



**PRELIMINARY DESKTOP REVIEW –
GEOTECHNICAL**
Gillieston Public School redevelopment and
new Public Preschool

17 January 2025

Prepared for:
Department of Education

Prepared by:
Stantec Australia Pty Ltd

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Executive Summary

Stantec Australia Pty Ltd was engaged by Department of Education (DoE) to complete a Preliminary Desktop Geotech Report (PDGR) for Gillieston Public School at 100 Ryans Road, Gillieston Heights, NSW (the site). At the time of preparing this report, this was the site assessed, however it is noted that the REF site boundary also includes Lot 2 DP1308605, located at 19 Northview Street.

DoE are in the process of developing plans approval requirements, the proponent is required to undertake a desktop investigation, to determine the suitability of the land for the proposed land use(s).

The primary objectives of this investigation were to outline the likely ground profile, provide preliminary geotechnical comments for design and construction, identify any potential geotechnical issues related to the proposed activity and make recommendation for further geotechnical investigation that may be required for design purposes. Specifically, the following aspects were identified in the PDGR:

- Estimated subsurface conditions including Acid Sulphate Soils (ASS), Salinity and groundwater;
- Excavatability of likely materials and vibration control comment during construction;
- Foundation options; and,
- Anticipated geotechnical issues.

Upon completion of the agreed scope of activity the following was concluded:

- > Referenced to regional 1:100,000 Geological Series Sheet, the site is underlain by Branxton Formation (Pmtb) with the lithology of conglomerate, sandstone, siltstone from Maitland Group.
- > Referenced to regional 1:100,000 Soil Landscape Sheet, the site is predominantly located on Bolwarra Heights Landscape (9232bh), which soil contains moderately deep (<150cm) well-drained Yellow Podzolic Soils, Brown Podzolic Soils with some moderately deep (<100cm) well drained Lithosols on crests, moderately deep (<140cm) imperfectly drained yellow Soloths on lower slopes.
- > Based on previous investigation records around the site, the expected subsurface conditions comprise topsoil and residual clay overlying relative shallow sandstone. Northwestern portion of the site could encounter deeper residual soil or alluvial deposit as it sits close to the alluvium river area.
- > The site is classified as the area of moderately salinity potential and acid sulfate Class B depicting as low probability of occurrence of 6 - 70 %.
- > Excavation will be limited to general leveling only for the proposed school buildings and is expected to be within soil and extremely low to low strength sandstone at shallow depth, which can be readily excavated using conventional earthmoving equipment.
- > Shallow footings comprising strip or pad footings founded and socketed a nominal 0.5m into the underlain residual stiff to very stiff soil may be designed for a serviceability end bearing capacity of 150 kPa. Should higher bearing capacity be required, piers may be required and socked 0.5m into the underlain highly weathered sandstone could be designed for a serviceability end bearing capacity of 700kPa.
- > Site risk assessment is made, and recommendations are listed in the Section 3.6 of this report.
- > Further investigation shall include at least eight (8) geotechnical investigatory boreholes across the site.





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Activity

The Gillieston Public School have been identified by the NSW Department of Education (DoE) as requiring redevelopment. The proposed Gillieston Public School redevelopment and new public preschool is driven by service need including increase in expected student enrolments and the and removing demountable structure and replacement with permanent teaching spaces.

The Gillieston Public School redevelopment and new public preschool comprises the following activity:

- > Demolition and removal of existing temporary structures.
- > Site preparation activity, including demolition, earthworks, tree removal.
- > Construction of new:
 - 32 permanent general learning spaces and 3 support teaching spaces
 - Administration and staff hubs
 - Hall, canteen and library
 - Out of school hours care
 - Public preschool (standalone building for 60 places)
 - Covered Outdoor Learning Areas (COLAs)
 - Outdoor play areas, including games courts and yarning circle
 - New at-grade car parking
 - Extension of the existing drop-off / pick-up area and new bus bay
 - Realignment of the existing fencing
 - Associated stormwater infrastructure upgrades
 - Associated landscaping
 - Associated pedestrian and road upgrade activity

1 Introduction

Stantec Australia (formerly Cardno) was engaged by DoE to complete a Preliminary Desktop Geotech Report (PDGR) for Gillieston Public School, which is located at 100 Ryans Road, Gillieston Heights, NSW (the site). At the time of preparing this report, this was the site assessed, however it is noted that the REF site boundary also includes Lot 2 DP1308605, located at 19 Northview Street.

The site location and site layout are depicted on **Appendix A – Site Plan**.

The scope of work for this investigation was completed in accordance with work order DDWO03878/22.

1.1 Background and Proposed Activity

Gillieston Public School is located in Gillieston Heights which is a suburb of the City of Maitland local government area in the Hunter Region of New South Wales. It is located at the vicinity of residential properties and Hunter Land Management. The site's infrastructure is predominantly located in the West portion of site and surrounded by open grass areas.

At the time this report was produced it was understood that the proposed activity will include demolition of the existing facilities and the construction of new school buildings with carparks.

No basement will be proposed. Earthworks will be limited to site general levelling only.

1.2 Objectives

The objectives of this preliminary geotechnical desktop review (PGDR) are to outline the likely ground profile, provide preliminary geotechnical comments for design and construction, identify any potential geotechnical issues related to the proposed activity and make recommendation for further intrusive geotechnical investigation (IGI) that may be required for design purposes.

1.3 Scope of Geotechnical Works

The following scope of geotechnical works was carried out to meet the objectives (outlined above in **Section 2**) of this investigation is summarised below:

> Desktop Study:

- Identify the site location and provide a legal description of the property.
- Provide a description of the regional geology, hydrogeology, soil landscape and potential acid sulphate soils risk based on available information.
- Describe the site topography, drainage, water features (if any) and likely ground conditions.
- Preliminary recommendations to include site classification to AS2870-2011, suitable foundation types, groundwater considerations, and impacts for adjoining structures.
- Recommendation for further intrusive geotechnical investigation (IGI) that may be required for design purposes.
- Include a risk assessment matrix assessing and ranking potential geotechnical risks to the project.



2 Significance of Environmental Aspects

Based on the identification of potential impacts and an assessment of the nature and extent of the impacts of the proposed activity, it is determined that all potential impacts can be appropriately mitigated to ensure that there is minimal impact on the locality, community and/or the environment.

See Section 7 for further details.

3 Site Details

The Site is identified as 100 Ryans Road and 19 Northview Street, Gillieston Heights, legally described as Lot 51 DP 1162489 and Part Lot 2 DP 1308605.

The Site is located within the Maitland Local Government Area (LGA) and is zoned RU2 Rural Landscape and R1 General Residential zone under the provisions of the Maitland Local Environmental Plan 2011 (MLEP2011).

Existing attributes of the subject site are noted as follows:

- > The subject site exhibits an area of approximately 23,385m² and is located in the suburb of Gillieston Heights;
- > The subject site has a frontage to Ryans Road to the east, Gillieston Road to the north, and Northview Street to the south;
- > In its existing state, the subject site comprises the existing Gillieston Public School. Existing school buildings are primarily located in the west portion of the subject site with a large area of open space situated in the eastern portion. There are limited permanent structures located on the subject site with thirteen (13) existing demountable classrooms currently occupying the subject site. Permanent buildings consist of the Main Administration Building, Original Brick Cottage, Library and GLS building located in the centre of the subject site; and
- > Carparking is provided from Gillieston Road for staff. Pedestrian access is available via this main entrance from Gillieston Road and via a separate pedestrian-only access gates on Northview Street and Ryans Road.

The existing site context is shown in **Figure 1** and **Figure 2** below.



Preliminary Desktop Review – Geotechnical
Gillieston Public School redevelopment and new public preschool

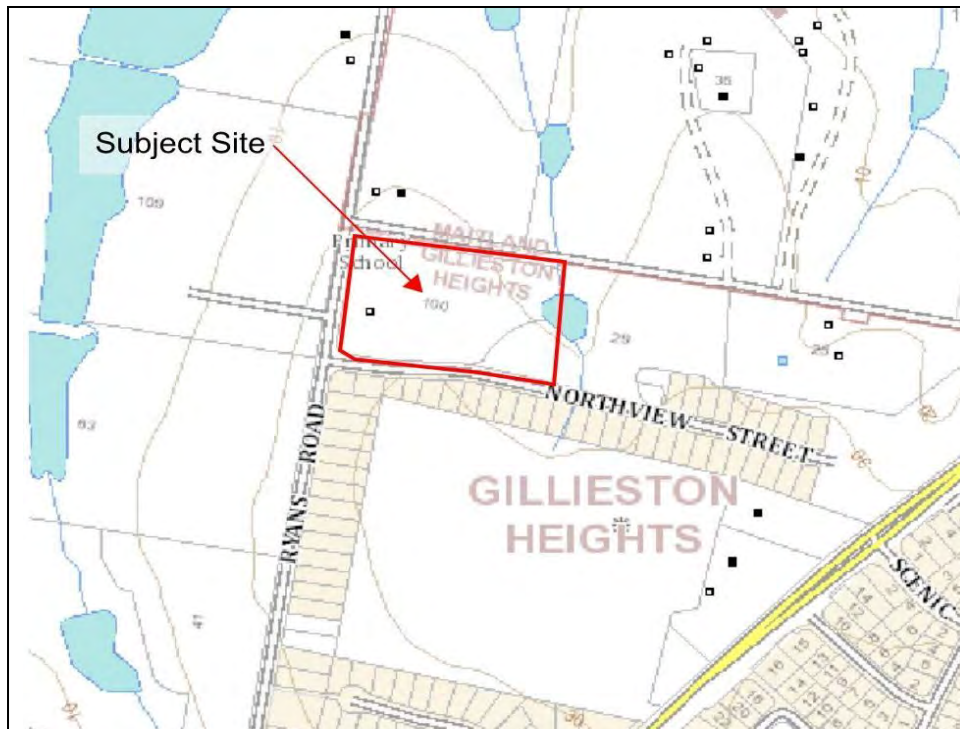


Figure 1 – Cadastral Map (Source: NSW Spatial Viewer, 2024)

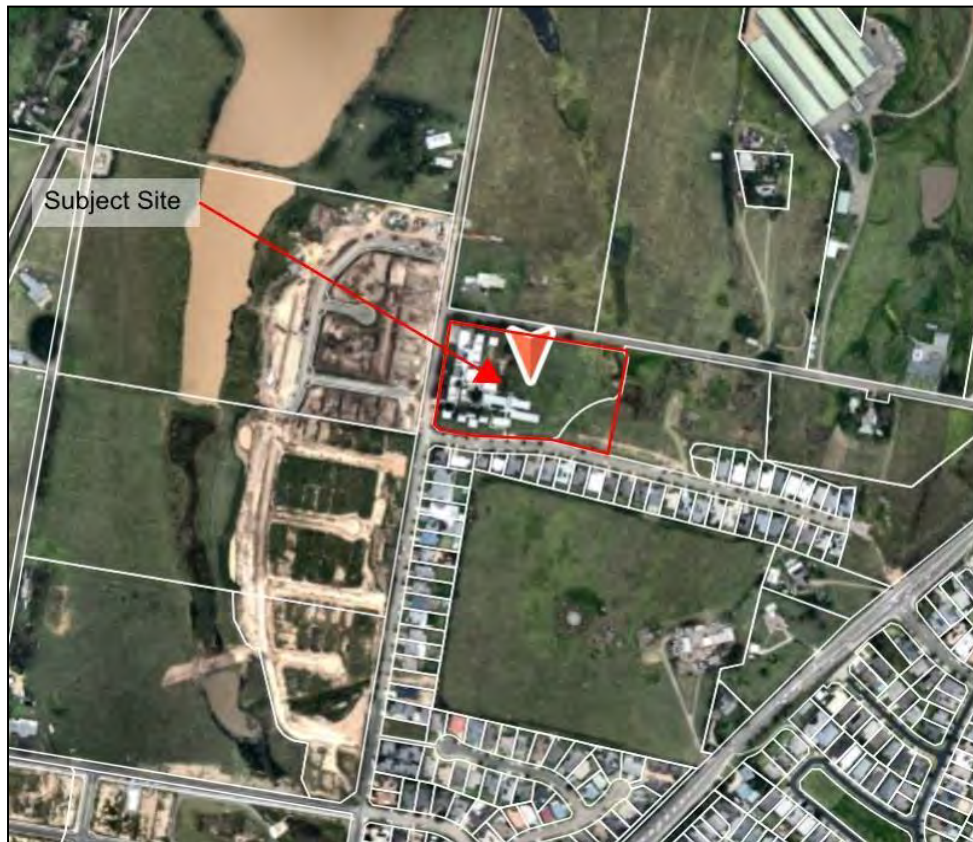


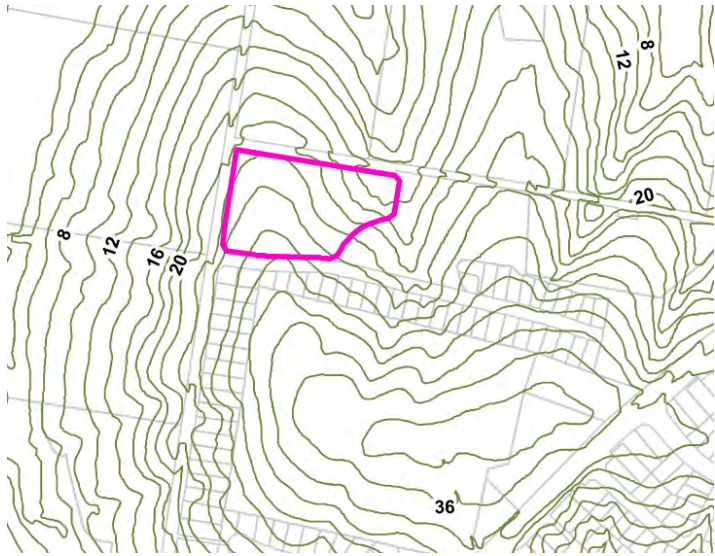
Figure 2 – Site Aerial Map (Source: Near Map, 2024)



3.1 Assessed Site Details

Site details that were assessed during the initial revision of this report and related to the site are included in **Table 3-1** below whilst site features are shown in **Appendix A**.

Table 3-1 Site Details

Details	Comments
Site address	100 Ryans Road, Gillieston Heights, NSW 2321
Applicable Lot and Deposited Plan	51/DP1162489
Current land use	The land is currently used Gillieston Public School. This consists of school infrastructure and open grass areas.
Proposed land use	To Stantec's knowledge the selected land will be used for facilities, buildings and infrastructures activity to accommodate the increased local enrolment demand. No basement will be proposed. Earthwork will be limited to site general levelling only.
Local Government Authority (LGA)	City of Maitland Local Government Area
Current zoning (Maitland Local Environmental Plan 2011)	RU2: Rural Landscape, and R1: General Residential
Site coordinates (GDA1994 – MGA56)	362417.343, 6375244.41
Regional Contour (mAHD) (Referenced to 2022 Lotsearch)	<p>Site dips down North generally from about RL 30m at the South of the site to about RL 24m.</p> 

3.2 Surrounding Land Use

The land uses immediately surrounding the site were identified using aerial imagery and are summarised below in **Table 3-2**. The site and surrounding land uses are shown in **Appendix A**.

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Table 3-2 Surrounding Land Use

Direction	Land Use or Activity
North	Gillieston Road and low-density residential properties
East	Low-density residential properties followed by Brave Cosmetics and Aquilina Auto Electrical Mobile Service
South	Northview Street, General residential properties followed by Hunter Land Management
West	Ryans Road, Rural Landscapes, an unnamed creek followed by Low-density residential properties

3.3 Regional and Site Settings

Site setting information, as listed within publicly available data sets, is summarised in **Table 3-3**.

Table 3-3 Site Setting Information

Item	Details
Regional Soil Landscape	<p>NSW DPIE <i>eSPADE</i> v2.1 website indicates that the site overlies on Bolwarra Heights Landscape (9232bh), which has the following characteristics:</p> <ul style="list-style-type: none"> • Landscape—rolling low hills on Permian sediments in the centre-west of the sheet in the East Maitland Hills region. Slopes are 5–20%, elevation to 100 m, local relief to 80 m. Cleared tall open-forest. • Soils—moderately deep (<150cm) well-drained Yellow Podzolic Soils, Brown Podzolic Soils with some moderately deep (<100cm) well drained Lithosols on crests, moderately deep (<140cm) imperfectly drained yellow Soloths on lower slopes. • Qualities and Limitations—moderate foundation hazard, water erosion hazard, high run-on (localised), seasonal waterlogging (localised), localised steep slopes with mass movement hazard.
Atlas of Australian Soils	<p>Atlas of Australian Soils indicated that the site overlies on unit Gb10 which is described as River terraces, levees, flood-plains, coastal swamps, and tidal flats. This unit contains the same land forms and soils as unit Gb9, but in addition has (i) swamps and levees of the lower river flood-plain of (Uf6.6), (Ug5), and other undescribed soils; (ii) estuarine flats of peaty or organic soils over acid clays; and (iii) tidal mud flats. The soils of these areas are not well known but probably have similarities with the soils of units J3, Mc4, NY1, and NN1. The smaller areas mapped as unit Gb10 consist mainly of areas of (i) and/or (iii) above. Gb9 is described as River terraces and flood-plains: chief soils are dark friable loamy soils (Um6.11) locally underlain by either sandy or clayey substrata, and occurring on the middle river terraces. Associated are hard alkaline dark soils (Ddl.33 and Ddl.43), and/or friable dark soils (Dd3.12), and/or hard alkaline brown soils (Dbl.33) on terrace remnants flanking the valley slopes; siliceous sands (Ucl.23) on low terraces adjoining the river; and local areas of various soils including (Ug5.15), (Ug5.16) and possibly (Ug5.4), (Dbl), and (Dy) soils. Locally the (Ug5) soils may form soil complexes with the (Dd) and (Db) soils.</p>
Regional Geology	<p>The MinView NSW surface geology (ge612) online map illustrates that the subject site is underlain by Branxton Formation (Pmtb) of the Maitland Group from Radian age. The map shows the site is underlain by Branxton Formation (Pmtb) which is characterised as dominantly conglomerate, sandstone, siltstone.</p>
Regional Groundwater	<p>The Lotsearch report (LS038890 EP) with data sourced from WaterNSW showed no registered groundwater bores within a 500 m radius of the site. The nearest bore was GW201877, a stock and domestic bore 1258 m north east of site.</p>
Surface Water Bodies	<p>The nearest surface water body is an unnamed creek, which surrounds the site in an unenclosed oval shape with a minor radius of 250m and major radius of 530m approximately.</p>
Acid Sulfate Soils	<p>The NSW Government Planning Industry and Environment online mapping tool, <i>eSPADE</i> Version 2.1, indicates that the site is not mapped as being situated within or near an ASS risk area. The nearest mapped ASS risk area is approximately 250m east in an unnamed creek, which is identified as H1, High probability <1 m below ground surface.</p>



Item	Details
Salinity	The Lotsearch report (LS038890 EP) with data sourced from National Land and Water Resources Audit demonstrates the existence of Dryland Salinity. The Dryland Salinity assessment result is given as High hazard or risk.

3.4 Site Description

The site is in an irregular shape with dimension of approximately 195 m x 116 m, covering an area of about 20643m². It is bounded by Gillieston Road and low-density residential properties to the North, low-density residential properties followed by Brave Cosmetics and Aquilina Auto Electrical Mobile Service to the East, Northview Street, General residential properties followed by Hunter Land Management to the South, Ryans Road, Rural Landscapes, an unnamed creek followed by Low-density residential properties to the West. The site is currently occupied by Gillieston Public School.

3.5 Geology

The 1:100,000 Geological Series Sheet provided in **Appendix – B** indicates that the site is underlain by Branxton Formation (Pmtb) with the lithology of conglomerate, sandstone, siltstone from Maitland Group. The site is also adjacent to:

- Alluvial backswamp deposits (Q_ab) to the north west, described as Organic-rich mud, peat, silt, clay, and
- Alluvial terrace deposits (QP_at) to north, described as silt, clay, (fluvially- deposited) fine to medium grained quartz-lithic sand, polymictic gravel from Quaternary age, and
- Alluvial valley deposits (Q_av) to north east, described as silt, clay, (fluvially deposited) lithic to quartz-lithic sand, gravel from Quaternary age, and
- Greta Coal Measures (Pgr) to west, described as sandstone, siltstone, pellet claystone, coal, chert, sporadic conglomerate from Permian age, and
- Muree Sandstone (Pmtu) to east, described as fine- to coarse-grained sandstone, conglomerate, minor claystone from Radian age.

The Central and Eastern NSW 1:100,000 Soil Landscape Sheet indicates that the site is entirely located on Bolwarra Heights (9232bh) depicts as moderately deep (<150cm) well-drained Yellow Podzolic Soils, Brown Podzolic Soils with some moderately deep (<100cm) well drained Lithosols on crests, moderately deep (<140cm) imperfectly drained yellow Soloths on lower slopes, also provided in **Appendix C**.

3.6 Likely Subsurface and Groundwater Condition

No geotechnical investigation was recorded previously undertaken in the vicinity of the Gillieston Public School by DoE.

Based on review of available information, the likely subsurface condition at the subject site comprises:

- **Topsoil / Loam** – Brown colour cohesive topsoil and loam to depths ranging from 0.0 m – 2.0 m, overlying;
- **Residual Clay/ Silty Clay** – Brown coloured clay, medium to high plasticity, depth ranging from 0.2 m to 3.0 m.
- **Sandstone** – likely starting depth ranging between 0.50 m to 5.0m, brown and grey, inferred very low strength and highly weathered at the shallow depths.



Considering no basement is proposed and activity will be limited to earthwork levelling only. It is anticipated the proposed earthwork will not intersect with the groundwater table.

With referenced to the Atlas of Australian Acid Sulfate Soils, it classifies the site as Class B depicting as low probability of occurrence, 6-70% chance of occurrence with occurrences in small, localised areas within proposed activity site. Acid Sulfate Soil risk map is provided in **Appendix E**.

4 Geotechnical Comments

4.1 Excavation and Earthwork

Excavation will be limited to general levelling only for the proposed school buildings and is expected to encounter mostly soil and very low to low strength sandstone at a likely shallow depth. Medium to very high strength rock is expected in the deeper depths and therefore it is unlikely to be countered on the proposed earthwork.

Excavation of soil and very low to low strength rock may be readily achieved using conventional earthmoving equipment. Ripping or hammering may not be required for the proposed earthwork. However, considering the condition of the structures within the school, the induced vibration level control will be required to avoid impacting the adjacent properties.

Induced vibrations in structures adjacent to the excavation should not exceed a Peak Particle Velocity (PPV) of 10mm/sec for brick or unreinforced structures.

If vibrations in adjacent structures exceed the values recommended above or appear excessive during construction, excavation should cease and the project Geotechnical Engineer should be contacted immediately for appropriate reviews so that counter- measures/actions can be taken.

Earthwork should be carried out in compliance with AS3798-2007 "Guidelines on earthworks for commercial and residential developments".

4.2 Site Classification and Subgrade Preparation

It is considered that the subsurface conditions comprise topsoil overlying residual clay materials and sandstone. An expected site classification of "Class M – Moderately reactive clay or silt site, which may experience moderate ground movement from moisture change" can be adopted (if applicable) for footings constructed in accordance with AS2870-2011. Additional lab tests during intrusive investigation will be required to verify this site classification.

The following site preparation measures are recommended:

- Remove all topsoil, fill and deleterious materials (including roots/vegetation);
- Proof roll and compact the exposed subgrade to at least 98% MMDD at +/- 2% OMC. Where the proof roll reveals soft-spots these should be excavated and replaced with approved engineering fill;



4.3 Temporary and Permanent Batter Slopes

Careful consideration must be given to the planning and design of excavation and excavation retention system (if required) to reduce the risks of destabilising and causing damage to the adjacent school structures and surrounding public footpaths/roads. As with any excavation (if any) some movement of the surrounding ground should be expected, the extent of which will depend on the encountered ground profile, support type and other factors such as stress relief in medium strength rock.

4.3.1.1 Temporary Cuts

Where open cuts are required as part of temporary activity during ground support. Recommendations for temporary unsupported cuts batters (if required) are presented in the following table:

Table 4-1 **Cut Batter Recommendations**

Geotechnical profile	Temporary Batter (Horizontal to Vertical Ratio)
Fill	2.5H:1V
Residual Soil	1.5H:1V
Sandstone Class IV - V	1V:2H

Notes:

1. Table 3-1 applies to temporary unsupported cut batters only, for a period of no greater than 3 months once constructed
2. Temporary batters apply to cuts no greater than 1.50m in vertical height. Where deeper cuts are proposed for each stratum, further geotechnical designed support or retention systems may be required.
3. Excavations in soil have assumed no groundwater table has been encountered;
4. The ground surface at the crest of the excavation is horizontal;
5. There is no surcharge at the crest of the excavation for a distance equal to the depth of the excavation;
6. All cuts are protected from erosion.

4.3.1.2 Permanent Cuts

Where permanent cuts will be required, it is proposed following measures would potentially be required.



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Table 4-2 Permanent Options

Geotechnical Profile	Permanent Options	Additional Comments
Fill	<ul style="list-style-type: none"> > Regrade batter – potentially strip and replace > Soil nail and shotcrete 	Due to variability of material in fill stratum, the existing fill where cuts are required, the fill recommended to be removed and replaced with controlled fill.
Residual Soils	<ul style="list-style-type: none"> > Regrade batter slope > Soil nail and shotcrete 	Residual soil encountered across subject site
Sandstone Class IV – V	<ul style="list-style-type: none"> > Regrade batter > Scaling, block removal and reprofiling > Rock / spot bolting > Rock fall netting > Catch fence and ditches 	Requires geotechnical input / site observations during top-down excavation activities to determine extend of stabilization options required

4.4 Expected Structural Foundations

Shallow footings comprising strip or pad footings founded and socketed a nominal 0.5m into the underlain residual stiff to very stiff soil may be designed for a serviceability end bearing capacity of 150 kPa.

Should higher bearing capacity be required, piers may be required and socked 0.5m into the underlain highly weathered sandstone could be designed for a serviceability end bearing capacity of 700kPa.

Foundations proportioned on the basis of the above allowable parameters would be expected to experience total settlements of less than 1% of the footing width (or pile diameter) under the applied working load, with differential settlements between adjacent columns expected to be less than half of this value.

All footings will need to be inspected by a geotechnical engineer to confirm that foundation conditions are suitable for the design parameters.

4.5 Groundwater

It is anticipated that groundwater will be associated with seepage flows along the interface of the residual clay and bedrock and also minor seepage through fractures and joints in the rock above the permanent regional groundwater table. Considering the proposed earthwork will be limited to general levelling only, it is anticipated the proposed earthwork will not intersect with the groundwater table.



4.6 Site Risk Assessment

Site risk assessment are listed below for DoE consideration and site plan is shown on the Appendix A.

Figure 3-1: Site Risk Assessment



Table 4-3 Site Risk Considerations

High Risk Area	
Cut and Fill operation	Minor levelling only across the site. Cut and fill operation will be required.
Subsurface condition	Possible relative thicker fill profile, overlying residual and sandstone. Residual soil is relative thicker and may encounter alluvial deposit at the north-western end of the site.
Expected foundation	Possible deep piers foundation required for foundation, pending to the fill and residual soil thickness.
Acid sulphate and Salinity	Low risk for ASS. Moderate to high salinity potential
Contamination	Higher potential due to the thicker fill profile and existing utilites.

High Risk Area	
Conclusion	This area is considered as high risk for variable subsurface conditions and associated geotechnical constraints, such as variable structural foundation requirement, and vibration impact to nearby receivers.

5 Further Investigation

Geotechnical investigation will be required on site to confirm the subsurface conditions and to inform aspects of the design and construction of the proposed building. In particular, confirmation of the subsurface conditions of the subsurface soil and bedrock.

It is expected that at least eight (8) boreholes to min 5m or 2m of rock core will be required. Lab tests recommended include:

- Atterberg Limit with Linear Shrinkage for site classification;
- Grading for subsurface condition assessment;
- CBR for future pavement assessment;
- Durability, ASS, Salinity tests; and
- Rock point load test and UCS tests for rock classification.

6 Conclusion

The following provides a summary of the conclusions and recommendations with regard to the preliminary geotechnical desktop review that was undertaken by Stantec for the DoE.

The following conclusions can be drawn from Stantec's preliminary desktop review undertaken; however, the preceding sections of this report should be read for a full description of the conclusions:

- > Preliminary geotechnical desktop review was undertaken for the proposed school redevelopment of 100 Ryans Road, Gillieston Heights, NSW 2321.
- > The subsurface condition information is expected as topsoil and residual clay / shaly clay followed by relative shallow sandstone.
- > The site is classified as the area of moderate to high salinity potential.
- > The site is classified as Australian acid sulfate soils Class B, depicting as low probability of occurrence, 6-70% chance of occurrence with occurrences in small, localised areas within proposed activity site.
- > Earthwork should be carried out in compliance with AS3798-2007 "Guidelines on earthworks for commercial and residential developments".
- > Geotechnical recommendations on earthwork and foundation options are discussed in Section 3.



7 Mitigation Measures

See the below table that outlines the appropriate mitigation measures for geotechnical risks outlined in this report.

Table 7-1 Mitigation Measures

Project Stage Design (D) Construction (C) Operation (O)	Mitigation Measures	Relevant Section of report
D / C	Intrusive geotechnical investigation to determine subsurface conditions and construction details of proposed buildings/ footings	Section 4 and Section 5



8 Limitations

Preliminary Geotech Desktop Review – Gillieston Public School (PGDR) for the purpose and objectives and scope identified in this report.

The agreed scope of this assessment has been limited for the current purposes of the Client. Subsurface conditions may vary considerably away from the sample locations where information has been obtained.

This Document has been provided by Stantec subject to the following limitations:

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Appendix A Site Plans



Site Diagram

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321



Legend

- █ Site Boundary
- █ Internal Parcel Boundaries

Total Area: 20643m²

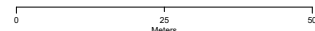
Total Perimeter: 592m

Disclaimers:

Measurements are approximate only and may have been simplified or smaller lengths removed for readability.

Parcels that make up a small percentage of the total site area have not been labelled for increased legibility.

Scale:



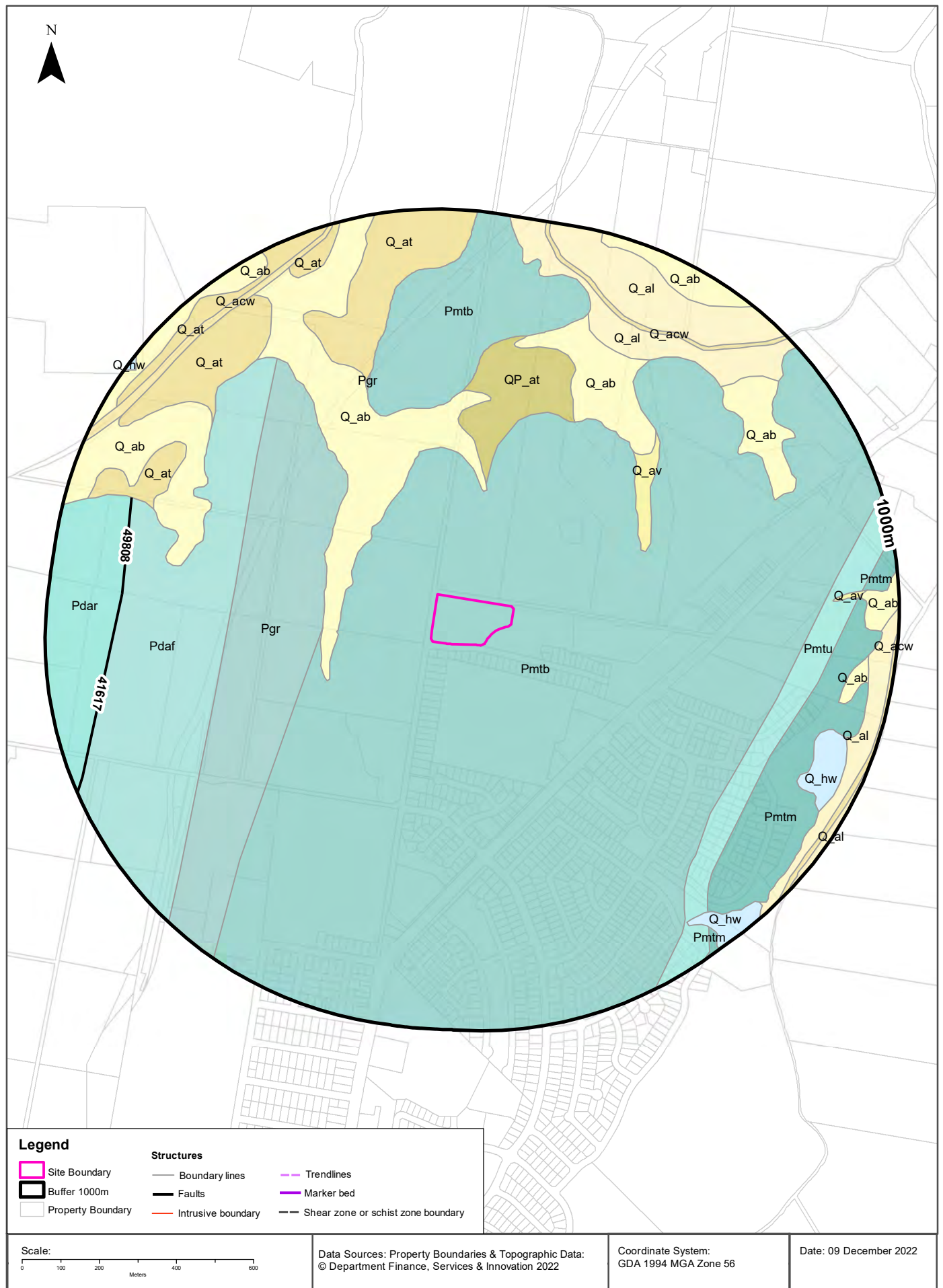
Data Source Aerial Imagery:
© Aerometrex Pty Ltd

Coordinate System:
GDA 1994 MGA Zone 56

Date: 09 December 2022

Appendix B Geology





Geology

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321

Geological Units

What are the Geological Units within the dataset buffer?

Unit Code	Unit Name	Description	Unit Stratigraphy	Age	Dominant Lithology	Distance
Pmtb	Branxton Formation	Conglomerate, sandstone, siltstone.	/Maitland Group//Branxton Formation//	Roadian (base) to Roadian (top)	Conglomerate	0m
Q_ab	Alluvial backswamp deposits	Organic-rich mud, peat, silt, clay.	/Alluvium//Alluvial backswamp deposits//	Quaternary (base) to Now (top)	Organic rich sediment	221m
Pgr	Greta Coal Measures	Sandstone, siltstone, pellet claystone, coal, chert, sporadic conglomerate.	/Greta Coal Measures///	Permian (base) to Permian (top)	Sandstone	282m
QP_at	Alluvial terrace deposits	Silt, clay, (fluvially-deposited) fine- to medium-grained quartz-lithic sand, polymictic gravel.	/Alluvium//Alluvial terrace deposits//	Quaternary (base) to Now (top)	Clastic sediment	303m
Q_av	Alluvial valley deposits	Silt, clay, (fluvially deposited) lithic to quartz-lithic sand, gravel.	/Alluvium//Alluvial valley deposits//	Quaternary (base) to Now (top)	Clastic sediment	364m
Pdaf	Farley Formation	Poorly sorted, light- and dark-grey, micaceous sandy siltstone, silty sandstone, mudstone and shale; sporadic thin limestone near Pokolbin; abundant marine fossils.	/Dalwood Group//Farley Formation//	Permian (base) to Lopingian (top)	Siltstone	521m
Q_at	Alluvial terrace deposits	Silt, clay, (fluvially-deposited) fine- to medium-grained quartz-lithic sand, polymictic gravel.	/Alluvium//Alluvial terrace deposits//	Quaternary (base) to Now (top)	Clastic sediment	582m
Pmtu	Muree Sandstone	Fine- to coarse-grained sandstone, conglomerate, minor claystone.	/Maitland Group//Muree Sandstone//	Roadian (base) to Roadian (top)	Sandstone	694m
Q_al	Alluvial levee/overbank deposits	Fluvially deposited fine- to medium-grained lithic to quartz-rich sand, silt, clay.	/Alluvium//Alluvial levee/overbank deposits//	Quaternary (base) to Now (top)	Clastic sediment	713m
Pmtm	Mulbring Siltstone	Medium- to dark-grey siltstone, minor claystone, sporadic thin cherty beds (resistant), rare thin sandstone and limestone beds, sporadic marine fossils.	/Maitland Group//Mulbring Siltstone//	Guadalupian (base) to Guadalupian (top)	Siltstone	754m
Q_acw	Alluvial channel deposits - subaqueous	Fluvially deposited sand, gravel, silt, clay.	/Alluvium//Alluvial channel deposits//Alluvial channel deposits-subaqueous/	Quaternary (base) to Now (top)	Clastic sediment	792m
Pdar	Rutherford Formation	Siltstone, marl and minor sandstone.	/Dalwood Group//Rutherford Formation//	Permian (base) to Permian (top)	Siltstone	808m
Q_hw	Anthropogenic stored water, pondage, reservoirs, canals	Thinly laminated muds and silts with humic to biogenic debris (as bottom sediment to the overlying stored waters).	/Anthropogenic deposits//Anthropogenic stored water, pondage, reservoirs, canals//	Quaternary (base) to Now (top)	Anthropogenic material	843m

Linear Geological Structures

What are the Dyke, Sill, Fracture, Lineament and Vein trendlines within the dataset buffer?

Map ID	Feature Description	Map Sheet Name	Distance
No Features			

What are the Faults, Shear zones or Schist zones, Intrusive boundaries & Marker beds within the dataset buffer?

Map ID	Boundary Type	Description	Map Sheet Name	Distance
41617	Faulted boundary	Fault, position approximate	Newcastle Coalfield 1:100,000 Regional Geology	808m
49808	Faulted boundary	Fault, inferred	NSW Seamless Geology Project, Zone 56	808m

Geological Data Source: Statewide Seamless Geology v2.1, Department of Regional NSW

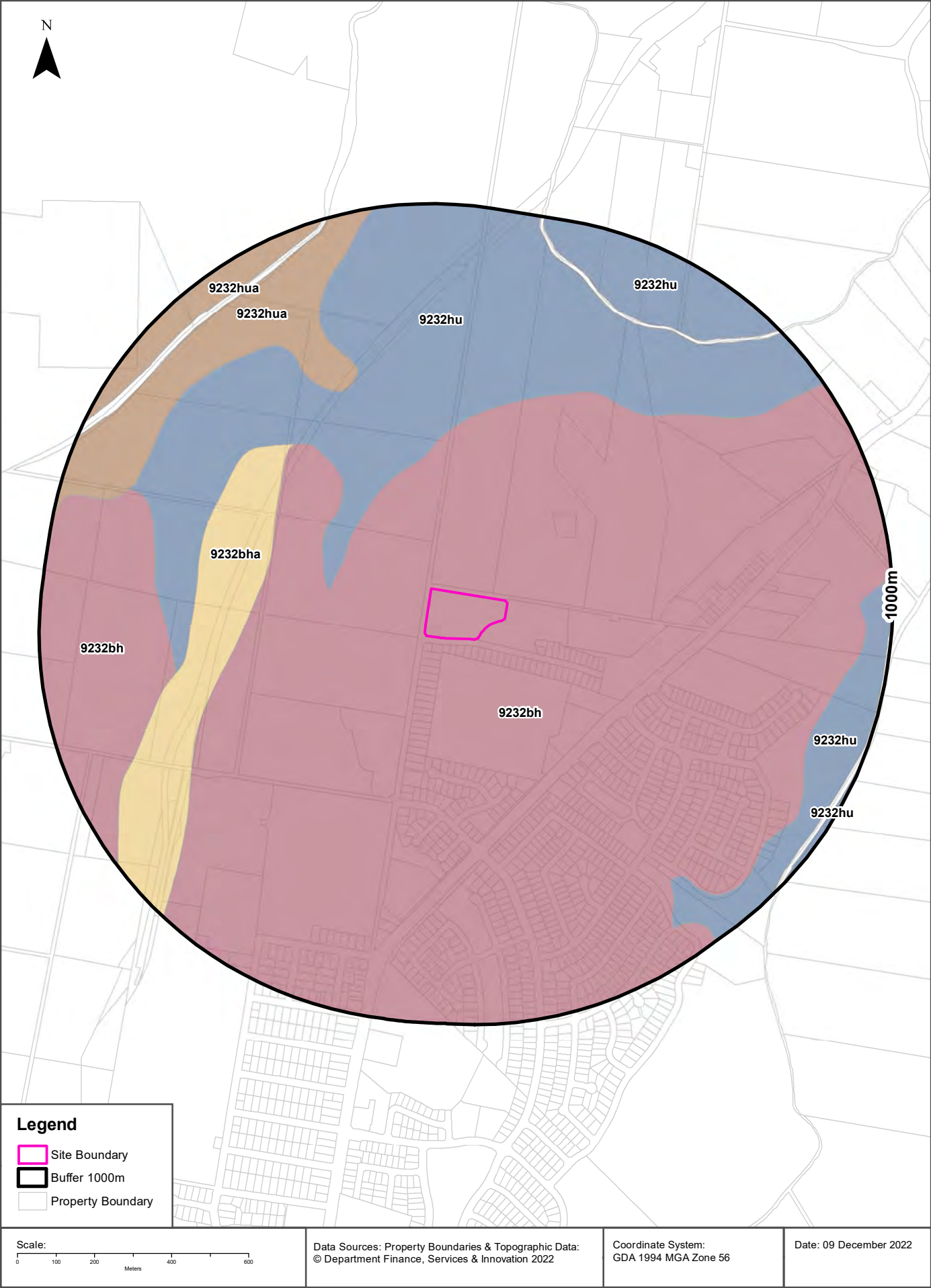
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Appendix C Soil Landscape



Soil Landscapes of Central and Eastern NSW

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321



Soils

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321

Soil Landscapes of Central and Eastern NSW

Soil Landscapes of Central and Eastern NSW within the dataset buffer:

Soil Code	Name	Distance	Direction
9232bh	Bolwarra Heights	0m	On-site
9232hu	Hunter	240m	North
9232bha	Bolwarra Heights variant a	425m	West
9232hua	Hunter variant a	564m	North West

Soil Landscapes of Central and Eastern NSW: NSW Department of Planning, Industry and Environment

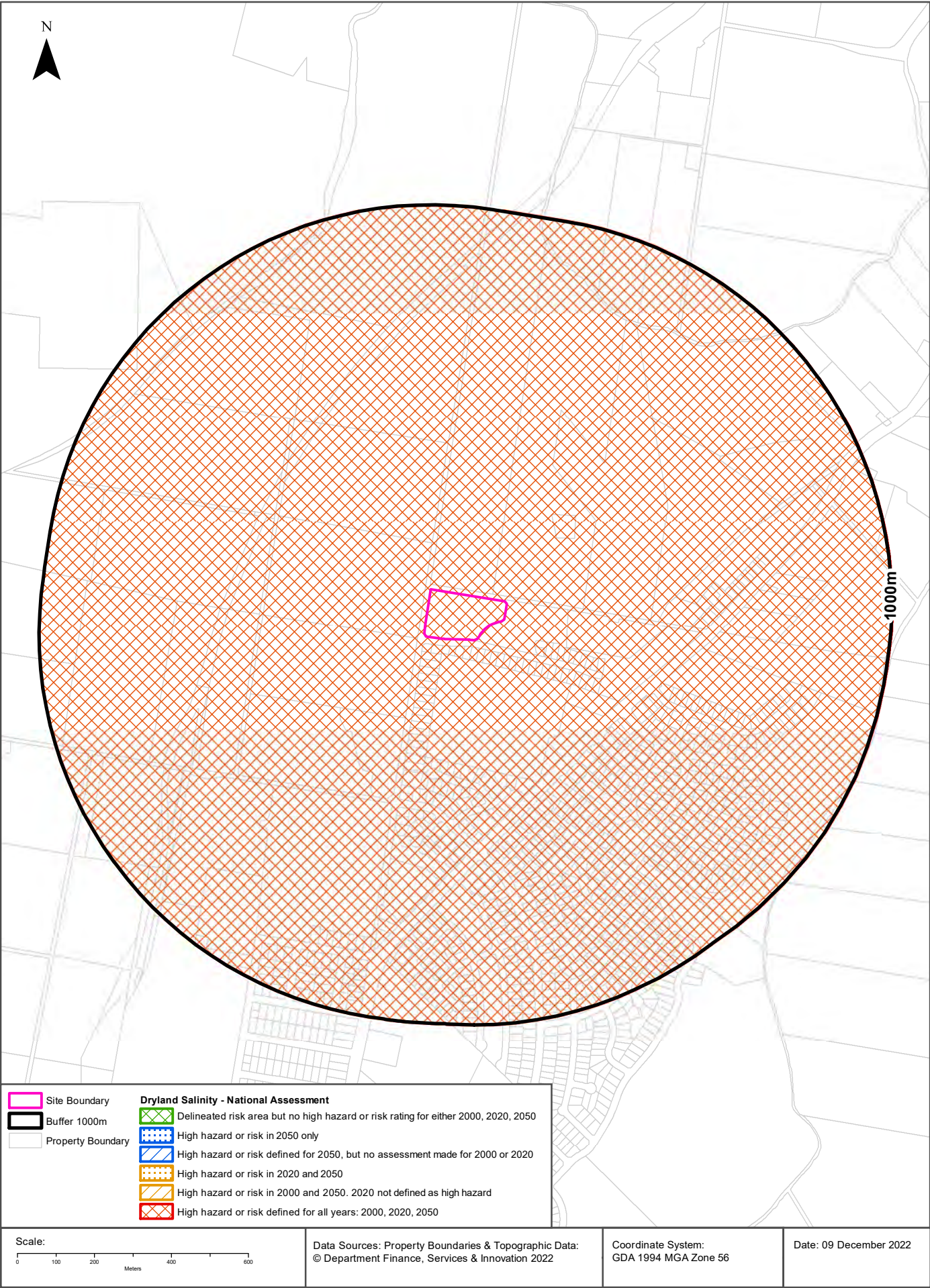
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Appendix D Salinity Assessment



Dryland Salinity

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321



Dryland Salinity

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321

Dryland Salinity - National Assessment

Is there Dryland Salinity - National Assessment data onsite?

Yes

Is there Dryland Salinity - National Assessment data within the dataset buffer?

Yes

What Dryland Salinity assessments are given?

Assessment 2000	Assessment 2020	Assessment 2050	Distance	Direction
High hazard or risk	High hazard or risk	High hazard or risk	0m	On-site

Dryland Salinity Data Source : National Land and Water Resources Audit

The Commonwealth and all suppliers of source data used to derive the maps of "Australia, Forecast Areas Containing Land of High Hazard or Risk of Dryland Salinity from 2000 to 2050" do not warrant the accuracy or completeness of information in this product. Any person using or relying upon such information does so on the basis that the Commonwealth and data suppliers shall bear no responsibility or liability whatsoever for any errors, faults, defects or omissions in the information.

Any persons using this information do so at their own risk.

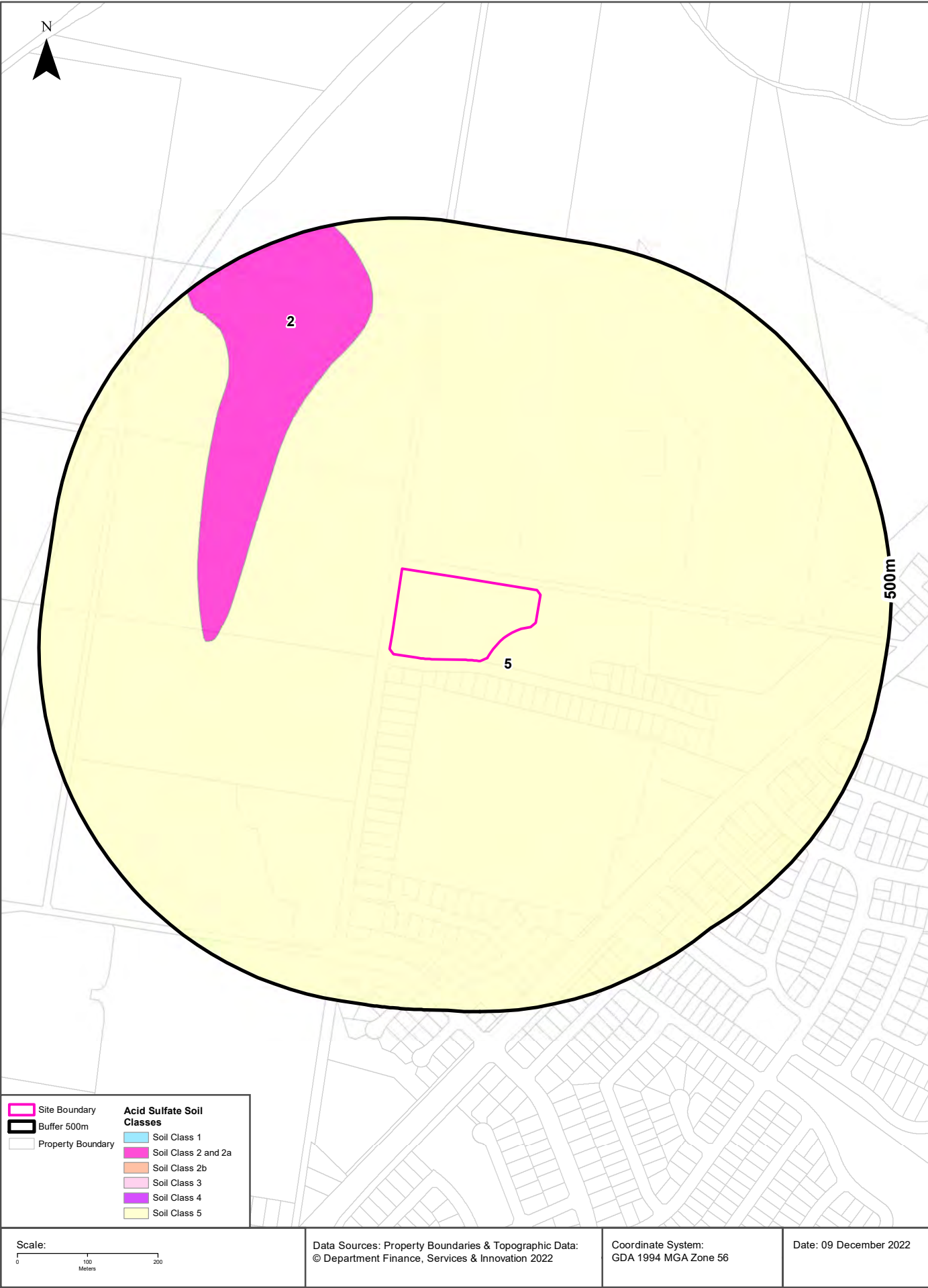
In many cases where a high risk is indicated, less than 100% of the area will have a high hazard or risk.

Appendix E Acid Sulfate Assessment



Acid Sulfate Soils

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321



Acid Sulfate Soils

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321

Environmental Planning Instrument - Acid Sulfate Soils

What is the on-site Acid Sulfate Soil Plan Class that presents the largest environmental risk?

Soil Class	Description	EPI Name
5	Works within 500 metres of adjacent Class 1, 2, 3, or 4 land that is below 5 metres AHD and by which the watertable is likely to be lowered below 1 metre AHD on adjacent Class 1, 2, 3 or 4 land, present an environmental risk	Maitland Local Environmental Plan 2011

If the on-site Soil Class is 5, what other soil classes exist within 500m?

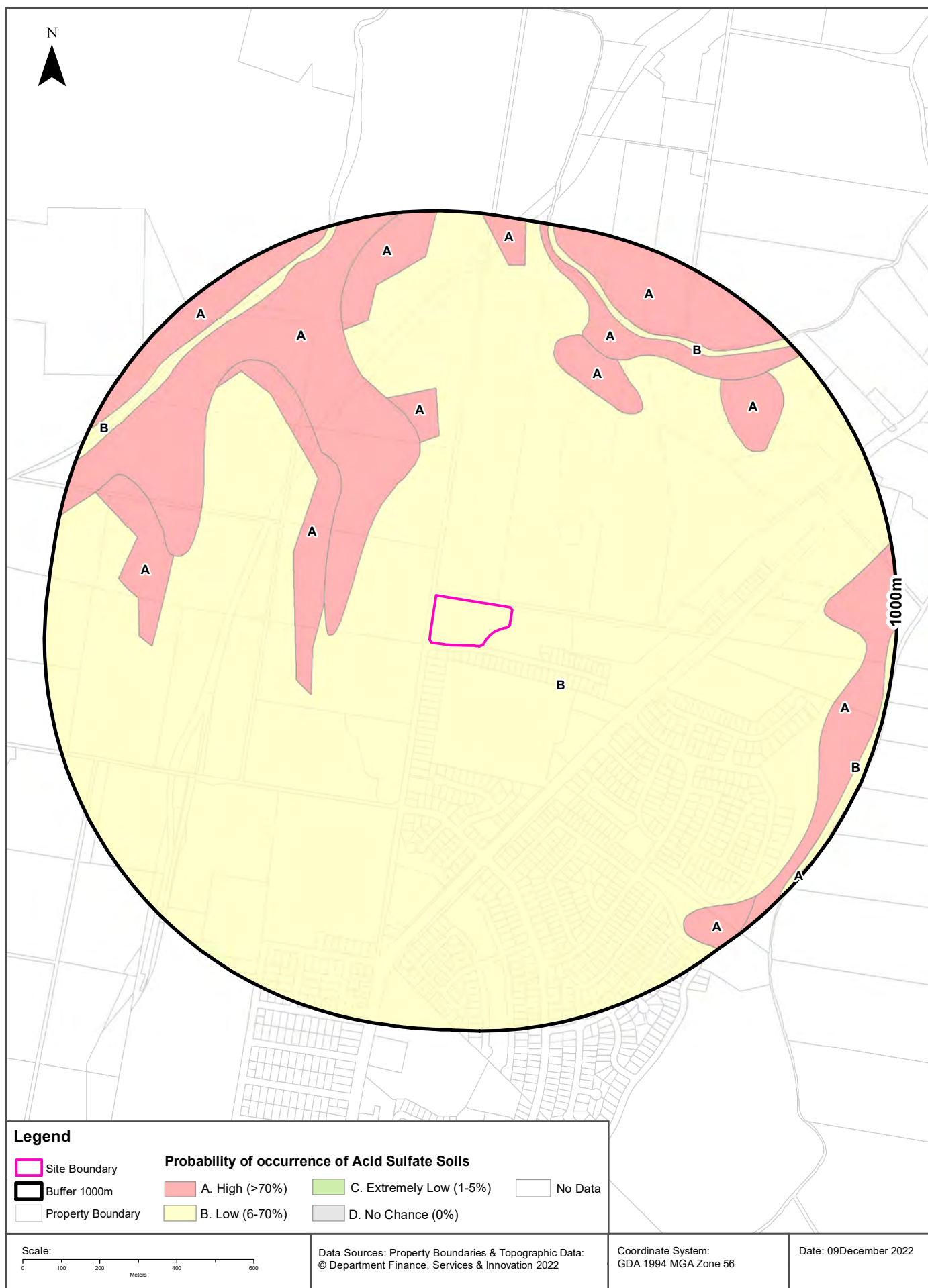
Soil Class	Description	EPI Name	Distance	Direction
2	Works below natural ground surface present an environmental risk; Works by which the watertable is likely to be lowered present an environmental risk	Maitland Local Environmental Plan 2011	219m	North West

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Atlas of Australian Acid Sulfate Soils

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321



Acid Sulfate Soils

Gillieston Public School, 100 Ryans Road, Gillieston, NSW 2321

Atlas of Australian Acid Sulfate Soils

Atlas of Australian Acid Sulfate Soil categories within the dataset buffer:

Class	Description	Distance	Direction
B	Low Probability of occurrence. 6-70% chance of occurrence.	0m	On-site
A	High Probability of occurrence. >70% chance of occurrence.	731m	North

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO

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