/*excluding** Lot 100 and connections) was surveyed in accordance with the <i>Surveying and Spatial Information Regulation 2017</i>, the part surveyed is accurate and the survey was completed on, 08th September 2020, the part not surveyed was compiled in accordance with that Regulation, or *(c) The land shown in this plan was compiled in accordance with the Surveying and Spatial Information Regulation 2017. Datum Line: SSM31970 – PM77046 Type: *Urban/*Rural The terrain is *Level-Undulating / *Steep-Mountainous. Signature:  Dated: ..08.09.2020 Surveyor Identification No: 8694 Surveyor registered under the <i>Surveying and Spatial Information Act 2002</i> *Strike out inappropriate words. **Specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey.		Crown Lands NSW/Western Lands Office Approval I, (Authorised Officer) in approving this plan certify that all necessary approvals in regard to the allocation of the land shown herein have been given. Signature: Date: File Number: Office:												
Subdivision Certificate I, <u>Sam Lobsey</u> *Authorised Person/*General Manager/*Accredited Certifier, certify that the provisions of section 6.15 <i>Environmental Planning and Assessment Act 1979</i> have been satisfied in relation to the proposed subdivision, new road or reserve set out herein. Signature:  Accreditation number:  Consent Authority: <u>Tamworth Regional Council</u> Date of endorsement: <u>23-10-2020</u> Subdivision Certificate number: <u>Sub 2021-0011</u> File number: *Strike through if inapplicable.														
Plans used in the preparation of survey/compilation. <table style="width:100%;"> <tr> <td>DP270231</td> <td>DP1076058</td> </tr> <tr> <td>DP270677</td> <td>DP1105753</td> </tr> <tr> <td>DP829526</td> <td>DP1171224</td> </tr> <tr> <td>DP837560</td> <td>DP1201566</td> </tr> <tr> <td>DP847401</td> <td>DP1214713</td> </tr> <tr> <td>DP864981</td> <td></td> </tr> </table> * RIGHT OF FOOTWAY VARIABLE WIDTH (DP1105753) AND RIGHT TO ENTER VARIABLE WIDTH (DP1105753)		DP270231	DP1076058	DP270677	DP1105753	DP829526	DP1171224	DP837560	DP1201566	DP847401	DP1214713	DP864981		Statements of intention to dedicate public roads, create public reserves and drainage reserves, acquire/resume land. IT IS INTENDED TO DEDICATE THE EXTENSION OF LONGYARD DRIVE TO THE PUBLIC AS PUBLIC ROAD SUBJECT TO THE FOLLOWING EASEMENTS: - EASEMENT FOR SERVICES 15 WIDE (DP1163198) - EASEMENT FOR WATER SUPPLY 5 WIDE AND VARIABLE (DP1105753) AND * - RIGHT OF CARRIAGEWAY 15 WIDE (DP1163198)
DP270231	DP1076058													
DP270677	DP1105753													
DP829526	DP1171224													
DP837560	DP1201566													
DP847401	DP1214713													
DP864981														
Surveyor's Reference: 19377		Signatures, Seals and Section 88B Statements should appear on PLAN FORM 6A												

PLAN FORM 6A (2017)

WARNING: Creasing or folding will lead to rejection

ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 5 sheet(s)

Registered:  11/01/2021

Office Use Only

Office Use Only

PLAN OF SUBDIVISION OF LOT 2
DP864981 LOT 120 DP1105753 AND
LOT 14 DP1171224

Subdivision Certificate number: Sub 2021-0011

Date of Endorsement: 23.10.2020

DP1262475

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) SSI Regulation 2017
- Statements of intention to create and release affecting interests in accordance with section 88B Conveyancing Act 1919
- Signatures and seals- see 195D Conveyancing Act 1919
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Lot	Street Number	Street Name	Street Type	Locality
100	N/A	Longyard	Drive	Hillvue
101	N/A	Longyard	Drive	Hillvue
102	N/A	CREE NORMAN Longyard	Drive	Hillvue

PURSUANT TO SECTION 88B OF THE CONVEYANCING ACT, 1919, AS AMENDED IT IS INTENDED TO:

CREATE:-

1	EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH	SHOWN (BA)
2	EASEMENT FOR MAINTENANCE 4 WIDE	SHOWN (BB)
3	EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH	SHOWN (BC)
4	EASEMENT FOR SHARED GOLF ZONE VARIABLE WIDTH	SHOWN (BD)
5	EASEMENT FOR SERVICES 9 WIDE & VARIABLE	SHOWN (BE)
6	EASEMENT FOR DRAINAGE OF WATER 11 WIDE AND VARIABLE	SHOWN (BF)
7	EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH	SHOWN (BG)
8	EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE	SHOWN (BH)
9	EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH	SHOWN (BI)
10	EASEMENT FOR DRAINAGE OF WATER VARIABLE WIDTH	SHOWN (BJ)
11	EASEMENT FOR OVERHEAD POWER LINES 20 WIDE AND VARIABLE	SHOWN (BK)
12	EASEMENT FOR DECK 11 WIDE	SHOWN (BL)
13	EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE	SHOWN (BM)
14	EASEMENT FOR SOLE USE OF WATER VARIABLE WIDTH	SHOWN (BN)
15	EASEMENT FOR DRAINAGE OF SEWAGE 3 WIDE	SHOWN (BO)

If space is insufficient use additional annexure sheet

Surveyor's Reference: 19377

PLAN FORM 6A (2017)

WARNING: Creasing or folding will lead to rejection

ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 3 of 5 sheet(s)

Registered:  11/01/2021

Office Use Only

Office Use Only

DP1262475

PLAN OF SUBDIVISION OF LOT 2
DP864981 LOT 120 DP1105753 AND
LOT 14 DP1171224

Subdivision Certificate number: Sub2021-0011

Date of Endorsement: 23.10.2020

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Executed by DROMAHAIR Pty Ltd
ACN 003 052 864 by its authorised officers
Pursuant to Section 127 of the Corporations Act 2001


JOHN PAUL O'ROURKE (Director)


ELIZABETH KALYANI O'ROURKE (Director)

If space is insufficient use additional annexure sheet

Surveyor's Reference: 19377

PLAN FORM 6A (2017)

WARNING: Creasing or folding will lead to rejection

ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 4 of 5 sheet(s)

Registered:



11/01/2021

Office Use Only

Office Use Only

DP1262475

PLAN OF SUBDIVISION OF LOT 2
DP864981 LOT 120 DP1105753 AND
LOT 14 DP1171224

Subdivision Certificate number: Sub2021-0011

Date of Endorsement: 23.10.2020

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) SSI Regulation 2017
- Statements of intention to create and release affecting interests in accordance with section 88B Conveyancing Act 1919
- Signatures and seals- see 195D Conveyancing Act 1919
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Executed on behalf of
TAMWORTH REGIONAL COUNCIL
by its duly Authorised Delegate pursuant
to S.377 of the Local Government Act 1993

Signature of Delegate

Name of Delegate

Sam Lobsey

Signature of Witness

Name of Witness

Carolyn Tickle

Position Held

Director, Planning
and Compliance

Address of Witness

431 Peel St, Tamworth

If space is insufficient use additional annexure sheet

Surveyor's Reference: 19377

PLAN FORM 6A (2017)

WARNING: Creasing or folding will lead to rejection

ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 5 of 5 sheet(s)

Registered:  11/01/2021 Office Use Only

Office Use Only

DP1262475

PLAN OF SUBDIVISION OF LOT 2
DP864981 LOT 120 DP1105753 AND
LOT 14 DP1171224

Subdivision Certificate number: Sub2021-0011
Date of Endorsement: 23.10.2020

This sheet is for the provision of the following information as required:

- A schedule of lots and addresses - See 60(c) *SSI Regulation 2017*
- Statements of intention to create and release affecting interests in accordance with section 88B *Conveyancing Act 1919*
- Signatures and seals- see 195D *Conveyancing Act 1919*
- Any information which cannot fit in the appropriate panel of sheet 1 of the administration sheets.

Mortgagee - Westpac Banking Corporation

I certify that I am an eligible witness and that the attorney whose signature appears opposite signed this instrument in my presence. [See * below]

Signature of witness: 

Name of witness: BRUCE WRIGHT

Address of witness: 1 King Street
Conecord West NSW

**s117RP Act requires that you must have known the signatory for more than 12 months or have sighted identifying documentation*

Certified correct for the purposes of the Real Property Act 1900 by the Bank
SIGNED by Michael J. [Redacted] as attorney
for Westpac Banking Corporation under power of
attorney registered Book 4299 no. 332

(Signature)

Three Attorney

By executing this instrument the attorney states that the attorney has received no notice of the revocation of the power of attorney

If space is insufficient use additional annexure sheet

Surveyor's Reference: 19377

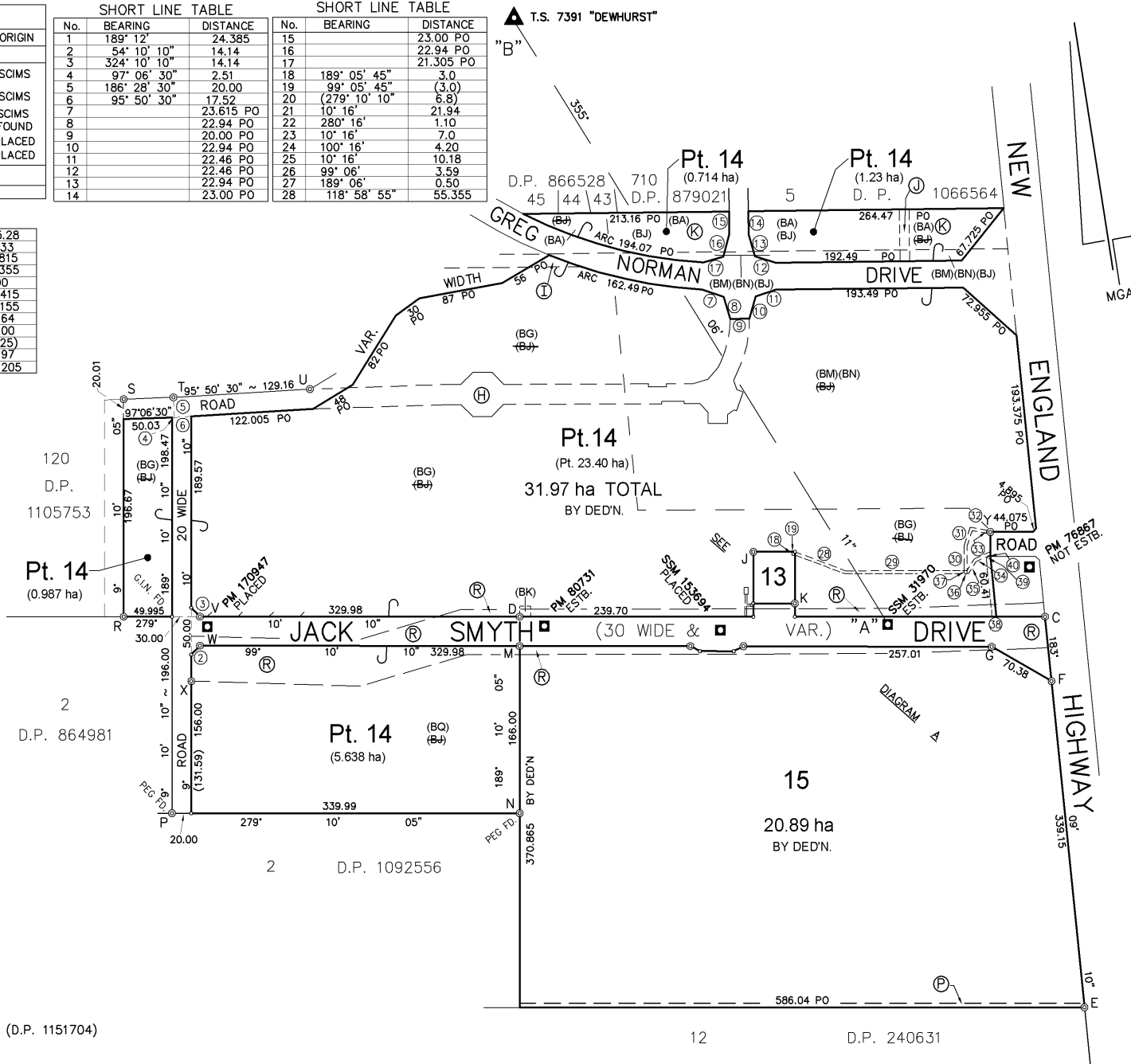
SURVEYING REGULATION 2006 : CLAUSE 35 (1) (b) & 61 (2)						
MARK	MGA CO-ORDINATES		ACCURACY		METHOD	ORIGIN
	EASTING	NORTHING	CLASS	ORDER		
SSM 31970	301 804.694	6 553 758.371	A	1	—	SCIMS
TS 7391	301 193.024	6 560 897.725	2A	0	—	SCIMS
DEWHURST [P]	301 465.955	6 553 812.837	C	4	—	SCIMS
PM 80731	302 008.005	6 553 799.751	U	U	TRAVERSE	FOUND
PM 76867	301 674.852	6 553 771.255	U	U	TRAVERSE	PLACED
SSM 153694	301 144.808	6 553 864.986	U	U	TRAVERSE	PLACED
COMBINED SCALE FACTOR				1.00002114		
				ZONE: 56		
SOURCE: SCIMS ON 7TH FEBRUARY, 2011						

SHORT LINE TABLE			SHORT LINE TABLE		
No.	BEARING	DISTANCE	No.	BEARING	DISTANCE
1	189° 12'	24.385	15		23.00 PO
2	54° 10' 10"	14.14	16		22.94 PO
3	324° 10' 10"	14.14	17		21.305 PO
4	97° 06' 30"	2.51	18	189° 05' 45"	3.0
5	186° 28' 30"	20.00	19	99° 05' 45"	(3.0)
6	95° 50' 30"	17.52	20	(279° 10' 10"	6.8)
7		23.15 PO	21		21.94
8		22.94 PO	22	280° 16'	1.10
9		20.00 PO	23	10° 16'	7.0
10		22.94 PO	24	100° 16'	4.20
11		22.46 PO	25	10° 16'	10.18
12		22.46 PO	26	99° 06'	3.59
13		22.94 PO	27	189° 06'	0.50
14		23.00 PO	28	118° 58' 55"	55.355

SCHEDULE OF REFERENCE MARKS				
No.	BEARING	DIST.	DESCRIPTION	
C	279° 10'	0.623	RM	G.I.P. D. P. 161273
D	283° 23'	0.665	RM	G.I.P. D. P. 161273
E	279° 09'	0.805	RM	G.I.P. FD. D. P. 854401
F	279° 05'	1.61	RM	G.I.P.IE
G	212° 23'	0.985	RM	G.I.P.IE
H	149° 18' 40"	27.31	RM	SSM 153694
I	106° 24'	0.745	RM	G.I.P.IE
J	9° 53'	3.26	RM	G.I.P.IE
K	203° 11'	0.74	RM	G.I.P.IE
L	184° 43'	2.255	RM	G.I.P.IE
M	134° 02'	1.345	RM	G.I.P. FD. D. P. 854401
N	237° 32'	1.76	RM	G.I.P. FD. D. P. 854401
R	310° 10'	2.30	RM	G.I.P. FD. D. P. 829526
S	105° 48'	7.12	RM	G.I.P. FD. D. P. 829526
T	186° 29'	0.50	RM	G.I.P. FD. D. P. 170658
U	279° 08'	10.43	RM	G.I.P. FD. D. P. 170658
V	288° 37'	0.945	RM	G.I.P. FD. D. P. 170947
W	194° 37'	0.93	RM	G.I.P.IE
X	111° 15'	19.52	RM	G.I.P. FD. D. P. 1151704
Y	325° 47'	1.29	RM	C.B. FD. D. P. 547774

SHORT LINE TABLE			
29	99° 05'	45"	125.28
30	9° 03'	55"	25.33
31	28° 58'	55"	18.815
32	109° 04'	10"	17.355
33	199° 04'	10"	3.00
34	254° 52'	10"	16.415
35	221° 44'	05"	14.155
36	279° 05'	45"	4.64
37	9° 03'	55"	3.00
38	279° 10'	10"	(4.525)
39	54° 07'	35"	2.97
40	99° 12'	00"	2.205

SURVEY CO-ORDINATION CONNECTIONS					
FROM		TO		BEARING	DISTANCE
SSM 31970	PM 80731	279° 08'	04"	343.083	MGA GRID.
		279° 08'	00"	343.090	SURV.
SSM 31970	PM 76867	78° 30'	00"	207.495	
PM 76867	PM 170947	274° 19'	20"	865.68	
PM 170947	PM 80731	99° 13'	25"	223.505	
PM 80731	SSM 153694	101° 15'	32"	315.23	
SSM 153694	SSM 31970	100° 40'	00"	130.475	
PM 76867	PM 80731	185° 00'	00"	72.395	
PM 170947	COR C	229° 49'	55"	95.965	



- (A) EASEMENT TO DRAIN WATER 3 WIDE
(B) EASEMENT TO DRAIN SEWAGE 3 WIDE
(C) EASEMENT TO DRAIN SEWAGE 4.5 WIDE
(D) EASEMENT FOR MULTI-PURPOSE ELECTRICAL
INSTALLATION 4.2 WIDE
(E) EASEMENT FOR MULTI-PURPOSE ELECTRICAL
INSTALLATION 3 WIDE
(G) EASEMENT FOR UNDERGROUND POWERLINES 2 WIDE
(H) RIGHT OF CARRIAGEWAY 20 WIDE & VAR. (D.P. 1076058)
(I) RIGHT OF CARRIAGEWAY 20 WIDE & VAR. (D.P. 829526)
(J) RIGHT OF CARRIAGEWAY 10 WIDE (AA357601)
(K) EASEMENT FOR TRANSMISSION 40.06 WIDE & VAR. (X146153)
(P) EASEMENT FOR WATER SUPPLY 4 WIDE (D.P. 1092556)
(R) EASEMENT FOR ENERGY TRANSMISSION 45 WIDE AND VARIABLE (AG420677) (D.P. 1151704)
(BA) COVENANT (BK 2626 NO 404)
(BG) BENEFITED BY EASEMENT TO DRAIN WATER 10 WIDE (DP629408)
(BJ) BENEFITED BY -
RIGHT OF CARRIAGEWAY 20 WIDE (DP872074)
RIGHT OF CARRIAGEWAY 6 WIDE (DP872074)
RESTRICTION ON THE USE OF LAND (DP872074)
(BK) RESTRICTION ON THE USE OF LAND (DP1092556)
(BM) COVENANT (Z224815)
(BN) COVENANT (BK 3012 NO 128)
(BO) COVENANT (284078)

Surveyor: GLENN ALFRED ROSE

Date of Survey: 8th FEB., 2011

Surveyor's Ref: L 1 4 3 6

PLAN OF SUBDIVISION OF

LOTS 1 & 3 D.P. 1092556

LGA: TAMWORTH REGIONAL

Locality: HILLVUE

Subdivision No: SUB 027/2012

Lengths are in metres. Reduction Ratio 1:3000

Registered



5.1.2012

DP1171224

SURVEYING & SPATIAL INFORMATION REGULATION 2006 : CLAUSE 61 (2)						
MARK	MGA CO-ORDINATES		ACCURACY			SOURCE
	EASTING	NORTHING	HEIGHT	CLASS	ORDER	
SSM 31970	301 804.694	6 553 758.371	407.693	LC	L3	SCIMS
PM 76867	302 008	6 553 799	403.00	U	U	BY ME
SSM 153694	301 674.852	6 553 771.255	410.14	U	U	BY ME
COMBINED SEA LEVEL AND SCALE FACTOR 1.00002114						ZONE: 56
SOURCE: SCIMS ON 7th FEBRUARY, 2011						

(BK) RESTRICTION ON THE USE OF LAND - DP1092556

Surveyor: GLENN ALFRED ROSE
Date of Survey: 8th FEB., 2011
Surveyor's Ref: L 1436

PLAN OF SUBDIVISION OF
LOTS 1 & 3 D.P. 1092556

LGA: TAMWORTH REGIONAL
Locality: HILLVUE
Subdivision No: SUB 027/2012
Lengths are in metres. Reduction Ratio 1:1500

Registered
5.1.2012

DP1171224

PLAN FORM 6

WARNING: Creasing or folding will lead to rejection

ePlan

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 1 of 2 sheet(s)

SIGNATURES, SEALS and STATEMENTS of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.

IT IS INTENDED TO DEDICATE
JACK SMYTH DRIVE SUBJECT TO
EASEMENTS TO THE PUBLIC AS
PUBLIC ROAD

PURSUANT TO SECTION 88B OF
THE CONVEYANCING ACT 1919,
AS AMENDED, IT IS INTENDED
TO CREATE: -

1. EASEMENT TO DRAIN WATER
3 WIDE
2. EASEMENT TO DRAIN SEWAGE
3 WIDE
3. EASEMENT TO DRAIN SEWAGE
4.5 WIDE
4. EASEMENT FOR MULTI-PURPOSE
ELECTRICAL INSTALLATION 4.2 WIDE
5. EASEMENT FOR MULTI-PURPOSE
ELECTRICAL INSTALLATION 3 WIDE
6. EASEMENT FOR UNDERGROUND
POWERLINES 2 WIDE
7. RESTRICTIONS ON THE USE
OF THE LAND

If space is insufficient use PLAN FORM 6A annexure sheet

Crown Lands NSW/Western Lands Office Approval

I, in approving this plan certify
(Authorised Officer)

that all necessary approvals in regard to the allocation of the land
shown herein have been given

Signature:

Date:

File Number:

Office:

Subdivision Certificate

I certify that the provisions of s.109J of the Environmental Planning and
Assessment Act 1979 have been satisfied in relation to:

the proposed NEW ROAD & SUBDIVISION set out herein
(insert 'subdivision' or 'new road')

* Authorised Person/General Manager/Accredited Certifier

Consent Authority: *Tamworth Regional Council*

Date of Endorsement: *10 November 2011*

Accreditation no:

Subdivision Certificate no: *Sub027/2012*

File no: *DA0584/2009*

* Strike through inapplicable parts.

Office Use Only

DP1171224

Office Use Only

Registered:  5.1.2012

Title System: TORRENS

Purpose: SUBDIVISION

PLAN OF SUBDIVISION OF
LOTS 1 & 3 D. P. 1092556

LGA: TAMWORTH REGIONAL

Locality: HILLVUE

Parish: CALALA

County: PARRY

Survey Certificate

I, GLENN ALFRED ROSE
of Brown and Krippner Pty. Ltd. PO Box 260 (DX6118) Tamworth 2340
a surveyor registered under the Surveying and Spatial Information
Act 2002, certify that the survey represented in this plan is accurate,
has been made in accordance with the Surveying and Spatial Information
Regulation 2006 and was completed on: 8th FEBRUARY 2011

The survey relates to: LOT 13 AND NEW ROAD ONLY

(specify the land actually surveyed or specify any land shown in the
plan that is not the subject of the survey)

Signature:  Dated: *9th FEB, 2011*

Surveyor registered under the Surveying and Spatial
Information Act 2002

Datum Line: "A - B" (SSM 31970 - TS 7391)

Type: *Urban/Rural*

Plans used in the preparation of survey/compilation

DP 161273
DP 240631
DP 804191
DP 829526
DP 854401
DP 1076058
DP 1092556
DP 1151704

(If insufficient space use Plan Form 6A annexure sheet)

SURVEYOR'S REFERENCE: L 1436

Drawing No. 1436D03

DEPOSITED PLAN ADMINISTRATION SHEET

Sheet 2 of 2 sheet(s)

PLAN OF SUBDIVISION OF
LOTS 1 & 3 D.P. 1092556

Office Use Only

DP1171224

Registered: 5.1.2012

Office Use Only

Subdivision Certificate No:

Sub027/2012

Date of Endorsement: 10.11.2011

THE COMMON SEAL OF THE TAMWORTH
REGIONAL COUNCIL WAS HEREUNTO
AFFIXED IN PURSUANCE OF A
RESOLUTION DULY PASSED BY THE
SAID COUNCIL ON THE

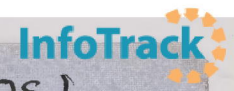
MAYOR.....

GENERAL
MANAGER.....



SURVEYOR'S REFERENCE: L 1436

Drawing No 1436D03



MPS (OS)
G377693

NEGATIVE PREPARED

X F P 161273

Plan Form No. 6* (for transfers, leases, etc.)

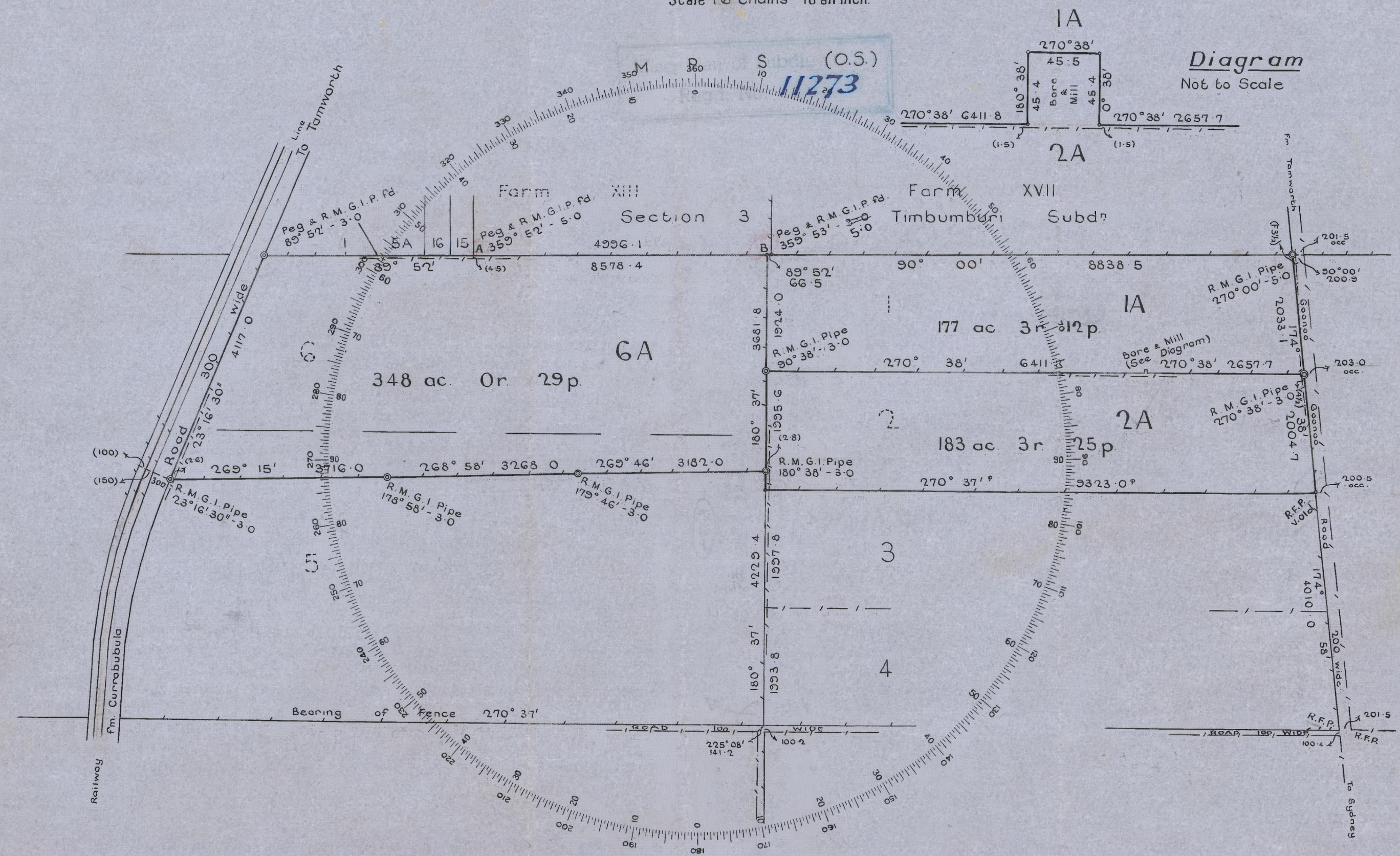
Municipality of
Shire of Peel

M.M.
PLAN

of a subdⁿ of Farms 1 & 2 and 5 & 6 Oxley Sec of land of the Peel River Land & Min. C^o L^{td}
Parish of Calala County of Parry
Scale 16 chains to an Inch.

6

This margin to be left free from notation



Approved by Council and covered by Council
Clerks Certificate

No. 11/1955

Subscribed and declared before me at Tamworth
10.1955

Justice of Peace

Survey of the southern boundary of Lot 2
has not been made. Measurements marked
have been compiled from original plan of
survey of Oxley Section.

Datum Line of Azimuth A-B.

I Russell Edward Brown of Tamworth
a Surveyor registered under the Surveyor's Act, 1929-46, do hereby solemnly and sincerely
declare (a) that all boundaries and measurements shown on this plan are correct,
(b) that all survey marks found and relevant physical objects on or adjacent to the
boundaries are correctly represented, (c) that all physical objects indicated actually exist
in the positions shown, (d) that the whole of the material facts in relation to the land
are correctly represented, (e) that the survey represented in this plan has been made
in accordance with the Survey Practice Regulations, 1933 * (1) by me (2) under my
supervision, the character and extent of which was as required by the Survey Practice
Regulations, 1933, and was completed on 1.2.55 and the reference
marks have been placed as shown hereon.

And I make this solemn declaration conscientiously believing the same to be true, and
by virtue of the provisions of the Oaths Act, 1900.

(Signature)

Surveyor registered under the Surveyors Act, 1929-46.

Length of connection from RM found adjacent to NW corner
of Lot 1A amended in Reg Gen. Depl. See D.P.13117 and 1971M4969.
This is the plan marked " " referred to in

Dated

R.L.S.
4/1/56 1342/58

Copy of plan 33269 L

*Strike out either (1) or (2). †insert date of Survey.

CERTIFICATE OF TITLE



12750074

NEW SOUTH WALES

PROPERTY ACT, 1900

Vol. 12750 Fol. 74

IVA NO. 16087



Edition issued 15-4-1975

I certify that the person described in the First Schedule is the registered proprietor of the undermentioned estate in the land within described subject nevertheless to such exceptions encumbrances and interests as are shown in the Second Schedule.

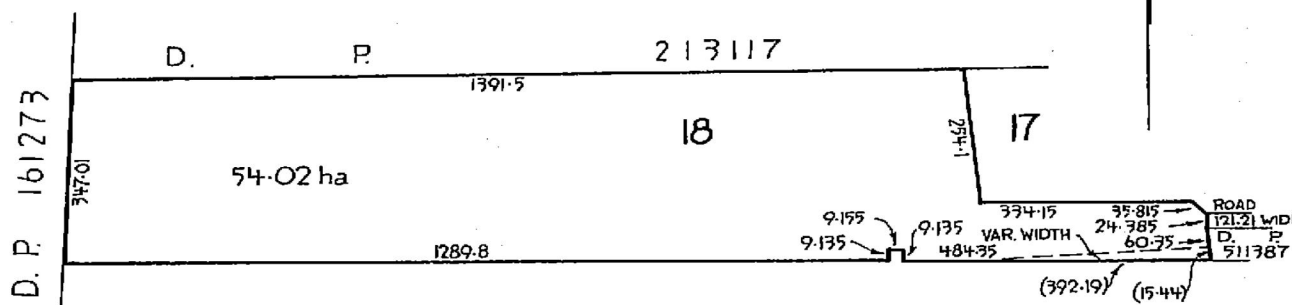
CANCELLED

Registrar General
SEE AUTO FOLIO



PLAN SHOWING LOCATION OF LAND

LENGTHS ARE IN METRES



IVA 16087

REDUCTION RATIO 1:10000

ESTATE AND LAND REFERRED TO

Estate in Fee Simple in Lot 18 in Deposited Plan 547774 in the Shire of Peel Town and Parish of Calala and County of Parry being part of 1268 square kilometres to Australian Agricultural Company on 20-11-1847.

FIRST SCHEDULE

PACGROVE PTY. LIMITED

SECOND SCHEDULE

- GRY
1. Reservations and conditions, if any, contained in the Crown Grant above referred to.
 2. ~~CAUTION. The land within described is held subject to any subsisting interest (as defined in Section 28A of the Real Property Act, 1900.)~~ 7121548
 3. Easement for Transmission Line created by Government Gazette dated 13-3-1964 Folio 864 affecting the part of the land above described variable width shown in the plan hereon.
- AA



SEARCH DATE

1/5/2024 9:17AM

FOLIO: 18/547774

First Title(s): SEE PRIOR TITLE(S)

Prior Title(s): VOL 12750 FOL 74

Recorded -----	Number -----	Type of Instrument -----	C.T. Issue -----
28/3/1988		TITLE AUTOMATION PROJECT	LOT RECORDED FOLIO NOT CREATED
27/9/1988		CONVERTED TO COMPUTER FOLIO	FOLIO CREATED CT NOT ISSUED
8/8/1990	DP804191	DEPOSITED PLAN	FOLIO CANCELLED
16/8/1996		AMENDMENT: LOCAL GOVT AREA	

*** END OF SEARCH ***



SEARCH DATE

1/5/2024 9:24AM

FOLIO: 12/804191

First Title(s): OLD SYSTEM

Prior Title(s): 10/213117 17-18/547774

Recorded	Number	Type of Instrument	C.T. Issue
8/8/1990	DP804191	DEPOSITED PLAN	FOLIO CREATED EDITION 1
20/8/1990	Z199937	DEPARTMENTAL DEALING	
24/8/1990	Z202635	DEPARTMENTAL DEALING	EDITION 2
27/8/1990	Z213327	DEPARTMENTAL DEALING	EDITION 3
20/9/1990	Z224814	DISCHARGE OF MORTGAGE	
20/9/1990	Z224815	TRANSFER	EDITION 4
12/11/1990	Z322149	REQUEST	EDITION 5
14/10/1992	DP826005	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

RP 13A

STAMP DUTY



224815

TRANSFER
(INCLUDING EASEMENT/COVENANTS)

REAL PROPERTY ACT, 1900

(See Instructions for Completion on back of form)

T	3	2 of 2	R ² /2
	\$	47	

DESCRIPTION OF LAND
Note (a)

LAND being transferred			
Torrens Title Reference	If part Only, Delete Whole and Give Details	Location	
Folio identifier 12/804191	PART being WHOLE that part of Lot 12 as formerly comprised in folio identifiers 17/547774 & part 18/547774	Tamworth	
Servient Tenement (Land burdened by easement)		Dominant Tenement (Land benefited by easement)	
Torrens Title Reference	Torrens Title Reference	Torrens Title Reference	Torrens Title Reference
LONG YARD GOLF COURSE PTY LIMITED of Level 20, 44 Market St Sydney			

TENEMENTS

PANEL

Note (b)

This panel also to be completed for covenants by transferor

TRANSFEROR

Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of \$130,000.00 and transfers an estate in fee simple in the land being transferred above described to the TRANSFEREE

Note (d)

TRANSFEROR

Note (c)

THE COUNCIL OF THE CITY OF TAMWORTH whose offices are in Fitzroy St Tamworth

OFFICE USE ONLY

S

TENANCY

Note (e)

as joint tenants/tenants in common.

PRIOR ENCUMBRANCES
Note (f)

subject to the following PRIOR ENCUMBRANCES 1. _____
2. _____ 3. _____

AND the TRANSFEROR:-

- (i) GRANTS/RESERVES an easement as set out in SCHEDULE ONE hereto
- (ii) COVENANTS with the TRANSFEREE as set out in SCHEDULE TWO hereto

Note (g)

Note (g)

AND the TRANSFEREE COVENANTS with the TRANSFEROR as set out in SCHEDULE THREE hereto

DATE 31-8-1990

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.



EXECUTION
Note (h)

Signed in my presence by the applicant who is personally known to me.

THE COMMON SEAL of LONG YARD GOLF COURSE PTY. LIMITED was hereunto affixed in the presence of:

Name of Witness (BLOCK LETTERS)

Address and Occupation of Witness

(Secretary)

Signature of Transferor (Director)

Note (h)

Signed in my presence by the Transferor who is personally known to me.

The Common Seal of THE COUNCIL OF THE CITY OF TAMWORTH was hereunto affixed in pursuance of

a resolution duly passed by the said Council:

Name of Witness (BLOCK LETTERS)

Address and Occupation of Witness

TO BE COMPLETED BY LODGING PARTY
Notes (i) and (j)

LODGED BY		CARROLL & O'DEA SOLICITORS 9th floor, 111 ELIZABETH ST., SYDNEY PO BOX 183 SYDNEY. PHONE 232 2133 FAX: 233 5907 N.G.O. 168H SYDNEY		LOCATION OF DOCUMENTS	
Checked	Passac	REGISTERED -19		Secondary Directions	ON CV
Signed	Extra Fee	20 SEP 1990		Delivery Directions	CT 168H.

OFFICE USE ONLY

RP 13A
1987

SCHEDULE ONE HEREINBEFORE REFERRED TO

The Transferor hereby grants/reserves

Notes (k) and (l)

SCHEDULE TWO HEREINBEFORE REFERRED TO

The Transferor hereby covenants with the Transferee that in respect of any dividing fence needed to be resited, constructed or reconstructed upon the common boundary of the land hereby transferred and adjoining land owned by the Transferor (hereinafter called the boundary) that:

Notes (m) and (l)
Also complete
tenements panel on
front of form

1. The cost of any resiting, construction or reconstruction of a rural type fence consistent with other fences in the general area and as may be reasonably required on the boundary or any part thereof shall be shared equally between the Transferor and the Transferee;
2. The cost of any special type of fencing reasonably required by the Transferee on the boundary or any part thereof and to prevent intrusion of golf balls into the property shall be borne by the Transferor;
3. The cost of any special type of fencing required by the Transferee on the boundary or any part thereof to provide better security or for any other reason in connection with the proposed sporting complex shall be borne by the Transferee.

IT IS HEREBY AGREED AND DECLARED that:

- a. The land which is subject to the burden of the foregoing restriction is the land hereby transferred;
- b. The land to which the benefit of the foregoing restriction is appurtenant is the adjoining land of the Transferor namely the land contained in DP 804191;
- c. The person having the right to release vary or modify the foregoing restriction is the Council of the City of Tamworth its successor or administrator.

RP 13A
1987

SCHEDULE THREE HEREINBEFORE REFERRED TO

Notes (n) and (l) The Transferee hereby covenants with



SEARCH DATE

1/5/2024 11:19AM

FOLIO: 11/804191

First Title(s): OLD SYSTEM

Prior Title(s): 10/213117

18/547774

Recorded	Number	Type of Instrument	C.T. Issue
8/8/1990	DP804191	DEPOSITED PLAN	FOLIO CREATED EDITION 1
20/8/1990	Z199937	DEPARTMENTAL DEALING	
24/8/1990	Z202635	DEPARTMENTAL DEALING	EDITION 2
20/9/1990	Z224816	TRANSFER	EDITION 3
7/2/1991	Z466709	CAVEAT	North of Subject Parcel
31/12/1991	E163730	WITHDRAWAL OF CAVEAT	
31/12/1991	E163732	DISCHARGE OF MORTGAGE	
31/12/1991	E163733	TRANSFER	EDITION 4
14/10/1992	DP826005	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS
14/9/2015	AJ811575	DEPARTMENTAL DEALING	

*** END OF SEARCH ***

1985



(1)



224816



TRANSFER

REAL PROPERTY ACT, 1900

T

CA	1 of 1	X
\$	47	

R11

DESCRIPTION
OF LAND

Note (a)

Torrens Title Reference	If Part Only, Delete Whole and Give Details	Location
Folio Identifier 10/213117 NOW BEING whole OF LAND COMPRISED IN FOLIO <u>11/804191</u>	WHOLE DP213117 That part of Lot 10/as is in Lot 11 DP 804191	at Tamworth

TRANSFEROR

Note (b)

TAMWORTH CITY COUNCIL, Council Chambers, Tamworth, also known as THE COUNCIL OF THE CITY OF TAMWORTH

ESTATE

Note (c)

(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of \$ 10,000.00
and transfers an estate in fee simple
in the land above described to the TRANSFEE

TRANSFEE

Note (d)

LONG YARD GOLF COURSE PTY. LIMITED of Level 20, 44 Market Street, Sydney

OFFICE USE ONLY

5

TENANCY

Note (e)

as joint tenants/tenants in common

PRIOR
ENCUMBRANCES

Note (f)

subject to the following PRIOR ENCUMBRANCES 1.
2. 3.

DATE 31-8-1990

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION

Note (g)

~~Signed in my presence by the transferor who is personally known to me~~

The Common Seal of THE COUNCIL OF THE CITY

Signature of Witness

OF TAMWORTH was hereunto affixed in pursuance

Name of Witness (BLOCK LETTERS)

of a Resolution duly passed by the said Council

Address and occupation of Witness

Mayor

Town Clerk

Note (g)

Signed in my presence by the transferee who is personally known to me

Signature of Witness

Name of Witness (BLOCK LETTERS)

Address and occupation of Witness

TO BE COMPLETED
BY LODGING PARTY

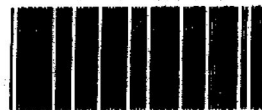
Notes (h)
and (i)

LODGED BY		LOCATION OF DOCUMENTS	
CARROLL & O'DEA SOLICITORS 10th floor, 111 ELIZABETH ST., SYDNEY SYDNEY. PHONE 232 2133 233 5907 G.O. 168H SYDNEY Delivery Box Number		CT	OTHER
			Herewith.
			In L.T.O. with
			Produced by
Checked 	Passed	REGISTERED - -19	
Signed	Extra Fee	Secondary Directions	
		Delivery Directions	CT 168 H.

OFFICE USE ONLY

RP 13

STAMP DUTY



E
163733 P

TRANSFER

REAL PROPERTY ACT, 1900

T

4 of 4

R

\$

Torrens Title Reference

If Part Only, Delete Whole and Give Details

Location

Folio Identifier 11/804191

WHOLE

Country Centre,
Tamworth

DESCRIPTION
OF LAND
Note (a)

TRANSFEROR
Note (b)

LONG YARD GOLF COURSE PTY. LIMITED A.C.N. 003 187 111

ESTATE
Note (c)
(the abovenamed TRANSFEROR) hereby acknowledges receipt of the consideration of \$150,000.00
and transfers an estate in fee simple
in the land above described to the TRANSFEE

TRANSFEE
Note (d)

TAMWORTH CITY COUNCIL of Peel House, Fitzroy Street, Tamworth. N.S.W. 2340.

OFFICE USE ONLY

TENANCY
Note (e)

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

PRIOR
ENCUMBRANCES
Note (f)

subject to the following PRIOR ENCUMBRANCES 1.
2. 3.

DATE 16 December 1991.

We hereby certify this dealing to be correct for the purposes of the Real Property Act, 1900.

EXECUTION
Note (g)

Signed in my presence by the transferor who is personally known to me

THE COMMON SEAL OF LONG YARD GOLF COURSE

Signature of Witness

PTY. LIMITED A.C.N. 003 187 111

Name of Witness (BLOCK LETTERS)

was hereunto affixed in the presence of:

Address and occupation of Witness

Signed in my presence by the transferee who is personally known to me

THE COMMON SEAL OF THE COUNCIL OF THE CITY

Signature of Witness

OF TAMWORTH was hereunto affixed in pursuance

Name of Witness (BLOCK LETTERS)

of a resolution duly passed by the said

Address and occupation of Witness

Council in the presence of:.....



Secretary

Mayor

Town Clerk

TO BE COMPLETED
BY LODGING PARTY
Notes (h)
and (i)

LODGED BY

GALLOWAY & CO.

Phone: 233-1011
DX 340,

Fax: 232-6491
L.T.O. Delivery 28A

Ref:

Delivery Box Number EVERSOLE - LONG YARD

LOCATION OF DOCUMENTS

CT OTHER

1

Herewith.

In L.T.O. with

Produced by

Checked

Passed

REGISTERED

-19

Signed

Extra Fee

Secondary
Directions

Delivery
Directions

FEV SOL



LAND
REGISTRY
SERVICES

Historical Title



NEW SOUTH WALES LAND REGISTRY SERVICES - HISTORICAL SEARCH

SEARCH DATE

1/5/2024 8:40AM

FOLIO: 14/1171224

First Title(s): OLD SYSTEM

Prior Title(s): 1/1092556

3/1092556

Recorded	Number	Type of Instrument	C.T. Issue
5/1/2012	DP1171224	DEPOSITED PLAN	FOLIO CREATED EDITION 1
4/10/2012	DP1179138	DEPOSITED PLAN	
3/6/2013	AH250037	REJECTED - TRANSFER GRANTING EASEMENT	
3/6/2013	AH250038	REJECTED - TRANSFER GRANTING EASEMENT	
11/11/2013	AI153508	DEPARTMENTAL DEALING	EDITION 2
10/12/2013	AI227234	DEPARTMENTAL DEALING	EDITION 3
24/12/2020	AQ692354	DEPARTMENTAL DEALING	
11/1/2021	DP1262475	DEPOSITED PLAN	FOLIO CANCELLED RESIDUE REMAINS

*** END OF SEARCH ***

Jack Smyth Drive, Hillvue

PRINTED ON 1/5/2024

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Received: 01/05/2024 08:40:47



SEARCH DATE

1/5/2024 8:38AM

FOLIO: 102/1262475

First Title(s): OLD SYSTEM

Prior Title(s): 14/1171224

Recorded	Number	Type of Instrument	C.T. Issue
11/1/2021	DP1262475	DEPOSITED PLAN	FOLIO CREATED EDITION 1

*** END OF SEARCH ***



FOLIO: 102/1262475

SEARCH DATE	TIME	EDITION NO	DATE
1/5/2024	8:32 AM	1	11/1/2021

LAND

LOT 102 IN DEPOSITED PLAN 1262475
AT HILLVUE
LOCAL GOVERNMENT AREA TAMWORTH REGIONAL
PARISH OF CALALA COUNTY OF PARRY
TITLE DIAGRAM DP1262475

FIRST SCHEDULE

TAMWORTH REGIONAL COUNCIL

SECOND SCHEDULE (19 NOTIFICATIONS)

- 1 RESERVATIONS AND CONDITIONS IN THE CROWN GRANT(S)
- 2 BK 2626 NO 404 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- 3 BK 3012 NO 128 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- 4 X146153 EASEMENT FOR TRANSMISSION LINE 40.06 METRE(S) WIDE & VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 5 Z224815 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- 6 DP629408 EASEMENT TO DRAIN WATER 10 METRE(S) WIDE APPURTENANT TO THE PART(S) SHOWN SO BENEFITED IN THE TITLE DIAGRAM
- 7 DP829526 RIGHT OF CARRIAGEWAY 20 METRE(S) WIDE & VARIABLE WIDTH AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 8 2840780 COVENANT AFFECTING THE PART SHOWN SO BURDENED IN THE TITLE DIAGRAM.
- 9 AA357601 RIGHT OF CARRIAGEWAY 10 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 10 AG420667 EASEMENT FOR ENERGY TRANSMISSION 45 METRE(S) WIDE AND VARIABLE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 11 DP1092556 RESTRICTION(S) ON THE USE OF LAND AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 12 DP1171224 EASEMENT TO DRAIN WATER 3 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 13 DP1171224 EASEMENT TO DRAIN SEWAGE 3 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 14 DP1171224 EASEMENT TO DRAIN SEWAGE 4.5 METRE(S) WIDE AFFECTING

Does not affect subject parcel

END OF PAGE 1 - CONTINUED OVER

FOLIO: 102/1262475

PAGE 2

SECOND SCHEDULE (19 NOTIFICATIONS) (CONTINUED)

- THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 15 DP1171224 EASEMENT FOR MULTI-PURPOSE ELECTRICAL INSTALLATION 4.2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 16 DP1171224 EASEMENT FOR MULTI-PURPOSE ELECTRICAL INSTALLATION 3 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 17 DP1171224 EASEMENT FOR UNDERGROUND POWER LINES 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 18 DP1179138 EASEMENT FOR UNDERGROUND POWER LINES 2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN THE TITLE DIAGRAM
- 19 DP1179138 EASEMENT FOR MULTI-PURPOSE ELECTRICAL INSTALLATION 4.2 METRE(S) WIDE AFFECTING THE PART(S) SHOWN SO BURDENED IN DP1179138

NOTATIONS

Does not affect subject parcel

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Jack Smyth Drive, Hillvue

PRINTED ON 1/5/2024

* Any entries preceded by an asterisk do not appear on the current edition of the Certificate of Title. Warning: the information appearing under notations has not been formally recorded in the Register. InfoTrack an approved NSW Information Broker hereby certifies that the information contained in this document has been provided electronically by the Registrar General in accordance with Section 96B(2) of the Real Property Act 1900.

Appendix E

Table E1: Summary of Laboratory Test Results – Priority metals, PAH, TRH and BTEX

Table E2: Summary of Laboratory Test Results - Priority OCP, OPP, PCB and Asbestos

Laboratory test result sheets

Chain of custody and sample receipt information

Table E1: Summary of Laboratory Results – Priority metals, PAH, TRH, BTEX

			Priority metals								Priority PAH				Priority TRH						BTEX			
			Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	Naphthalene ^b	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ (BaP TEQ)	Total PAH	TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	Benzene	Toluene	Ethylbenzene	Total Xylenes
		PQL	4	0.4	1	1	1	0.1	1	1	1	0.05	0.5	0.05	25	50	25	50	100	100	0.2	0.5	1	1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
8	0.5 m	07/05/24	6	<0.4	14	40	11	<0.1	13	56	<1	0.2	<0.5	2.7	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	4 170	- 0.7	3 -	300 -	- -	- 120	40 180	230 -	- 1,300	- 5,600	0.6 65	390 105	NL 125	95 45
8	2.5 m	07/05/24	7	<0.4	13	37	11	<0.1	14	56	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	NL 170	- 0.7	3 -	300 -	- -	- 120	150 180	NL -	- 1,300	- 5,600	2 65	NL 105	NL 125	NL 45
9	1 m	07/05/24	5	<0.4	20	39	11	<0.1	19	56	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	NL 170	- 0.7	3 -	300 -	- -	- 120	90 180	NL -	- 1,300	- 5,600	1 65	NL 105	NL 125	310 45
QA	0 m	07/05/24	4	<0.4	26	37	9	<0.1	27	51	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	5 170	- 0.7	3 -	300 -	- -	- 120	50 180	280 -	- 1,300	- 5,600	0.7 65	480 105	NL 125	110 45
QA - [TRIPLICATE]	0 m	07/05/24	4	<0.4	20	38	9	<0.1	17	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -
9	2.5 m	07/05/24	<4	<0.4	12	35	7	<0.1	16	50	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	NL 170	- 0.7	3 -	300 -	- -	- 120	150 180	NL -	- 1,300	- 5,600	2 65	NL 105	NL 125	NL 45
10	0.5 m	07/05/24	6	<0.4	16	35	9	<0.1	13	49	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	5 170	- 0.7	3 -	300 -	- -	- 120	50 180	280 -	- 1,300	- 5,600	0.7 65	480 105	NL 125	110 45
11	2 m	07/05/24	5	<0.4	15	54	10	<0.1	12	60	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	NL 170	- 0.7	3 -	300 -	- -	- 120	150 180	NL -	- 1,300	- 5,600	2 65	NL 105	NL 125	NL 45
C2	0.7 m	07/05/24	5	<0.4	11	31	13	<0.1	11	64	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	5 170	- 0.7	3 -	300 -	- -	- 120	50 180	280 -	- 1,300	- 5,600	0.7 65	480 105	NL 125	110 45
C5	0.2 m	07/05/24	7	<0.4	29	39	12	<0.1	16	43	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	5 170	- 0.7	3 -	300 -	- -	- 120	50 180	280 -	- 1,300	- 5,600	0.7 65	480 105	NL 125	110 45
C5	1 m	07/05/24	5	<0.4	13	41	9	<0.1	12	60	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	NL 170	- 0.7	3 -	300 -	- -	- 120	90 180	NL -	- 1,300	- 5,600	1 65	NL 105	NL 125	310 45
C6	2 m	07/05/24	4	<0.4	14	33	10	<0.1	13	51	<1	<0.05	<0.5	<0.05	<25	<50	<25	<50	<100	<100	<0.2	<0.5	<1	<1
			300 100	90 -	300 410	17,000 110	600 1,100	80 -	1,200 35	30,000 250	NL 170	- 0.7	3 -	300 -	- -	- 120	150 180	NL -	- 1,300	- 5,600	2 65	NL 105	NL 125	NL 45
10	2 m	07/05/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance

EIL/ESL exceedance

HIL/HSL and EIL/ESL exceedance

ML exceedance

ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report

Blue = DC exceedance

Red = EGV-indirect exceedance

HSL 0-<1 Exceedance

Bold = Lab detections

- = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable

NL = Not limiting

NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

Notes:

a

QA/QC replicate of sample listed directly below the primary sample

b

Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL

c

EIL criteria applies to DDT only

Site Assessment Criteria (SAC):			
SAC based on generic land use thresholds for Recreational C including public open space			
Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:			
HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-A/B (NEPC, 2013)	ESL	Urban Residential and Public Open Space (NEPC, 2013)
DC	Direct contact HSL C Recreational /Open space (CRC CARE, 2011)	ML	Residential, Parkland and Public Open Space (NEPC, 2013)

0226965.00

Jack Smyth Drive, Hillvue, NSW, 2340

Table E2: Summary of Laboratory Results – Priority OCP, OPP, PCB and Asbestos

			Priority OCP									Priority OPP	PCB	Asbestos (FA/AF)					Asbestos, Other						
			DDT+DDE+DDD ^c	Aldrin + Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Mirex	Chlorpyrifos	Total PCB	Asb_Sample_masses	ACM >7mm Estimation	ACM >7mm Estimation	FA and AF Estimation	FA and AF Estimation	Asbestos ID in soil >0.1g/kg	Trace Analysis (AS)	Asbestos ID in soil >0.1g/kg	Asbestos ID in soil <0.1g/kg	Trace Analysis (NEPC)	Total Asbestos#1	Asbestos Summary
		PQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1			0.01		0.001						0.1	0.1
Sample ID	Depth	Sample Date	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	g	g	%(w/w)	g	%(w/w)	-	-	-	-	-	g/kg	
8	0.5 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
8	2.5 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
9	1 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
QA	0 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
QA - [TRIPLICATE]	0 m	07/05/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -							
9	2.5 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
10	0.5 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	1,119.36	-	<0.01	-	<0.001	-	-	NAD	NAD	NAD	<0.1	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	0.001 -							
11	2 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	2,200	-	<0.01	-	<0.001	-	-	NAD	NAD	NAD	<0.1	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	0.001 -							
C2	0.7 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
C5	0.2 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
C5	1 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
C6	2 m	07/05/24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	-	-	-	-	-	NAD	NAD	-	-	-	-	-
			400 180	10 -	70 -	340 -	20 -	10 -	10 -	400 -	20 -	250 -	1 -	- -	- -	- -	- -	- -							
10	2 m	07/05/24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -							

Lab result

HIL/HSL value EIL/ESL/EGV value

HIL/HSL exceedance

EIL/ESL exceedance

HIL/HSL and EIL/ESL exceedance

ML exceedance

ML and HIL/HSL or EIL/ESL exceedance

Indicates that asbestos has been detected by the lab, refer to the lab report

Blue = DC exceedance

Red = EGV-indirect exceedance

HSL 0-<1 Exceedance

Bold = Lab detections

- = Not tested or No HIL/HSL/EIL/ESL (as applicable) or Not applicable

NL = Not limiting

NAD = No Asbestos detected

HIL = Health investigation level HSL = Health screening level (excluding DC) EIL = Ecological investigation level ESL = Ecological screening level EGV = Environmental Guideline Value ML = Management Limit DC = Direct Contact HSL

- Notes:
- a QA/QC replicate of sample listed directly below the primary sample
 - b Naphthalene reported as highest detection from the BTEXN or PAH suite, or if both results <PQL as lowest PQL
 - c EIL criteria applies to DDT only

Site Assessment Criteria (SAC):			
SAC based on generic land use thresholds for Recreational C including public open space			
Refer to the SAC section of report for information of SAC sources and rationale. Summary information as follows:			
HIL	HIL-C (NEPC, 2013 or HEPA, 2020 (PFAS only))	EGV	EGV, all land uses, direct exposure (HEPA, 2020)
HSL (vapour intrusion)	HSL-A/B (NEPC, 2013)	ESL	Urban Residential and Public Open Space (NEPC, 2013)
DC	Direct contact HSL C Recreational /Open space (CRC CARE, 2011)	ML	Residential, Parkland and Public Open Space (NEPC, 2013)

CERTIFICATE OF ANALYSIS 351486

Client Details

Client	Douglas Partners Pty Ltd (Port Macquarie)
Attention	Joel Cowan
Address	PO Box 5463, Port Macquarie, NSW, 2444

Sample Details

Your Reference	<u>226965.00 - Hillvue</u>
Number of Samples	13 Soil
Date samples received	17/05/2024
Date completed instructions received	17/05/2024

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	24/05/2024
Date of Issue	24/05/2024
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Asbestos Approved By

Analysed by Asbestos Approved Analyst: Nyovan Moonean
 Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By

Dragana Tomas, Senior Chemist
 Jenny He, Senior Chemist
 Liam Timmins, Organics Supervisor
 Loren Bardwell, Development Chemist
 Lucy Zhu, Asbestos Supervisor

Authorised By

Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil

Our Reference		351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference	UNITS	8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	109	109	103	82	107

vTRH(C6-C10)/BTEXN in Soil

Our Reference		351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference	UNITS	11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
TRH C ₆ - C ₉	mg/kg	<25	<25	<25	<25	<25
TRH C ₆ - C ₁₀	mg/kg	<25	<25	<25	<25	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	104	105	108	99	92

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		351486-11
Your Reference	UNITS	QA
Depth		-
Date Sampled		07/05/2024
Type of sample		Soil
Date extracted	-	20/05/2024
Date analysed	-	21/05/2024
TRH C ₆ - C ₉	mg/kg	<25
TRH C ₆ - C ₁₀	mg/kg	<25
vTRH C ₆ - C ₁₀ less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	94

svTRH (C10-C40) in Soil

Our Reference		351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference	UNITS	8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	21/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	108	92	107	102	111

svTRH (C10-C40) in Soil

Our Reference		351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference	UNITS	11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
TRH C ₁₀ - C ₁₄	mg/kg	<50	<50	<50	<50	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100	<100	<100	<100	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100	<100	<100	<100	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	107	108	93	91	94

svTRH (C10-C40) in Soil		
Our Reference		351486-11
Your Reference	UNITS	QA
Depth		-
Date Sampled		07/05/2024
Type of sample		Soil
Date extracted	-	20/05/2024
Date analysed	-	20/05/2024
TRH C ₁₀ - C ₁₄	mg/kg	<50
TRH C ₁₅ - C ₂₈	mg/kg	<100
TRH C ₂₉ - C ₃₆	mg/kg	<100
Total +ve TRH (C10-C36)	mg/kg	<50
TRH >C ₁₀ -C ₁₆	mg/kg	<50
TRH >C ₁₀ -C ₁₆ less Naphthalene (F2)	mg/kg	<50
TRH >C ₁₆ -C ₃₄	mg/kg	<100
TRH >C ₃₄ -C ₄₀	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	<50
Surrogate o-Terphenyl	%	93

PAHs in Soil						
Our Reference		351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference	UNITS	8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	0.6	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	0.4	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	0.4	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	0.2	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	2.7	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	88	89	88	89	87

PAHs in Soil						
Our Reference		351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference	UNITS	11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	84	86	87	88	86

PAHs in Soil		
Our Reference		351486-11
Your Reference	UNITS	QA
Depth		-
Date Sampled		07/05/2024
Type of sample		Soil
Date extracted	-	20/05/2024
Date analysed	-	20/05/2024
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.1
Fluoranthene	mg/kg	<0.1
Pyrene	mg/kg	<0.1
Benzo(a)anthracene	mg/kg	<0.1
Chrysene	mg/kg	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2
Benzo(a)pyrene	mg/kg	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1
Total +ve PAH's	mg/kg	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5
Surrogate <i>p</i> -Terphenyl-d14	%	87

Organochlorine Pesticides in soil						
Our Reference		351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference	UNITS	8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	74	75	75	77	78

Organochlorine Pesticides in soil						
Our Reference		351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference	UNITS	11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mirex	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	76	78	77	75	74

Organochlorine Pesticides in soil		
Our Reference		351486-11
Your Reference	UNITS	QA
Depth		-
Date Sampled		07/05/2024
Type of sample		Soil
Date extracted	-	20/05/2024
Date analysed	-	20/05/2024
alpha-BHC	mg/kg	<0.1
HCB	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Mirex	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	75

Organophosphorus Pesticides in Soil						
Our Reference		351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference	UNITS	8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	74	75	75	77	78

Organophosphorus Pesticides in Soil						
Our Reference		351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference	UNITS	11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Mevinphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phorate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Disulfoton	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion-Methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyrifos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenthion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methidathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenamiphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phosalone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Coumaphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 4-Chloro-3-NBTF	%	76	78	77	75	74

Organophosphorus Pesticides in Soil		
Our Reference		351486-11
Your Reference	UNITS	QA
Depth		-
Date Sampled		07/05/2024
Type of sample		Soil
Date extracted	-	20/05/2024
Date analysed	-	20/05/2024
Dichlorvos	mg/kg	<0.1
Mevinphos	mg/kg	<0.1
Phorate	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Disulfoton	mg/kg	<0.1
Chlorpyrifos-methyl	mg/kg	<0.1
Parathion-Methyl	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Fenthion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Methidathion	mg/kg	<0.1
Fenamiphos	mg/kg	<0.1
Ethion	mg/kg	<0.1
Phosalone	mg/kg	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1
Coumaphos	mg/kg	<0.1
Surrogate 4-Chloro-3-NBTF	%	75

PCBs in Soil						
Our Reference	UNITS	351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference		8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	84	85	84	84	86

PCBs in Soil						
Our Reference	UNITS	351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference		11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate 2-Fluorobiphenyl	%	84	84	85	84	83

PCBs in Soil		
Our Reference		351486-11
Your Reference	UNITS	QA
Depth		-
Date Sampled		07/05/2024
Type of sample		Soil
Date extracted	-	20/05/2024
Date analysed	-	20/05/2024
Aroclor 1016	mg/kg	<0.1
Aroclor 1221	mg/kg	<0.1
Aroclor 1232	mg/kg	<0.1
Aroclor 1242	mg/kg	<0.1
Aroclor 1248	mg/kg	<0.1
Aroclor 1254	mg/kg	<0.1
Aroclor 1260	mg/kg	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1
Surrogate 2-Fluorobiphenyl	%	84

Acid Extractable metals in soil

Our Reference		351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference	UNITS	8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Date analysed	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Arsenic	mg/kg	6	7	5	<4	6
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	14	13	20	12	16
Copper	mg/kg	40	37	39	35	35
Lead	mg/kg	11	11	11	7	9
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	13	14	19	16	13
Zinc	mg/kg	56	56	56	50	49

Acid Extractable metals in soil

Our Reference		351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference	UNITS	11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Date analysed	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Arsenic	mg/kg	5	5	7	5	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	15	11	29	13	14
Copper	mg/kg	54	31	39	41	33
Lead	mg/kg	10	13	12	9	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	12	11	16	12	13
Zinc	mg/kg	60	64	43	60	51

Acid Extractable metals in soil			
Our Reference		351486-11	351486-14
Your Reference	UNITS	QA	QA - [TRIPLICATE]
Depth		-	-
Date Sampled		07/05/2024	07/05/2024
Type of sample		Soil	Soil
Date prepared	-	21/05/2024	21/05/2024
Date analysed	-	21/05/2024	21/05/2024
Arsenic	mg/kg	4	4
Cadmium	mg/kg	<0.4	<0.4
Chromium	mg/kg	26	20
Copper	mg/kg	37	38
Lead	mg/kg	9	9
Mercury	mg/kg	<0.1	<0.1
Nickel	mg/kg	27	17
Zinc	mg/kg	51	50

Moisture						
Our Reference	UNITS	351486-1	351486-2	351486-3	351486-4	351486-5
Your Reference		8	8	9	9	10
Depth		0.5	2.5	1	2.5	0.5
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Moisture	%	20	16	21	28	19

Moisture						
Our Reference	UNITS	351486-6	351486-7	351486-8	351486-9	351486-10
Your Reference		11	C2	C5	C5	C6
Depth		2	0.7	0.2	1	2
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	20/05/2024	20/05/2024	20/05/2024	20/05/2024	20/05/2024
Date analysed	-	21/05/2024	21/05/2024	21/05/2024	21/05/2024	21/05/2024
Moisture	%	24	23	19	12	15

Moisture		
Our Reference	UNITS	351486-11
Your Reference		QA
Depth		-
Date Sampled		07/05/2024
Type of sample		Soil
Date prepared	-	20/05/2024
Date analysed	-	21/05/2024
Moisture	%	23

Asbestos ID - soils						
Our Reference	UNITS	351486-1	351486-2	351486-3	351486-4	351486-7
Your Reference		8	8	9	9	C2
Depth		0.5	2.5	1	2.5	0.7
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	24/05/2024	24/05/2024	24/05/2024	24/05/2024	24/05/2024
Sample mass tested	g	Approx. 30g	Approx. 30g	Approx. 35g	Approx. 25g	Approx. 30g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	Nil	Nil	Nil	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference	UNITS	351486-8	351486-9	351486-10	351486-11
Your Reference		C5	C5	C6	QA
Depth		0.2	1	2	-
Date Sampled		07/05/2024	07/05/2024	07/05/2024	07/05/2024
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	24/05/2024	24/05/2024	24/05/2024	24/05/2024
Sample mass tested	g	Approx. 30g	Approx. 35g	Approx. 40g	Approx. 40g
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Asbestos comments	-	Nil	Nil	Nil	Nil
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils NEPM - ASB-001			
Our Reference		351486-5	351486-6
Your Reference	UNITS	10	11
Depth		0.5	2
Date Sampled		07/05/2024	07/05/2024
Type of sample		Soil	Soil
Date analysed	-	24/05/2024	24/05/2024
Sample mass tested	g	1,119.36	2,200
Sample Description	-	Brown coarse-grained soil & rocks	Brown coarse-grained soil & rocks
Asbestos ID in soil (AS4964) >0.1g/kg	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected
Total Asbestos ^{#1}	g/kg	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected
ACM >7mm Estimation*	g	—	—
FA and AF Estimation*	g	—	—
ACM >7mm Estimation*	%(w/w)	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001
Asbestos comments	-	Nil	Nil

Coal Tar			
Our Reference		351486-12	351486-13
Your Reference	UNITS	10	11
Depth		2	2
Date Sampled		07/05/2024	07/05/2024
Type of sample		Soil	Soil
Date prepared	-	23/05/2024	23/05/2024
Date analysed	-	23/05/2024	23/05/2024
Presence of Coal Tar*	-	Absent	Absent

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
ASB-001	Asbestos ID - Identification of asbestos in soil samples using Polarised Light Microscopy and Dispersion Staining Techniques. Minimum 500mL soil sample was analysed as recommended by "National Environment Protection (Assessment of site contamination) Measure, Schedule B1 and "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg (0.01% w/w) as per Australian Standard AS4964-2004. Results reported denoted with * are outside our scope of NATA accreditation. NOTE#1 Total Asbestos g/kg was analysed and reported as per Australian Standard AS4964 (This is the sum of ACM >7mm, <7mm and FA/AF relative to the sample mass tested) NOTE#2 The screening level of 0.001% w/w asbestos in soil for FA and AF only applies where the FA and AF are able to be quantified by gravimetric procedures. This screening level is not applicable to free fibres. Estimation = Estimated asbestos weight Results reported with "---" is equivalent to no visible asbestos identified using Polarised Light microscopy and Dispersion Staining Techniques.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.

Method ID	Methodology Summary
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PCBs" is simply a sum of the positive individual PCBs.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-MS/GC-MSMS. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL' values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero' values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL' values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.
RTA T542	Determination of Phenol in core samples as per RTA test method T542. This procedure gives an indication of whether a sample of asphalt has been made with coal tar. The coal tar method gives an approximate result with a high degree of uncertainty.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	351486-2
Date extracted	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Date analysed	-			21/05/2024	1	21/05/2024	21/05/2024		21/05/2024	21/05/2024
TRH C ₆ - C ₉	mg/kg	25	Org-023	<25	1	<25	<25	0	80	81
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	<25	1	<25	<25	0	80	81
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	75	77
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	86	87
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	78	81
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	81	79
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	78	81
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	97	1	109	82	28	82	84

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Date analysed	-			[NT]	11	21/05/2024	21/05/2024		[NT]	[NT]
TRH C ₆ - C ₉	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
TRH C ₆ - C ₁₀	mg/kg	25	Org-023	[NT]	11	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-023	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-023	[NT]	11	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-023	[NT]	11	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Naphthalene	mg/kg	1	Org-023	[NT]	11	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	[NT]	11	94	100	6	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	351486-2
Date extracted	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Date analysed	-			20/05/2024	1	21/05/2024	21/05/2024		20/05/2024	20/05/2024
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	<50	1	<50	<50	0	122	112
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	<100	1	<100	<100	0	115	109
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	<100	1	<100	<100	0	100	89
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	<50	1	<50	<50	0	122	112
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	<100	1	<100	<100	0	115	109
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	<100	1	<100	<100	0	100	89
Surrogate o-Terphenyl	%		Org-020	93	1	108	96	12	100	95

QUALITY CONTROL: svTRH (C10-C40) in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Date analysed	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
TRH C ₁₀ - C ₁₄	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH C ₁₅ - C ₂₈	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH C ₂₉ - C ₃₆	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C ₁₀ -C ₁₆	mg/kg	50	Org-020	[NT]	11	<50	<50	0	[NT]	[NT]
TRH >C ₁₆ -C ₃₄	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
TRH >C ₃₄ -C ₄₀	mg/kg	100	Org-020	[NT]	11	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-020	[NT]	11	93	100	7	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	351486-2
Date extracted	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Date analysed	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	78
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	78
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	96
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	<0.1	100	84	74
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	0.6	0.2	100	88	82
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.4	0.2	67	86	74
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	<0.1	67	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	<0.1	67	86	74
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	0.4	0.2	67	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	0.2	0.1	67	84	76
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	0.2	0.2	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	0.3	0.2	40	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	88	1	88	85	3	87	85

QUALITY CONTROL: PAHs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Date analysed	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(b,j,k)fluoranthene	mg/kg	0.2	Org-022/025	[NT]	11	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	[NT]	11	<0.05	<0.05	0	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	[NT]	11	87	85	2	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	351486-2
Date extracted	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Date analysed	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	108	94
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	68
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	72
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	80
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	112	94
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	72
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	78
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	68	68
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	80
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	76	70
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	78	1	74	74	0	84	77

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Date analysed	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Mirex	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	11	75	76	1	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	351486-2
Date extracted	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Date analysed	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	88	84
Mevinphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	82
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	72	68
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	86
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	90	84
Fenthion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	72
Bromophos-ethyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	88
Phosalone	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	78	1	74	74	0	84	77

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Date analysed	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Mevinphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phorate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Disulfoton	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyrifos-methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion-Methyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenthion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Methidathion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Fenamiphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Phosalone	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Coumaphos	mg/kg	0.1	Org-022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	[NT]	11	75	76	1	[NT]	[NT]

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	351486-2
Date extracted	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Date analysed	-			20/05/2024	1	20/05/2024	20/05/2024		20/05/2024	20/05/2024
Aroclor 1016	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	88	70
Aroclor 1260	mg/kg	0.1	Org-021/022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	84	1	84	83	1	84	82

QUALITY CONTROL: PCBs in Soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Date analysed	-			[NT]	11	20/05/2024	20/05/2024		[NT]	[NT]
Aroclor 1016	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1260	mg/kg	0.1	Org-021/022/025	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	[NT]	11	84	83	1	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	351486-2
Date prepared	-			21/05/2024	1	21/05/2024	21/05/2024		21/05/2024	21/05/2024
Date analysed	-			21/05/2024	1	21/05/2024	21/05/2024		21/05/2024	21/05/2024
Arsenic	mg/kg	4	Metals-020	<4	1	6	6	0	104	86
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	102	83
Chromium	mg/kg	1	Metals-020	<1	1	14	15	7	103	92
Copper	mg/kg	1	Metals-020	<1	1	40	37	8	103	105
Lead	mg/kg	1	Metals-020	<1	1	11	11	0	103	86
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	100	102
Nickel	mg/kg	1	Metals-020	<1	1	13	13	0	105	88
Zinc	mg/kg	1	Metals-020	<1	1	56	52	7	100	79

QUALITY CONTROL: Acid Extractable metals in soil					Duplicate			Spike Recovery %		
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	11	21/05/2024	21/05/2024		[NT]	[NT]
Date analysed	-			[NT]	11	21/05/2024	21/05/2024		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	11	4	5	22	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	11	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	11	26	22	17	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	11	37	35	6	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	11	9	8	12	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	11	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	11	27	18	40	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	11	51	45	12	[NT]	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.
Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.	
The recommended maximums for analytes in urine are taken from "2018 TLVs and BEIs", as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.	
Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2	

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 351486-11 for Ni. Therefore a triplicate result has been issued as laboratory sample number 351486-14.

Asbestos-ID in soil: NEPM

This report is consistent with the reporting recommendations in the National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013. This is reported outside our scope of NATA accreditation.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.

Note: Samples 351486-1-4, 7-11 were sub-sampled from jars provided by the client.

Project No: 226965.00	Suburb: Hillvue	To: Envirolab Services
Project Manager: Joel Cowan	Order Number: PM260283	Sampler: Cowan
Email: joel.cowan@douglaspartners.com.au		Attn: Sample Receipt
Turnaround time: ☒ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day		(02) 9910 6200 samplereceipt@envirolab.com

Prior Storage: ☒ Fridge ☐ Freezer ☐ Esky ☐ Shelf **Do samples contain 'potential' HBM?** ☒ No ☐ YES, handle, transport, store in accordance with FPM HAZID)

Lab ID	Sample ID			Date Sampled	Sample Type	Container Type	Analytes										Notes/ Preservation/ Additional Requirements
	Location / Other ID	Depth From	Depth To		S - soil W - water M - Material	G - glass P - plastic	Combo 6AN	Combo 6a	Coal Tar								
1	8	0.5		7/05/24	S	G		X									
2	8	2.5		7/05/24	S	G		X									
3	9	1		7/05/24	S	G		X									
4	9	2.5		7/05/24	S	G		X									
5	10	0.5		7/05/24	S	G\P	X										
6	11	2		7/05/24	S	G\P	X										
7	C2	0.7		7/05/24	S	G		X									
8	C5	0.2		7/05/24	S	G		X									
9	C5	1		7/05/24	S	G		X									
10	C6	2		7/05/24	S	G		X									
11	QA			7/05/24	S	G		X									
12	10	2		7/05/24	P				X								
13	11	2		7/05/24	P				X								

ENVIROLAB

LAB

Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 357476

Date Received: 17/5/24

Time Received: 10:20

Received By: ST

Temp: Cool/Ambient

Cooling: Ice/No pack

Security: Intact/Broken/None


Envirolab Services
 12 Ashley St
 Chatswood NSW 2067
 Ph: (02) 9910 6200
 Job No: 38748
 Date Received: 17/05/24
 Time Received: 09:20
 Received By: CT
 Temp: Cool/Ambient
 Cooling: Ice/Refrigerator
 Security: Intact/Broken/None

Metals to analyse: As, Be, B, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, Se, Zn		LAB RECEIPT	
Number of samples in container: 15		Transported to laboratory by:	
Send results to: Douglas Partners Pty Ltd		Lab Ref. No:	
Address: Unit 2, 32 Geebung Drive, Port Macquarie		Received by:	
Phone: (02) 6581 5992		Date & Time:	
Relinquished by:		Signed:	

351486



GROUND
ED
EXPERTISE

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au

PURCHASE ORDER

Date

15-May-24

PO No.

PM260283

Vendor/ Subcontractor:

Envirolab

Contact Name: Aileen / Jacinta

Deliver To:

Douglas Partners Pty Ltd

2/32 Geebung Drive, Port Macquarie NSW 2444

Requisitioner: Taanya Brown

This order covers the supply of goods, materials or services shown here, subject to the terms and conditions of the purchase order.

PO number or **Project number** and **Requisitioner** should always be quoted in your invoice.

To ensure prompt payment, please attach this PO to your invoice and email it directly to apinvoices@douglaspartners.com.au in PDF format.

Item	Description	Quantity	Unit Price	Total	Project No. & G/L Code
	Chemical testing				226965.00/512.00
Comments or Special Instructions				SUBTOTAL	
				GST/TAX	
				SHIPPING/ OTHER	
				TOTAL	

Brisbane (07) 32737 8900 • Cairns (07) 4055 1550 • Canberra (02) 6260 2788 • Central Coast (02) 4351 1422 • Coffs Harbour (02) 6650 3200 • Darwin (08) 8948 6800 • Geelong (03) 5221 0711 • Gold Coast (07) 5568 8900 • Macarthur (02) 4647 0075 • Melbourne (03) 9683 3500 • Newcastle (02) 4960 9600 • North-West Sydney (02) 4666 0450 • Perth (08) 9204 3511 • Port Macquarie (02) 6581 5992 • Sunshine Coast (07) 5351 0400 • Sydney (02) 9809 0666 • Townsville (07) 4779 9866 • Wollongong (02) 4271 1836

Registered Address: 96 Hermitage Road, West Ryde NSW 2114 • PO Box 472, West Ryde NSW 1685

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd (Port Macquarie)
Attention	Joel Cowan

Sample Login Details

Your reference	226965.00 - Hillvue
Envirolab Reference	351486
Date Sample Received	17/05/2024
Date Instructions Received	17/05/2024
Date Results Expected to be Reported	24/05/2024

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	13 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	10
Cooling Method	None
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	Phone: 02 9910 6200
Fax: 02 9910 6201	Fax: 02 9910 6201
Email: ahie@envirolab.com.au	Email: jhurst@envirolab.com.au

Analysis Underway, details on the following page:



Sample ID	VTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metals in soil	Asbestos ID - soils	Asbestos ID - soils NEPM - ASB-001	Coal Tar
8-0.5	✓	✓	✓	✓	✓	✓	✓	✓		
8-2.5	✓	✓	✓	✓	✓	✓	✓	✓		
9-1	✓	✓	✓	✓	✓	✓	✓	✓		
9-2.5	✓	✓	✓	✓	✓	✓	✓	✓		
10-0.5	✓	✓	✓	✓	✓	✓	✓		✓	
11-2	✓	✓	✓	✓	✓	✓	✓		✓	
C2-0.4	✓	✓	✓	✓	✓	✓	✓	✓		
C5-0.2	✓	✓	✓	✓	✓	✓	✓	✓		
C5-1	✓	✓	✓	✓	✓	✓	✓	✓		
C6-2	✓	✓	✓	✓	✓	✓	✓	✓		
QA	✓	✓	✓	✓	✓	✓	✓	✓		
10-2										✓
11-2										✓

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Appendix F

Data Quality Objectives

1. Data quality objectives

The DSI has been devised broadly in accordance with the seven-step data quality objectives (DQO) process which is provided in Appendix B, Schedule B2 of NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

Table 1: Data quality objectives

Step	Summary
1: State the problem	The objective of the investigation is to assess the contamination status of the site with respect to the proposed land use. The report is being undertaken as the site is to be redeveloped. The requirements of the Tamworth Regional Council, will also be considered by consulting their Development Control Plan (DCP), Local Environment Plan (LEP) and any other requirements based on our recent experience with Council on similar sites. A preliminary conceptual site model (CSM) has been prepared (Section 9) for the proposed development. The project team consisted of experienced engineers and scientists working in the roles of Project Principal, Project Reviewer, Project Manager and field staff.
2: Identify the decisions / goal of the study	The site history has identified possible contaminating previous uses which are identified in the CSM (Section 9). The CSM identifies the associated contaminants of potential concern (CoPC) and the likely impacted media. The site assessment criteria (SAC) for each of the CoPC are detailed in Appendix G. The decision is to establish whether or not the results fall below the SAC. On this basis, an assessment of the site's suitability from a contamination perspective will be derived and a decision made on whether (or not) further assessment and / or remediation will be required.
3: Identify the information inputs	Inputs will be the analytical results for the CoPC (identified in the CSM, Section 9) from NATA accredited laboratories and methods, where possible. The SAC for each of the CoPC are detailed in Appendix G. A photoionisation detector (PID) will be used on-site to screen soils for VOC. PID readings will be used to inform sample selection for laboratory analysis.
4: Define the study boundaries	The lateral boundaries of the investigation area are shown on Drawing 1, Appendix B. The vertical boundaries are to the extent of contamination impact as determined from the site history assessment and site observations. The assessment is limited to the timeframe over which the field works were undertaken. Constraints to the assessment are identified and discussed in the conclusions of the report, Section 15.
5: Develop the analytical	The decision rule is to compare all analytical results with the SAC (Appendix G, based on NEPC (2013)). Where guideline values are absent,

Step	Summary
approach (or decision rule)	other sources of guideline values accepted by NEPC (2013) shall be adopted where possible. Where a sample result exceeds the adopted criterion, a further site-specific assessment will be made as to the risk posed by the presence of that contaminant(s). Initial comparisons will be with individual results then, where required, summary statistics (including mean, standard deviation and 95% upper confidence limit (UCL) of the arithmetic mean (95% UCL)) to assess potential risks posed by the site contamination. Quality control results are to be assessed according to their relative percent difference (RPD) values. For field duplicates, triplicates and laboratory results, RPD values should generally be below 30%; for field blanks and rinsates, results should be at or less than the limits of reporting (NEPC, 2013). The field and laboratory quality assurance assessment is included in Appendix I.
6: Specify the performance or acceptance criteria	Contaminants at the site comply with the human health and environmental SAC and as such, do not pose a potentially unacceptable risk to receptors (alternative hypothesis).
7: Optimise the design for obtaining data	As the purpose of the investigation is to assess the contamination status of the site, the sampling program is reliant on professional judgement to identify and sample the potentially affected areas. Further details regarding the proposed sampling plan are presented in Section 10.

2. References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

Appendix G

Site Assessment Criteria

1. Introduction

1.1 Guidelines

The following key guidelines were consulted for deriving the site assessment criteria (SAC):

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).
- CRC CARE *Health screening levels for petroleum hydrocarbons in soil and groundwater* (CRC CARE, 2011).

1.2 General

The SAC applied in the current investigation are informed by the CSM which identified human and environmental receptors to potential contamination at the site. Analytical results are assessed (as a Tier 1 assessment) against the SAC comprising primarily the investigation and screening levels of Schedule B1 of NEPC (2013).

The following inputs are relevant to the selection and/or derivation of the SAC:

- Land use: recreational.
 - Corresponding to land use category 'C', public open space such as parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths. It does not include undeveloped public open space (such as urban bushland and reserves) which should be subject to a site-specific assessment where appropriate. It is noted that health screening levels (HSLs) for standard residential land use (HSL A) have been utilised for the assessment of soil vapour risk from petroleum hydrocarbons given the proposed development includes buildings/structures as per (NEPC, 2013).
- Soil type: Clay.

2. Soils

2.1 Health investigation and screening levels

The generic health investigation levels (HIL) and health screening levels (HSL) are considered to be appropriate for the assessment of human health risk via all relevant pathways of exposure associated with contamination at the site. The adopted soil HIL and HSL for the contaminants of concern are in Table 1 and Table 2.

Table 1: Health investigation levels (mg/kg)

Contaminant	HIL-C
Metals	
Arsenic	300
Beryllium	90
Boron	20 000
Cadmium	90

Contaminant	HIL-C
Chromium (VI)	300
Cobalt	300
Copper	17 000
Lead	600
Manganese	19 000
Mercury (inorganic)	80
Methyl mercury	13
Nickel	1200
Selenium	700
Zinc	30 000
PAH	
B(a)P TEQ	3
Total PAH	300
Phenols	
Phenol	40 000
Pentachlorophenol	120
OCP	
DDT+DDE+DDD	400
Aldrin and dieldrin	10
Chlordane	70
Endosulfan	340
Endrin	20
Heptachlor	10
HCB	10
Methoxychlor	400
OPP	
Chlorpyrifos	250
PCB	
PCB	1

Table 2: Health Screening Levels (mg/kg)

Contaminant	HSL-A&B	HSL-A&B	HSL-A&B	HSL-A&B
CLAY	0 m to <1 m	1 m to <2 m	2 m to <4 m	4 m+
Benzene	0.7	1	2	3
Toluene	480	NL	NL	NL
Ethylbenzene	NL	NL	NL	NL
Xylenes	110	310	NL	NL
Naphthalene	5	NL	NL	NL
TRH F1	50	90	150	290
TRH F2	280	NL	NL	NL

Notes to Table 2:

TRH F1 is TRH C₆-C₁₀ minus BTEX

TRH F2 is TRH >C₁₀-C₁₆ minus naphthalene

The soil saturation concentration (C_{sat}) is defined as the soil concentration at which the porewater phase cannot dissolve any more of an individual chemical. The soil vapour that is in equilibrium with the porewater will be at its maximum. If the derived soil HSL exceeds C_{sat}, a soil vapour source concentration for a petroleum mixture could not exceed a level that would result in the maximum allowable vapour risk for the given scenario. For these scenarios, no HSL is presented for these chemicals and the HSL is shown as 'not limiting' or 'NL'

The HSL for direct contact derived from CRC CARE (2011) are in Table 3.

Table 3: Health screening levels for direct contact (mg/kg)

Contaminant	DC HSL-C
Benzene	120
Toluene	18 000
Ethylbenzene	5300
Xylenes	15 000
Naphthalene	1900
TRH F1	5100
TRH F2	3800
TRH F3	5300
TRH F4	7400

Notes to Table 3:

TRH F1 is TRH C₆-C₁₀ minus BTEX

TRH F2 is TRH >C₁₀-C₁₆ minus naphthalene

2.2 Asbestos in soil

The HSL for asbestos in soil are based on likely exposure levels for different scenarios published in NEPC (2013) for the following forms of asbestos:

- Bonded asbestos containing material (ACM); and
- Fibrous asbestos and asbestos fines (FA and AF).

The HSL are in Table 4.

Table 4: Health screening levels for asbestos

Form of asbestos	HSL-C
ACM	0.02%
FA and AF	0.001%
FA and AF and ACM	No visible asbestos for surface soil *

Notes to Table 4:

Surface soils defined as top 10 cm.

* Based on site observations at the sampling points and the analytical results of surface samples.

2.3 Ecological investigation levels

Ecological investigation levels (EIL) and added contaminant limits (ACL), where appropriate, have been derived in NEPC (2013) for arsenic, copper, chromium (III), nickel, lead, zinc, DDT and naphthalene. The adopted EIL, derived using the interactive (excel) calculation spreadsheet on the NEPM toolbox website are shown in Table 6, with inputs into their derivation shown in Table 5.

Table 5: Inputs to the derivation of the ecological investigation levels

Variable	Input	Rationale
Age of contaminants	"Aged" (>2 years)	Site History
pH	5.0	Assumed
CEC	5.0 cmol _c /kg	Assumed
Clay content	10%	Maximum permissible clay as per NEPM (2013)
Traffic volumes	High	Developed area
State / Territory	NSW	Site Location

Table 6: Ecological investigation levels (mg/kg)

Contaminant	EIL-A-B-C
Metals	
Arsenic	100
Copper	110
Nickel	35
Chromium III	410
Lead	1100
Zinc	250
PAH	
Naphthalene	170
OCP	
DDT	180

Notes to Table 6:
 EIL-A-B-C urban residential and public open space

2.4 Ecological screening levels

Ecological screening levels (ESL) are used to assess the risk of selected petroleum hydrocarbon compounds, BTEX and benzo(a)pyrene to terrestrial ecosystems. The adopted ESL are shown in Table 7.

Table 7: Ecological screening levels (mg/kg)

Contaminant	Soil Type	ESL-A-B-C
Benzene	Coarse	50
Toluene	Coarse	85
Ethylbenzene	Coarse	70
Xylenes	Coarse	105
TRH F1	Coarse/ Fine	180*
TRH F2	Coarse/ Fine	120*
TRH F3	Coarse	300
TRH F4	Coarse	2800
B(a)P	Coarse	0.7
Benzene	Fine	65
Toluene	Fine	105
Ethylbenzene	Fine	125
Xylenes	Fine	45
TRH F1	Coarse/ Fine	180*
TRH F2	Coarse/ Fine	120*
TRH F3	Fine	1300
TRH F4	Fine	5600
B(a)P	Fine	0.7

Notes to Table 7:

ESL are of low reliability except where indicated by * which indicates that the ESL is of moderate reliability

TRH F1 is TRH C₆-C₁₀ minus BTEX

TRH F2 is TRH >C₁₀-C₁₆ including naphthalene

ESL-A-B-C urban residential and public open space

2.5 Management limits

In addition to appropriate consideration and application of the HSL and ESL, there are additional considerations which reflect the nature and properties of petroleum hydrocarbons, including:

- Formation of observable light non-aqueous phase liquids (LNAPL);
- Fire and explosion hazards; and
- Effects on buried infrastructure e.g. penetration of, or damage to, in-ground services.

The adopted management limits are in Table 8.

Table 8: Management limits (mg/kg)

Contaminant	Soil type	ML-A-B-C
TRH F1	Coarse	700
TRH F2	Coarse	1000
TRH F3	Coarse	2500
TRH F4	Coarse	10 000
TRH F1	Fine	800
TRH F2	Fine	1000
TRH F3	Fine	3500
TRH F4	Fine	10 000

Notes to Table 8:

TRH F1 is TRH C₆-C₁₀ including BTEX

TRH F2 is TRH >C₁₀-C₁₆ including naphthalene

ML-A-B-C residential, parkland and public open space

3. References

CRC CARE. (2011). *Health screening levels for petroleum hydrocarbons in soil and groundwater*. Parts 1 to 3, Technical Report No. 10: Cooperative Research Centre for Contamination Assessment and Remediation of the Environment.

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

Appendix H

Field Work Methodology

1. Guidelines

The following key guidelines were consulted for the field work methodology:

- NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013).

2. Soil sampling

Soil sampling is carried out in accordance with Douglas' standard operating procedures. The general sampling and sample management procedures comprise:

- Collect soil samples directly from the excavator bucket at the nominated sample depth;
- Transfer samples in laboratory-prepared glass jars with Teflon lined lids by hand, capping immediately and minimising headspace within the sample jar;
- Collect replicate samples in zip-lock bags for photoionisation detector (PID) screening;
- Collect ~500 ml samples for fibrous asbestos and asbestos fines (FA and AF) analysis;
- Wear a new disposable nitrile glove for each sample point thereby minimising potential for cross-contamination;
- Collect 10% replicate samples for quality control (QC) purposes;
- Label sample containers with individual and unique identification details, including project number, sample location and sample depth (where applicable);
- Place samples into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

2.1 Field testing

Field testing is carried out in accordance with Douglas' standard operating procedures. The general sampling and sample management procedures comprise:

PID field test

- Calibrate the PID with isobutylene gas at 100 ppm and with fresh air prior to commencement of each successive day's field work;
- Allow the headspace in the PID zip-lock bag samples to equilibrate; and
- Screen using the PID.

3. References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

Appendix I

Data Quality Control Assurance and Quality Control

1. Field and Laboratory Data Quality Assurance and Quality Control

The field and laboratory data quality assurance and quality control (QA/QC) procedures and results are summarised in the following Table 1. Reference should be made to the field work methodology and the laboratory results / certificates of analysis for further details. The relative percentage difference (RPD) results, along with the other field QC samples are included at the end of this appendix.

Table 1: Field and laboratory quality control

Item	Evaluation / acceptance criteria	Compliance
Analytical laboratories used	NATA accreditation	C
Holding times	Various based on type of analysis	C
Intra-laboratory replicates	10% of primary samples; <30% RPD	PC
Laboratory Duplicate	1 per lab batch; As laboratory certificate	PC
Matrix Spikes	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Surrogate Spikes	All organics analysis; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Control Samples	1 per lab batch; 70-130% recovery (inorganics); 60-140% recovery (organics)	C
Standard Operating Procedures (SOP)	Adopting SOP for all aspects of the sampling field work	C

Notes Table 1:

C - compliance

PC - partial compliance

NC - non-compliance

1.1 Intra-laboratory replicates

The RPD results were all within the acceptable range, with the exception of those indicated in Table QA1 (results in bold) with the exception of Nickel. The exceedances are not, however, considered to be of concern given that:

- The actual differences in the concentrations of the replicate pairs where RPD exceedances occurred were typically low;
- The replicate pairs were collected from fill soils which by its nature are heterogeneous;
- Replicates, rather than homogenised duplicates, were used to minimise risk of volatile loss, hence greater analytical variability between replicate pairs can be expected;
- The RPD results from a replicate pair were within the acceptable limits; and
- All other QA/QC parameters met the data quality indicators.

1.2 Laboratory Duplicates

The RPD results for the laboratory duplicates were all within the acceptable range, with the exception of one sample for Nickel. The laboratory therefore conducted a triplicate sample test. The primary, field duplicate, lab duplicate and lab triplicate results were all within same order of magnitude and below the site assessment criteria and are therefore considered acceptable.

1.3 Summary

In summary, the QC data is determined to be of sufficient quality to be considered generally acceptable for the assessment.

2. Data Quality Indicators

The reliability of field procedures and analytical results was assessed against the following data quality indicators (DQI) as outlined in NEPC *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]* (NEPC, 2013):

- Completeness: a measure of the amount of usable data from a data collection activity;
- Comparability: the confidence (qualitative) that data may be considered to be equivalent for each sampling and analytical event;
- Representativeness: the confidence (qualitative) of data representativeness of media present on-site;
- Precision: a measure of variability or reproducibility of data; and
- Accuracy: a measure of closeness of the data to the 'true' value.

Table 2: Data quality indicators

Data quality indicator	Method(s) of achievement
Completeness	Preparation of borehole and test pit logs, sample location plan and chain of custody records.
	Laboratory sample receipt information received confirming receipt of samples intact and appropriateness of the chain of custody.
	Samples analysed for contaminants of potential concern (COPC) identified in the conceptual site model (CSM).
	Completion of chain of custody (COC) documentation.
	NATA accredited laboratory results certificates provided by the laboratory.
	Satisfactory frequency and results for field and laboratory quality control (QC) samples as discussed in Section 1.
Comparability	Using appropriate techniques for sample recovery, storage and transportation, which were the same for the duration of the project.
	Experienced sampler used.
	Use of NATA registered laboratories, with test methods the same or similar between laboratories.
	Satisfactory results for field and laboratory QC samples.
Representativeness	Target media sampled.
	Sample numbers recovered and analysed are considered to be representative of the target media and complying with DQO.
	Samples were extracted and analysed within holding times.
	Samples were analysed in accordance with the COC.
Precision	Field staff followed standard operating procedures.
	Acceptable RPD between original samples and replicates.
	Satisfactory results for all other field and laboratory QC samples.
Accuracy	Field staff followed standard operating procedures.
	Satisfactory results for all field and laboratory QC samples.

Based on the above, it is considered that the DQI have been generally complied with.

3. Conclusion

Based on the results of the field QA and field and laboratory QC, and evaluation against the DQI it is concluded that the field and laboratory test data obtained are generally reliable and useable for this assessment.

4. References

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

Table QA1: Relative Percentage Difference Results – Soil Sampling

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority metals								Priority PAH				PAH											
						Total Arsenic	Cadmium	Total Chromium	Copper	Lead	Mercury (inorganic)	Nickel	Zinc	^b Naphthalene	Benzo(a)pyrene (BaP)	Benzo(a)pyrene TEQ (BaP TEQ)	Total PAH	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a,h,i)perylene	Chrysene	Dibenzo(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene
351486	9	1m	07/05/24	Soil	mg/kg	5	<0.4	20	39	11	<0.1	19	56	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
351486	QA	0 m	07/05/24	Soil	mg/kg	4	<0.4	26	37	9	<0.1	27	51	<1	<0.05	<0.5	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			Difference		mg/kg	1	0	6	2	2	0	8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	22%	0%	26%	5%	20%	0%	35%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	Priority TRH						TRH		BTEX				Priority OCP											
						TRH C6 - C10	TRH >C10-C16	F1 ((C6-C10)-BTEX)	F2 (>C10-C16 less Naphthalene)	F3 (>C16-C34)	F4 (>C34-C40)	TRH C6 - C9	TRH C10-C36	Benzene	Toluene	Ethylbenzene	Total Xylenes	DDT+DDE+DDD ^c	Aldrin + Dieldrin	Total Chlordane	Total Endosulfan	Endrin	Heptachlor	Hexachlorobenzene	Methoxychlor	Mirex			
351486	9	1m	07/05/24	Soil	mg/kg	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
351486	QA	0 m	07/05/24	Soil	mg/kg	<25	<50	<25	<50	<100	<100	<25	<50	<0.2	<0.5	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			Difference		mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Lab Report No	Sample ID	Depth	Sample Date	Sample Type	Units	OCP						Priority OPP	OPP														PCB	Additional PhysChem	
						Heptachlor Epoxide	Endrin Aldehyde	alpha-BHC	beta-BHC	delta-BHC	Lindane	Chlorpyrifos	Azinphos methyl (Guthion)	Bromophos-ethyl	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Ronnel (fenchlorphos)	Fenitrothion	Fenthion	Malathion	Parathion	Parathion-methyl	Methidathion	Fenamiphos	Total PCB	Moisture
351486	9	1m	07/05/24	Soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	210,000
351486	QA	0 m	07/05/24	Soil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	230,000
			Difference		mg/kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20,000
			RPD		%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%