Appendix K

Preliminary Site Investigation

Cessnock Road Upgrade at Testers Hollow

Preliminary Site Investigation

Roads and Maritime Services | July 2019

NSW GOVERNMENT

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Limitations

The sole purpose of this report and the associated services performed by Jacobs was to provide a preliminary assessment of site contamination conditions in accordance with the scope of services set out in the contract between Jacobs and Roads and Maritime (the Client). That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the public domain, the Client (if any) and from observations made during the site inspection. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

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1 Introduction

Jacobs Group (Australia) Pty Ltd (Jacobs) was commissioned by NSW Roads and Maritime Services (Roads and Maritime) to carry out a Preliminary Site Investigation (PSI) of the construction footprint of the upgrade to Cessnock Road (Main Road) at Testers Hollow.

The proposal is located in the Lower Hunter, about five kilometres north of the Kurri Kurri Interchange on the Hunter Expressway. It is on the border between the suburbs of Cliftleigh and Gillieston Heights and straddles the Cessnock and Maitland Local Government Areas.

The development of Testers Hollow has been identified as part of the *The Hunter Regional Plan 2036* (Department of Planning and Environment NSW, 2016) which was released in October 2016 by NSW Planning and Environment (DPE) and is the State Government's 20-year blueprint for the Hunter. The plan's vision is to create a leading regional economy in Australia with a vibrant metropolitan city at its heart.

Cessnock Road provides an important connection between the New England Highway and the Hunter Expressway and in doing so provides access to jobs, schools and services for the people of Maitland, Heddon Greta, Kurri Kurri and surrounding communities.

Cessnock Road at Testers Hollow is currently affected by flooding and is overtopped by flood waters during events equivalent to, and in excess of, the five-year Annual Recurrence Interval (ARI) flood. The proposal is needed to address this flooding issue. Over the ten years to March 2017, Testers Hollow has flooded on at least six occasions, requiring road closures of between two days and 17 days. Flood heights over the road have ranged from 0.4 metres to 1.8 metres. The flooding at Testers Hollow impacts on connectivity for commuters and freight in the surrounding area because, during closures, traffic is diverted around Wentworth Swamp which adds a further 15 minutes to the trip between Kurri Kurri and Maitland.

In support of the proposal, an understanding of the potential extent and nature of contamination (if any) of shallow soil, and an assessment of potential risks to human health and environmental receptors in the vicinity of the area is required. Accordingly, a Preliminary (Contaminated) Site Investigation (PSI) was undertaken for the proposal.

The PSI scope involves a site history assessment, including review of past land ownership and usage, review of historical aerial photographs, and a comprehensive site inspection and limited, targeted soil sampling and analytical event.

This PSI report has been prepared in general accordance with the requirements specified for a Preliminary Site Investigation as detailed in the NSW Environment Protection Agency (EPA) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (EPA, 1997).

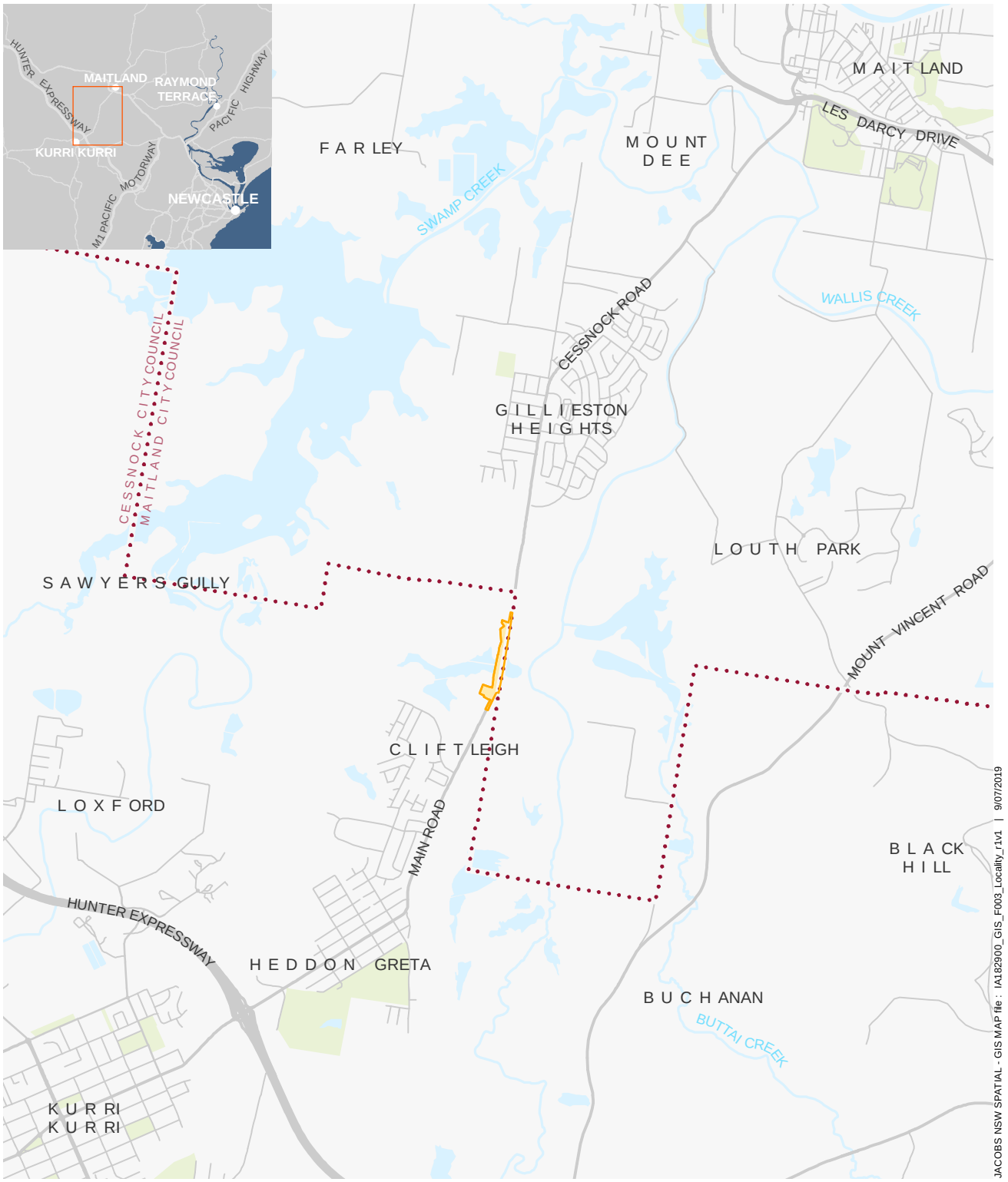
1.1 The proposal

Roads and Maritime Services NSW (Roads and Maritime) proposes to upgrade MR195 Cessnock Road (also known as Main Road) at Testers Hollow, between Gillieston Heights and Cliftleigh. The proposal is located in the Maitland Local Government Area (LGA) and the Cessnock LGA. The proposal would improve the flood immunity of Cessnock Road at Testers Hollow as it would bring the road up to the standard for new State roads.

Key features of the proposal include:

- A new two lane 60 and 80 kilometre per hour road, one lane in each direction with two metre shoulders, around 900 metres long between Gillieston Heights and Cliftleigh built alongside the existing Cessnock Road
- The new road would be about 1.5 metres higher than the existing Cessnock Road, which would allow access in a five per cent AEP. AEP refers to the likelihood of a flood event occurring in any one year
- The new road would tie in with the existing road at the northern and southern extents
- Existing access arrangements would be maintained to private property and to the existing combined U-turn bay and intersection at Avery Lane
- New drainage to allow water to pass freely under the new road
- Utility and street light relocations
- Partial property acquisitions
- Ancillary works including drainage works, safety barriers, signs, linemarking, landscaping and environmental protection works
- Temporary ancillary facilities including site compounds and stockpile sites.

The locality of the site is presented as **Figure 1** and the proposal as **Figure 2**.



Legend

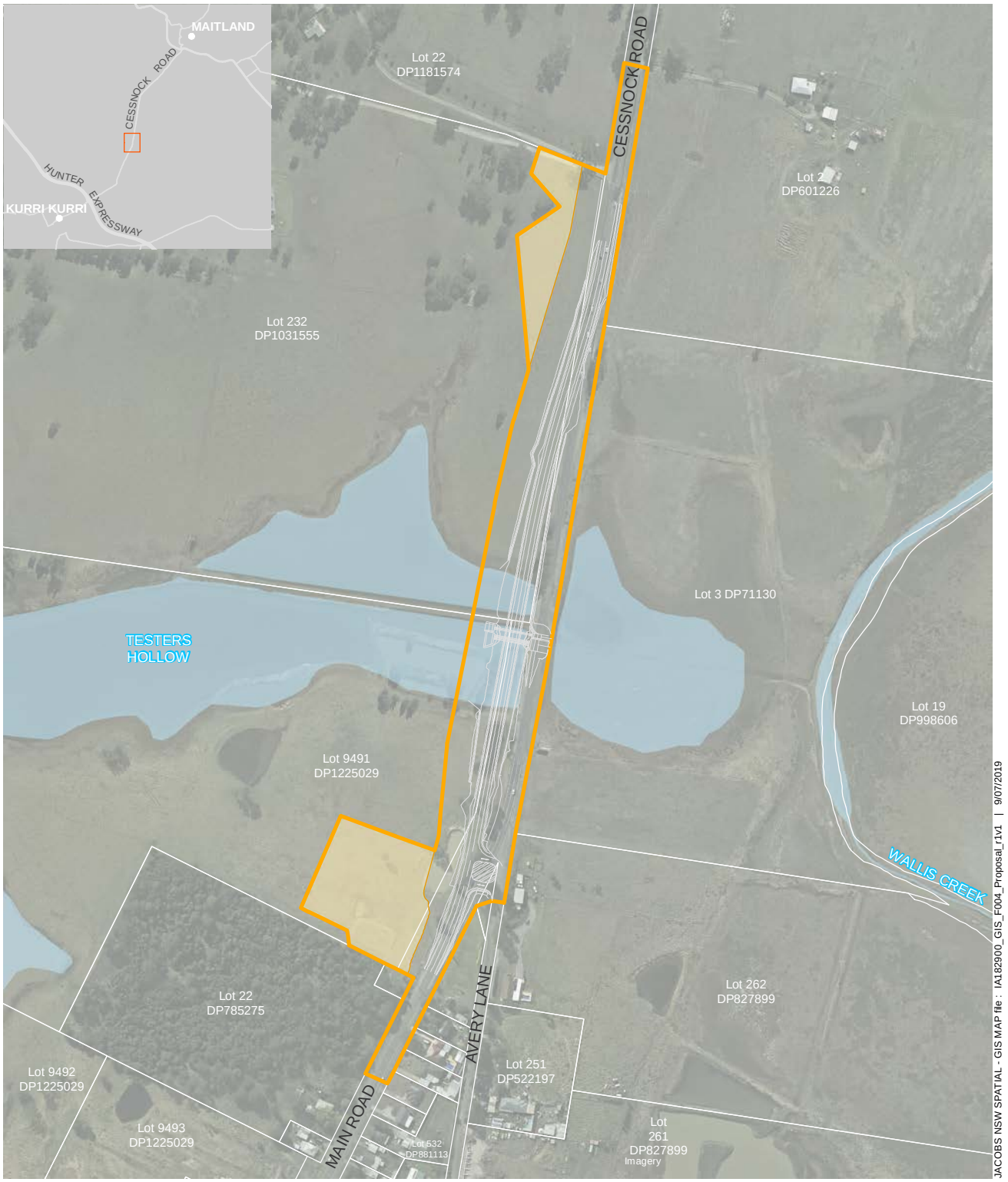
Proposal area

0 1 2 km

1:50,000 @ A4

N

Figure 1 | The locality of the site



Legend

- Proposal area
- Potential ancillary site
- Waterbody
- Design

0 100 200 m

1:4,800 @ A4

N

Figure 2 | The proposal

2 Objectives and Scope of Works

2.1 Objectives

The objectives of the PSI are:

- To identify and document the potential for shallow soil contamination that could impact upon the proposal, based on a review of current and historical information detailing activities undertaken within and/or adjoining the site
- To comment on the suitability of the site (with respect to contamination) for the proposal
- Assess the need for further investigations.

2.2 Scope of Works

The scope of works undertaken to address the objectives are detailed below.

A desktop contamination assessment included a review of information (where available) from the following sources:

- NSW EPA Contaminated Land Record of Notices
- NSW EPA List of NSW Contaminated sites notified to the NSW EPA
- NSW EPA Protection of the Environment Operations Act Public Register
- Historical aerial photographs
- Topographic and/or orthophoto maps
- Geology and soil maps
- Available hydrogeological information
- Other information pertaining to potential contamination as detailed in the Environmental Risk and Planning Report (Lotsearch, 16 July 2018)
- Observations from a site inspection to assess potential contaminating activities undertaken within and/or adjacent to the site
- Collection of photographs based on site observations and documentation of site features that could indicate potential for contamination in surficial soils
- Collection of shallow soil samples at selected locations for analysis for potential contaminants of concern;
- Data reduction and comparison to relevant contamination standards
- Preparation of a PSI report detailing the results of the desktop assessment and the site inspection.
- Existing site report “Report on Preliminary Site Assessment: Proposed Residential Development Main Road, Cliftleigh” Douglas Partners 2005.
- “Notice of determination of application for Construction Certificate” Application Number 10/2007/757/16 – Site regrading for Testers Hollow Rehabilitation Works (included as **Appendix G**).

3 Site Setting

The proposal area information presented below is based on a review of readily available government information sources and information provided in the Lotsearch (July 2018) report for the Testers Hollow Study Area. A copy of the Lotsearch report is provided in **Appendix A**.

3.1 Site Identification

The proposal crosses lot ID DP1223319, DP1031555, DP71130 which are field boundaries either side of Cessnock Road (Main Road). The proposal starts opposite DP785275 and follows adjacent to the current Cessnock Road crossing through Testers Hollow and an area of Freshwater Wetlands on Coastal Floodplains.

3.2 Site Zoning and Land Use

The proposal is located in the Lower Hunter, about five kilometres north of the Kurri Kurri Interchange on the Hunter Expressway. It is on the border between the suburbs of Cliftleigh and Gillieston Heights and between the Cessnock and Maitland local government areas. At the time of undertaking the PCSI, the proposal was occupied by a combination of land uses including:

- North: Open field and area including Lower Hunter Spotted Gum
- East: Testers Hollow Freshwater Wetlands on Coastal Floodplains
- South: Main Road and adjacent residential blocks
- West: Open field and area including *Eucalyptus parramattensis* subsp. *decadens*.

The zonings of the proposal under the Cessnock Local Environment Plan (LEP) 2011 were:

- RE1 – Public Recreation
- RU2 – Rural Landscape
- R2 – Low Density Residential
- SP2 – Infrastructure
- E2 – Environmental Conservation

3.3 Topography and Drainage

The topography of the proposal can be characterised as flat landform with a uniform steep slope forming northwards of the site and a uniformed gentle slope to the south. The proposal is covered by both unsealed (grassed areas, open space and Testers Hollow) and sealed areas (Cessnock Road). The topography suggests that water falling onto the unsealed areas is likely to infiltrate directly into site soils and make its way into Testers Hollow. Rainfall falling onto sealed areas is likely to travel into Testers Hollow as well, due to the lack of specific drainage structures to divert water away from this area.

3.4 Hydrogeology

In consideration of the topography of the proposal and surrounding areas, the proposal is likely to act as a watershed. Shallow groundwater beneath the site is expected to be perched above the residual weathered bedrock and to be recharged predominantly by the infiltration of surface water falling onto the unsealed surfaces of the proposal and into Testers Hollow. Two standpipes were installed as part of the Geotechnical Factual Report (Jacobs, 2018) which showed water was encountered at 1.5m below existing ground surface (mbgs) (BH01) and 0.55mbgs (BH03) respectively. Static water level was also measured at 2mbgs for BH02. This suggests that during heavy periods of rainfall the likelihood of flooding occurring around Testers Hollow is very high.

Based on information from the Lotsearch (July 2018), the aquifer beneath the proposal is described as fractured or fissured, extensive aquifers of low to moderate productivity.

The Lotsearch (July 2018) search of the NSW Department of Primary Industries – Office of Water registered groundwater bore database indicated that there were no registered groundwater wells located onsite or within 500m of the proposal. Only two wells are located within 2km of the proposal of which details are provided below in **Table 3.1**.

Table 3.1: Registered Groundwater Wells

Well ID	Location	Registered Use	Depth
21010164	659m north east	unknown	Not disclosed
GW051647	1238m north east	Stock	12.00

3.5 Geology

Reference to the Lotsearch (July 2018) geology maps indicates the majority of the proposal is underlain by Branxton Formation which are primarily sub-horizontally bedded sedimentary strata comprising interbedded siltstones, sandstones and conglomerates. The north of the proposal is underlain by undifferentiated alluvial deposits, which is described as sand, silt, clay and gravel.

3.6 Soils

The Newcastle 1:100,000 soil landscape map indicates that the investigation area traverses two soil landscapes. It is expected that each end of the proposal will comprise the Bolwarra Heights (bh) soil unit and that the central section will comprise the Wallis Creek (wc) soil unit.

The Bolwarra Heights soil unit is described as moderately deep (<150 cm) residual soils associated with the Maitland Group Formation. The Wallis Creek soil unit, on the other hand, includes deep Quaternary alluvium consisting primarily of sand and minor clay deposits.

3.7 Acid Sulfate Soils

Acid sulfate soils (ASS) are the common name given to naturally occurring sediments and soils containing iron sulfides (principally iron sulfide or iron disulfide or their precursors). The exposure of the sulfide in these soils to oxygen by drainage or excavation leads to the generation of sulfuric acid. Areas of ASS can typically be found in low lying and flat locations which are often swampy or prone to flooding.

A review of the ASS risk maps from the Lotsearch (July 2018) indicated that the centre of the proposal which is located within Testers Hollow is mapped as having a high probability of occurrence, more than 70%. The remaining north and south of the site shows an extremely low probability of occurrence defined as 1-5% chance of occurrence with occurrences in small localised areas.

4 Information Review

The proposal area history has been sourced from publicly available information and the *Environmental Risk and Planning Report* (Lotsearch, June 2018) commissioned by Jacobs which is provided in **Appendix A**.

The information reviewed and summary of the results in the context of contamination risk is provided in **Table 4.1**. Contamination risks have been assessed as high (if present on site), moderate (if present within 500m of the site), low risk (if greater than 500m and less than 1km from the site) and no risk where there were no relevant records or information was not relevant with respect to contamination.

Businesses with potential contaminating activities are based on those industries detailed in the Australian Standard *Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds* (AS 4482.1-2005).

The Douglas Partners investigation (2005) (Table 3 – Potential Contamination) lists a number of historical land usages and associated, potentially contaminating activities for the areas surrounding the Testers Hollow proposal area. The site assessment was undertaken to identify possible opportunities and constraints to future urban development within the area adjacent to the proposal area and to provide a preliminary contamination assessment of these areas. While the information contained in the Douglas Partners report is specific to the surrounding lands, there is one location noted by Douglas Partners at the eastern boundary of Lot 949 (DP 1223319) that identified fibro fragments that thought to be associated with a recently demolished (circa 2005) chicken shed within Lot 22 (DP785275) and a stockpile (photo 3 within the Douglas Partners report) that included dumped concrete rubble (up to 1.5 m high) with some steel, bricks and trace bitumen within the north-east corner of the lot. Based on the Jacobs site inspection, this stockpile is no longer evident on site at this location, however, it is useful to understand the site history and waste management behaviour in the area and draw some conclusions regarding the risk of unexpected finds of potential contaminants (including asbestos materials and other waste streams) that could be within the proposal area.

A review of the *"Notice of determination of application for Construction Certificate" Application Number 10/2007/757/16* – Site regrading for Testers Hollow Rehabilitation Works (refer to **Appendix B**) indicates significant changes to surface ground conditions in some areas of the proposal site. No validation reporting or other information has been reviewed as part of the demolition and site clearances that would likely have been undertaken in advance of regrading works, and it is unknown if potentially hazardous building materials (possibly including asbestos) may be associated with the regrading and contouring works previously undertaken in the area.

Table 4.1: Summary of Potential Contamination Risks

Source	Information	Potential for site contamination	Comment
NSW EPA	• NSW contaminated sites notified to EPA under Contaminated Lands Management Act 1997 (CLM Act). • Contaminated Land: Records of Notice • Known former gasworks sites • National waste management site database which lists known landfills, waste transfer stations and waste reprocessing facilities • NSW EPA PFAS investigation program	n/a	None disclosed
NSW EPA	Licensed activities under the *Protection of the Environment Operations Act 1997* (POEO Act)	Low	Cessnock City Council, related to other activities on waterways including application of Herbicides – Onsite Maitland City Council, related to other activities on waterways including application of Herbicides – Onsite Australian Rail Track Corporation Limited, railway systems activities - 945m North West John Holland Rail Pty Ltd, railway systems activities - 945m North West
NSW EPA	Delicensed POEO Act 1997 activities still regulated by the NSW EPA	n/a	None disclosed
NSW EPA	Former licensed POEO Act 1997 activities now revoked or surrendered	Low	Three organisations at various waterways throughout NSW including the Cessnock area, related to other activities / Non-scheduled activity - Application of Herbicides – Onsite • Luhrmann Environment Management • Robert Orchard • Sydney Weed & Pest Management Pty Ltd
NSW Department of Environment, Climate Change and Water	Environmentally sensitive zones for the regulation of Underground Petroleum Storage Systems (UPSS)	Low	Site located on a UPSS sensitive zone

4.1 Aerial Photography

Aerial imagery was reviewed for the years 1954, 1966, 1976, 1983, 1993, 2001, 2006, 2010, 2012 and 2015 to assess land use and changes in general conditions within and adjacent to the site. The findings of the aerial

imagery review are summarised in **Table 4.2**. Historical aerial imagery is presented in the Lotsearch (July 2018) report provided in **Appendix A**.

Table 4.2: Aerial Imagery Review

Date	Site	Surrounding Areas
1954	The site appears to be completely grassland with a track running from the south of the site to the north (known currently as Main Road). Possibility of agricultural land with field boundaries and scattered trees north of the site. Three small buildings south of the site that appear to be chicken sheds. Flooded land appears at centre of the site, known as Testers Hollow Creek.	The areas surrounding the site appear to be predominantly grassland with some scattered buildings south and east of the site. Densely populated trees south of the site, possibility of a plantation.
1966	Chicken sheds are no longer apparent in the aerial photograph. Additional vegetation around Testers Hollow Creek	The areas surrounding the site appear largely the same as per the 1954 imagery.
1976	The site appears largely unchanged from the 1966 imagery.	Residential and industrial development south of the site which includes 2 large units).
1983	The site appears largely unchanged from the 1976 imagery.	Expansion of industrial area south of site (additional 2 units) including appearance of a tank.
1993	The site appears largely unchanged from the 1983 imagery.	The areas surrounding the site appear largely the same as per the 1983 imagery.
2001	The site appears largely unchanged from the 1991 imagery.	The areas surrounding the site appear largely the same as per the 1991 imagery.
2006	The site appears largely unchanged from the 2001 imagery.	Removal of all four industrial looking units south of the site.
2010	The site appears largely unchanged from the 2006 imagery.	The areas surrounding the site appear largely the same as per the 2006 imagery.
2012	The site appears largely unchanged from the 2006 imagery apart from area prone to flooding by Testers Hollow seems to have increased considerably in all directions	The areas surrounding the site area prone to flooding by Testers Hollow seems to have increased considerably in all directions.
> 2015	There appears to be significant re-grading on the site including infilling of the dam and placement of fill material of unknown origin around flood prone area to create embankments. Cut and fill operations include excavations for erosion and sediment control. There also appears to be land clearance as part of vegetation removal.	There appears to be further re-grading east of the site including cut and fill operations including excavations for erosion and sediment control.

4.2 Previous Investigations

Roads and Maritime Services (December 2017) Cessnock Road upgrade at Testers Hollow, Preliminary Environmental Investigation

A search (22 November 2016) of the NSW Environment Protection Authority (EPA) contaminated land record of notices for the Cessnock and Maitland local government areas returned eight notices relating to four sites. None of the sites are within or immediately adjacent to the investigation area. A search of the List of NSW contaminated sites notified to EPA (as at 10 November 2017) identified no sites within or near the investigation area.

The soils of the study area have potential for erosion, with moderate to high erodibility depending on the soil materials with a K-factor of the soils between 0.022-0.045 located within the proposal. There are potential risks (water quality, damage to infrastructure) associated with salinity in the investigation area (in the Wallis Creek soil landscaped). There is a high probability of acid sulfate soil occurrence in the central part of the investigation area. This represents a risk for water quality due to potential leaching of naturally occurring metals in surrounding soils and clays., and the potential impacts to receiving aquatic ecosystems (if any).

The report summarised that the presence of known or potential contaminated sites requires further consideration pending selection and refinement of a preferred option.

Douglas Partners (October 2005) Proposed Residential Development Main Road, Cliftleigh, Preliminary Site Assessment

The Douglas Partners (October 2005) Proposed Residential Development Main Road, Cliftleigh, Preliminary Site Assessment was prepared on behalf of Winten Property Group for the proposal of a mixed residential development in Cliftleigh. The preliminary site assessment forms part of the application to Cessnock City Council (CCC) for rezoning of the site to accommodate the proposed development. The site assessment was undertaken to identify possible opportunities and constraints to future urban development within the site. From a contamination perspective, it was concluded that the site is generally considered suitable for development with respect to geo-environmental factors, subject to detailed investigation and design.

4.3 Integrity Assessment

Historical and site information has been sourced from the Lotsearch report and other reports provided by Roads and Maritime. Jacobs has relied on the accuracy of the documentation provided and our experience in historical document interpretation. Whilst there is a margin for error in interpretation, Jacobs consider the information presented in this assessment to be of acceptable reliability for the purposes of this investigation.

5 Site Information

5.1 Site Inspection

A site inspection was undertaken by a Jacobs Environmental Scientist on 26 July 2018. The results of this inspection identified potential asbestos containing material (ACM) and triggered the need for an additional site inspection and subsequent sample capture and analysis. The additional site inspection was undertaken on 27 September 2018. Both site inspections were carried out from publicly accessible areas and private land. Photographs taken during on 27 September 2018 are provided in **Appendix C**.

The existing Cessnock Road is constructed upon a fill embankment across the lower-lying central portion of the project which is up to approximately 3.5 m high at its central point, where an existing culvert is present to accommodate surficial water flows. This existing fill embankment has batter angles of up to 35°. The western existing highway embankment fill batter at its highest point (i.e. in the vicinity of the culvert) has been shotcreted over a length of approximately 50 m, presumably to protect the batter and limit potential for instability during flood events. The significant re-grading on the site including infilling of the dam and placement of fill material is supported by the Winter Group Construction Certificate (**Appendix B**). Cut and fill operations include excavations for erosion and sediment control.

At the time of undertaking the site inspection, the majority of the site consisted of areas of open field covered by grass, scattered trees and waterlogged areas. North of the proposal area is a grassed area located within a Potential Archaeological Deposit (PAD) with no obvious visual signs of contamination. The centre of the site mainly features waterlogged areas with densely populated grass. The paddocks, where the project is situated, have been modified through the construction of farm dams with the excavated spoil placed in a series of fill mounds (as per site photographs in **Appendix C**). The paddocks within the central portion of the alignment showed softening and water ponding during the investigation. Many of these areas are unlikely to be trafficable by vehicles or heavier plant, particularly during or following significant rainfall events.

The south of the site consists of open field areas with evidence of tree plantations including *Eucalyptus parramattensis* subsp. *decadens*. Aerial imagery shows the historic location of chicken sheds within the paddock area south of the site pre-1954. The age of these buildings could indicate that they contain hazardous building materials including, but not limited to asbestos and heavy metals. Whilst these buildings no longer exist in the area, the area could remain a potential contamination source for the proposal if fill from the source area were to be moved into the proposal area.

Dead grasses associated with fence lines and power poles were observed across relevant areas of the site boundaries, indicating that herbicide application has occurred for vegetation management. Based on the age of power poles and fence posts, it is possible that that these timber structures have previously been treated with Copper, Chromium and Arsenic (CCA) to prevent infestation from insects. Evidence of cattle grazing in some areas of the site may contribute to potential pathogens in waterways.

5.2 Fieldwork

Based on the size of the site (approximately 3.35 hectares), a sampling density of 17 sample points was undertaken in consideration of access restrictions to many areas of the site, however adopting the weight of evidence guidance as set out in the NSW EPA Sampling Design Guidelines (1995). This sampling density is not in line with the sampling densities recommended under Table A of the Sampling Design Guidelines. Access to all areas of the proposal area for sample capture purposes was limited due to the presence of PADs. Accordingly, samples could only be collected from shallow soils along the site boundaries along the existing road alignment, outside of PADs.

Samples were taken using a combination of grab samples and hand augurs to capture at surface and shallow soil samples. On the day of sampling (27 September 2018), ground conditions were ideal to take samples of both kinds, however, hand auger sampling was only used in areas submerged by water near the centre of the site.

Based on visual and olfactory evidence, no obvious indication of potential spills or liquid deposits were observed. No groundwater or surface water samples were collected as part of this assessment.

Analytical data and inspection locations were required to satisfy both the contamination risk aspects, as well as offer information necessary for preliminary in-situ waste classifications and help support future decisions relating to the potential management of waste materials.

Soil sample locations were excavated using a decontaminated gardening spade and hand auger, to surficial depths based on the hardness of the soils restricting any depth of penetration. The garden spade and hand auger was appropriately decontaminated between sample locations using deionised water and Decon 90 liquid detergent and paper towels. A hard brush was used to initially clean hard and clayey soil where necessary, and the brush was also appropriately cleaned using water and Decon 90 between sample locations.

Soil samples were collected from the surface, adjacent and below fill mounds and submerged areas where possible, while also from other materials indicating observable signs of contamination (discoloured, erroneous wastes). New latex gloves were used for the collection of each sample.

Appropriate care was taken to ensure that representative samples were obtained from the locations required and that the integrity was maintained, particularly when dealing with potentially volatile and semi-volatile components. The collected soil material was transferred directly to laboratory prepared sample jars. Duplicate soil samples for quality assurance purposes were not mixed and placed directly into sample jars.

The soil sample jars comprised glass with a Teflon lined lid and was supplied by the primary laboratory. The jars were completely filled with soil, sealed, labelled with the job number, date, unique sampling point identification and depth. An additional 500g of soil sample was collected at each location and placed in sealed bags provided by the laboratory to test for National Environment Protection Measures (NEPM) Asbestos analysis.

All samples, including Quality Assurance (QA) samples, were transported to the primary laboratory under Chain-of Custody (COC) procedures and maintained in an ice-filled cooler.

Analytical laboratory testing of environmental samples was conducted by a NATA (National Association of Testing Authorities) accredited laboratory (Envirolab) using appropriate analytical methods (method reference codes in accordance with relevant Envirolab Suite codes and/or USEPA method reference).

The proposed QA and quality control analytical program for the site is proposed as follows:

- Intra-laboratory Duplicates (primary laboratory) - 3 samples (for 17 primary samples, including geotechnical locations from the geotechnical investigations carried out earlier by Jacobs)
- Rinsate sample - one sample on the sampling equipment (gardening spade).

Shallow samples using gardening spade:

- TH01_S, TH02_S, TH03_S, TH05_S, TH07_S, TH08_S, TH09_S, TH10_S.

Hand auger samples:

- TH04_D, TH06_D.

As part of the Geotechnical Factual Report, (Jacobs, 2018) laboratory tests were conducted on selected soil samples retrieved from the boreholes to assess the chemical and mechanical characteristics of the materials. Laboratory testing was performed using NATA accredited laboratories (Macquarie Geotech Pty Ltd and Envirolab Pty Ltd) in accordance with the relevant Roads and Maritime and Australian Standards.

Tabulated summaries of laboratory testing results and laboratory test certificates are presented in **Appendix D**. Sample IDs are provided below.

Borehole samples

- BH01_0.2-0.3, BH03_0.2-0.4.

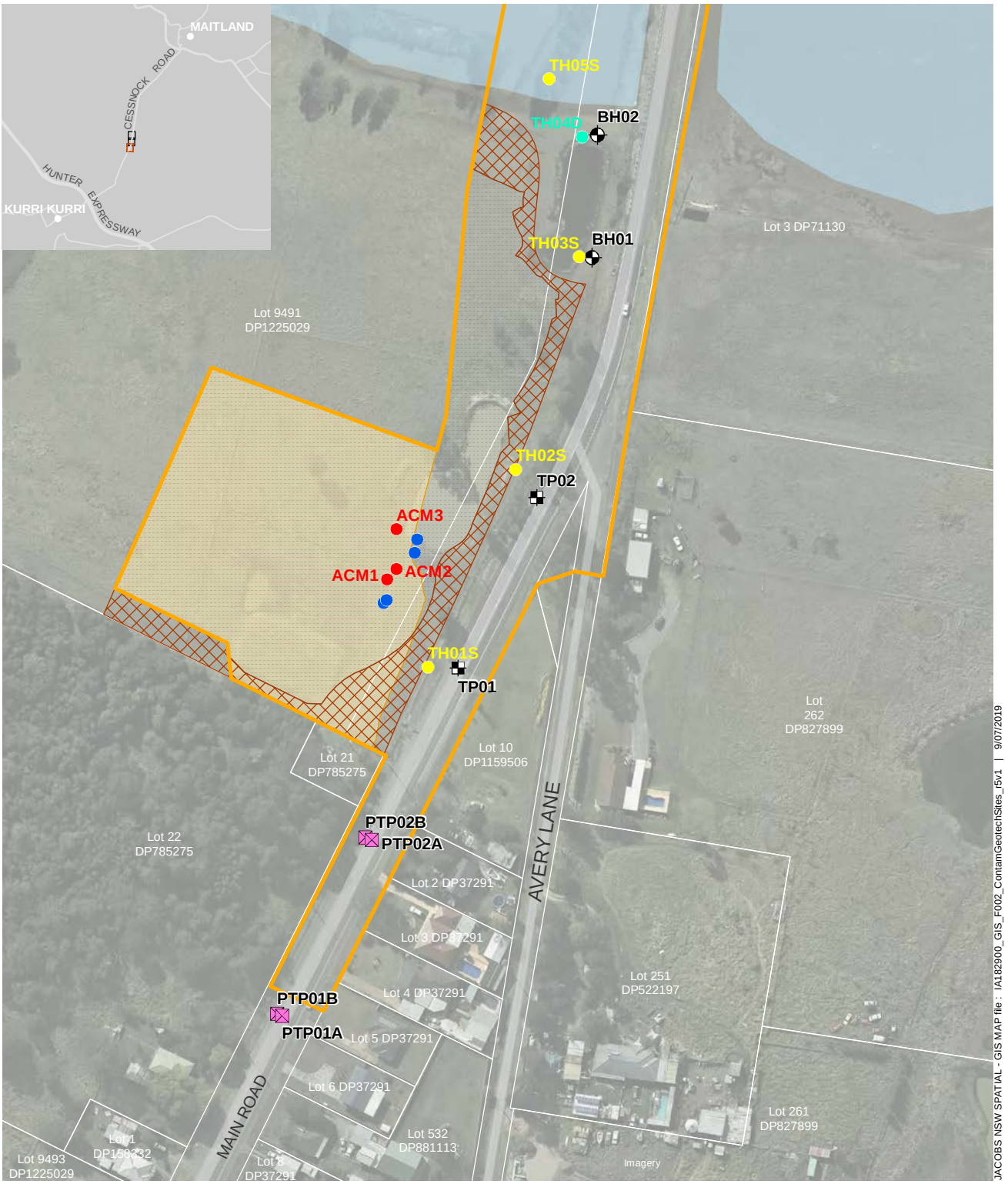
Pavement test pits and test pits:

- PTP02A_0.4-0.5, PTP03B_0.4-0.5, TP01_0.3-0.4, TP03_0.1-0.2, TP05_0.4-0.5.

The types and quantity of the laboratory testing are outlined in the Geotechnical Factual Report (Jacobs, 2018).

Four shards of potential ACM were found on 25 June 2018. Three shards of ACM were found on 27 September 2018 during the additional site inspection specifically carried out to confirm the presence of ACM. The three shard samples collected during this site visit were sent to the laboratory for an asbestos presence / absence test.

Soil sample locations for both PSI and geotechnical samples are displayed in **Figure 3**.



Legend

- Proposal area
- Potential ancillary site
- Waterbody
- PAD
- Artefact bearing soils
- Asbestos containing material collected July 2018

Contamination sample locations, September 2018

- Asbestos containing material
- Grab samples
- Hand auger location

Geotechnical investigation sites

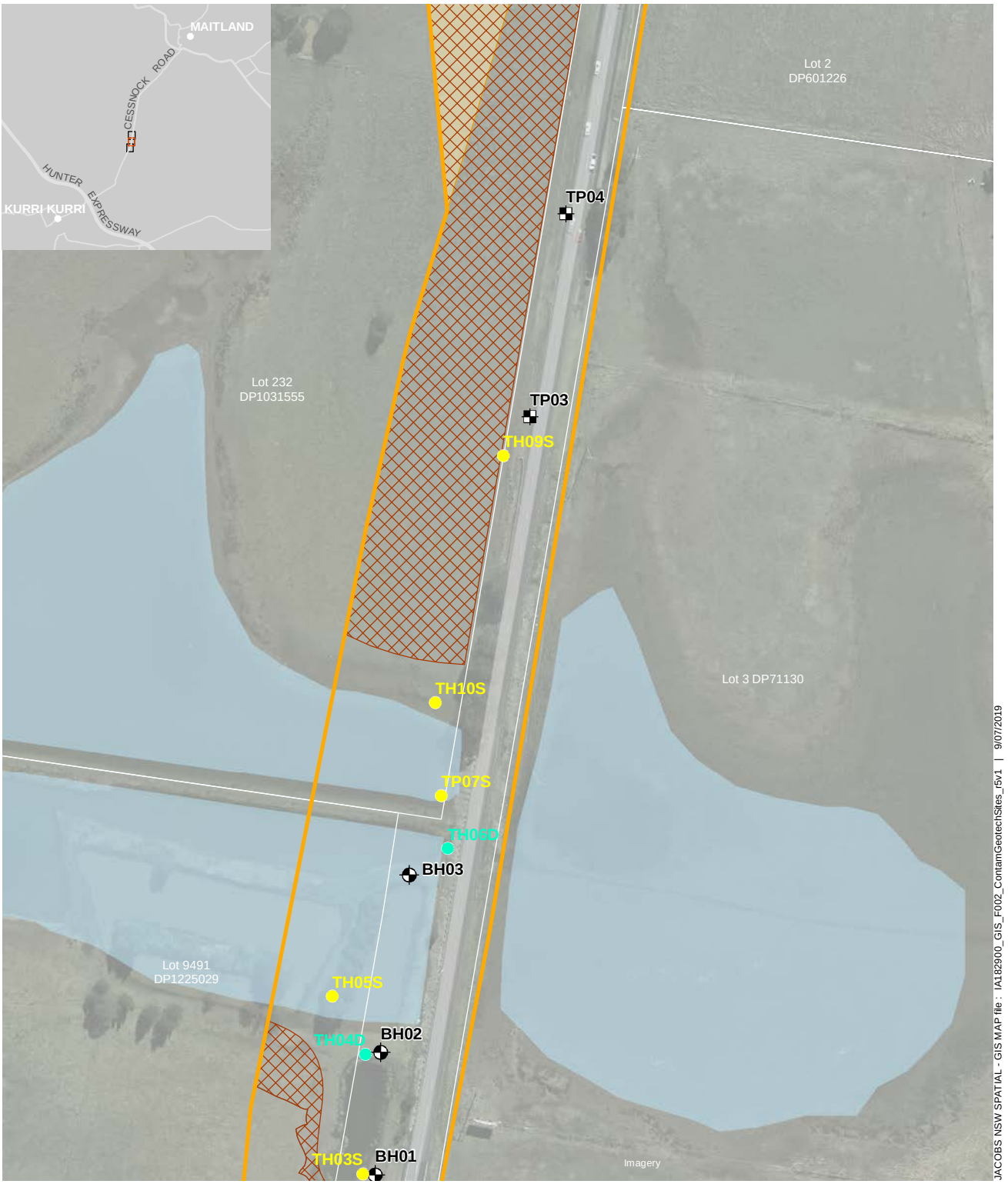
- Borehole
- Pavement test pit
- Test pit

0 50 100 m

1:2,000 @ A4

N

Figure 3 | Contamination sample locations and geotechnical investigation sites



Legend

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- Proposal area
- Potential ancillary site
- Waterbody
- PAD
- Artefact bearing soils

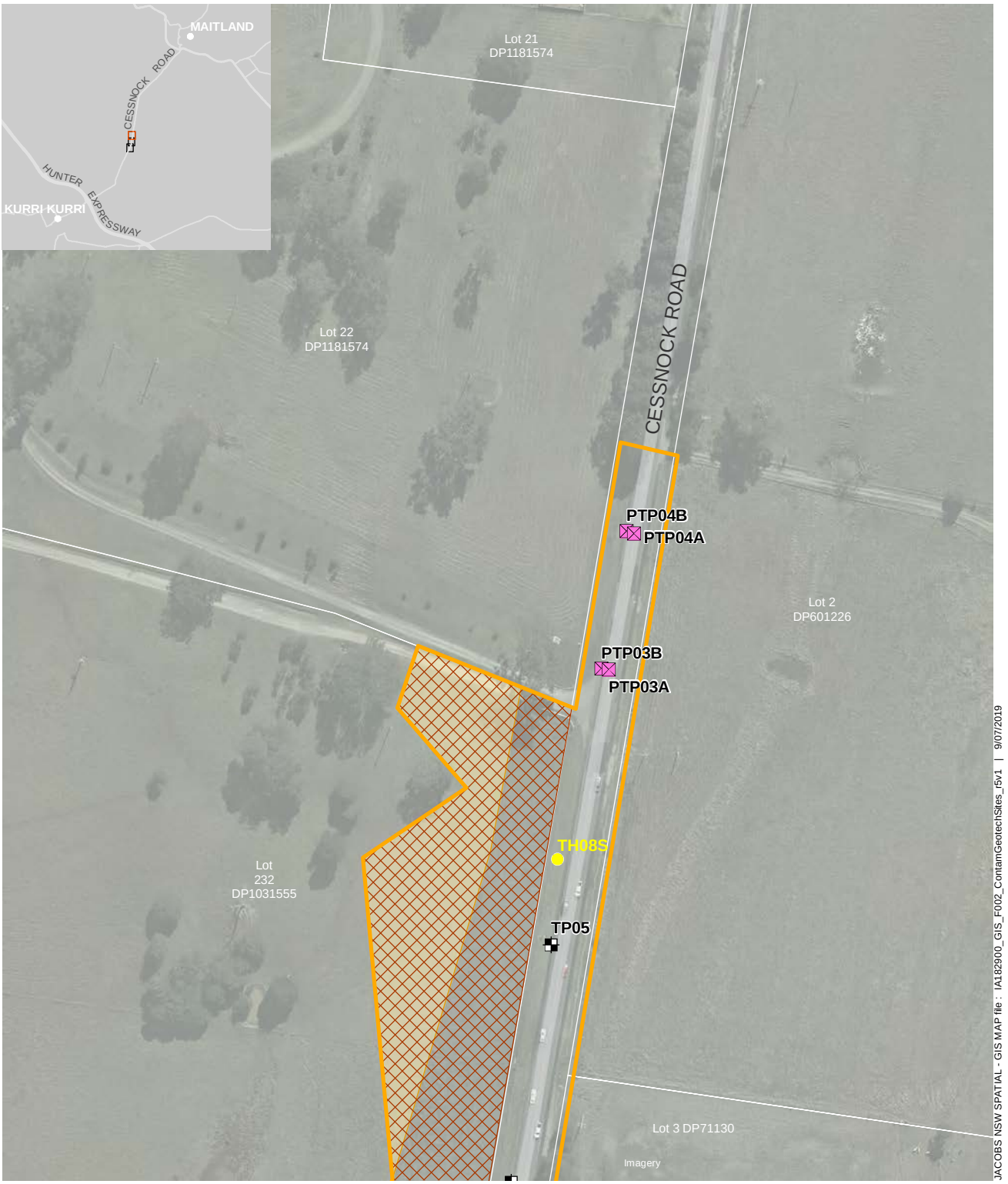
Contamination sample locations, September 2018

- Grab samples
- Hand auger location

Geotechnical investigation sites

- Borehole
- Test pit

Figure 3 | Contamination sample locations and geotechnical investigation sites



Legend

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N

- Proposal area
- Potential ancillary site
- PAD

Contamination sample locations, September 2018

- Grab samples

Geotechnical investigation sites

- Pavement test pit
- Test pit

Figure 3 | Contamination sample locations and geotechnical investigation sites

6 Soil Investigation

Jacobs undertook soil investigation works within the site boundary on 19 July 2018, 3 August 2018 and 27 September 2018. The soil and preliminary in-situ waste investigation was undertaken in accordance with documented Jacobs procedures by a competent Jacobs environmental scientist.

6.1 Analytical Parameters and Methods

Jacobs commissioned Envirolab as the primary laboratory for analysis. Envirolab are National Association of Testing (NATA) accredited and where possible analysis was undertaken in accordance with NATA certification requirements. Samples listed above were analysed for the following analytical Suite:

- Polycyclic Aromatic Hydrocarbons (PAH) possibly associated with bitumen, burnt waste and chemical residues
- Organochlorine/phosphorus Pesticides (OCC/OPP) possibly associated with chemical residues and waste drums
- Metals (As, Cd, Cr, Cu, Ni, Pb, Zn, Hg) possibly associated with scrap metal, burnt waste, batteries and miscellaneous waste
- Polychlorinated Biphenyls (PCB) possibly associated with waste electrical components and oils;
- Asbestos possibly associated with demolition waste and observed fibre cement waste.

6.2 Laboratory QA/QC Program

The reliability of test results from the analytical laboratory was monitored according to the Quality Assurance/Quality Control (QA/QC) procedures used by the NATA accredited laboratory. The QA/QC programme employed by Envirolab specified holding times, extraction dates, method descriptions, COC requirements, analysis, LORs and acceptance criteria for the results. Laboratory QA/QC requirements undertaken by Envirolab were based on NEPM (2013) requirements and are outlined below. **Table 6.3** outlines the data validation criteria, qualifications to the data and the overall QA/QC procedures used for the laboratory testing program:

Table 6.3: Laboratory QA/QC procedures

Protocol	Description
Holding Times	Holding times are the maximum permissible elapsed time in days from the collection of the sample to its extraction and/or analysis. All extraction and analyses should be completed within standard guidelines.
Reagent Blanks	The reagent blank sample is a laboratory prepared sample containing the reagents used to prepare the sample for final analysis. The purpose of this procedure is to identify contamination in the reagent materials and assess potential bias in the sample analysis due to contaminated reagents. The QC criterion is no detectable contamination in the reagents. Each analysis procedure will be subject to a reagent blank analysis.
Laboratory Duplicates	Laboratory duplicates are field samples that are split in the laboratory and subsequently analysed a number of times in the same batch. These sub-samples are selected by the laboratory to assess the accuracy and precision of the analytical method. Envirolab undertake QA/QC procedures such as intra-laboratory duplicates at a frequency of 1 per 8-10 samples.
Laboratory Control Standard	Laboratory control samples consisted of a clean matrix (de-ionised water or clean sand) spiked with a known concentration of the analyte being measured. These samples monitored method recovery in clean samples and were used (where required) to evaluate matrix interference by comparison with matrix spikes. A laboratory control standard is a standard reference material used in preparing primary standards. The concentration should be equivalent to a mid-range standard to confirm the primary calibration. Laboratory control samples are performed on a frequency of 1 per 20 samples or at least one per analytical run.
Matrix Spikes / Matrix Spike	MS/MSDs are field samples to which a predetermined stock solution of known concentration has been added. The samples are then analysed for recovery of the known addition. Recoveries should be within the stated

Protocol	Description
Duplicates (MS/MSD)	laboratory control limits and duplicates should have Relative Percentage Difference (RPD)s less than the limits specified in this report.
Surrogate Spikes	For organic analyses, a surrogate was added at the extraction stage in order to verify method effectiveness. Surrogate spikes provide a means of checking for every analysis that no gross errors have occurred at any stage of the procedure leading to significant analyte loss. Recoveries should be within the stated laboratory control limits.
QA/QC Conclusion	The QA/QC indicators should either all comply with the required standards or showed no variations that would have a significant effect on the quality of the data.

7 Quality Control Plan

Field and laboratory QA/QC requirements compliant with NEPC (2013) requirements (where applicable) were undertaken as part of the fieldwork program as outlined below.

7.1 Field QA/QC Program

Field QA/QC Program

Field QA/QC for this project consisted of the collection of blind duplicate and rinsate samples.

Environmental Samples

Environmental samples or field samples were the representative soil samples collected for analysis to determine aspects of their chemical composition.

Blind Replicate Samples

Three blind replicate samples were provided by the collection of two environmental samples from the same location. These samples were preserved, stored, transported, prepared and analysed in an identical manner. As a minimum, the results of analyses on the blind replicate sample pair were assessed by calculating the Relative Percentage Differences (RPDs) between the results. The RPD was calculated as the difference between the results divided by their mean value and expressed as a percentage. If the RPD exceeded the value adopted for any analytes, additional investigation would be required, or justification provided for not conducting additional investigation.

Blind replicate samples were generally collected at a rate of one duplicate for every 20 environmental samples in accordance with AS 4482.1-2005 Guide to the sampling and investigation of potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds.

Rinsate Blank

Rinsate (equipment) blanks consisted of pre-preserved bottles filled with laboratory-prepared water that had been passed over decontaminated field equipment. Rinsate blanks were prepared on site, labelled with a unique sample identification number and transported to the primary laboratory for analysis as regular environmental samples. The purpose of rinsate blank was to assess the efficiency of decontamination procedures. One rinsate blank was collected from the gardening spade that was used to collect grab samples.

7.2 Laboratory QA/QC Program

Envirolab undertook internal laboratory quality controls in accordance with NATA requirements and NEPM. The Data Acceptance Criteria (DAC) adopted for the assessment are:

- Duplicates: 0 – 50% RPD (When the average concentration is 1-10 times the LOR); 0 – 30% RPD (when the average concentration is 10 to 30 times the LOR); 0 – 20% RPD (when the average concentration is > 30 times the LOR
- Matrix Spikes, LCS and Surrogate recoveries: Generally, 70-130% for inorganics/metals; 60-140% for organics (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra-trace organics and speciated phenols are acceptable.

Laboratory QC data is presented in full in the laboratory certificates in **Appendix D.**

Laboratory Control Samples

Recoveries for all laboratory control samples conformed to the Data Acceptance Criteria (DAC).

Surrogates

Recoveries for laboratory surrogate samples conformed to the DAC.

Matrix Spikes

Recoveries for all matrix spike control samples conformed to the DAC.

Method Blank

All method blanks reported analyte concentrations less the laboratory LOR and therefore conformed to the DAC.

Sample Holding Times

All samples were extracted and analysed within the specified holding times.

Sample Condition

All samples were received by the analytical laboratories in correctly preserved and chilled containers with no reported breakages.

Laboratory quality control reports are presented with the laboratory reports in **Appendix D**.

7.3 Data Acceptance Criteria

The QA/QC Data collected by the Investigation were assessed against the Data Acceptance Criteria (DAC) provided in **Table 7.1**.

Table 7.1 : QA/QC Compliance Assessment

QA/QC Sample Type	Method of Assessment	Acceptable Range
Field QA/QC		
Field Duplicate	The assessment of split replicate is undertaken by calculating the Relative Percent Difference (RPD) of the replicate concentration compared with the original sample concentration. The RPD is defined as: $RPD = 100 \times \frac{\lvert X1 - X2 \rvert}{Average}$ Where: X1 and X2 are the concentration of the original and replicate samples.	The acceptable range depends upon the levels detected: ▪ 0 – 100% RPD (When the average concentration is < 5 times the LOR) ▪ 0 – 75% RPD (When the average concentration is 5 to 10 times the LOR) ▪ 0 – 50% RPD (When the average concentration is > 10 times the LOR)
Blanks (Rinsate)	Each blank is analysed as per the original samples.	Analytical Result < LOR

QA/QC Sample Type	Method of Assessment	Acceptable Range
Laboratory-prepared Trip Spike	The trip spike is analysed after returning from the field and the % recovery of the known spike is calculated.	70% - 130%
Laboratory QA/QC		
Laboratory Duplicates	Assessment as per Blind Replicates and Split Samples.	The acceptable range is defined by the laboratory and depends upon the levels detected: ▪ No limit (When the average concentration is < 10 times the LOR) ▪ 0 – 50% RPD (When the average concentration is between 10 and 20 times the LOR) ▪ 0 – 20% RPD (When the average concentration is > 20 times the LOR)
Surrogates Matrix Spikes Laboratory Control Samples	Assessment is undertaken by determining the percent recovery of the known spike or addition to the sample. $\% \text{ Recovery} = 100 \times \frac{C - A}{B}$ Where: A = Concentration of analyte determined in the original sample; B = Added Concentration; C = Calculated Concentration.	Based on statistical evaluation (see lab reports).
Method Blanks	Each blank is analysed as per the original sample.	Analytical Result < LOR
Note: LOR = Laboratory Level of Reporting (LOR) or the minimum detection limit for a particular analyte.		

8 Quality Assurance / Quality Control

For the purpose of assessing the quality of data presented in this report, Envirolab collected and analysed various Quality Control (QC) samples (blind duplicate sample) and completed their own internal QC. This section of this report is focused on the presentation of the results of these QC samples, adherence to Quality Assurance (QA) systems and discussion of deviations, if any from the DAC.

8.1 Field Quality Assurance

Field QA/QC for this project consisted of the collection of blind and split replicate samples.

8.2 Field Quality Control

Field QA/QC for this project consisted of the collection of blind replicate and rinsate samples.

The following QC samples were collected for laboratory analysis:

- Blind Replicate: Dup01_27092018 (duplicate of soil sample TH10_S)
- Blind Replicate: DupA_19/07/2018 (duplicate of soil sample BH01_0.2-0.3)
- Blind Replicate: DupB_19/07/2018 (duplicate of soil sample BH03_0.2-0.4)
- Rinsate blank: Rinsate_TH_27092018 (from gardening spade).

Blind Replicate Samples

Three blind replicate samples (soil) were analysed to assess the quality control during the field sampling program. This equates to approximately 17% blind replicate analysis for soil. The blind replicate analysis exceeds and therefore conforms to the AS 4482.1 – 2005 requirement of 5%.

RPDs for all analytes for soil blind replicate pairs conformed to the DAC with the exception of the following samples:

- Nickel (RPD 50%) between sample TH10_S and Dup01
- TRH >C16 - C34 (RPD 106%) between samples TH10_S and Dup01
- TRH >C10 - C40 (RPD 129%) between sample TH10_S and Dup01
- TPH C29-C36 (RPD 105%) between samples TH10_S and Dup01
- PAHs (RPD 52-80%) between samples TH10_S and Dup01
- PAHs (RPD 50-54%) between samples BH01 and DupA.

These results are shown in **Appendix E**.

It should be noted that all primary and blind replicate pair samples were collected from areas of open field, fill of mounds and edge of roadside. All these areas are located in land susceptible to flooding during heavy rainfall events. It is inherently difficult to obtain representative duplicate sample from heterogeneous fill material which cannot be mixed (i.e. to maintain the integrity of the sample for volatile compound analysis).

Based on the above, it is unlikely that the exceedances of the RPDs affect the overall usability of the data set.

Rinsate Blanks

One rinsate blank (rinsate_TH) collected from a gardening spade during soil investigations, were submitted to the primary laboratory for analysis.

Analysed for heavy metals, TRH, BTEXN and PAH compounds, the rinsate blank submitted as part of the soil investigation did not report concentrations of any compounds above the LOR with the exception of Zinc (0.06), however still within the guideline values and therefore conformed to the DAC.

8.3 QA/QC Assessment

It is concluded that laboratory data are of acceptable quality and are considered useable in making conclusions and recommendations regarding the quality of soil and waste from the site.

9 Site Assessment Criteria and Results

The soil screening values are taken from the NEPM 2013, Schedule B1 – Guideline on Investigation Levels for Soil and Groundwater, which include the following assessment categories:

- Health Investigation Levels (HIL) C - Includes developed open space such parks, playgrounds, playing fields (e.g. ovals), secondary schools and footpaths
- The waste classification criteria are taken from the NSW EPA Waste Classification Guidelines Part 1: Classifying Waste (2014).

9.1 Soil Analytical Results

Soil analytical results from samples collected in comparison to the Site Assessment Criteria (SAC) are discussed below, and results detailed in **Appendix F**. Analytical results for the soil investigation laboratory certificates of analysis are presented in **Appendix D**.

Heavy Metals

Concentrations of heavy metals in all samples analysed were below the SAC.

BTEX

Concentrations of BTEX compounds in all samples analysed were below the LOR and below the SAC.

TRH

Concentrations of TRH in all samples analysed were below the SAC.

PAH

As per the NEPM 1999 guidelines, the soil type has been classified coarse and measured against the land use urban residential and public open space. There are four exceedances for F3 >C16-C34 for which the criteria is 300 mg/kg with a highest detection of 2600 mg/kg for TP05. Other exceedances occurred for PAHs for several samples. Results indicate exceedances at majority of locations for PAHs with Benzo(a)pyrene showing a detection of 110 mg/kg at TP03 and 21 mg/kg at TP05.

Minor exceedances of ecological criteria for zinc were also reported in some soil samples within areas that are associated with the above sample locations. Samples taken as part of Geotechnical Factual Report (Jacobs, 2018) indicate exceedances for TPH (total petroleum hydrocarbons) with a highest detection of 1900 mg/kg at (TP03) and 740 mg/kg at (TP05). (TP03 and TP05) and exceedances for PAH (TP03).

PCB

Concentrations of all PCB compounds in all samples analysed were below the LOR and below the SAC.

Herbicides

Concentrations of herbicides in all samples analysed were below the LOR and below the SAC.

9.2 Asbestos

Sample analysis was undertaken by Envirolab in accordance with the Asbestos Fines and Fibrous Asbestos under the National Environmental Protection Measure (NEPM) 2013 and the modified Australian Standard for the qualitative identification of asbestos AS4964.2004. Jacobs also reference the Western Australian Department of Health Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (WA DoH 2009 – “The Guidelines”).

The Guidelines provide the following definitions that are adopted by the NEPM:

- Asbestos-Containing Material (ACM): Products or materials that contain asbestos in an inert bound matrix such as cement or resin. Here taken to be sound material, even as fragments and not fitting through a 7 x 7mm sieve
- Asbestos Fines (AF): Includes asbestos free fibres, small fibre bundles and also ACM fragments that pass through a 7 x 7mm sieve
- Fibrous Asbestos (FA): Friable asbestos material, such as severely weathered ACM, and asbestos in the form of loose fibrous material such as insulation products
- Free Fibres: Mineral asbestos fibres or asbestos fibres released from ACM or other asbestos sources due to deterioration, demolition or disturbance
- Friable Material: Material which is crumbled or reduced to powder by hand. Asbestos in this form is especially hazardous due to potential for fibres to become airborne.

In accordance with the referenced documents and the investigation undertaken by Jacobs, emphasis has been placed on a weight-of-evidence approach, combined with analytical results and professional judgement during site inspections and observations. Hand-held shards of asbestos cement sheeting were observed to be weathered and damp, but not dry and crumbly.

The analytical results for the field investigation (Envirolab work order 201900, 09/10/2018) indicate no trace asbestos in bulk materials for all samples analysed, with the soil type primarily classified as brown coarse grained soil and rocks. Under Envirolab test method soils NEPM - ASB-001, a 'No' reporting for trace asbestos means that no asbestos was found at the reporting limit 0.1g/kg, by polarised light microscopy including dispersion staining. No asbestos was reported in any of the soil samples above the level of reporting. Specifically:

- No Trace asbestos was reported in bulk materials at the locations sampled
- No asbestos (fines and fibrous FA + AF) was reported in soils above detection limits of<0.0004 grams (g)
- No fibrous asbestos (fines and fibrous <7mm) was detected at locations sampled
- No fibrous asbestos >7mm was detected at the locations tested.

Accordingly, and upon application of the Guidelines and associated weight of evidence observations, Jacobs classify the asbestos shard material on site as being Bonded Asbestos.

In summary, the surficial soils reported negative results for asbestos at all locations tested. Three ACM shards were found during the site visit and upon testing for Asbestos, a positive result was confirmed at all three locations. The negative analytical results for asbestos in soils suggests that ACM shards are non-friable.

9.3 Preliminary In-Situ Waste Classification

The purpose of a preliminary in-situ waste classification is to help understand if anticipated excavated material will be suitable for on-site reuse, and to facilitate off-site disposal at a licensed facility. It also helps understand if there are any potential issues with re-use of the excavated material on site.

The general site use as a road, and historical use as farm grazing for livestock as well as historic chicken sheds (which have since been demolished) helps to provide insight relating to possible sources of waste material.

The results of the laboratory analysis were compared against the following guidelines:

- NSW EPA (2014) Waste Classification Guidelines. Part 1: Classifying waste (NSW EPA, 2014) for the excavated road base

- NEPC National Environment Protection (Assessment of Site Contamination) Measure 1999, as revised 2013 (NEPM, 2013) for the excavated sandstone.

Laboratory results were only compared against health screening and investigation levels and management limits for residential and urban residential and public open space as detailed in the NEPM (2013) guidelines.

Several concentrations of contaminants within the samples analysed were above the respective guidelines for total PAH. The sampling and analysis of the soil samples indicated that this material for PAHs (Benzo(a)pyrene) exceeded guidelines for NSW Restricted Solid Waste SCC2. Based on PAHs, the exceedances for samples described below:

- Seven samples were classified as General Solid Waste CT1
- Four as Restricted Solid Waste CT2
- One as General Solid Waste SCC1
- One as Restricted Solid Waste SCC2.

TP05 located on the edge of the road returned value of 21 mg/kg and TP03 located also on the verge of the road returned value of 110 mg/kg. This could be associated with coal tar asphalt which is a material historical used within the Newcastle area for construction of roads. A further 11 samples returned readings between 0.89-7.2 mg/kg. Given the likely source of PAH contamination (bitumen particles within collected soil samples), Jacobs consider that the weight of evidence applied to waste classification decisions would be to consider shallow soils as likely to be classed as General Solid Waste, with random, isolated bitumen particles that may from time-to-time be comingled with soils adjacent to roadways.

The positive identification of asbestos containing material (ACM) at three locations would automatically classify this waste as 'Special Waste'.

There are two elevated concentration for Nickel at TH10_S (65 mg/kg) and TH07_S (48 mg/kg) which classifies waste as General Solid Waste.

The NSW EPA has issued a Resource Recovery Exemption to facilitate the re-use of excavated road materials back into road corridors. This exemption permits the following excavated materials to be re-used without prior testing and sampling: "*Rock, soil, sand, bitumen, reclaimed asphalt pavement, gravel, slag from iron and steel manufacturing, fly and bottom ash, concrete, brick and ceramics excavated during the construction and maintenance of council and RMS public roads and road public infrastructure facilities*."

The exceptions to this are soils and other materials that contain coal tar or asbestos, or any waste that is classified as hazardous, restricted solid, special or liquid waste as defined in the *Protection of the Environment Operations Act 1997* (POEO Act). Coal tar bitumen cannot be reused on site for the purposes of road construction works, however coal tar bitumen is pre-classified as General Solid Waste (non-putrescible) for the purposes of offsite disposal

The preliminary in-situ waste classification for the selected samples may benefit from Toxicity Characteristics Leaching Procedure (TCLP) testing to see if the waste classification can be reduced. Ex-situ sampling (stockpiled excess soil) would provide a more representative indication of waste classification.

The preliminary in-situ waste classification is based on site observations and the results of laboratory analysis and provides a reasonable interpretation of the general condition of material observed and sampled.

Detailed results of the preliminary in-situ waste classification assessment are provided in **Appendix G**.

10 Preliminary Conceptual Site Model

To assist in assessing potential contamination risks which could impact upon the proposal, Jacobs have developed the following preliminary conceptual site model (CSM) for the site based on the site history review and observations made during the site inspection. The CSM has assessed contamination risks as those risks which could present a potential risk to workers during construction or operation of the roadway, or the general public for ongoing road usage (e.g. presence of gross and widespread contamination, considerable material investment required to remove, reduce or manage the risk).

Table 10.1: Preliminary Conceptual Site Model

Source	Contaminants of Concern	Contamination Mechanism	Contamination Depth	Receptor	Risk Assessment
Activities on waterways including application of Herbicides	Potential for a range of organic and inorganic contaminants	Spills onto surface soils, and infiltration into groundwater	Surface (soils) and depth (soils and groundwater)	Site users, environmental receptors.	Low – Routine use of approved herbicides
Australian Rail Track Corporation Limited and John Holland Rail Pty Ltd related to railway systems activities	Potential for a range of organic and inorganic contaminants including, but not limited, to heavy metals, hydrocarbons, pesticides and asbestos	Contamination of surface soils underlying local site	Surface	Site users, environmental receptors	Low – located approximately 1km North West
The site is located within a high risk (0-1m) of Acid Sulfate Soil potential	Acid Sulfate Soil and potential for a range of organic and inorganic contaminants	Contamination of surface soils underlying local site	Surface	Site users, environmental receptors	Medium – As site is located within a high-risk area, there is possibility of acid sulphate soil formation during excavation or oxidation of sediments during works.
Salinity	Potential for a range of organic and inorganic contaminants	Contamination of surface soils underlying local site	Surface	Site users, environmental receptors	Low - Risks (water quality, damage to infrastructure) associated with salinity in the investigation area (in the Wallis Creek soil landscaped).
Agricultural related activities including but not limited to chicken sheds, stockyards, chemical use and storage	Potential for a range of organic and inorganic contaminants including but not limited to building waste, asbestos, heavy metals, hydrocarbons, pesticides, nutrients and pathogens.	Spills onto surface soils, and infiltration into groundwater	Surface (soils) and depth (soils and groundwater)	Site users, environmental receptors.	Medium – Contaminated soils (if present) possibly localised around former chicken shed areas, and possibly further across the proposal site due to previous re-grading activities.
Road run-off	Heavy metals, hydrocarbon compounds (TRH, BTEX, PAH)	Road run-off into surface water	Surface	Environmental receptors	Low – Road unlikely to be significantly contaminated (oil and fuel spills and vehicle particulate deposition) as not heavily trafficked. Contamination (if present) likely to be heavily diluted during rainfall and flooding events.

Source	Contaminants of Concern	Contamination Mechanism	Contamination Depth	Receptor	Risk Assessment
Fly-tipped wastes	Potential for a range of organic and inorganic contaminants including, but not limited, to asbestos, heavy metals, hydrocarbons, pesticides and asbestos	Contamination of surface soils underlying and immediately surrounding wastes	Surface	Site users, environmental receptors	Medium – potential for fly-tipped waste to be present within the site and maybe disturbed as part of construction activities.

11 Conclusions and Recommendations

Jacobs has undertaken the PSI of the proposal area to assess accessible locations with respect to shallow contamination in soil and potential contamination exposure risks during the proposed construction activities.

The following summary conclusions are made in relation to the PSI outcomes:

- The PSI site history land use review indicates no records of businesses that would be associated with contaminating activities on the proposal area, no records of contamination notices and no records on the National Waste Management Site Database with the exceptions of licensed activities related to waterways within the site
- The historical aerial imagery review indicates open field space, planted trees, series of fill mounds and historic chicken shed demolition with indications of potential areas of fill and/or dumping
- Elevated concentrations of PAH in soil have been detected at some surficial soil sample locations
- The source of elevated PAH in soil is considered to be associated with coal tar bitumen particles that have partitioned from the adjacent roadway where soil samples have been collected
- Asbestos fibres have been identified in shards of fibrous building material collected at surface
- No asbestos fibres have been identified in the soil samples analysed for asbestos at the locations tested
- Excluding bonded asbestos and PAH in soil, there are no other exceedances of applied human health criteria for the remaining analytical suite at the locations tested
- Preliminary insitu waste classification that indicates general solid waste for PAH impacted soils due to the pre-classification for the purposes of offsite disposal
- Pre-classified PAH impacted waste cannot be reused on site for the purposes of road construction activities
- Areas containing asbestos waste are automatically classified as special waste at some locations.

The results of the investigation indicate that shards of ACM reported positive concentrations of asbestos fibres. A likely source of asbestos contamination has been identified as being fly-tipped waste and possible remnant demolition waste from historic chicken sheds.

Identified locations of asbestos waste may pose an unacceptable risk to site users and off-site human receptors if ground disturbance were to occur. In consideration of the risk of disturbance of bonded ACM, the potential liberation of asbestos fibres during construction activities is unquantified. However, it is recommended that management of surface soils and fill material impacted by asbestos be undertaken and in accordance with the WADOH (2009), Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia. Management activities could include further inspection, sampling and analysis of historically recontoured areas of the proposal area, and activity-based air sampling for asbestos fibres, for example.

Given the limited analytical results undertaken as part of the preliminary contamination assessment scope, and the areas excluded from sampling due to access restrictions due to the PAD areas, it is difficult to predict the extent of potential asbestos contamination in soils across the proposal area without additional analytical data. However, some assumptions can be made in relation to visual observations gathered at ground surface during the site inspections, combined with the review of historical aerial imagery, as follows:

- Asbestos building material collected as part of this PSI appeared to be bonded, with no free asbestos fibres detected in associated soil samples where building fragments were encountered, suggesting that asbestos fibres have not partitioned from shards into soils at the locations tested;
- The proposal is assumed to involve raising the existing ground surface by the importation of fill, which could provide an effective barrier to incidental exposure to asbestos shards in the future, however there would be

an exposure risk to humans during the construction phase and future institutional controls would be required if known areas of asbestos remained on the proposal site;

- In its current state, usage and condition, the proposal area poses limited risk to human health under the current exposure scenario (active roadway), due to assumed incomplete exposure pathways to identified contaminants (PAH in bitumen and bonded asbestos shards).

Based on the above summary conclusions and assumptions, the following recommendations are made in relation to the PSI outcomes:

- Additional grid-based and judgemental sampling across the previously re-contoured proposal site areas for ACM should be considered to help identify the potential extent of asbestos contamination and formulate waste management options
- Allowance for appropriate off-site disposal of PAH impacted soil and bitumen waste streams during the design phase
- Adoption of ‘unexpected finds’ protocols within planning documents (such as Construction Environmental Management Plan or similar) to plan for and accommodate potential ACM demolition waste during the construction phase.

12 Limitations

The sole purpose of this report and the associated services performed by Jacobs was to provide a preliminary assessment of site contamination conditions in accordance with the scope of services set out in the contract between Jacobs and Road and Maritime (the Client). That scope of services, as described in this report, was developed with the Client.

In preparing this report, Jacobs has relied upon, and presumed accurate, any information (or confirmation of the absence thereof) provided by the Client and/or from other sources. Except as otherwise stated in the report, Jacobs has not attempted to verify the accuracy or completeness of any such information. If the information is subsequently determined to be false, inaccurate or incomplete then it is possible that our observations and conclusions as expressed in this report may change.

Jacobs derived the data in this report from information sourced from the public domain, the Client (if any) and from observations made during the site inspection. The passage of time, manifestation of latent conditions or impacts of future events may require further examination of the project and subsequent data analysis, and re-evaluation of the data, findings, observations and conclusions expressed in this report. Jacobs has prepared this report in accordance with the usual care and thoroughness of the consulting profession, for the sole purpose described above and by reference to applicable standards, guidelines, procedures and practices at the date of issue of this report. For the reasons outlined above, however, no other warranty or guarantee, whether expressed or implied, is made as to the data, observations and findings expressed in this report, to the extent permitted by law.

This report should be read in full and no excerpts are to be taken as representative of the findings. No responsibility is accepted by Jacobs for use of any part of this report in any other context.

This report has been prepared on behalf of, and for the exclusive use of, Jacobs' Client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

References

ASRIS (2018). *Australian Soil Resource Information System*, available at http://www.asris.csiro.au/, accessed 6 November 2018

Douglas Partners (2005) *Proposed Residential Development Main Road, Cliftleigh, Preliminary Site Assessment*, (Douglas Partners, 2005)

Jacobs (2018) *New Dubbo Bridge - Concept Design and REF (PSC01) - Geotechnical Factual Report,* November 2018, report reference IA182600-RP-GI-083

Lotsearch Enviro Professional (2018) *Environmental Risk and Planning Report* (Lotsearch, 2018)

National Environmental Protection Council (1999) *National Environment Protection Measure (Assessment of Site Contamination) Measure 1999* (NEPC, 1999).

NSW EPA (2000) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites* (NSW EPA, 2000).

Office of Environment and Heritage, eSPADE database, https://www.environment.nsw.gov.au/eSpade2Webapp (accessed 6 November 2018).

Roads and Maritime Services (December 2017) *Cessnock Road upgrade at Testers Hollow, Preliminary Environmental Investigation*, (RMS, 2017)

Standards Australia (2005) *Australian Standard AS 4482.1-2005 Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile* compounds (AS 4482.1-2005).

Appendix A – Lotsearch (16 July 2018) Environmental Risk and Planning Report

LOTSEARCH

LOTSEARCH ENVIRO PROFESSIONAL

Date: 16 Jul 2018 10:39:09

Reference: LS003851

Address: Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Disclaimer:
The purpose of this report is to provide an overview of some of the site history, environmental risk and planning information available, affecting an individual address or geographical area in which the property is located. It is not a substitute for an on-site inspection or review of other available reports and records. It is not intended to be, and should not be taken to be, a rating or assessment of the desirability or market value of the property or its features.
You should obtain independent advice before you make any decision based on the information within the report.
The detailed terms applicable to use of this report are set out at the end of this report.

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Location Confidences

Where Lotsearch has had to georeference features from supplied addresses, a location confidence has been assigned to the data record. This indicates a confidence to the positional accuracy of the feature. Where applicable, a confidence is given under the field heading “LocConf” or “Location Confidence”.

Location Confidence	Description
Premise Match	Georeferenced to the site location / premise or part of site
Area Match	Georeferenced with the confidence of the general/approximate area
Road Match	Georeferenced to the road or rail
Road Intersection	Georeferenced to the road intersection
Buffered Point	Feature is a buffered point
Network of Features	Georeferenced to a network of features

Dataset Listing

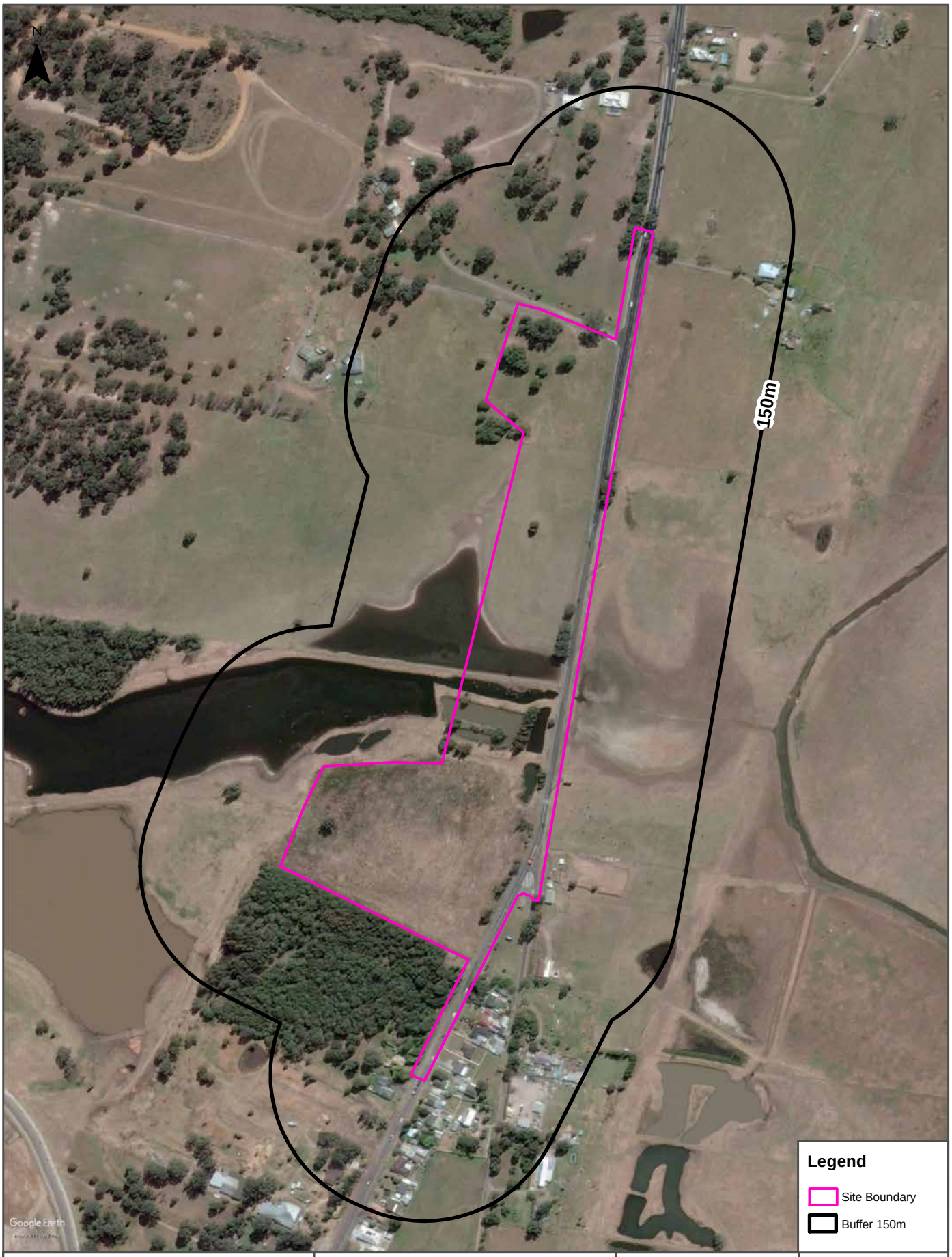
Datasets contained within this report, detailing their source and data currency:

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Cadastre Boundaries	Dept. Finance, Services & Innovation	16/07/2018	16/07/2018	Daily	-	-	-	-
Topographic Data	Dept. Finance, Services & Innovation	09/04/2018	09/04/2018	As required	-	-	-	-
List of NSW contaminated sites notified to EPA	Environment Protection Authority	06/07/2018	02/07/2018	Monthly	1000	0	0	0
Contaminated Land Records of Notice	Environment Protection Authority	06/07/2018	06/07/2018	Monthly	1000	0	0	0
Former Gasworks	Environment Protection Authority	04/07/2018	11/10/2017	Monthly	1000	0	0	0
National Waste Management Site Database	Geoscience Australia	04/07/2018	07/03/2017	Quarterly	1000	0	0	0
EPA PFAS Investigation Program	Environment Protection Authority	04/07/2018	04/07/2018	Monthly	2000	0	0	0
EPA Other Sites with Contamination Issues	Environment Protection Authority	11/01/2018	11/01/2018	Quarterly	1000	0	0	0
Licensed Activities under the POEO Act 1997	Environment Protection Authority	01/06/2018	01/06/2018	Monthly	1000	1	2	4
Delicensed POEO Activities still Regulated by the EPA	Environment Protection Authority	01/06/2018	01/06/2018	Monthly	1000	0	0	0
Former POEO Licensed Activities now revoked or surrendered	Environment Protection Authority	01/06/2018	01/06/2018	Monthly	1000	3	3	3
UPSS Environmentally Sensitive Zones	Environment Protection Authority	14/04/2015	12/01/2010	As required	1000	1	1	1
UBD Business Directory 1982 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1982 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1970 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1970 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1961 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1961 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory 1950 (Premise & Intersection Matches)	Hardie Grant			Not required	150	0	0	0
UBD Business Directory 1950 (Road & Area Matches)	Hardie Grant			Not required	150	-	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Premise & Intersection Matches)	Hardie Grant			Not required	500	0	0	0
UBD Business Directory Drycleaners & Motor Garages/Service Stations (Road & Area Matches)	Hardie Grant			Not required	500	-	0	0
Points of Interest	Dept. Finance, Services & Innovation	09/04/2018	09/04/2018	Annually	1000	0	0	2
Tanks (Areas)	Dept. Finance, Services & Innovation	09/04/2018	09/04/2018	Annually	1000	0	0	0
Tanks (Points)	Dept. Finance, Services & Innovation	09/04/2018	09/04/2018	Annually	1000	0	0	0
Major Easements	Dept. Finance, Services & Innovation	09/04/2018	09/04/2018	As required	1000	0	2	4
State Forest	Dept. Finance, Services & Innovation	18/01/2018	18/01/2018	As required	1000	0	0	0
NSW National Parks and Wildlife Service Reserves	NSW Office of Environment & Heritage	18/01/2018	30/09/2017	Annually	1000	0	0	0
Hydrogeology Map of Australia	Commonwealth of Australia (Geoscience Australia)	08/10/2014	17/03/2000	As required	1000	1	1	1

Dataset Name	Custodian	Supply Date	Currency Date	Update Frequency	Dataset Buffer (m)	No. Features Onsite	No. Features within 100m	No. Features within Buffer
Botany Groundwater Management Zones	NSW Department of Primary Industries	15/03/2018	01/10/2005	As required	1000	0	0	0
Groundwater Boreholes	NSW Dept. of Primary Industries - Water NSW; Commonwealth of Australia (Bureau of Meteorology)	21/03/2016	01/12/2015	Annually	2000	0	0	2
Geological Units 1:250,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	2	-	7
Geological Structures 1:250,000	NSW Dept. of Industry, Resources & Energy	20/08/2014		None planned	1000	0	-	8
Naturally Occurring Asbestos Potential	NSW Dept. of Industry, Resources & Energy	04/12/2015	24/09/2015	Unknown	1000	0	0	0
Soil Landscapes	NSW Office of Environment & Heritage	12/08/2014		None planned	1000	2	-	7
Atlas of Australian Soils	CSIRO	19/05/2017	17/02/2011	As required	1000	1	1	2
Standard Local Environmental Plan Acid Sulfate Soils	NSW Planning and Environment	07/10/2016	07/10/2016	As required	500	1	-	-
Atlas of Australian Acid Sulfate Soils	CSIRO	19/01/2017	21/02/2013	As required	1000	2	2	3
Dryland Salinity - National Assessment	National Land and Water Resources Audit	18/07/2014	12/05/2013	None planned	1000	1	1	2
Dryland Salinity Potential of Western Sydney	NSW Office of Environment & Heritage	12/05/2017	01/01/2002	None planned	1000	-	-	-
Mining Subsidence Districts	Dept. Finance, Services & Innovation	13/07/2017	01/07/2017	As required	1000	1	1	2
SEPP 14 - Coastal Wetlands	NSW Planning and Environment	17/12/2015	24/10/2008	Annually	1000	0	0	0
SEPP 26 - Littoral Rainforest	NSW Planning and Environment	17/12/2015	05/02/1988	Annually	1000	0	0	0
SEPP 71 - Coastal Protection	NSW Planning and Environment	17/12/2015	01/08/2003	Annually	1000	0	0	0
SEPP Major Developments 2005	NSW Planning and Environment	09/03/2013	25/05/2005	Under Review	1000	0	0	0
SEPP Strategic Land Use Areas	NSW Planning and Environment	01/08/2017	28/01/2014	Annually	1000	0	0	0
LEP - Land Zoning	NSW Planning and Environment	11/04/2018	16/03/2018	Quarterly	1000	4	7	19
LEP - Minimum Subdivision Lot Size	NSW Planning and Environment	04/04/2018	23/03/2018	Quarterly	0	2	-	-
LEP - Height of Building	NSW Planning and Environment	04/04/2018	23/03/2018	Quarterly	0	0	-	-
LEP - Floor Space Ratio	NSW Planning and Environment	04/04/2018	23/03/2018	Quarterly	0	0	-	-
LEP - Land Application	NSW Planning and Environment	04/04/2018	23/03/2018	Quarterly	0	2	-	-
LEP - Land Reservation Acquisition	NSW Planning and Environment	04/04/2018	09/03/2018	Quarterly	0	1	-	-
State Heritage Items	NSW Office of Environment & Heritage	04/04/2018	30/09/2016	Quarterly	1000	0	0	0
Local Heritage Items	NSW Planning and Environment	04/04/2018	23/03/2018	Quarterly	1000	1	1	2
Bush Fire Prone Land	NSW Rural Fire Service	10/05/2018	23/01/2018	Quarterly	1000	3	3	4
Lower Hunter and Central Coast Regional Vegetation Survey	NSW Office of Environment & Heritage	28/02/2015	16/11/2009	As required	1000	6	8	18
RAMSAR Wetlands	Commonwealth of Australia Department of the Environment	08/10/2014	24/06/2011	As required	1000	0	0	0
Groundwater Dependent Ecosystems	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	1	4	4
Inflow Dependent Ecosystems Likelihood	Bureau of Meteorology	14/08/2017	15/05/2017	Unknown	1000	4	7	9
NSW BioNet Species Sightings	NSW Office of Environment & Heritage	09/07/2018	09/07/2018	Daily	10000	-	-	-

Aerial Imagery 2017

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:
0 50 100 200
Meters

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Coordinate System:
GDA 1994 MGA Zone 56

Date: 13 July 2018

Contaminated Land & Waste Management Facilities

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

List of NSW contaminated sites notified to EPA

Records from the NSW EPA Contaminated Land list within the dataset buffer:

Map Id	Site	Address	Suburb	Activity	Management Class	Status	Location Confidence	Dist (m)	Direction
N/A	No records in buffer								

The values within the EPA site management class in the table above, are given more detailed explanations in the table below:

EPA site management class	Explanation
Contamination being managed via the planning process (EP&A Act)	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. The contamination of this site is managed by the consent authority under the Environmental Planning and Assessment Act 1979 (EP&A Act) planning approval process, with EPA involvement as necessary to ensure significant contamination is adequately addressed. The consent authority is typically a local council or the Department of Planning and Environment.
Contamination currently regulated under CLM Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). Management of the contamination is regulated by the EPA under the CLM Act. Regulatory notices are available on the EPA's Contaminated Land Public Record of Notices.
Contamination currently regulated under POEO Act	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation. Management of the contamination is regulated under the Protection of the Environment Operations Act 1997 (POEO Act). The EPA's regulatory actions under the POEO Act are available on the POEO public register.
Contamination formerly regulated under the CLM Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation under the Contaminated Land Management Act 1997 (CLM Act). The contamination was addressed under the CLM Act.
Contamination formerly regulated under the POEO Act	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed under the Protection of the Environment Operations Act 1997 (POEO Act).
Contamination was addressed via the planning process (EP&A Act)	The EPA has determined that the contamination is no longer significant enough to warrant regulation. The contamination was addressed by the appropriate consent authority via the planning process under the Environmental Planning and Assessment Act 1979 (EP&A Act).
Ongoing maintenance required to manage residual contamination (CLM Act)	The EPA has determined that ongoing maintenance, under the Contaminated Land Management Act 1997 (CLM Act), is required to manage the residual contamination. Regulatory notices under the CLM Act are available on the EPA's Contaminated Land Public Record of Notices.
Regulation being finalised	The EPA has completed an assessment of the contamination and decided that the contamination is significant enough to warrant regulation under the Contaminated Land Management Act 1997. A regulatory approach is being finalised.
Regulation under the CLM Act not required	The EPA has completed an assessment of the contamination and decided that regulation under the Contaminated Land Management Act 1997 is not required.
Under assessment	The contamination is being assessed by the EPA to determine whether regulation is required. The EPA may require further information to complete the assessment. For example, the completion of management actions regulated under the planning process or Protection of the Environment Operations Act 1997. Alternatively, the EPA may require information via a notice issued under s77 of the Contaminated Land Management Act 1997 or issue a Preliminary Investigation Order.

NSW EPA Contaminated Land List Data Source: Environment Protection Authority

© State of New South Wales through the Environment Protection Authority

Contaminated Land & Waste Management Facilities

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Contaminated Land: Records of Notice

Record of Notices within the dataset buffer:

Map Id	Name	Address	Suburb	Notices	Area No	Location Confidence	Distance	Direction
N/A	No records in buffer							

Contaminated Land Records of Notice Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority
Terms of use and disclaimer for Contaminated Land: Record of Notices, please visit
http://www.epa.nsw.gov.au/clm/clmdisclaimer.htm

Former Gasworks

Former Gasworks within the dataset buffer:

Map Id	Location	Council	Further Info	Location Confidence	Distance	Direction
N/A	No records in buffer					

Former Gasworks Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

National Waste Management Site Database

Sites on the National Waste Management Site Database within the dataset buffer:

Site Id	Owner	Name	Address	Suburb	Class	Landfill	Reprocess	Transfer	Comments	Loc Conf	Dist (m)	Direction
N/A	No records in buffer											

Waste Management Facilities Data Source: Geoscience Australia
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

EPA PFAS Investigation Program

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

EPA PFAS Investigation Program

Sites that are part of the EPA PFAS investigation program, within the dataset buffer:

Id	Site	Address	Location Confidence	Distance	Direction
N/A	No records in buffer				

EPA PFAS Investigation Program: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

EPA Other Sites with Contamination Issues

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

EPA Other Sites with Contamination Issues

This dataset contains other sites identified on the EPA website as having contamination issues. This dataset currently includes:

- James Hardie asbestos manufacturing and waste disposal sites
- Radiological investigation sites in Hunter's Hill

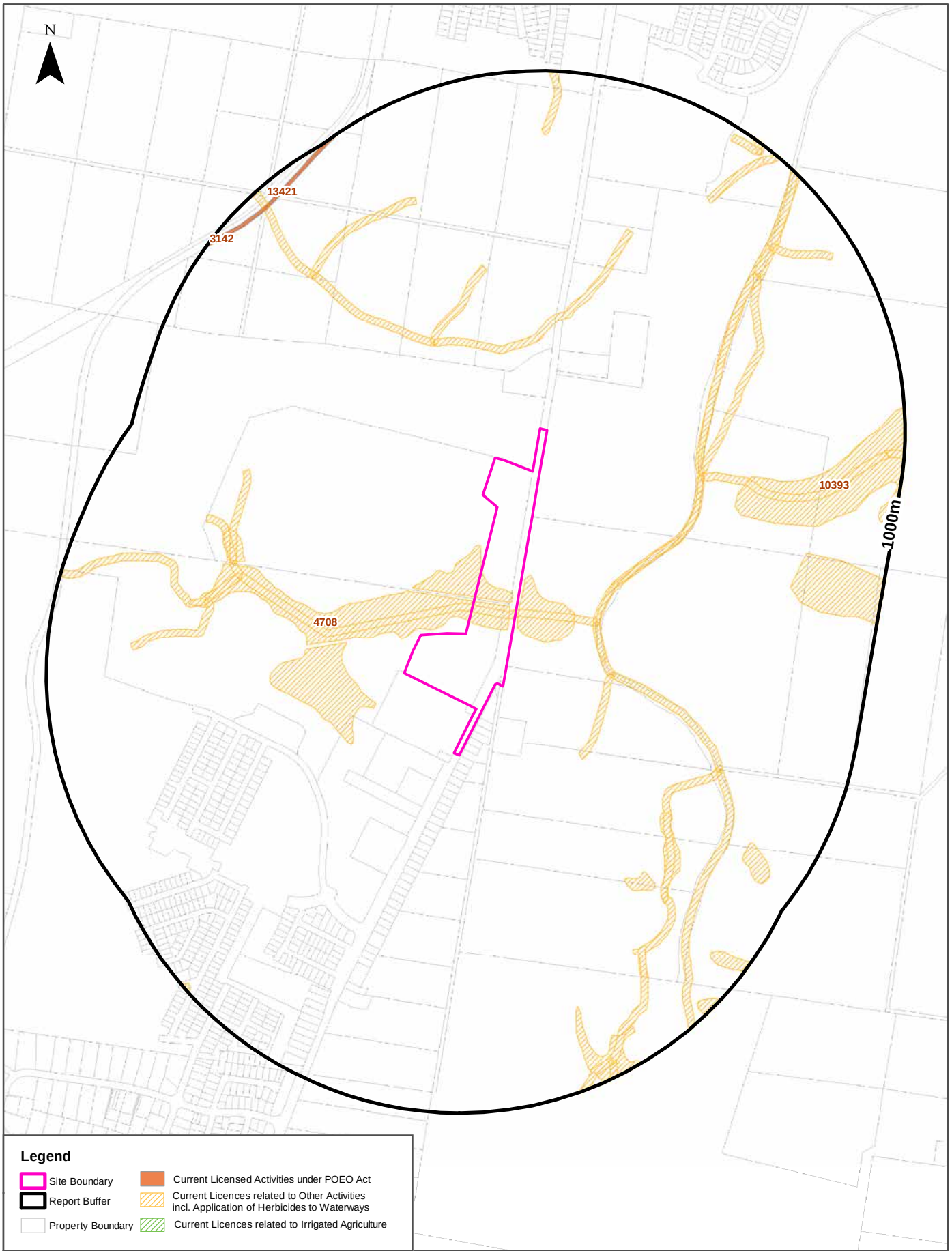
Sites within the dataset buffer:

Site Id	Site Name	Site Address	Dataset	Comments	Location Confidence	Distance	Direction
N/A	No records in buffer						

EPA Other Sites with Contamination Issues: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Current EPA Licensed Activities

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018

EPA Activities

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Licensed Activities under the POEO Act 1997

Licensed activities under the Protection of the Environment Operations Act 1997, within the dataset buffer:

EPL	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
4708	CESSNOCK CITY COUNCIL	-	-	CESSNOCK	Other activities	Network of Features	0m	Onsite
10393	MAITLAND CITY COUNCIL	ALL WATERBODIES IN THE MAITLAND LOCAL GOVERNMENT AREA	.	MAITLAND	Other activities	Network of Features	0m	East
3142	AUSTRALIAN RAIL TRACK CORPORATION LIMITED		GPO BOX 14, SYDNEY, NSW 2001		Railway systems activities	Network of Features	945m	North West
13421	JOHN HOLLAND RAIL PTY LTD		PO Box 215 , PARRAMATTA, NSW 2124		Railway systems activities	Road Match	945m	North West

POEO Licence Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Delicensed & Former Licensed EPA Activities

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Scale: 0 100 200 400 600 Meters

Property Boundary Data Source:
© Department Finance, Services & Innovation 2018

Coordinate System:
GDA 1994 MGA Zone 56

Date: 16 July 2018

EPA Activities

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Delicensed Activities still regulated by the EPA

Delicensed activities still regulated by the EPA, within the dataset buffer:

Licence No	Organisation	Name	Address	Suburb	Activity	Loc Conf	Distance	Direction
N/A	No records in buffer							

Delicensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

Former Licensed Activities under the POEO Act 1997, now revoked or surrendered

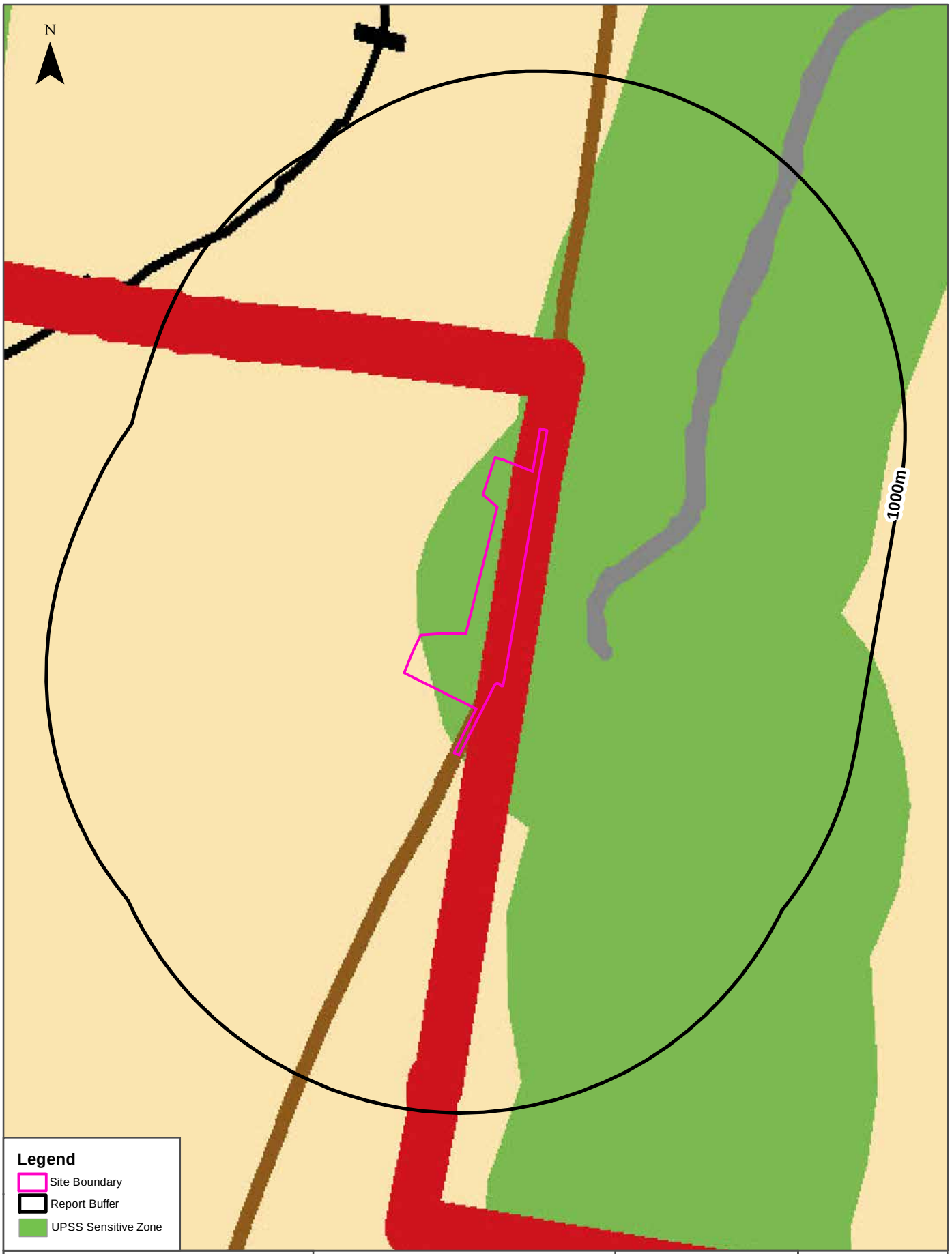
Former Licensed activities under the Protection of the Environment Operations Act 1997, now revoked or surrendered, within the dataset buffer:

Licence No	Organisation	Location	Status	Issued Date	Activity	Loc Conf	Distance	Direction
4653	LUHRMANN ENVIRONMENT MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
4838	Robert Orchard	Various Waterways throughout New South Wales - SYDNEY NSW 2000	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite
6630	SYDNEY WEED & PEST MANAGEMENT PTY LTD	WATERWAYS THROUGHOUT NSW - PROSPECT, NSW, 2148	Surrendered		Other Activities / Non Scheduled Activity - Application of Herbicides	Network of Features	0m	Onsite

Former Licensed Activities Data Source: Environment Protection Authority
© State of New South Wales through the Environment Protection Authority

UPSS Sensitive Zones

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters	UPSS Data Source: Environment Protection Authority © Dept of Environment, Climate Change & Water (NSW)	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018

Historical Business Directories

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

1982 Business Directory Records
Premise or Road Intersection Matches

Records from the 1982 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1982 Business Directory Records
Road or Area Matches

Records from the 1982 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

1970 Business Directory Records
Premise or Road Intersection Matches

Records from the 1970 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1970 Business Directory Records
Road or Area Matches

Records from the 1970 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

1961 Business Directory Records
Premise or Road Intersection Matches

Records from the 1961 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1961 Business Directory Records
Road or Area Matches

Records from the 1961 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

1950 Business Directory Records
Premise or Road Intersection Matches

Records from the 1950 UBD Business Directory, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

1950 Business Directory Records
Road or Area Matches

Records from the 1950 UBD Business Directory, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer			

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Historical Business Directories

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Dry Cleaners, Motor Garages & Service Stations Premise or Road Intersection Matches

Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a premise or road intersection, within the dataset buffer:

Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Feature Point	Direction
N/A	No records in buffer					

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Dry Cleaners, Motor Garages & Service Stations Road or Area Matches

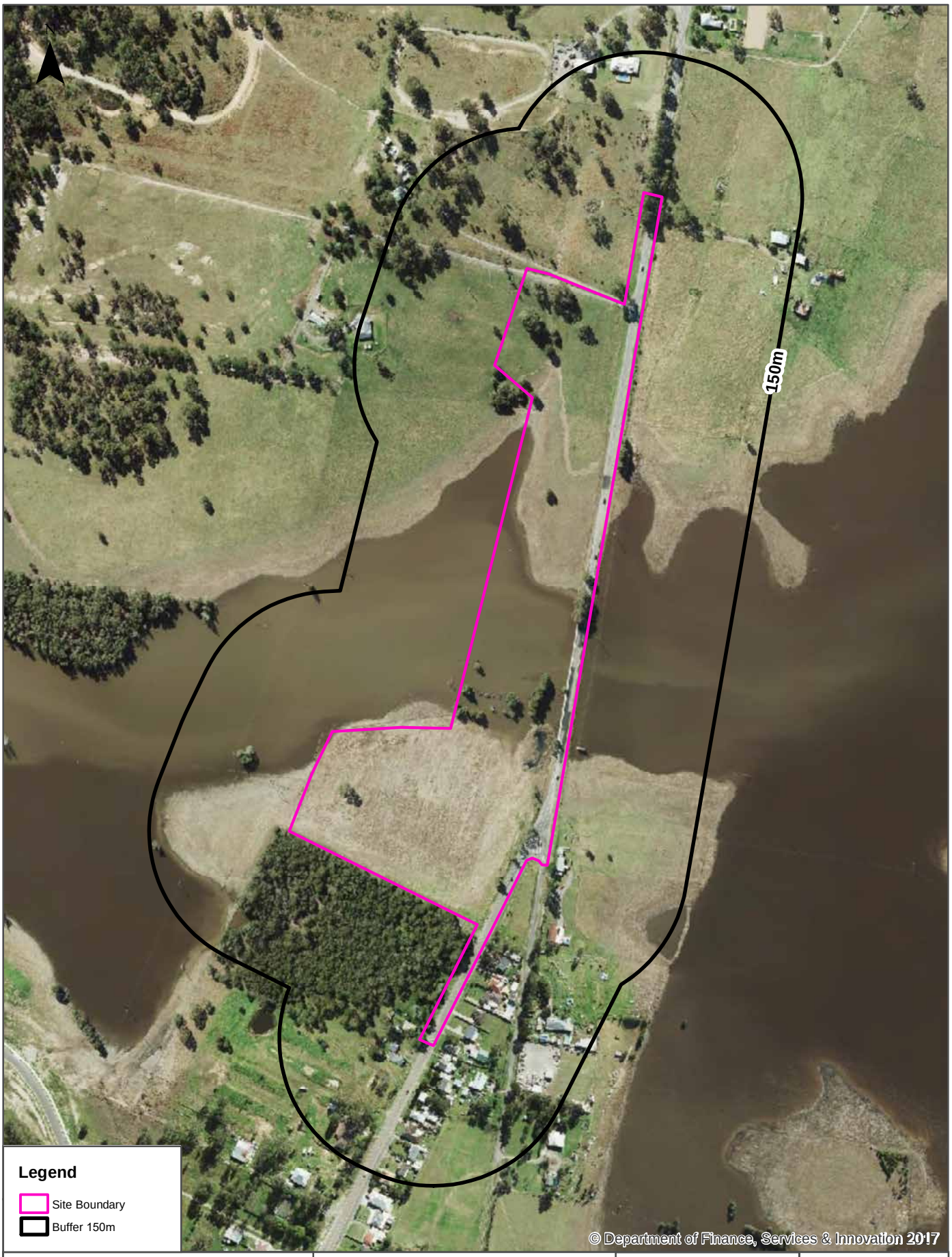
Dry Cleaners, Motor Garages & Service Stations from UBD Business Directories, mapped to a road or an area, within the dataset buffer. Records are mapped to the road when a building number is not supplied, cannot be found, or the road has been renumbered since the directory was published:

Business Activity	Premise	Ref No.	Year	Location Confidence	Distance to Road Corridor or Area
N/A	No records in buffer				

Business Directory Content Derived from Universal Business Directories (UBD) - Licensed from Hardie Grant

Aerial Imagery 2012

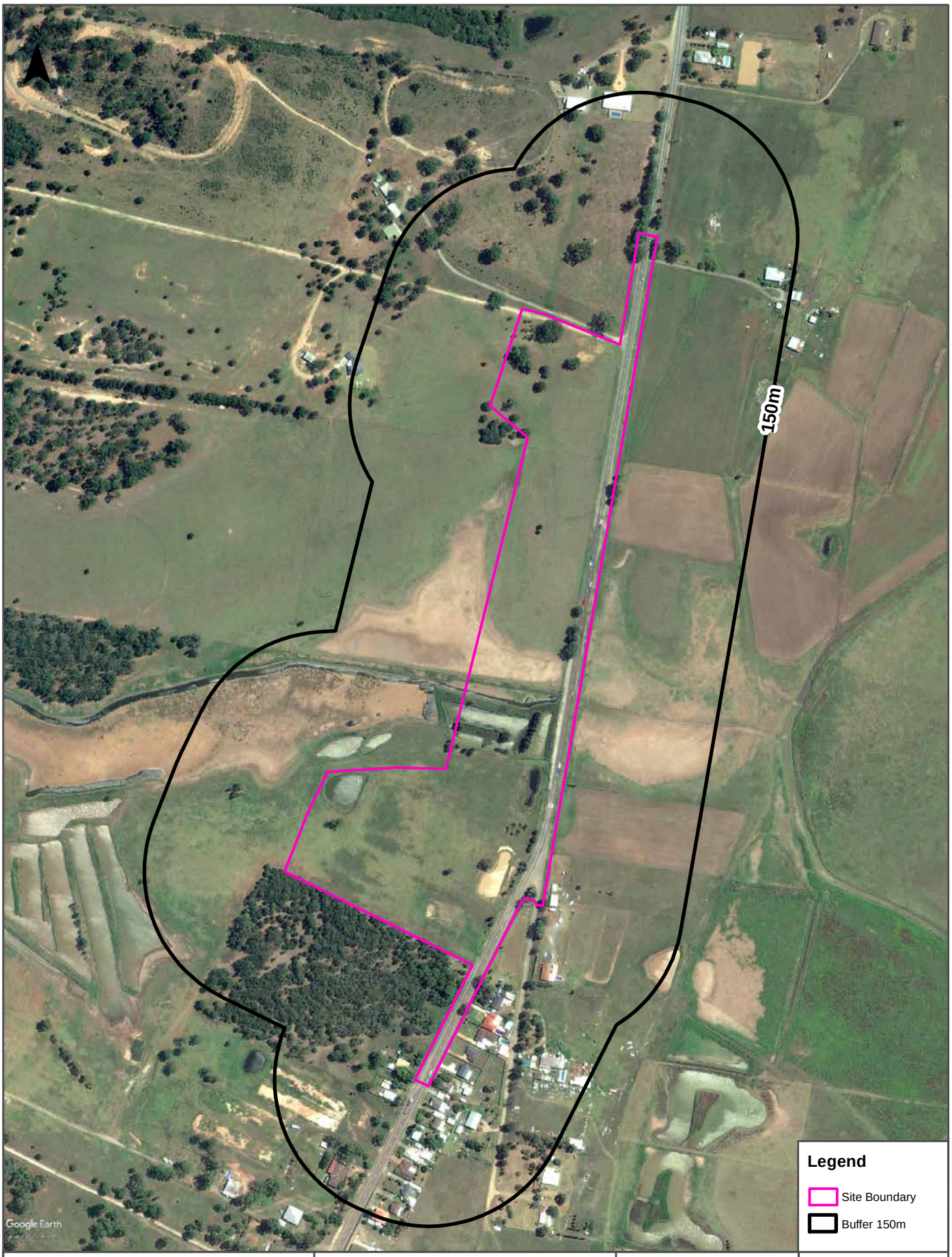
Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:	Data Sources: Aerial Imagery © Department Finance, Services & Innovation	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018
0 50 100 200 300 Meters			

Aerial Imagery 2010

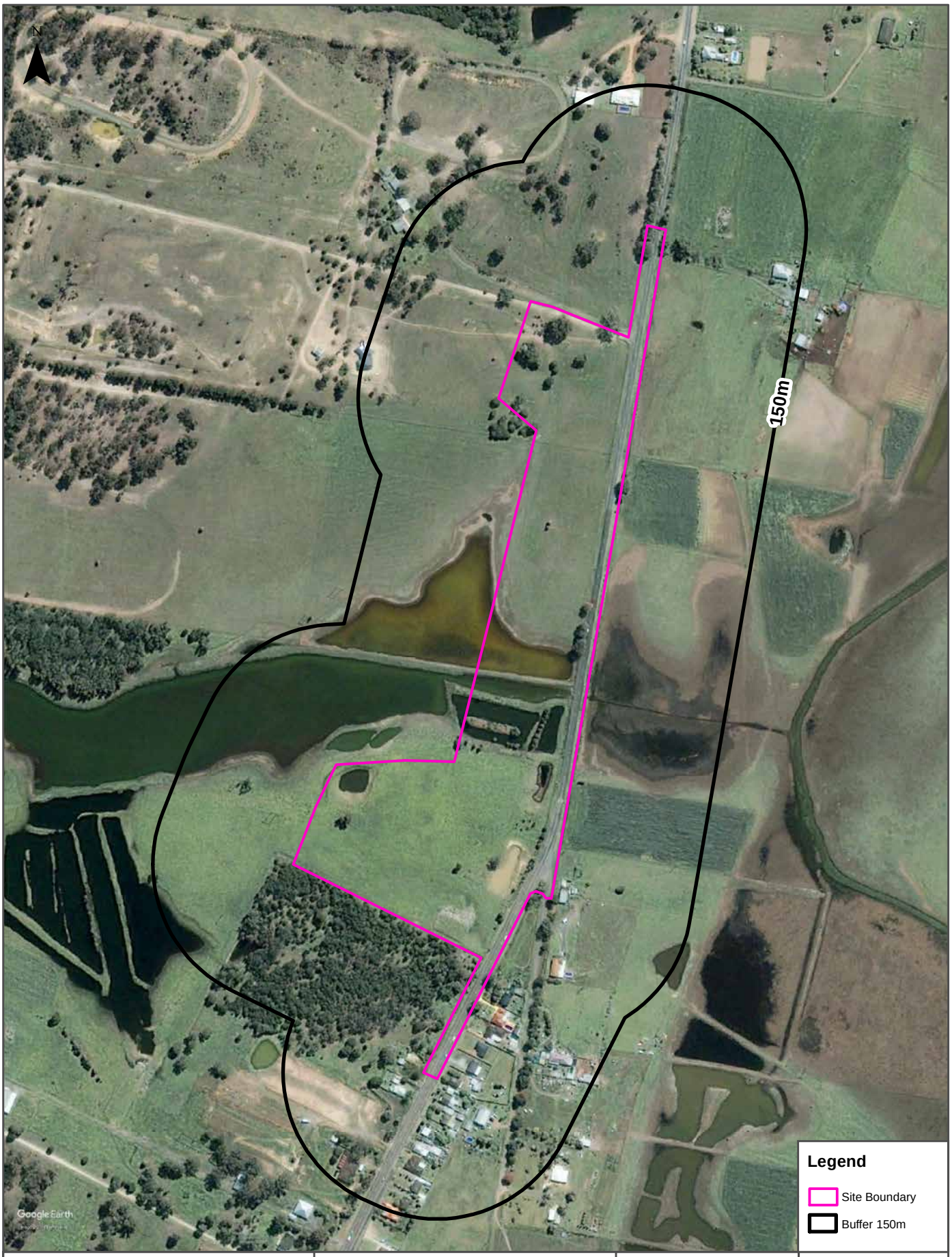
Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:	Data Source Aerial Imagery: © 2018 Google Inc, used with permission. Google and the Google logo are registered trademarks of Google Inc.	Coordinate System: GDA 1994 MGA Zone 56	Date: 13 July 2018
0 50 100 200 Meters			

Aerial Imagery 2006

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:
0 50 100 200
Meters

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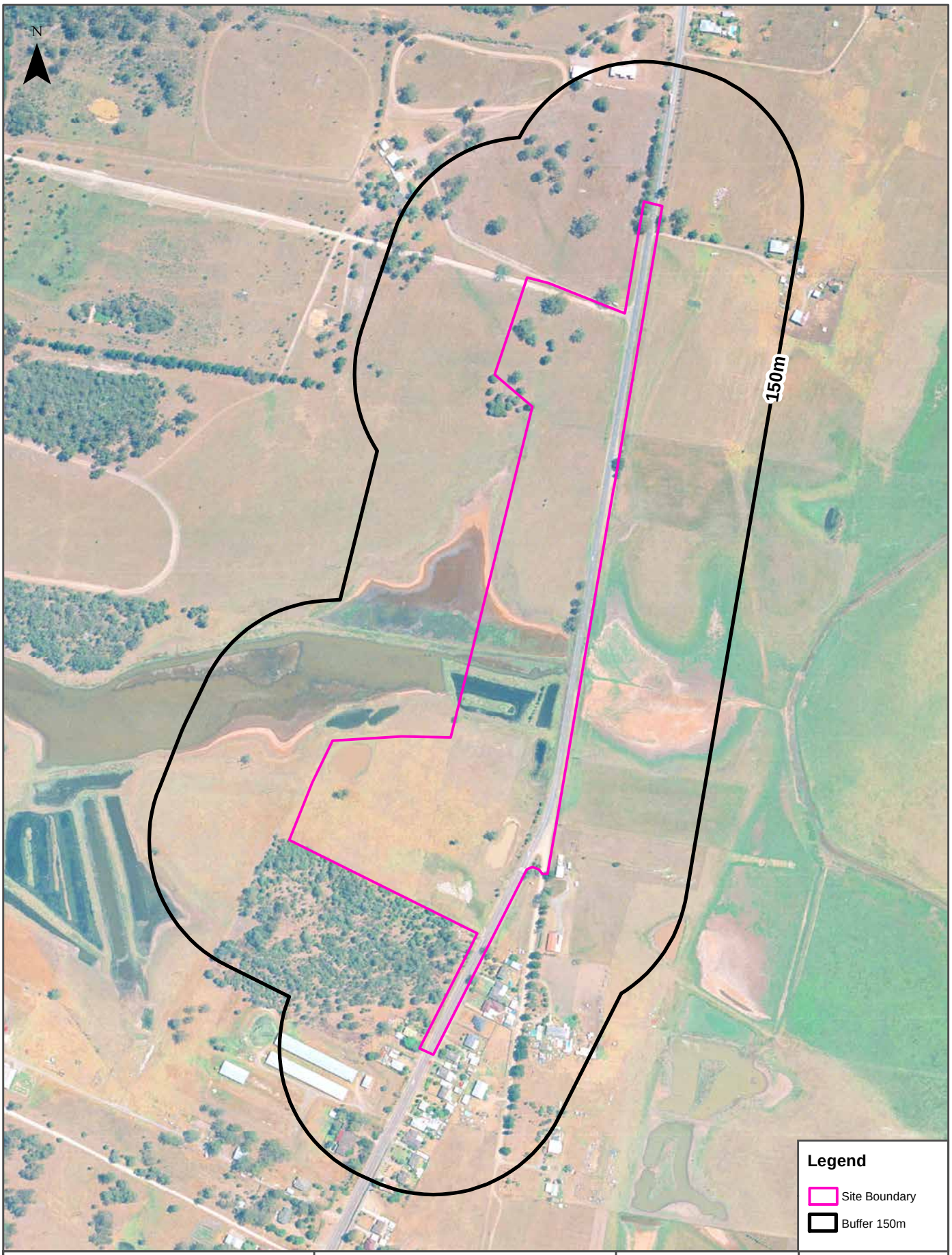
Coordinate System:
GDA 1994 MGA Zone 56

Date: 13 July 2018

Aerial Imagery 2001

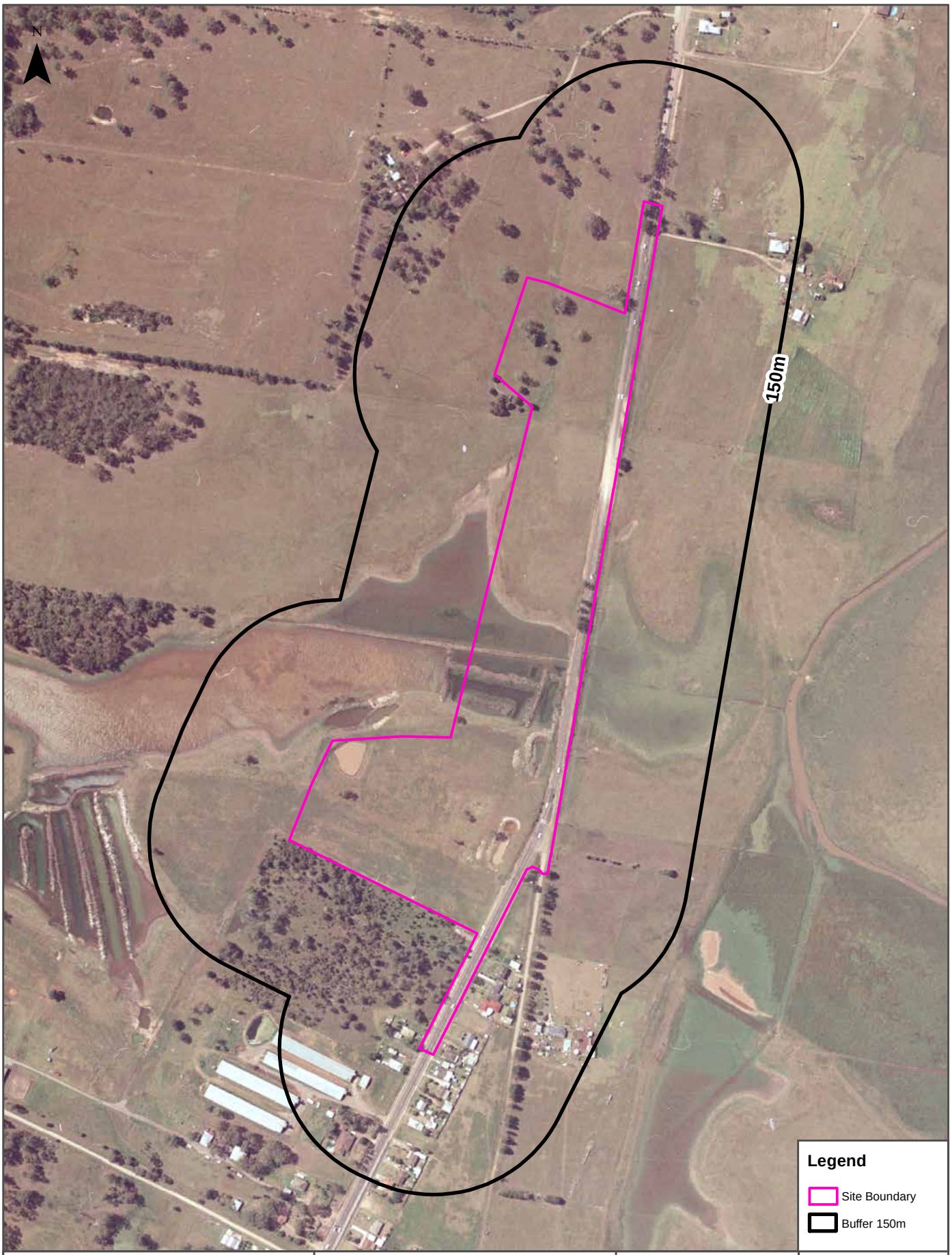
Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 13 July 2018
0 50 100 200 Meters	© NSW Department Finance, Services & Innovation	GDA 1994 MGA Zone 56	

Aerial Imagery 1993

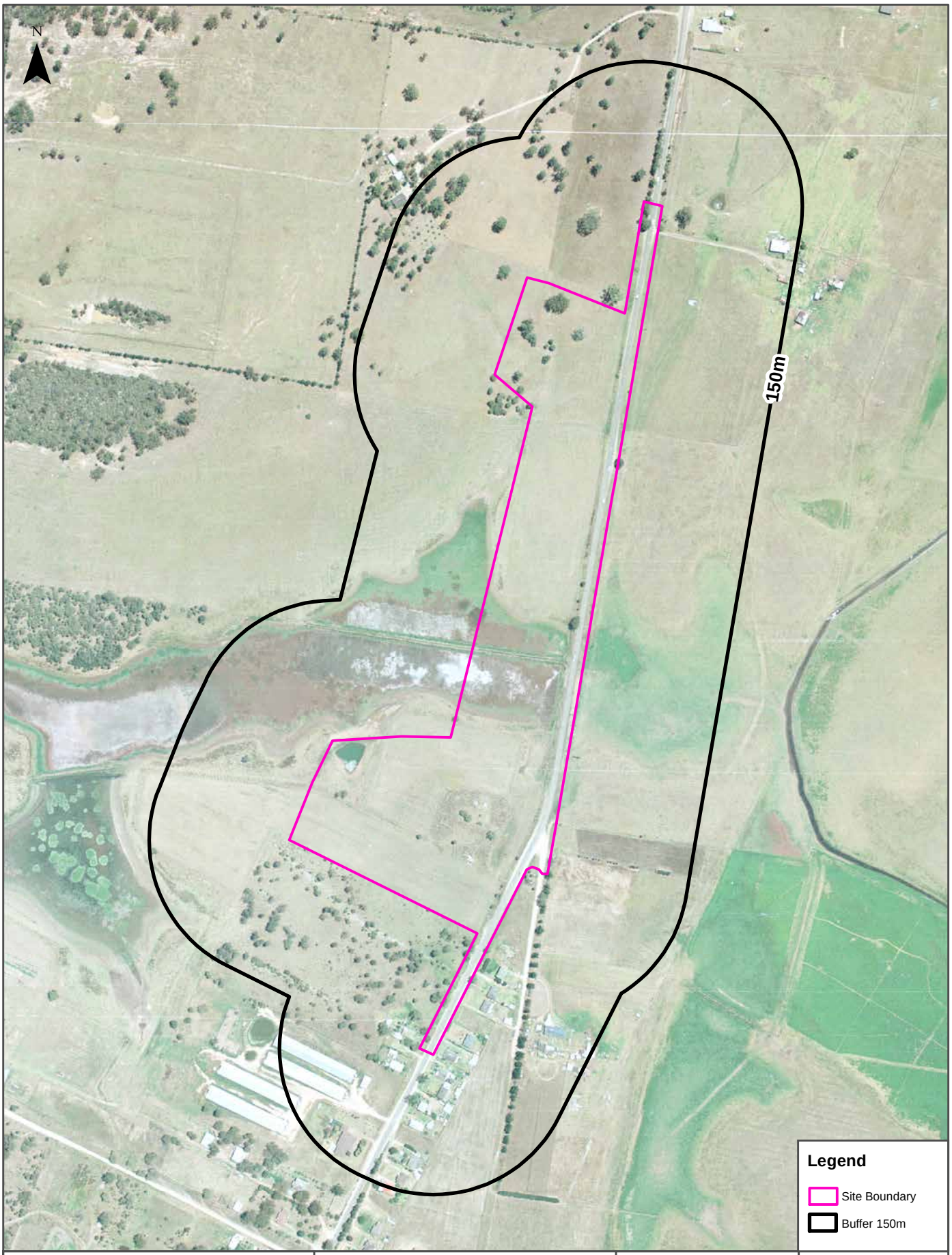
Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 13 July 2018
0 50 100 200 Meters	© NSW Department Finance, Services & Innovation	GDA 1994 MGA Zone 56	

Aerial Imagery 1983

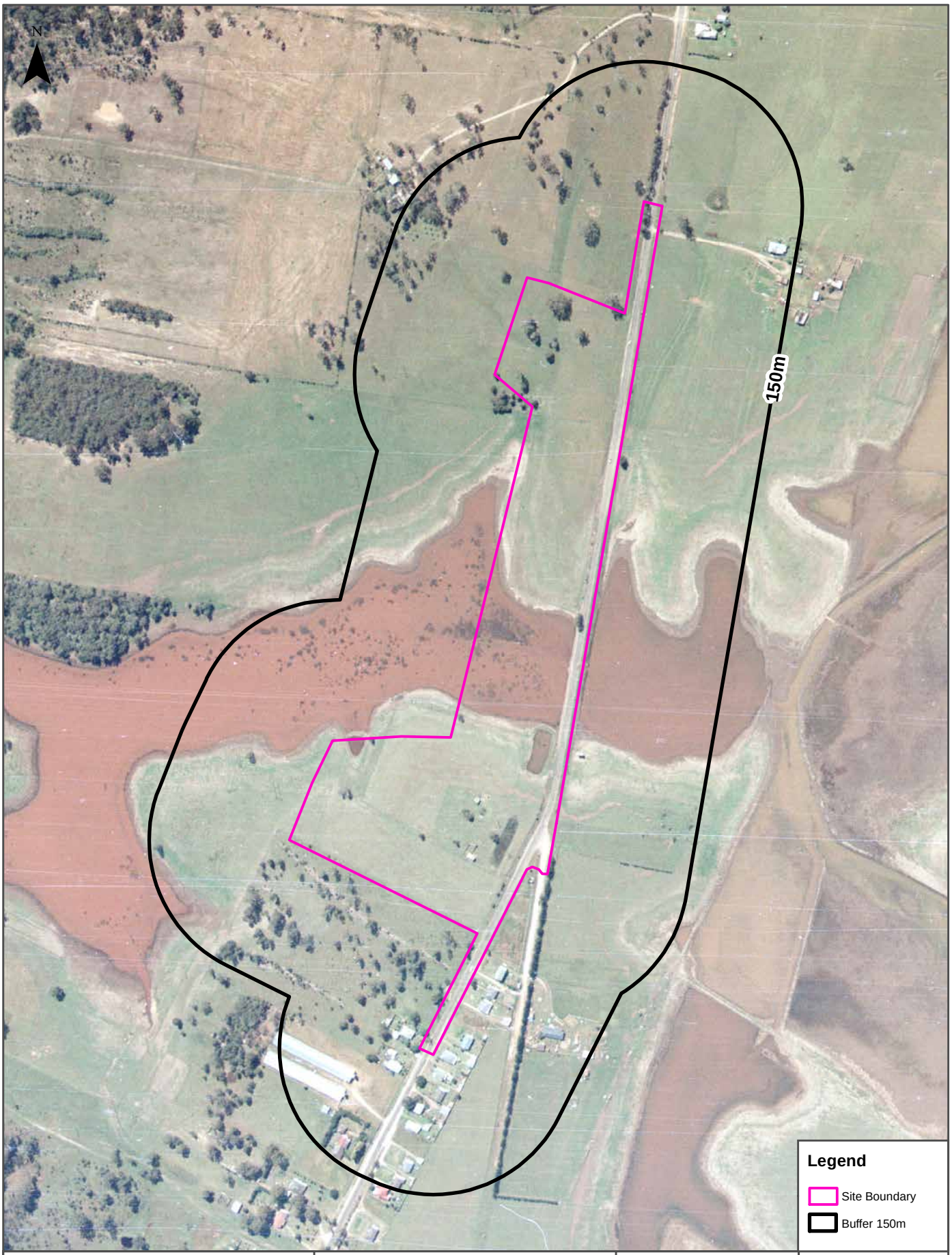
Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 13 July 2018
0 50 100 200 Meters	© NSW Department Finance, Services & Innovation	GDA 1994 MGA Zone 56	

Aerial Imagery 1976

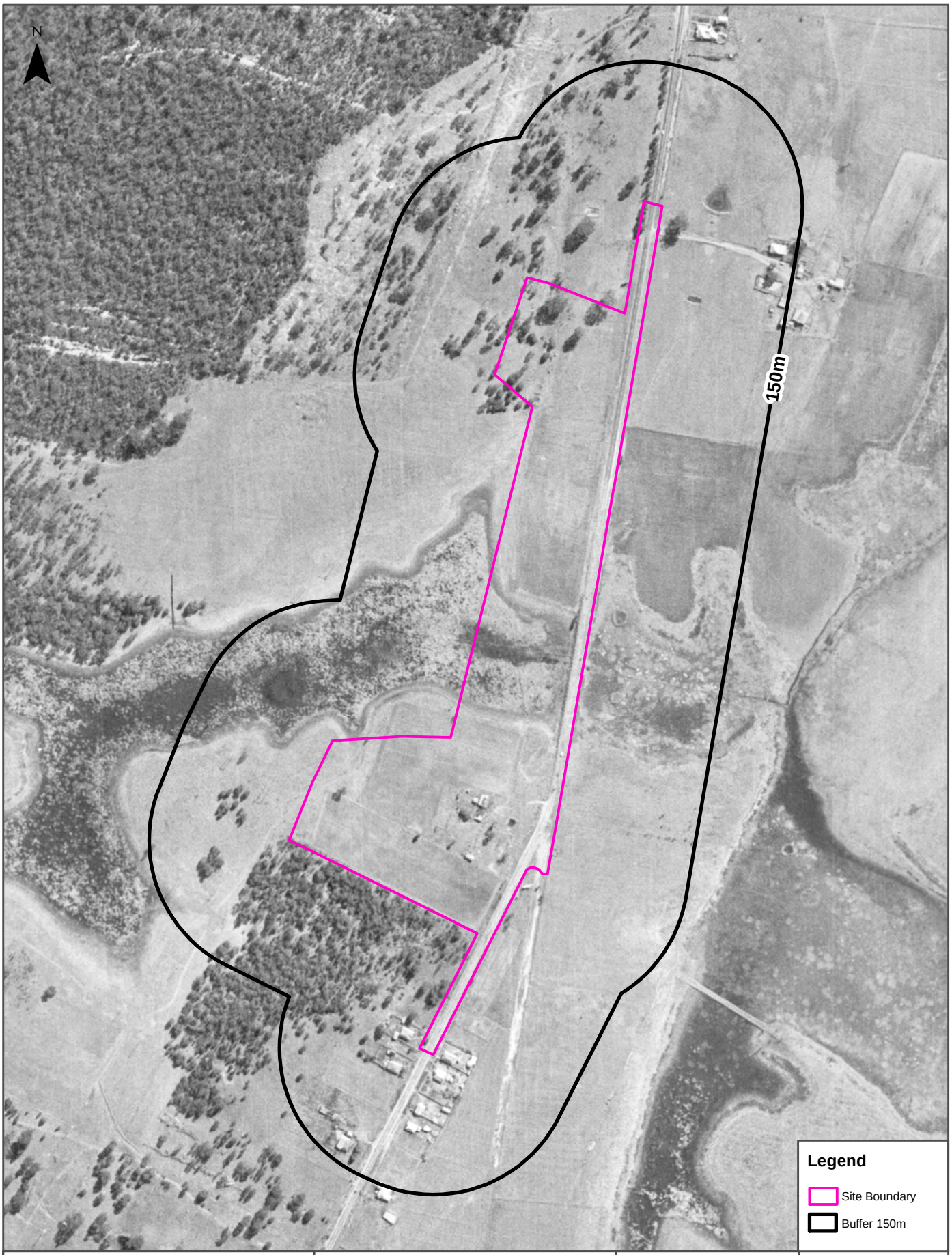
Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 13 July 2018
0 50 100 200 Meters	© NSW Department Finance, Services & Innovation	GDA 1994 MGA Zone 56	

Aerial Imagery 1966

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:
0 50 100 200
Meters

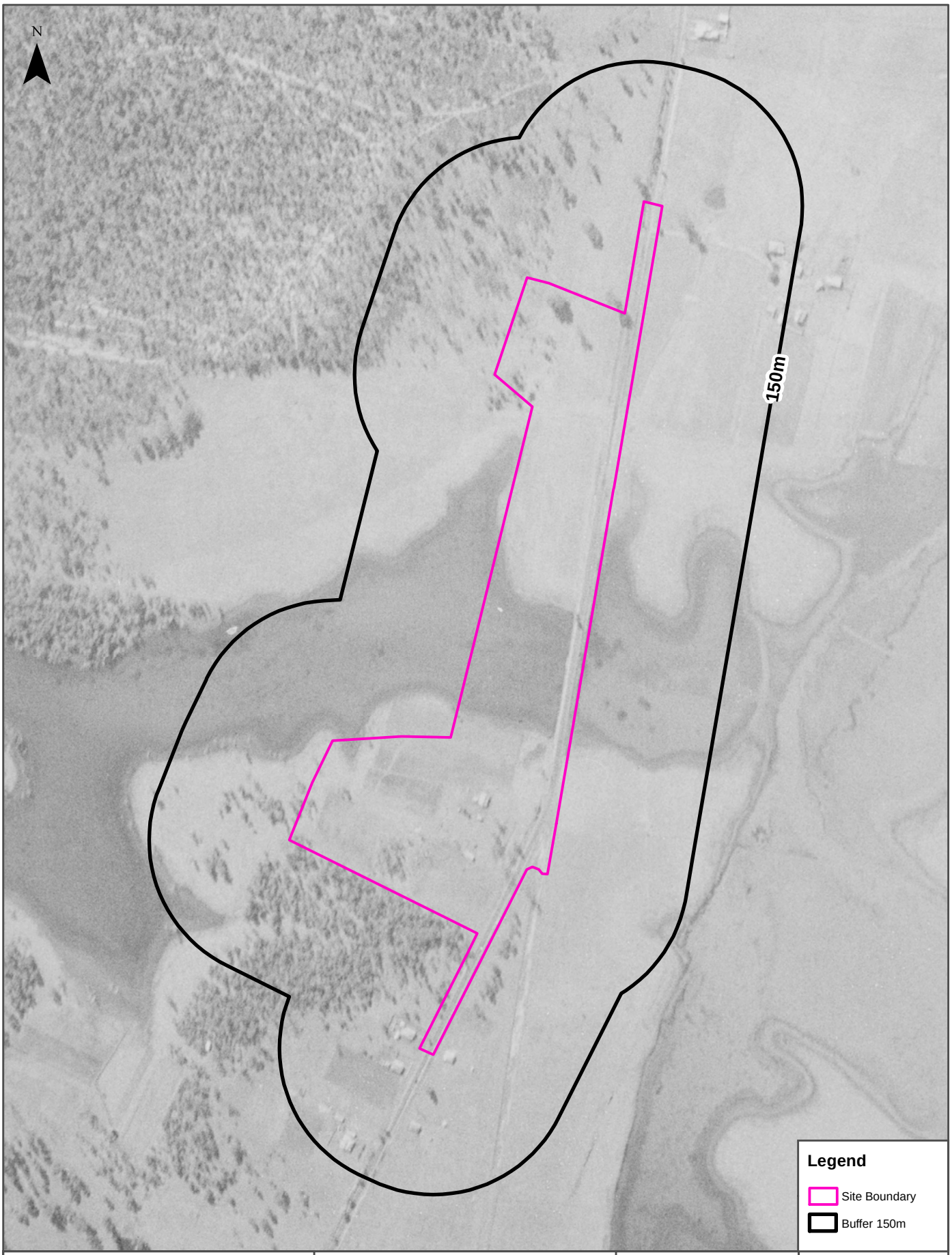
Data Source Aerial Imagery:
© NSW Department Finance, Services & Innovation

Coordinate System:
GDA 1994 MGA Zone 56

Date: 13 July 2018

Aerial Imagery 1954

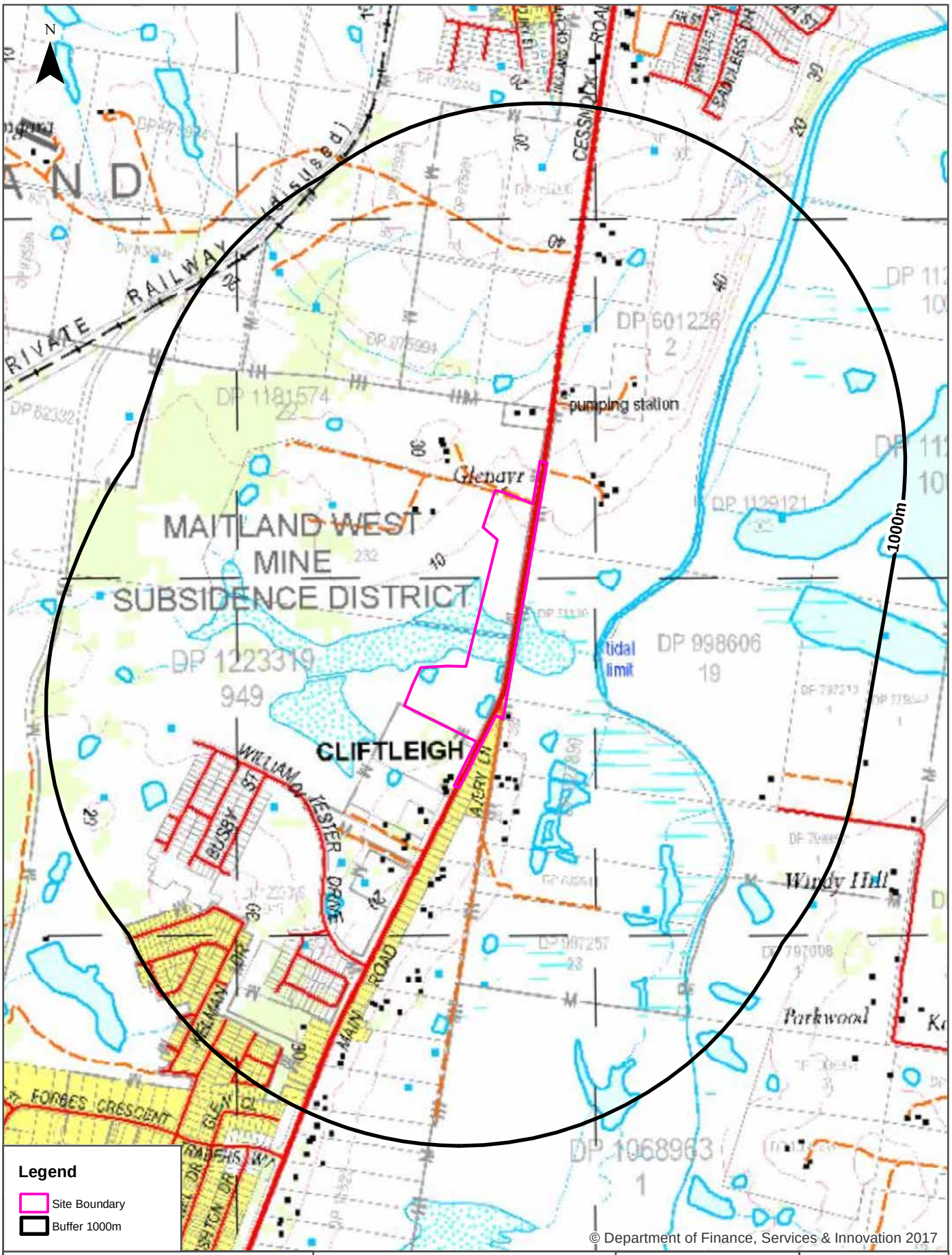
Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale:	Data Source Aerial Imagery:	Coordinate System:	Date: 13 July 2018
0 50 100 200 Meters	© NSW Department Finance, Services & Innovation	GDA 1994 MGA Zone 56	

Topographic Map 2015

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters	Data Sources: Topographic Map Data © NSW Land and Property Information	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018

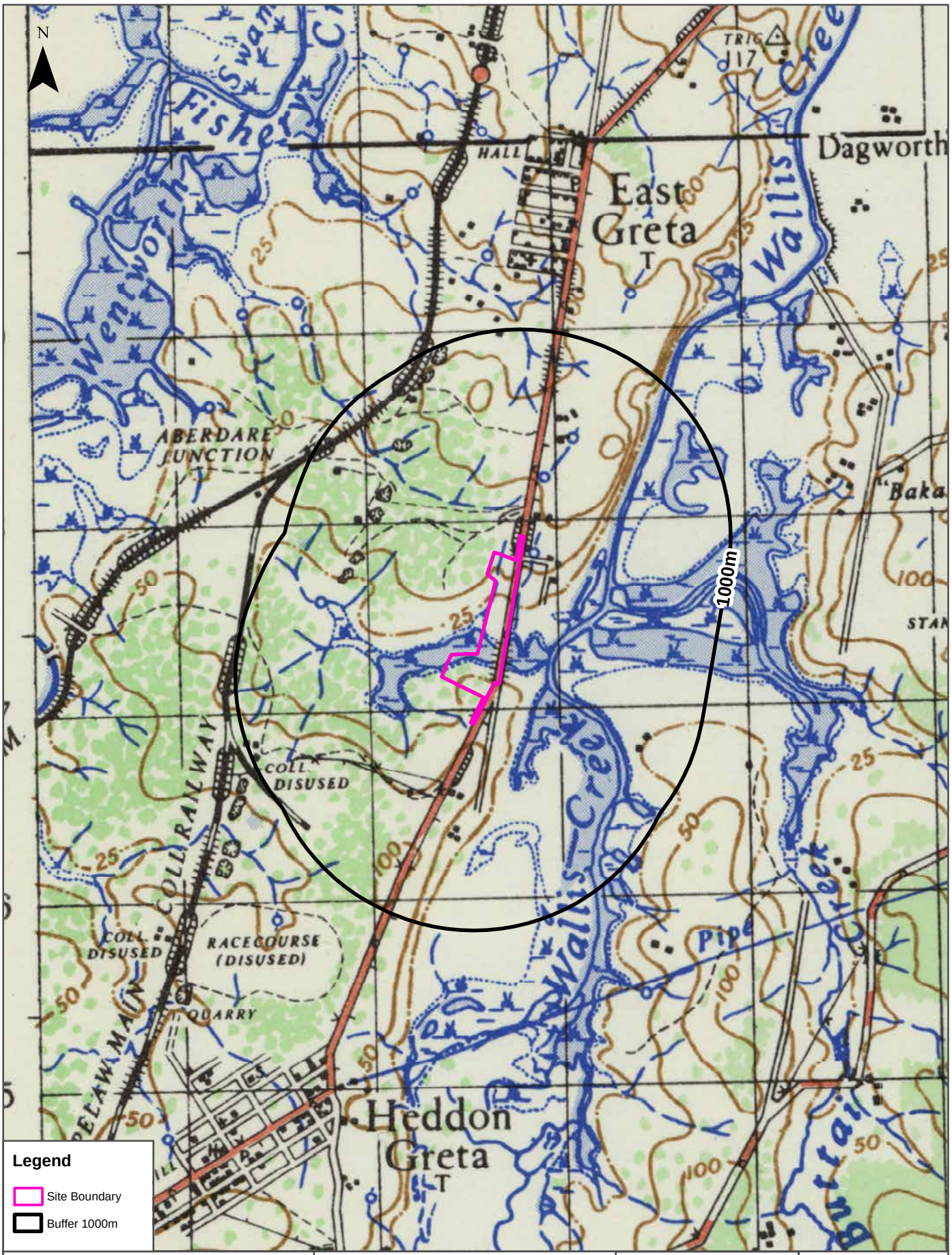
Historical Map 1981

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Scale: 0 200 400 800 Meters	Data Sources: Sheet 9232, Edition 1, Newcastle, NSW NATMAP 1:100,000 Topographic Maps Geoscience Australia	Coordinate System: GDA 1994 MGA Zone 56	Date: 13 July 2018

Historical Map 1941

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 200 400 800 Meters

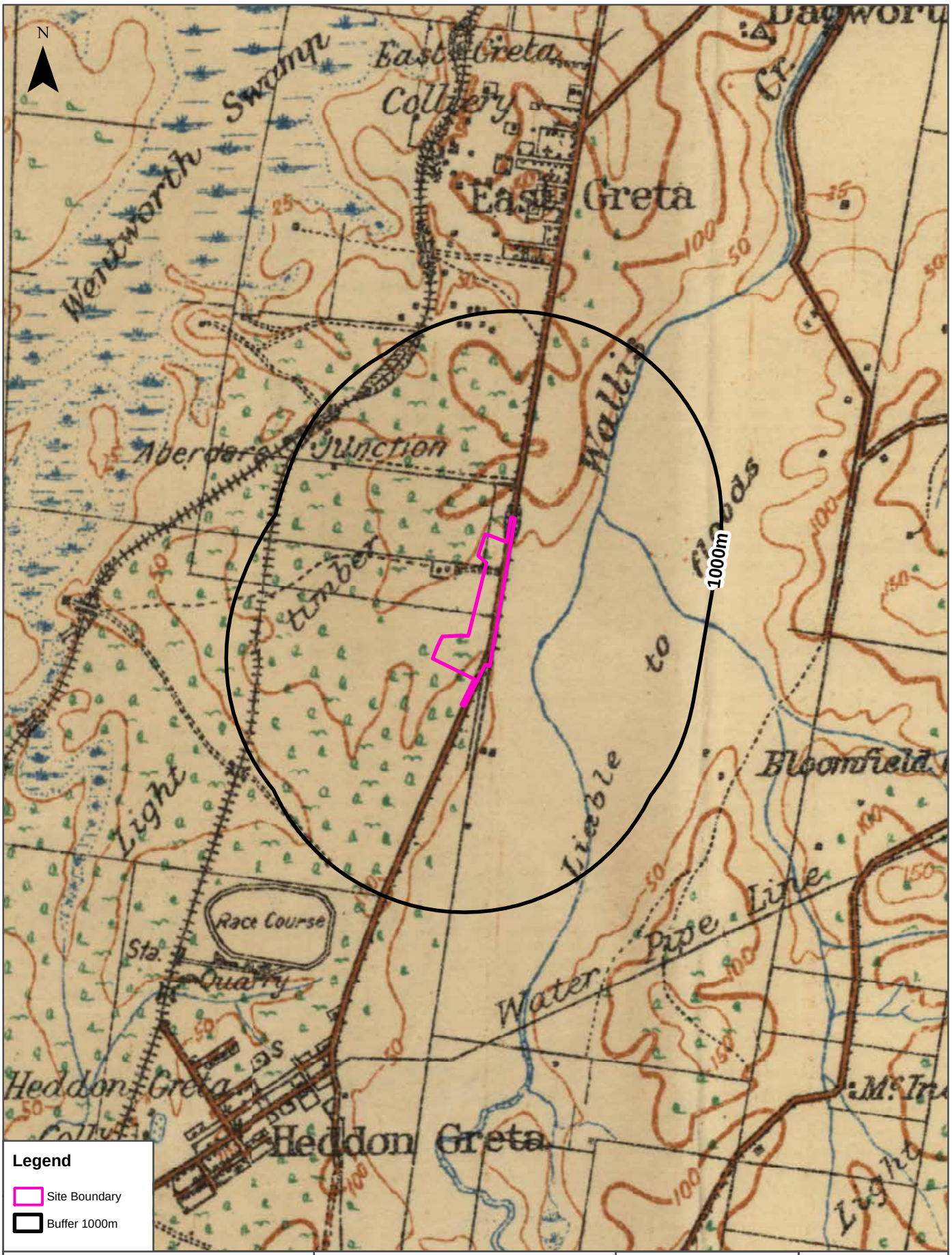
Data Sources: Australia 1:63360, Sheet 396, Newcastle, NSW. Prepared by Australian Section Imperial General Staff

Coordinate System: GDA 1994 MGA Zone 56

Date: 13 July 2018

Historical Map 1913

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 200 400 800 Meters

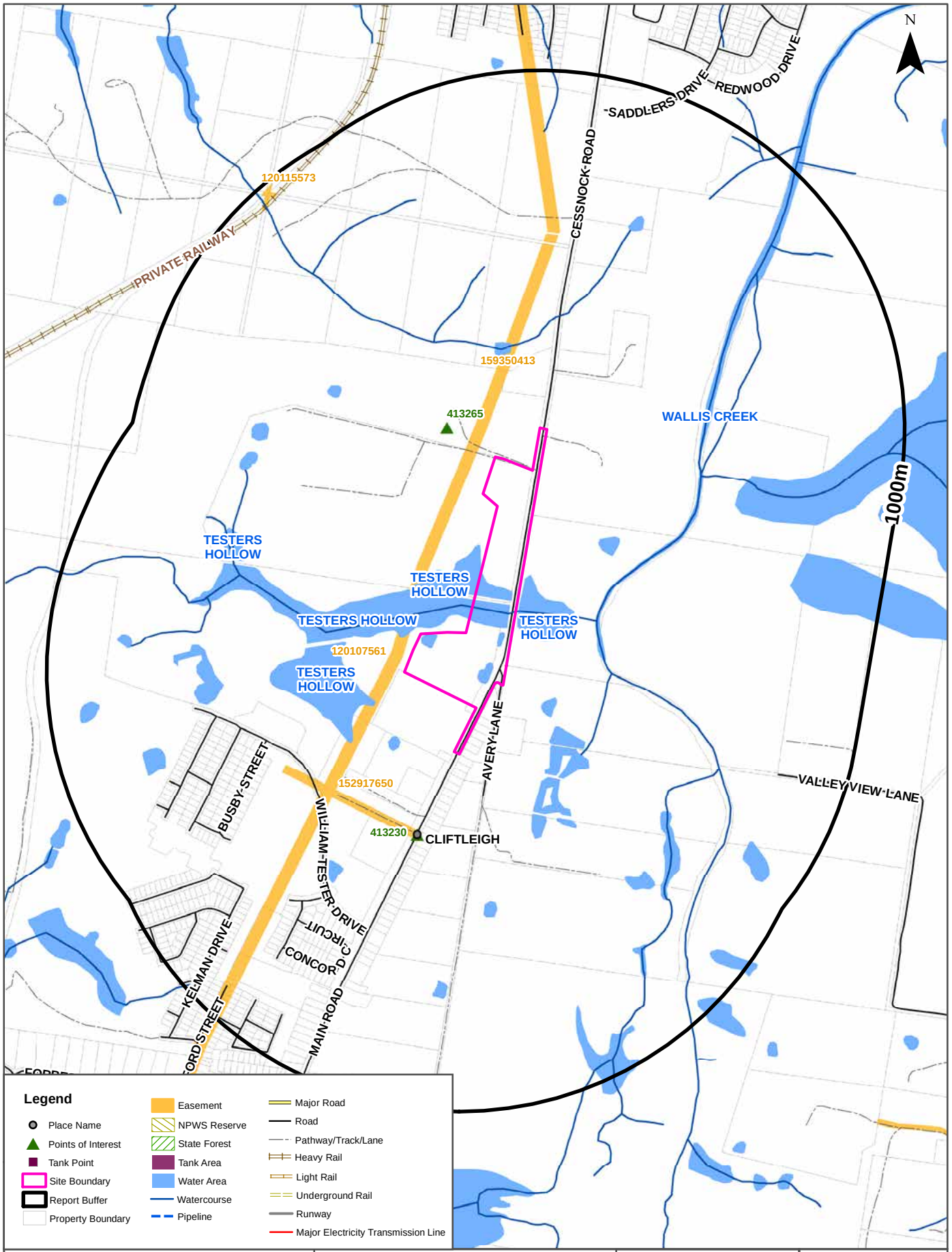
Data Sources: Australia 1:63360, Sheet 396, Newcastle, NSW. Prepared by Commonwealth Section Imperial General Staff

Coordinate System: GDA 1994 MGA Zone 56

Date: 13 July 2018

Topographic Features

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Topographic Features

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Points of Interest

What Points of Interest exist within the dataset buffer?

Map Id	Feature Type	Label	Distance	Direction
413265	Homestead	GLENAYR	157m	North
413230	Village	CLIFTLEIGH	254m	South

Topographic Data Source: © Land and Property Information (2015)
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Topographic Features

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Tanks (Areas)

What are the Tank Areas located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks (Points)

What are the Tank Points located within the dataset buffer?
Note. The large majority of tank features provided by LPI are derived from aerial imagery & are therefore primarily above ground tanks.

Map Id	Tank Type	Status	Name	Feature Currency	Distance	Direction
	No records in buffer					

Tanks Data Source: © Land and Property Information (2015)
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Major Easements

What Major Easements exist within the dataset buffer?
Note. Easements provided by LPI are not at the detail of local governments. They are limited to major easements such as Right of Carriageway, Electrical Lines (66kVa etc.), Easement to drain water & Significant subterranean pipelines (gas, water etc.).

Map Id	Easement Class	Easement Type	Easement Width	Distance	Direction
120107561	Primary	Undefined		22m	South West
159350413	Primary	Easement for Access		22m	South West
152917650	Primary	Right of way		245m	South West
120115573	Primary	Undefined		948m	North West

Easements Data Source: © Land and Property Information (2015)
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Topographic Features

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

State Forest

What State Forest exist within the dataset buffer?

State Forest Number	State Forest Name	Distance	Direction
N/A	No records in buffer		

State Forest Data Source: © Land and Property Information (2015)
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National Parks and Wildlife Service Reserves

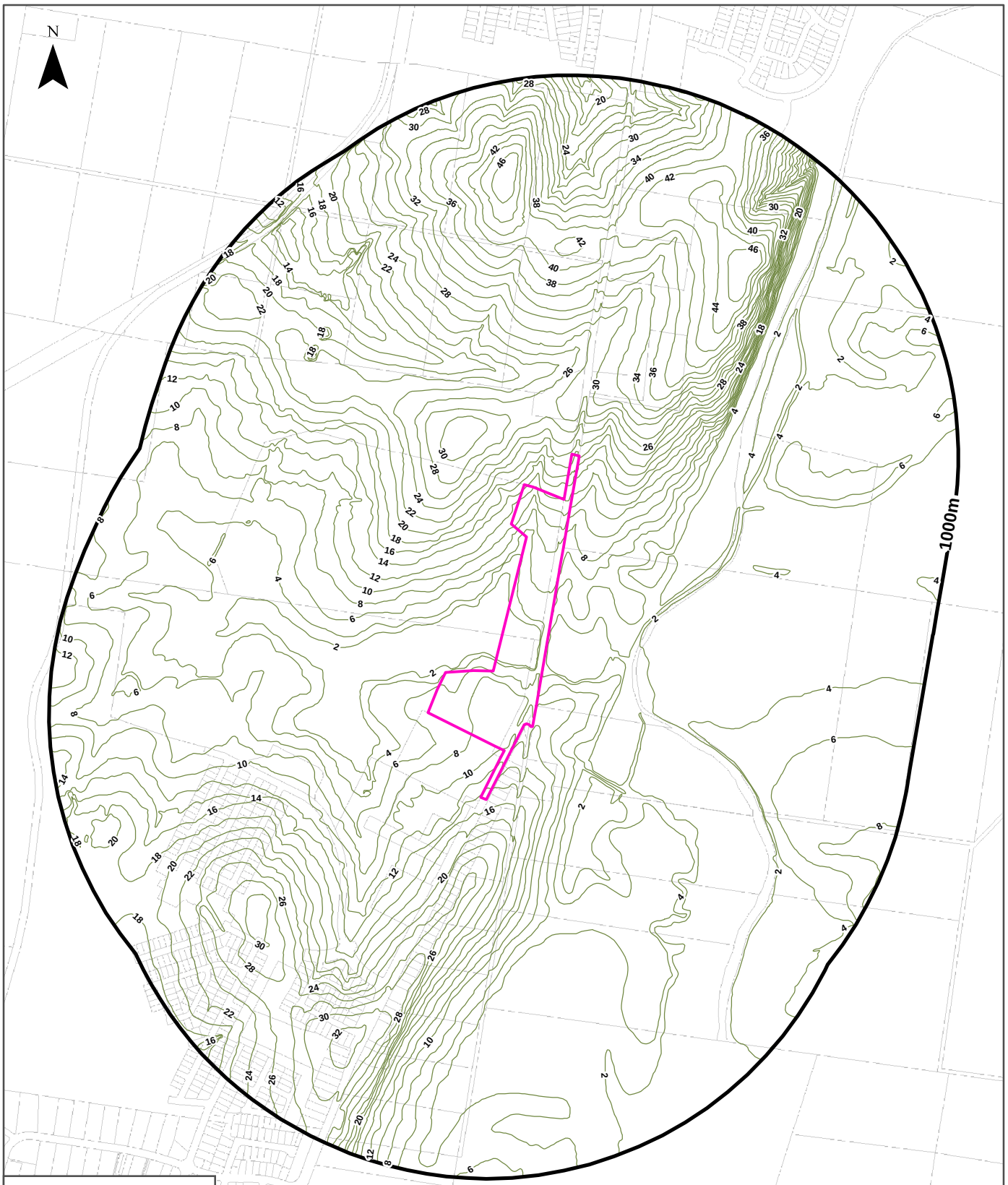
What NPWS Reserves exist within the dataset buffer?

Reserve Number	Reserve Type	Reserve Name	Gazetted Date	Distance	Direction
N/A	No records in buffer				

NPWS Data Source: © Land and Property Information (2015)
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Elevation Contours (m AHD)

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Legend

- Elevation Contour (m AHD)
- Site Boundary
- Report Buffer
- Property Boundary

Accuracy & Currency: This contour data can be up to 0.4 of the contour interval out in height and must therefore not be used for any design or engineering works, but only as a general guide to topography. Gaps may occur along contour lines due to vertical topography, obscured topography in the source photography such as buildings, dense vegetation or dead ground, or the fact that original buildings have been replaced in the intervening thirty years since the original contour capture.

Scale:	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018
0 100 200 400 Meters			

Hydrogeology & Groundwater

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Hydrogeology

Description of aquifers on-site:

Description
Fractured or fissured, extensive aquifers of low to moderate productivity

Description of aquifers within the dataset buffer:

Description
Fractured or fissured, extensive aquifers of low to moderate productivity

Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia)
Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Botany Groundwater Management Zones

Groundwater management zones relating to the Botany Sand Beds aquifer within the dataset buffer:

Management Zone No.	Restriction	Distance	Direction
N/A	No records in buffer		

Botany Groundwater Management Zones Data Source : NSW Department of Primary Industries

Groundwater Boreholes

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Scale:	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018
0 100 200 400 600 800 1,000 1,200 Meters			

Hydrogeology & Groundwater

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Groundwater Boreholes

Boreholes within the dataset buffer:

GW No.	Licence No	Work Type	Owner Type	Purpose	Contractor	Complete Date	Final Depth (m)	Drilled Depth (m)	Salinity (mg/L)	SWL (m)	Yield (L/s)	Elev (AHD)	Dist	Dir
21010164				UNK								12.90	659m	North East
GW051647	20BL112319	Bore	Private	Stock		01/09/1980	12.00	12.00					1238 m	North East

Borehole Data Source : NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corporation for all bores prefixed with GW. All other bores © Commonwealth of Australia (Bureau of Meteorology) 2015. Creative Commons 3.0 © Commonwealth of Australia http://creativecommons.org/licenses/by/3.0/au/deed.en

Hydrogeology & Groundwater

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Driller's Logs

Drill log data relevant to the boreholes within the dataset buffer:

Groundwater No	Drillers Log	Distance	Direction
GW051647	0.00m-0.15m Topsoil 0.15m-3.00m Clay 3.00m-3.81m Sand Yellow 3.81m-4.57m Sand White 4.57m-6.10m Clay Sand 6.10m-12.00m Sandstone Hard	1238m	North East

Drill Log Data Source: NSW Department of Primary Industries - Office of Water / Water Administration Ministerial Corp
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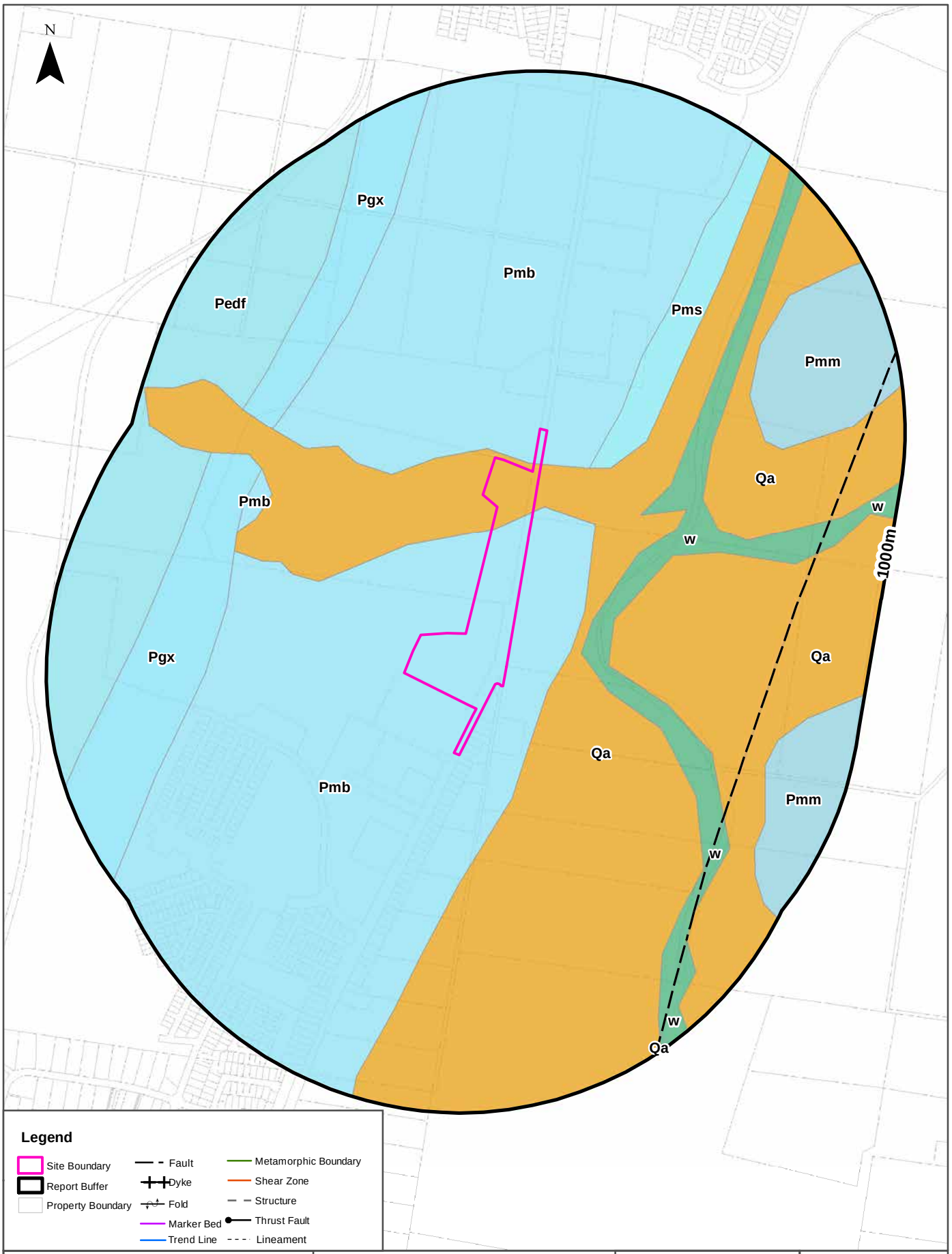
Geology 1:250,000

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Geology

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Geological Units

What are the Geological Units onsite?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Pmb	Conglomerate, sandstone, siltstone	Branxton Formation	Maitland Group		Palaeozoic			1:250,000
Qa	Undifferentiated alluvial deposits; sand, silt, clay and gravel; some residual and colluvial deposits. Includes some channel, levee, lacustrine, floodplain and swamp deposits. May include some higher level Tertiary terraces	undifferentiated			Cainozoic			1:250,000

What are the Geological Units within the dataset buffer?

Symbol	Description	Unit Name	Group	Sub Group	Age	Dom Lith	Map Sheet	Dataset
Pedf	Silty sandstone	Farley Formation	Dalwood Group		Palaeozoic			1:250,000
Pgx	Coal seams, siltstone, sandstone, conglomerate	Greta Coal Measures			Palaeozoic			1:250,000
Pmb	Conglomerate, sandstone, siltstone	Branxton Formation	Maitland Group		Palaeozoic			1:250,000
Pmm	Siltstone, claystone, minor fine-grained sandstone	Mulbring Siltstone	Maitland Group		Palaeozoic			1:250,000
Pms	Fine to coarse-grained sandstone, conglomerate, minor clay	Muree Sandstone	Maitland Group		Palaeozoic			1:250,000
Qa	Undifferentiated alluvial deposits; sand, silt, clay and gravel; some residual and colluvial deposits. Includes some channel, levee, lacustrine, floodplain and swamp deposits. May include some higher level Tertiary terraces	undifferentiated			Cainozoic			1:250,000
w	Water				Cainozoic			1:250,000

Geological Structures

What are the Geological Structures onsite?

Feature	Name	Description	Map Sheet	Dataset
No features				1:250,000

What are the Geological Structures within the dataset buffer?

Feature	Name	Description	Map Sheet	Dataset
Fault		Fault, Concealed	Bohena	1:250,000

Feature	Name	Description	Map Sheet	Dataset
Fault		Fault, Accurate	Bohena	1:250,000
Fault		Fault, Concealed	Bohena	1:250,000
Fault		Fault, Concealed	Bohena	1:250,000
Fault		Fault, Concealed	Bohena	1:250,000
Fault		Fault, Concealed	Bohena	1:250,000
Fault		Fault, Concealed	Bohena	1:250,000
Fault		Fault, Concealed	Bohena	1:250,000

Geological Data Source : NSW Department of Industry, Resources & Energy
© State of New South Wales through the NSW Department of Industry, Resources & Energy

Naturally Occurring Asbestos Potential

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Naturally Occurring Asbestos Potential

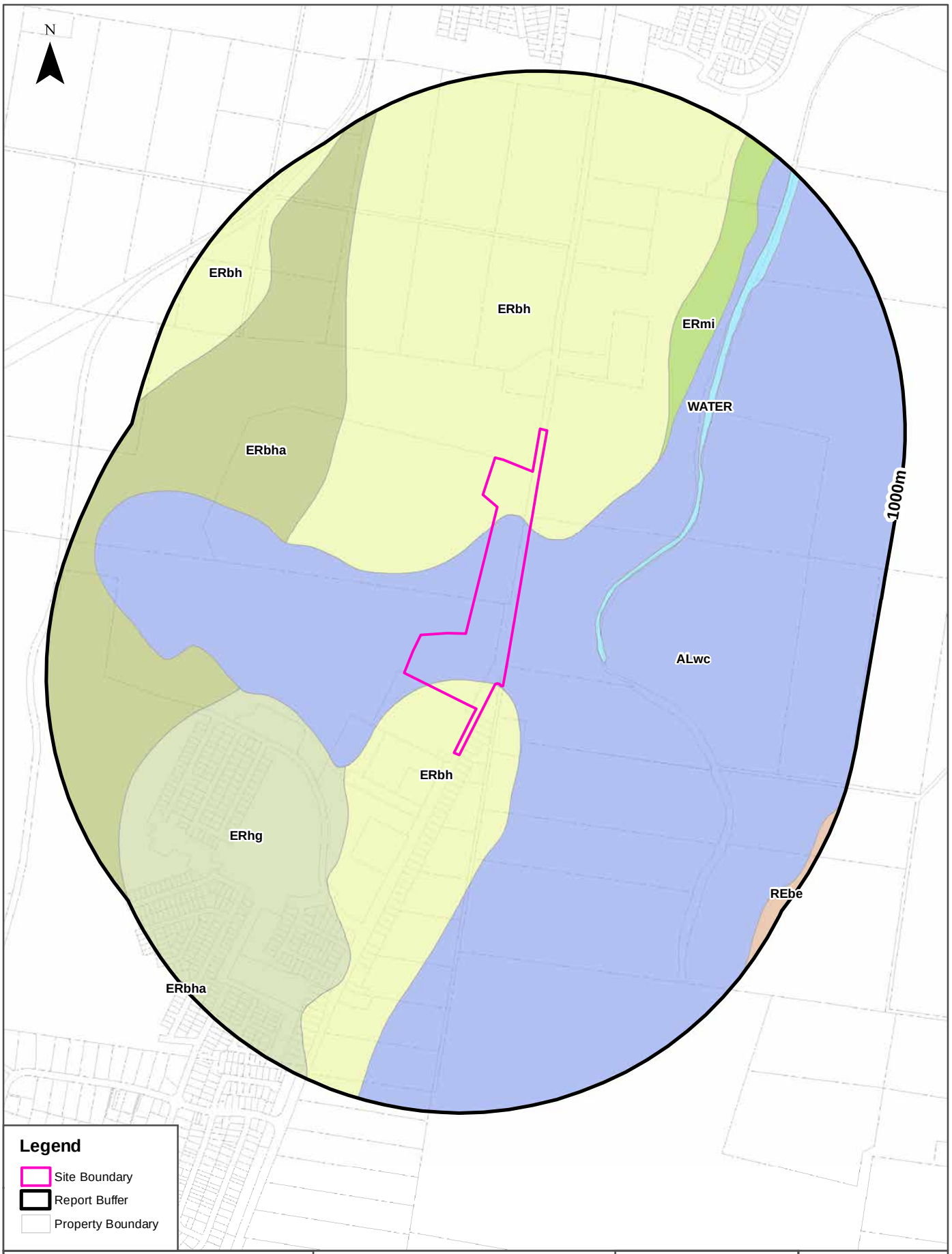
Naturally Occurring Asbestos Potential within the dataset buffer:

Potential	Sym	Strat Name	Group	Formation	Scale	Min Age	Max Age	Rock Type	Dom Lith	Description	Dist	Dir
No records in buffer												

Mining Subsidence District Data Source: © State of New South Wales through NSW Department of Industry, Resources & Energy

Soil Landscapes

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Soils

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Soil Landscapes

What are the onsite Soil Landscapes?

Soil Code	Name	Group	Process	Map Sheet	Scale
ALwc	WALLIS CREEK		ALLUVIAL	Newcastle	1:100,000
ERbh	BOLWARRA HEIGHTS		EROSIONAL	Newcastle	1:100,000

What are the Soil Landscapes within the dataset buffer?

Soil Code	Name	Group	Process	Map Sheet	Scale
ALwc	WALLIS CREEK		ALLUVIAL	Newcastle	1:100,000
ERbh	BOLWARRA HEIGHTS		EROSIONAL	Newcastle	1:100,000
ERbha	BOLWARRA HEIGHTS variant a		EROSIONAL	Newcastle	1:100,000
ERhg	HEDDON GRETA		EROSIONAL	Newcastle	1:100,000
ERmi	MIDDLEHOPE		EROSIONAL	Newcastle	1:100,000
REbe	BERESFIELD		RESIDUAL	Newcastle	1:100,000
WATER	WATER		WATER	Newcastle	1:100,000

Soils Landscapes Data Source : NSW Office of Environment and Heritage
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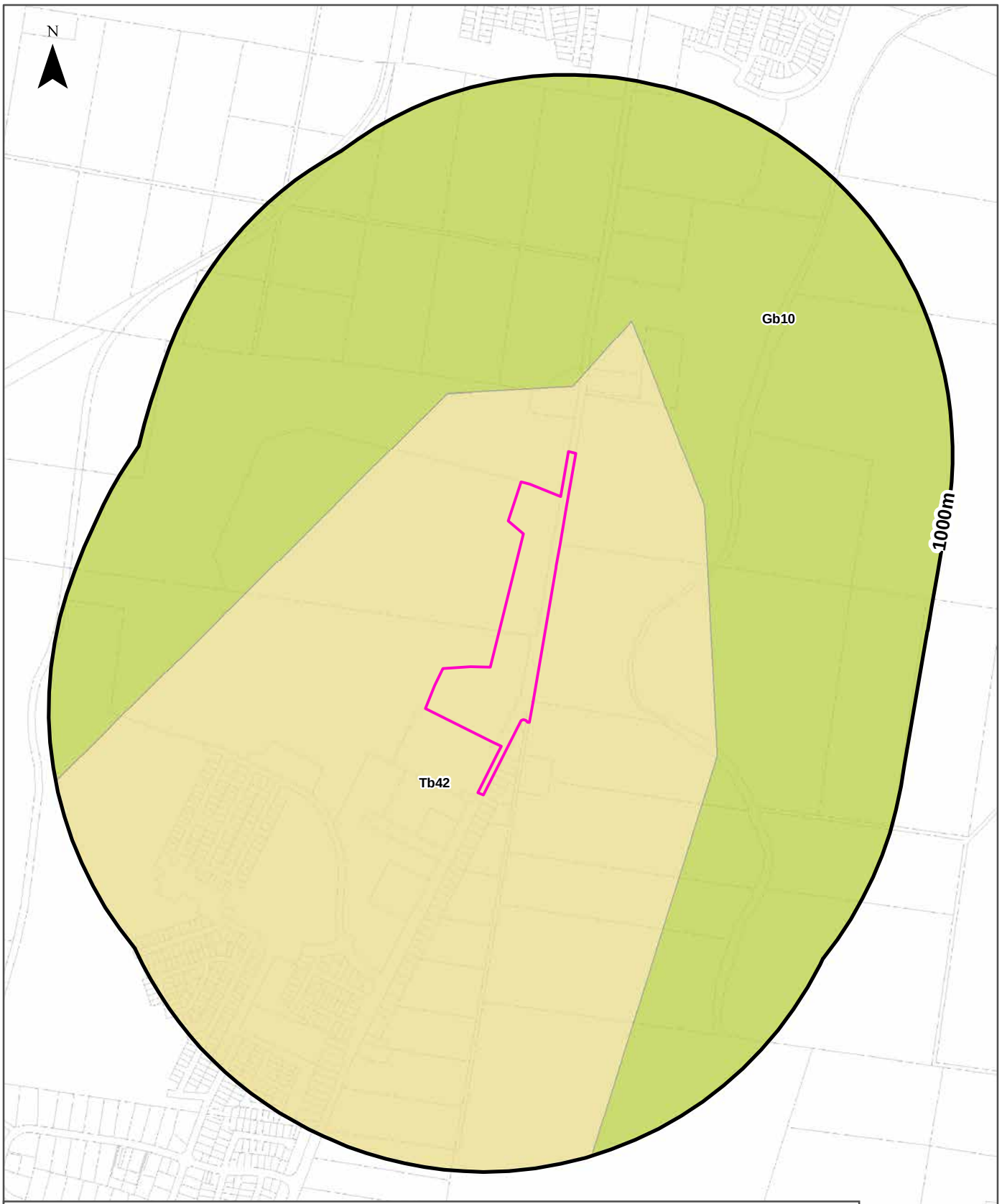
Atlas of Australian Soils

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Legend

- Site Boundary
- Report Buffer
- Property Boundary

Australian Soil Classification Orders

Anthroposol	Dermosol	Kandosol	Podosol	Tenosol	No Data
Calcarosol	Ferrosol	Kurosol	Rudosol	Vertosol	
Chromosol	Hydrosol	Organosol	Sodosol	Lake	

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Soils

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Atlas of Australian Soils

Soil mapping units and Australian Soil Classification orders within the dataset buffer:

Map Unit Code	Soil Order	Map Unit Description	Distance
Tb42	Kurosol	Undulating to hilly with a general ridge, slope, and valley sequence throughout; some outcropping sandstone or conglomerate on the ridges, occasionally some escarpments: chief soils are hard acidic yellow mottled soils (Dy3.41), possibly with (Dy3.42). Associated are: narrow ridges of shallow (Dy3.41) and (Dr3.41) soils, both often containing ironstone gravel; (Dr2.41) soils on broader ridges some broad sandy flats of (Dy5.81) soils containing ironstone gravels; dunes of (Uc1.2) soils on local sand deposits; and various undescribed soils along the streams where salinity is a common local feature.	0m
Gb10	Dermosol	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.	171m

Atlas of Australian Soils Data Source: CSIRO
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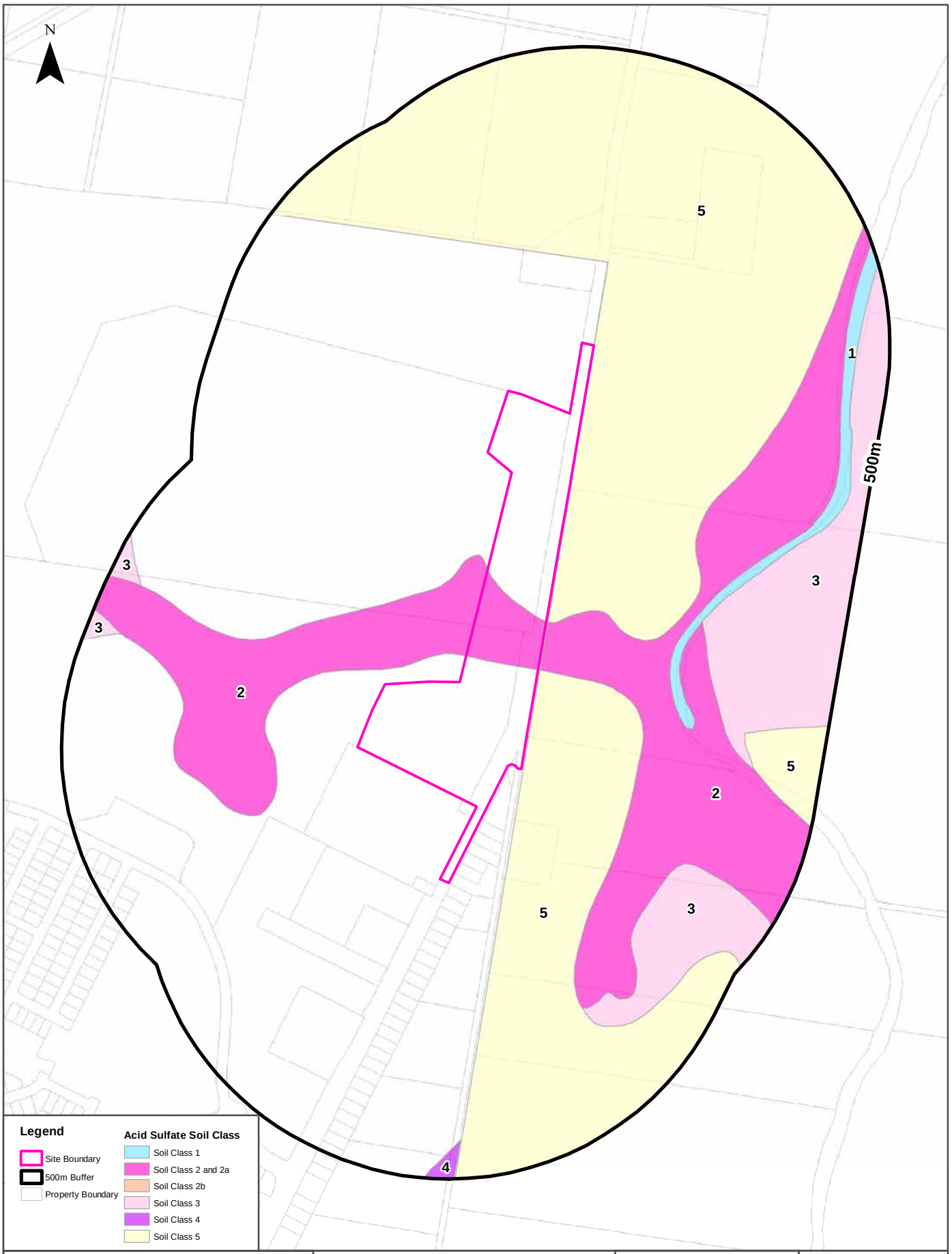
Acid Sulfate Soils

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Acid Sulfate Soils

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Standard Local Environmental Plan Acid Sulfate Soils

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

Soil Class	Description	LEP
2	Works below natural ground surface present an environmental risk; Works by which the watertable is likely to be lowered present an environmental risk	Cessnock Local Environmental Plan 2011

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

Soil Class	Description	LEP	Distance	Direction
N/A				

Acid Sulfate Data Source Accessed 07/10/2016: NSW Crown Copyright - Planning and Environment
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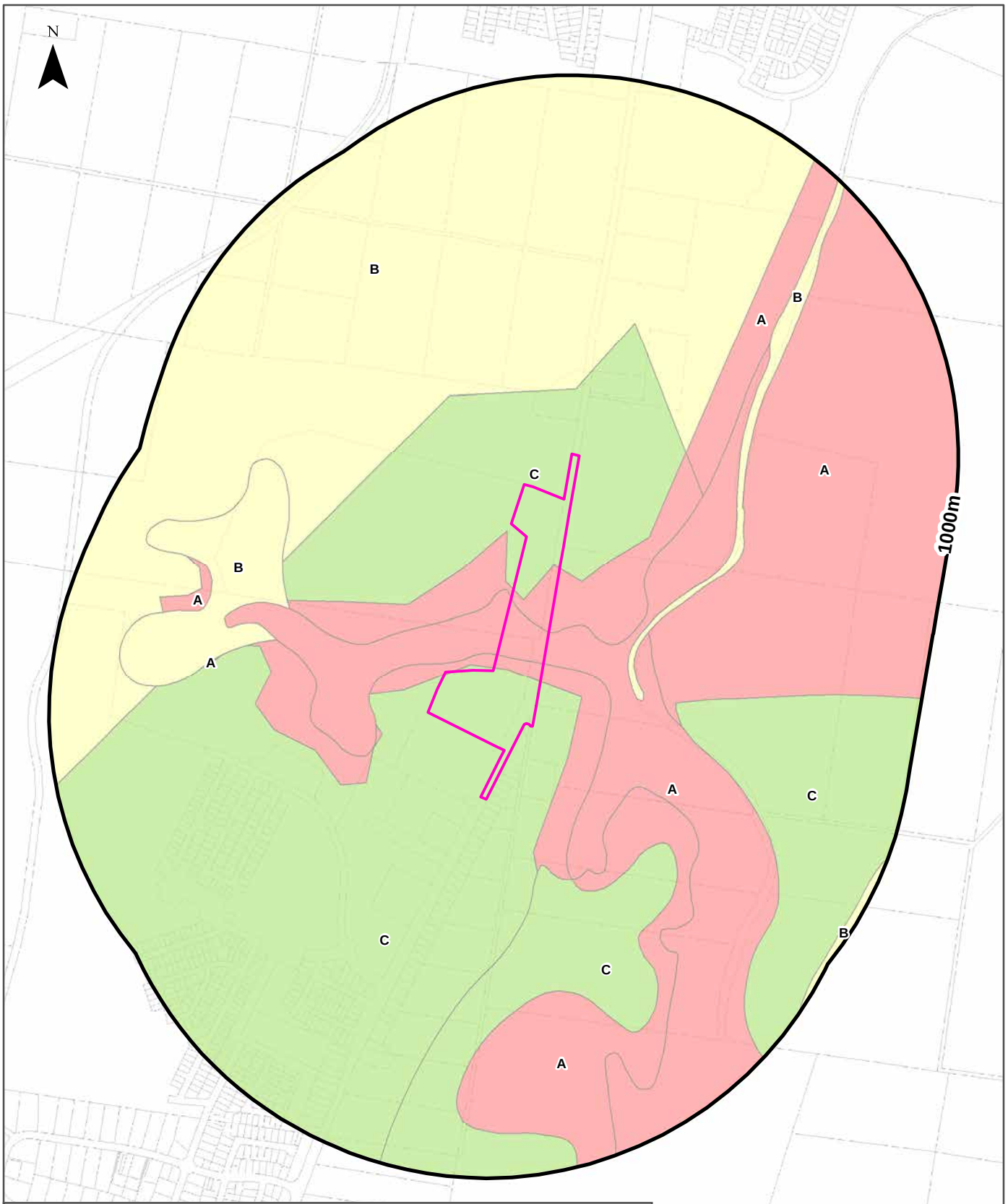
Atlas of Australian Acid Sulfate Soils

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Legend

- Site Boundary
- Report Buffer
- Property Boundary

Probability of occurrence of Acid Sulfate Soils

- A. High (>70%)
- B. Low (6-70%)
- C. Extremely Low (1-5%)
- D. No Chance (0%)
- No Data

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16July 2018

Acid Sulfate Soils

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Atlas of Australian Acid Sulfate Soils

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

Class	Description	Distance
A	High Probability of occurrence. >70% chance of occurrence.	0m
C	Extremely low probability of occurrence. 1-5% chance of occurrence with occurrences in small localised areas.	0m
B	Low Probability of occurrence. 6-70% chance of occurrence.	170m

Atlas of Australian Acid Sulfate Soils Data Source: CSIRO
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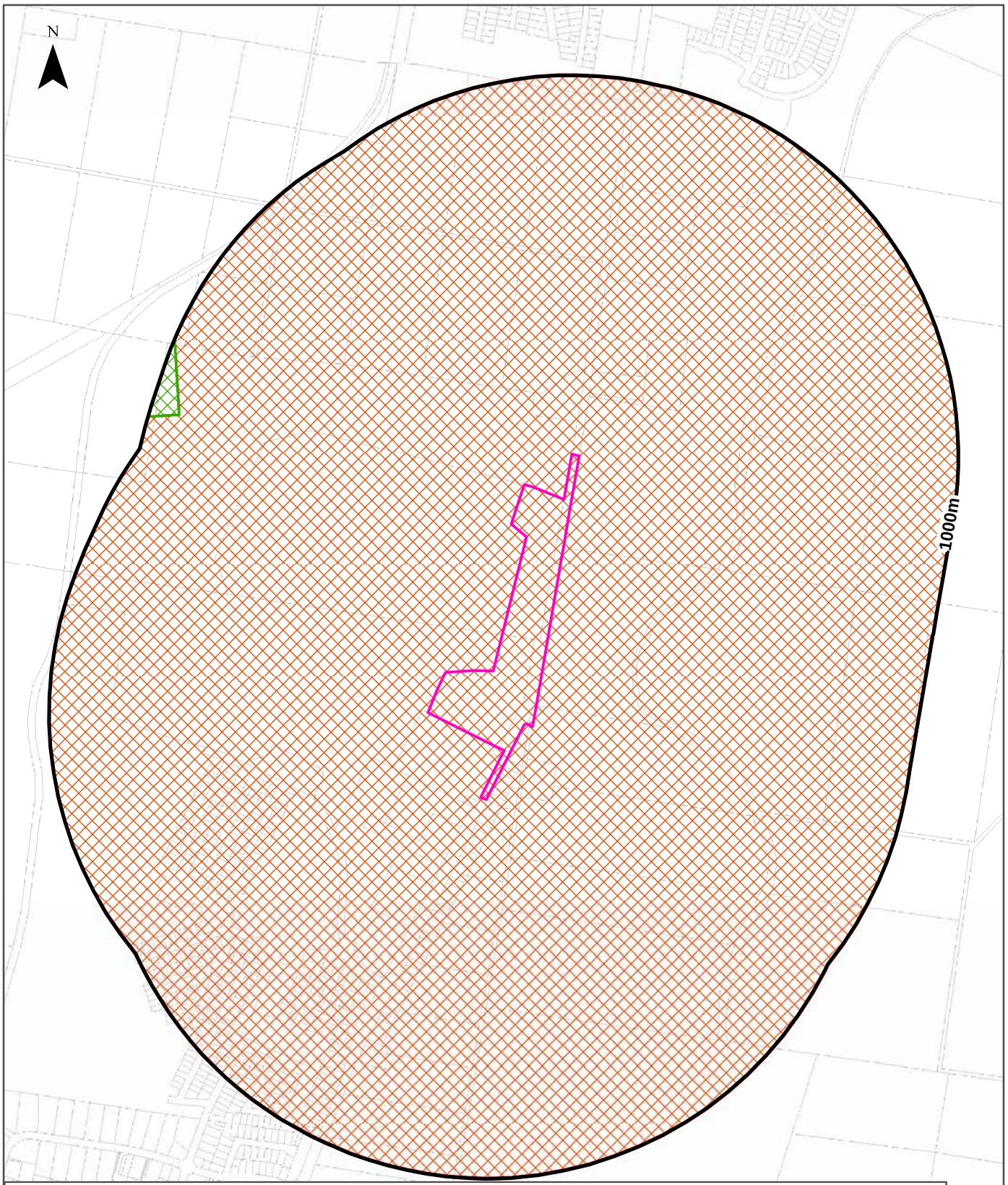
Dryland Salinity

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Legend

- Site Boundary
- Report Buffer
- Property Boundary

Dryland Salinity - National Assessment

- Delineated risk area but no high hazard or risk rating for either 2000, 2020, 2050
- High hazard or risk in 2050 only
- High hazard or risk defined for 2050, but no assessment made for 2000 or 2020
- High hazard or risk in 2020 and 2050
- High hazard or risk in 2000 and 2050. 2020 not defined as high hazard
- High hazard or risk defined for all years: 2000, 2020, 2050

Salinity Potential of Western Sydney

- Area of Known Salinity
- Area of High Salinity Potential
- Area of Moderate Salinity Potential
- Area of Very Low Salinity Potential
- Area of Water

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Dryland Salinity

Main Road, Testers Hollow, Gillieston Heights, 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	Onsite
Delineated risk area but no high hazard or risk rating	Delineated risk area but no high hazard or risk rating	Delineated risk area but no high hazard or risk rating	923m	North West

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.

Dryland Salinity Potential of Western Sydney

Dryland Salinity Potential of Western Sydney within the dataset buffer?

Feature Id	Classification	Description	Distance	Direction
N/A	Outside Data Coverage			

Dryland Salinity Potential of Western Sydney Data Source : NSW Office of Environment and Heritage
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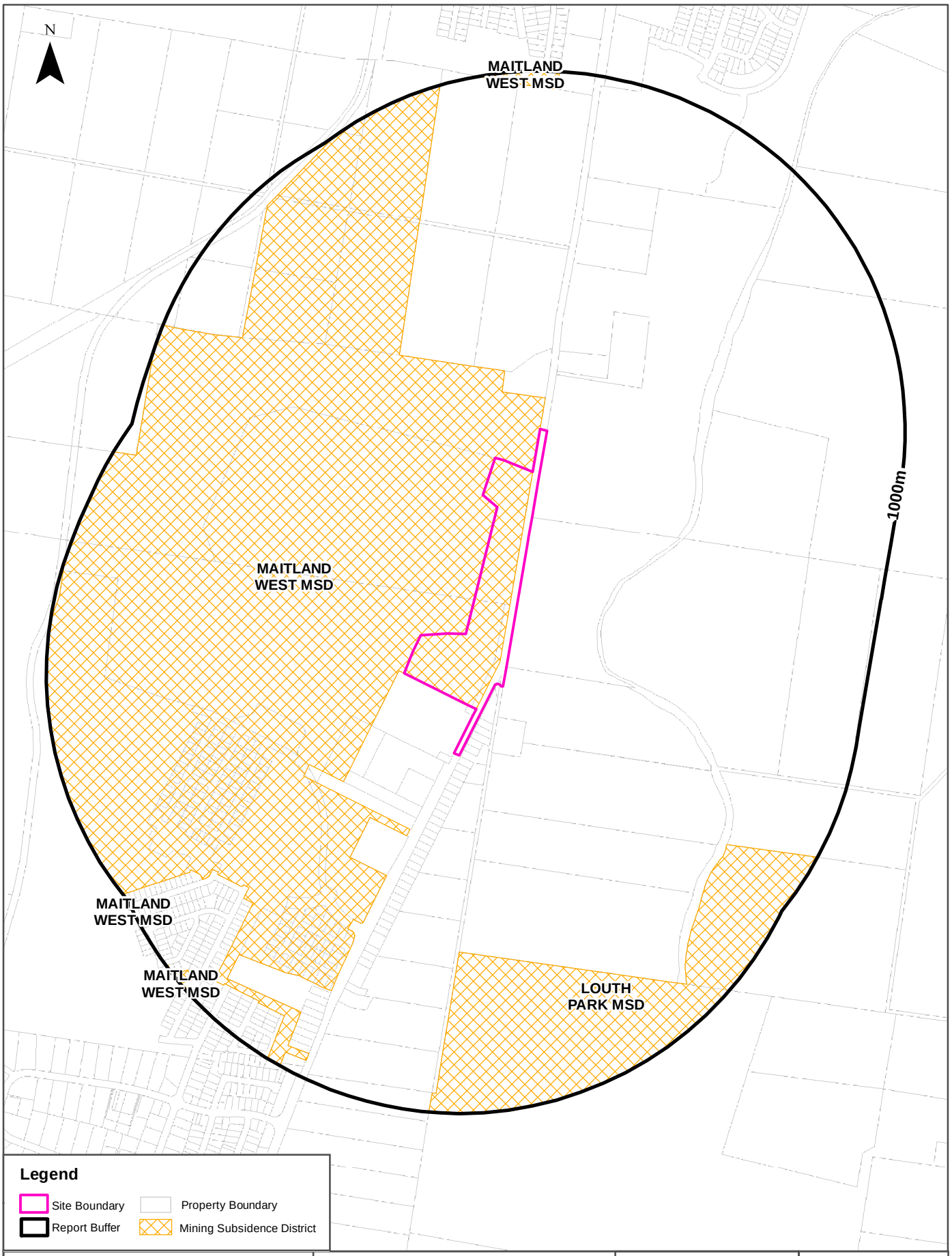
Mining Subsidence Districts

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries:© Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Mining Subsidence Districts

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Mining Subsidence Districts

Mining Subsidence Districts within the dataset buffer:

District	Distance	Direction
MAITLAND WEST	0m	Onsite
LOUTH PARK	548m	South East

Mining Subsidence District Data Source: © Land and Property Information (2016)
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Environmental Zoning

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

State Environmental Planning Policy Protected Areas

Are there any State Environmental Planning Policy Protected Areas onsite or within the dataset buffer?

Dataset	Onsite	Within Site Buffer	Distance
SEPP14 - Coastal Wetlands	No	No	N/A
SEPP26 - Littoral Rainforests	No	No	N/A
SEPP71 - Coastal Protection Zone	No	No	N/A

SEPP Protected Areas Data Source: NSW Department of Planning & Environment
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State Environmental Planning Policy Major Developments (2005)

State Environmental Planning Policy Major Developments within the dataset buffer:

Map Id	Feature	Effective Date	Distance	Direction
N/A	No records within buffer			

SEPP Major Development Data Source: NSW Department of Planning & Environment
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State Environmental Planning Policy Strategic Land Use Areas

State Environmental Planning Policy Strategic Land Use Areas onsite or within the dataset buffer:

Strategic Land Use	SEPPNo	Effective Date	Amendment	Amendment Year	Distance	Direction
No records within buffer						

SEPP Strategic Land Use Data Source: NSW Department of Planning & Environment
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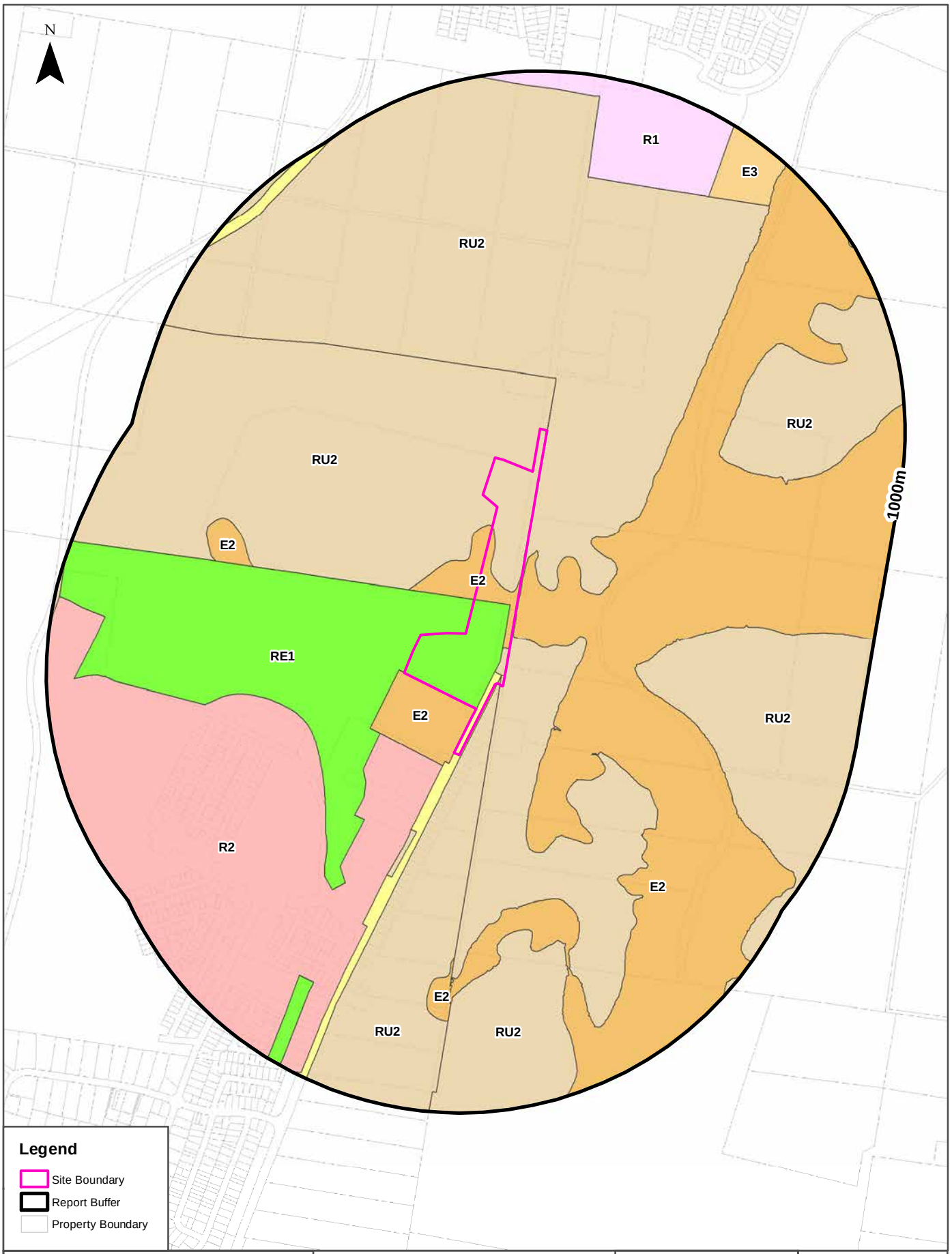
LEP Planning Zones

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018 Planning: NSW Crown Copyright - Planning & Environment	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018

Local Environmental Plan

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Land Zoning

What Local Environmental Plan Land Zones exist within the dataset buffer?

Zone	Description	Purpose	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Distance	Direction
RE1	Public Recreation		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		0m	Onsite
RU2	Rural Landscape		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		0m	Onsite
E2	Environmental Conservation		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		0m	Onsite
SP2	Infrastructure	Classified Road	Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		0m	Onsite
RU2	Rural Landscape		Maitland Local Environmental Plan 2011	25/08/2017	25/08/2017	22/12/2017	Amendment No 21	0m	North
E2	Environmental Conservation		Maitland Local Environmental Plan 2011	16/12/2011	16/12/2011	22/12/2017		1m	East
R2	Low Density Residential		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		48m	South West
RU2	Rural Landscape		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		245m	South
RU2	Rural Landscape		Maitland Local Environmental Plan 2011	16/12/2011	16/12/2011	22/12/2017		354m	South East
RU2	Rural Landscape		Maitland Local Environmental Plan 2011	25/08/2017	25/08/2015	22/12/2017	Amendment No 21	485m	East
E2	Environmental Conservation		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		505m	West
RU2	Rural Landscape		Maitland Local Environmental Plan 2011	16/12/2011	16/12/2011	22/12/2017		516m	South
E2	Environmental Conservation		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		556m	South
R1	General Residential		Maitland Local Environmental Plan 2011	25/08/2017	25/08/2017	22/12/2017	Amendment No 21	716m	North
RE1	Public Recreation		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		753m	South West
E3	Environmental Management		Maitland Local Environmental Plan 2011	16/12/2011	16/12/2011	22/12/2017		794m	North East
SP2	Infrastructure	Railway	Maitland Local Environmental Plan 2011	30/05/2014	30/05/2014	22/12/2017	Amendment No 6	946m	North
RU2	Rural Landscape		Maitland Local Environmental Plan 2011	25/08/2017	25/08/2017	22/12/2017	Amendment No 21	977m	North
RE1	Public Recreation		Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		996m	South

Local Environment Plan Data Source: NSW Crown Copyright - Planning & Environment
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Local Environmental Plan

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Minimum Subdivision Lot Size

What are the onsite Local Environmental Plan Minimum Subdivision Lot Sizes?

Symbol	Minimum Lot Size	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
AB	40 ha	Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		38.56
AC	80 ha	Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	14/07/2017		11.04

Maximum Height of Building

What are the onsite Local Environmental Plan Maximum Height of Buildings?

Symbol	Maximum Height of Building	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
No Data							

Floor Space Ratio

What are the onsite Local Environmental Plan Floor Space Ratios?

Symbol	Floor Space Ratio	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
No Data							

Land Application

What are the onsite Local Environmental Plan Land Applications?

Application Type	LEP or SEPP	Published Date	Commenced Date	Currency Date	Amendment	Percentage of Site Area
Included	Cessnock Local Environmental Plan 2011	01/04/2016	01/04/2016	01/04/2016	Amendment No 16	100
Included	Maitland Local Environmental Plan 2011	16/12/2011	16/12/2011	16/12/2011		0.27

Land Reservation Acquisition

What are the onsite Local Environmental Plan Land Reservation Acquisitions?

Reservation	LEP	Published Date	Commenced Date	Currency Date	Amendment	Comments	Percentage of Site Area
Infrastructure	Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	08/04/2016			9.5

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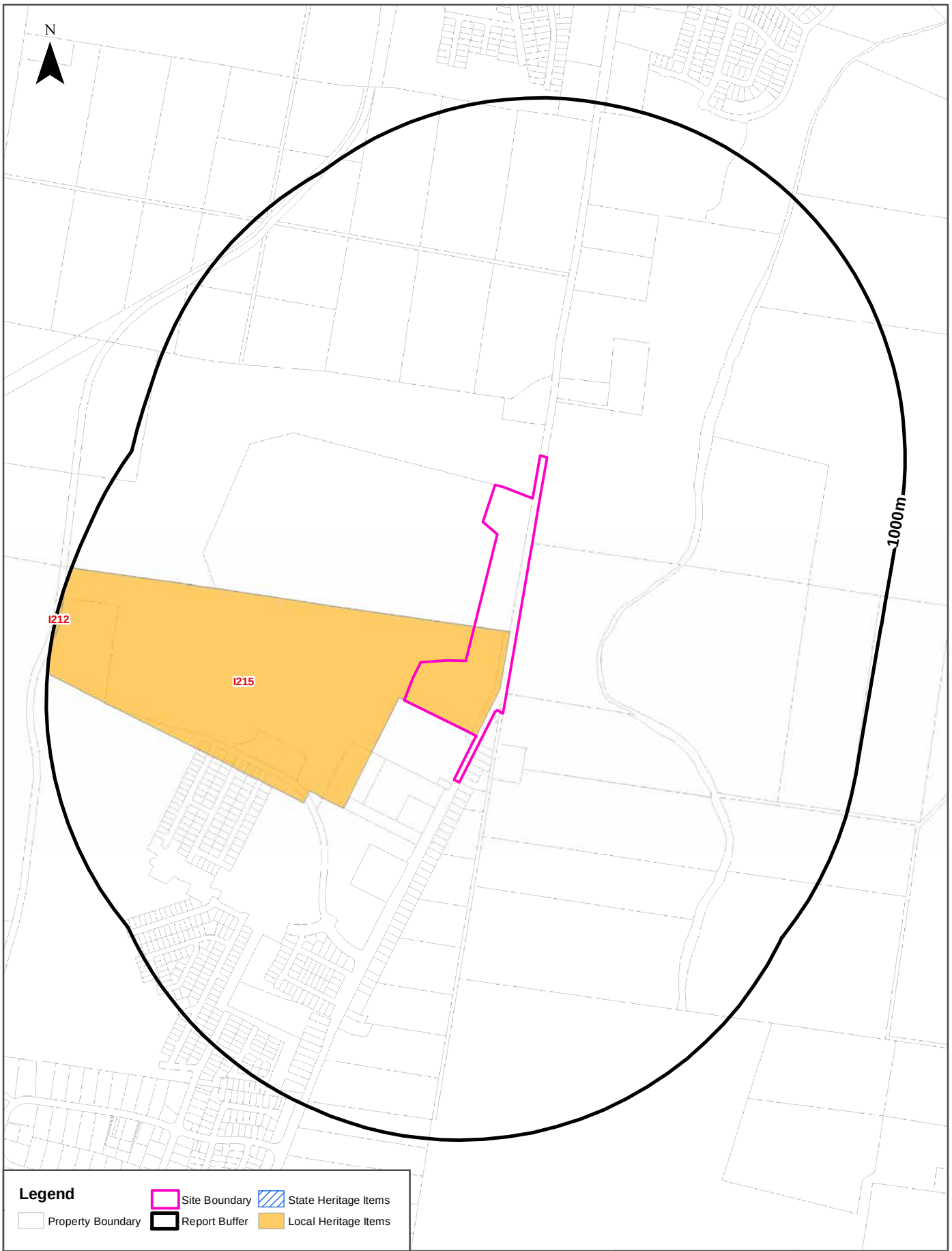
Heritage Items

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018
Heritage - NSW Crown Copyright - Planning & Environment

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Heritage

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

State Heritage Items

What are the State Heritage Items located within the dataset buffer?

Map Id	Name	Address	LGA	Listing Date	Listing No	Plan No	Distance	Direction
N/A	No records in buffer							

Heritage Data Source: NSW Crown Copyright - Planning & Environment
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Local Heritage Items

What are the Local Heritage Items located within the dataset buffer?

Map Id	Name	Classification	Significance	LEP or Act	Published Date	Commenced Date	Currency Date	Distance	Direction
I215	Collieries of the South Maitland Coalfields/Greta Coal Measures Group (1340721) (Neath Colliery)	Item - General	Local	Cessnock Local Environmental Plan 2011	02/08/2013	02/08/2013	08/04/2016	0m	Onsite
I212	South Maitland Railway System	Item - Landscape	Local	Cessnock Local Environmental Plan 2011	23/12/2011	23/12/2011	08/04/2016	983m	South West

Heritage Data Source: NSW Crown Copyright - Planning & Environment
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Natural Hazards - Bush Fire Prone Land

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Scale: 0 100 200 400 600 Meters

Data Sources: Bush Fire Prone Land: © NSW Rural Fire Service 2018. Property Boundaries: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Natural Hazards

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Bush Fire Prone Land

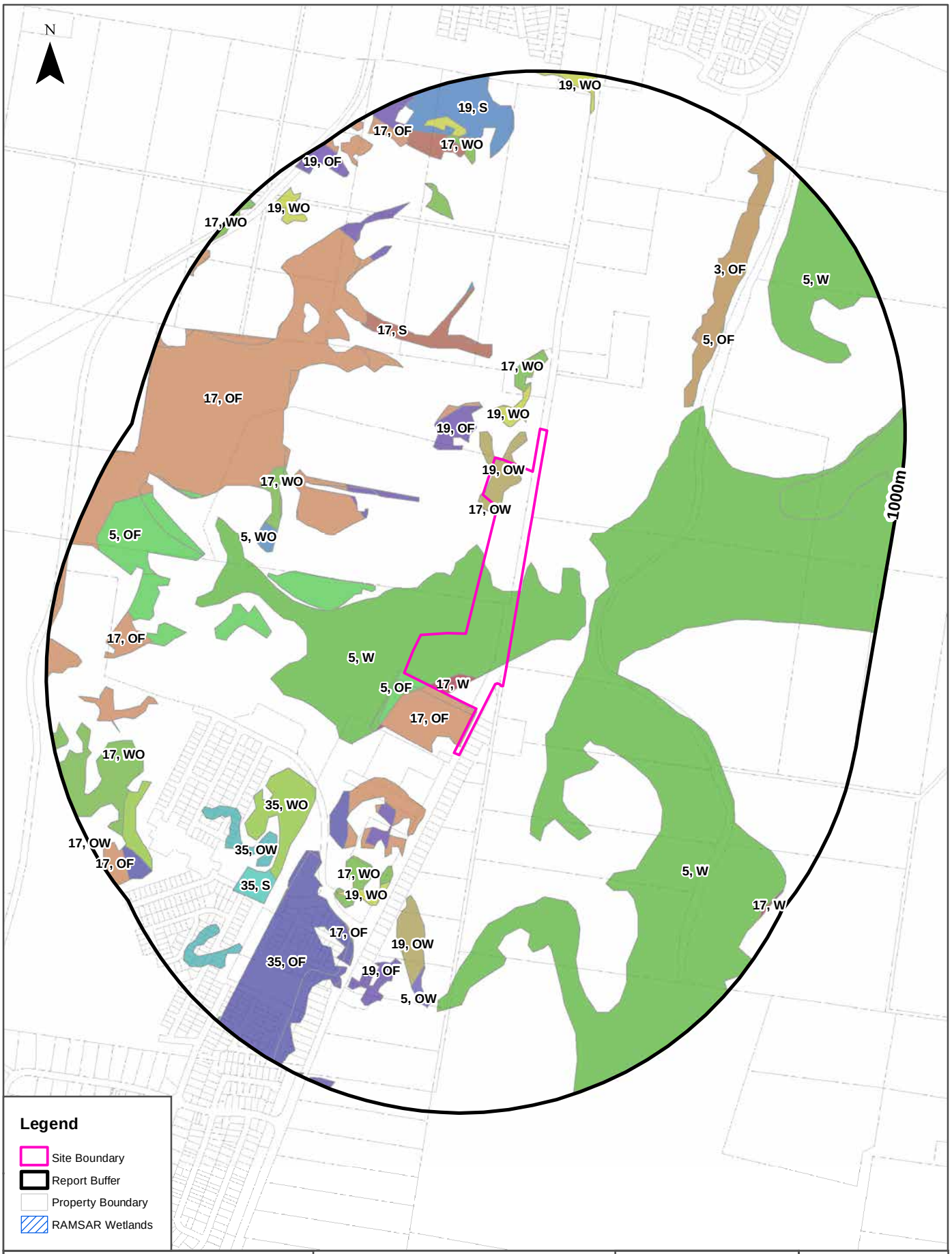
What are the nearest Bush Fire Prone Land Categories that exist within the dataset buffer?

Bush Fire Prone Land Category	Distance	Direction
Vegetation Buffer	0m	Onsite
Vegetation Category 1	0m	Onsite
Vegetation Category 3	0m	Onsite
Vegetation Category 2	750m	South West

NSW Bush Fire Prone Land - © NSW Rural Fire Service under Creative Commons 4.0 International Licence

Ecological Constraints - Vegetation & RAMSAR Wetlands

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters	Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018	Coordinate System: GDA 1994 MGA Zone 56	Date: 16 July 2018

Ecological Constraints

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Lower Hunter and Central Coast Regional Vegetation Survey

What vegetation from the Lower Hunter and Central Coast Regional Survey exists within the dataset buffer?

Map id	Unit Desc	Canopy Code	Canopy Cover	Species	Distance	Direction
5	Alluvial Tall Moist Forest	W	Wetland	E. saligna / S. glomulifera / Glochidion ferdinandi	0m	Onsite
19	Hunter Lowland Redgum Forest	OW	Very Sparse (Open Woodland) 10-20% cover	E. tereticornis / E. punctata / E. crebra / A. floribunda / C. maculata	0m	Onsite
17	Lower Hunter Spotted Gum - Ironbark Forest	W	Wetland	C. maculata / E. fibrosa / E. punctata	0m	Onsite
17	Lower Hunter Spotted Gum - Ironbark Forest	OF	Mid Dense (Open Forest) 50-<100% cover	C. maculata / E. fibrosa / E. punctata	0m	Onsite
5	Alluvial Tall Moist Forest	OF	Mid Dense (Open Forest) 50-<100% cover	E. saligna / S. glomulifera / Glochidion ferdinandi	0m	Onsite
17	Lower Hunter Spotted Gum - Ironbark Forest	OW	Very Sparse (Open Woodland) 10-20% cover	C. maculata / E. fibrosa / E. punctata	0m	Onsite
19	Hunter Lowland Redgum Forest	WO	Sparse (Woodland) 20-<50% cover	E. tereticornis / E. punctata / E. crebra / A. floribunda / C. maculata	42m	North
19	Hunter Lowland Redgum Forest	OF	Mid Dense (Open Forest) 50-<100% cover	E. tereticornis / E. punctata / E. crebra / A. floribunda / C. maculata	85m	North
17	Lower Hunter Spotted Gum - Ironbark Forest	WO	Sparse (Woodland) 20-<50% cover	C. maculata / E. fibrosa / E. punctata	107m	North
17	Lower Hunter Spotted Gum - Ironbark Forest	S	Scrub	C. maculata / E. fibrosa / E. punctata	242m	North
35	Kurri Sand Swamp Woodland	OF	Mid Dense (Open Forest) 50-<100% cover	E. parramattensis subsp decadens / A. bakeri /Melaleuca nodosa	311m	South West
3	Hunter Valley Dry Rainforest	OF	Mid Dense (Open Forest) 50-<100% cover	Ficus rubiginosa / Streblus brunonianus / C. maculata	388m	North East
35	Kurri Sand Swamp Woodland	WO	Sparse (Woodland) 20-<50% cover	E. parramattensis subsp decadens / A. bakeri /Melaleuca nodosa	399m	South West
19	Hunter Lowland Redgum Forest	S	Scrub	E. tereticornis / E. punctata / E. crebra / A. floribunda / C. maculata	414m	North
5	Alluvial Tall Moist Forest	WO	Sparse (Woodland) 20-<50% cover	E. saligna / S. glomulifera / Glochidion ferdinandi	475m	West
35	Kurri Sand Swamp Woodland	OW	Very Sparse (Open Woodland) 10-20% cover	E. parramattensis subsp decadens / A. bakeri /Melaleuca nodosa	545m	South West
5	Alluvial Tall Moist Forest	OW	Very Sparse (Open Woodland) 10-20% cover	E. saligna / S. glomulifera / Glochidion ferdinandi	594m	South
35	Kurri Sand Swamp Woodland	S	Scrub	E. parramattensis subsp decadens / A. bakeri /Melaleuca nodosa	610m	South West

Lower Hunter and Central Coast Regional Vegetation Survey: NSW Office of Environment and Heritage

RAMSAR Wetlands

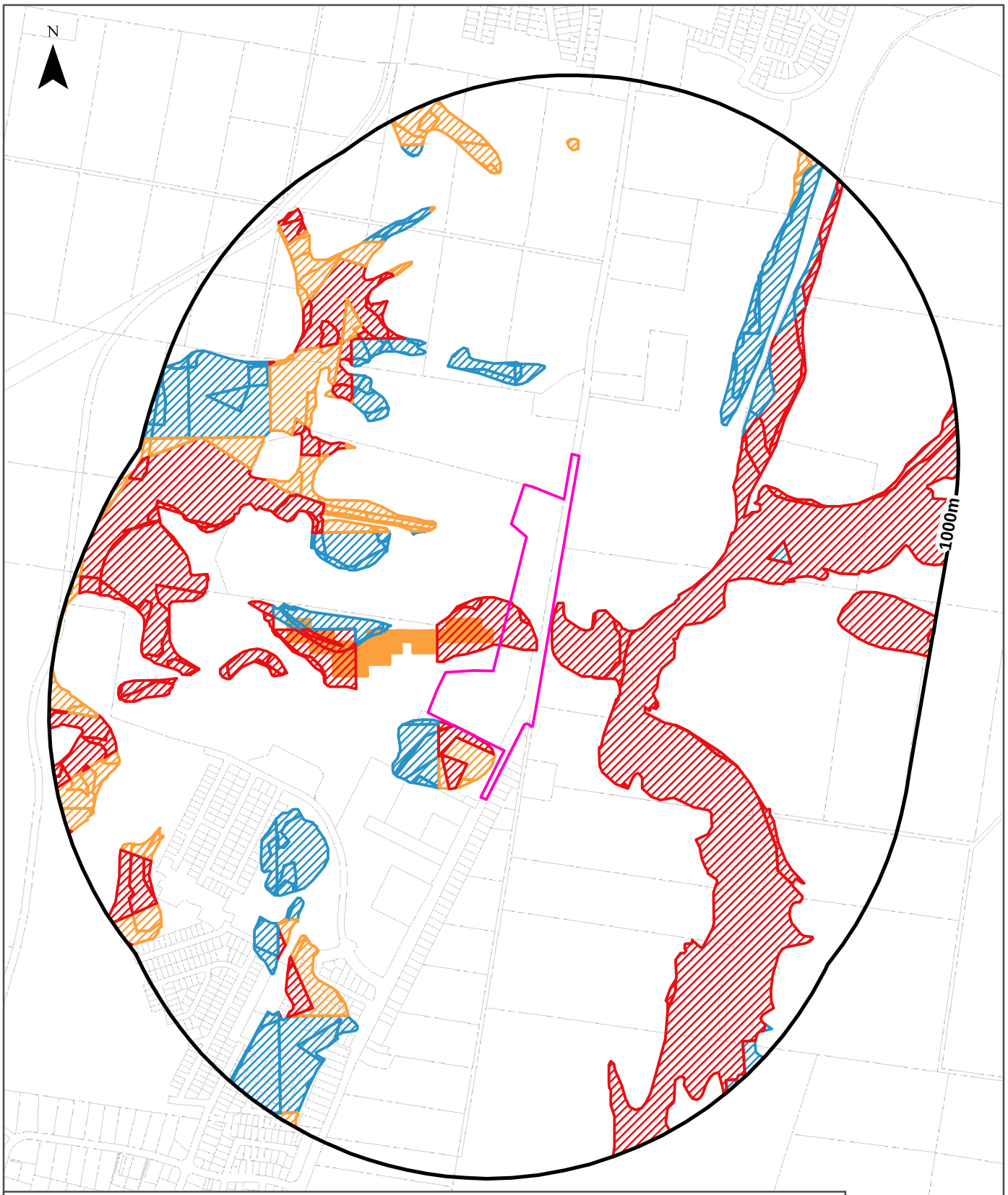
What RAMSAR Wetland areas exist within the dataset buffer?

Map Id	RAMSAR Name	Wetland Name	Designation Date	Source	Distance	Direction
N/A	No records in buffer					

RAMSAR Wetlands Data Source: © Commonwealth of Australia - Department of Environment

Ecological Constraints - Groundwater Dependent Ecosystems Atlas

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Legend

- Site Boundary
- Report Buffer
- Property Boundaries
- High potential GDE - from national assessment
- High potential GDE - from regional studies
- Moderate potential GDE - from national assessment
- Moderate potential GDE - from regional studies
- Low potential GDE - from national assessment
- Low potential GDE - from regional studies
- Known GDE - from regional studies
- Unclassified potential GDE - from national assessment
- Unclassified potential GDE - from regional studies

Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Ecological Constraints

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Groundwater Dependent Ecosystems Atlas

Type	GDE Potential	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	High potential GDE - from regional studies	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		0m
Terrestrial	Low potential GDE - from regional studies	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		7m
Terrestrial	Moderate potential GDE - from regional studies	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		10m
Aquatic	Moderate potential GDE - from national assessment	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Wetland		21m

Groundwater Dependent Ecosystems Atlas Data Source: The Bureau of Meteorology
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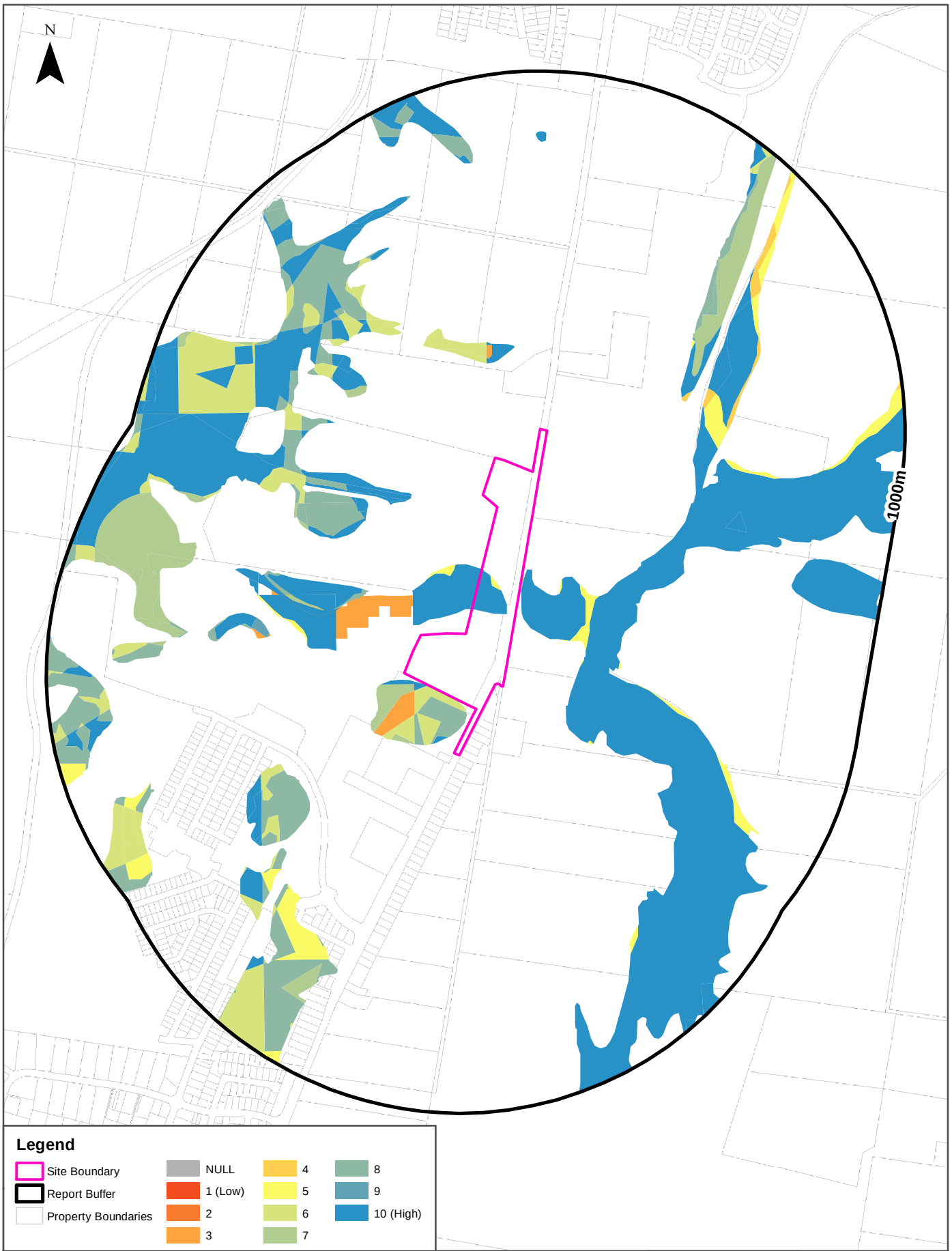
Ecological Constraints - Inflow Dependent Ecosystems Likelihood

Main Road, Testers Hollow, Gillieston Heights, NSW 2321



Scale: 0 100 200 400 600 Meters

Data Sources: Property Boundaries & Topographic Data: © Department Finance, Services & Innovation 2018

Coordinate System: GDA 1994 MGA Zone 56

Date: 16 July 2018

Ecological Constraints

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

Inflow Dependent Ecosystems Likelihood

Type	IDE Likelihood	Geomorphology	Ecosystem Type	Aquifer Geology	Distance
Terrestrial	5	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		0m
Terrestrial	6	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		0m
Terrestrial	8	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		0m
Terrestrial	10	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		0m
Terrestrial	7	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		1m
Aquatic	3	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Wetland		21m
Terrestrial	3	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		30m
Terrestrial	4	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		385m
Terrestrial	9	Undulating to low hilly country on weak rocks, with alluvial and sandy littoral plains.	Vegetation		391m

Inflow Dependent Ecosystems Likelihood Data Source: The Bureau of Meteorology
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Ecological Constraints

Main Road, Testers Hollow, Gillieston Heights, NSW 2321

NSW BioNet Atlas

Species on the NSW BioNet Atlas that have a NSW or federal conservation status, a NSW sensitivity status, or are listed under a migratory species agreement, and are within 10km of the site?

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Amphibia	Litoria aurea	Green and Golden Bell Frog	Endangered	Not Sensitive	Vulnerable	
Animalia	Amphibia	Litoria brevipalmata	Green-thighed Frog	Vulnerable	Not Sensitive	Not Listed	
Animalia	Amphibia	Litoria littlejohni	Littlejohn's Tree Frog	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Aves	Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Not Sensitive	Critically Endangered	
Animalia	Aves	Ardea ibis	Cattle Egret	Not Listed	Not Sensitive	Not Listed	CAMBA;JAMBA
Animalia	Aves	Ardenna pacificus	Wedge-tailed Shearwater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Calidris melanotos	Pectoral Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;JAMBA
Animalia	Aves	Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable	Category 2	Not Listed	
Animalia	Aves	Chthonicola sagittata	Speckled Warbler	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Circus assimilis	Spotted Harrier	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Sensitive	Not Listed	
Animalia	Aves	Epthianura albifrons	White-fronted Chat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Falco subniger	Black Falcon	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Gallinago hardwickii	Latham's Snipe	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Sensitive	Not Listed	CAMBA
Animalia	Aves	Hamirostra melanosternon	Black-breasted Buzzard	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Irediparra gallinacea	Comb-crested Jacana	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Lathamus discolor	Swift Parrot	Endangered	Category 3	Critically Endangered	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Aves	Lophoictinia isura	Square-tailed Kite	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Merops ornatus	Rainbow Bee-eater	Not Listed	Not Sensitive	Not Listed	JAMBA
Animalia	Aves	Neochmia ruficauda	Star Finch	Presumed Extinct	Not Sensitive	Endangered	
Animalia	Aves	Neophema pulchella	Turquoise Parrot	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox connivens	Barking Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Ninox strenua	Powerful Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Numenius minutus	Little Curlew	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Oxyura australis	Blue-billed Duck	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pachycephala pectoralis contempta	Golden Whistler (Lord Howe Is. subsp.)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Petroica boodang	Scarlet Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Petroica phoenicea	Flame Robin	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Sensitive	Not Listed	
Animalia	Aves	Rostratula australis	Australian Painted Snipe	Endangered	Not Sensitive	Endangered	
Animalia	Aves	Sternula albifrons	Little Tern	Endangered	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tringa stagnatilis	Marsh Sandpiper	Not Listed	Not Sensitive	Not Listed	ROKAMBA;CAMBA; JAMBA
Animalia	Aves	Tyto longimembris	Eastern Grass Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Tyto novaehollandiae	Masked Owl	Vulnerable	Category 3	Not Listed	
Animalia	Aves	Tyto tenebricosa	Sooty Owl	Vulnerable	Category 3	Not Listed	
Animalia	Mammalia	Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Not Sensitive	Endangered	
Animalia	Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus australis	Little Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Mormopterus norfolkensis	Eastern Freetail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Myotis macropus	Southern Myotis	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Petauroides volans	Greater Glider	Not Listed	Not Sensitive	Vulnerable	
Animalia	Mammalia	Petaurus australis	Yellow-bellied Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Petaurus norfolcensis	Squirrel Glider	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascogale tapoatafa	Brush-tailed Phascogale	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Phascolarctos cinereus	Koala	Vulnerable	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pseudomys novaehollandiae	New Holland Mouse	Not Listed	Not Sensitive	Vulnerable	
Animalia	Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Not Sensitive	Vulnerable	

Kingdom	Class	Scientific	Common	NSW Conservation Status	NSW Sensitivity Class	Federal Conservation Status	Migratory Species Agreements
Animalia	Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Sensitive	Not Listed	
Animalia	Mammalia	Vespadelus troughtoni	Eastern Cave Bat	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia bakeri	Marblewood	Vulnerable	Not Sensitive	Not Listed	
Plantae	Flora	Acacia bynoeana	Bynoe's Wattle	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Callistemon linearifolius	Netted Bottle Brush	Vulnerable	Category 3	Not Listed	
Plantae	Flora	Cymbidium canaliculatum	Tiger Orchid	Endangered Population	Category 2	Not Listed	
Plantae	Flora	Diuris pedunculata	Small Snake Orchid	Endangered	Category 2	Endangered	
Plantae	Flora	Eucalyptus camaldulensis	River Red Gum	Endangered Population	Not Sensitive	Not Listed	
Plantae	Flora	Eucalyptus glaucina	Slaty Red Gum	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Eucalyptus parramattensis subsp. decadens		Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Grevillea parviflora subsp. parviflora	Small-flower Grevillea	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Pterostylis gibbosa	Illawarra Greenhood	Endangered	Category 2	Endangered	
Plantae	Flora	Rutidosis heterogama	Heath Wrinklewort	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Not Sensitive	Vulnerable	
Plantae	Flora	Tetratheca juncea	Black-eyed Susan	Vulnerable	Not Sensitive	Vulnerable	
Plantae	Flora	Tinospora tinosporoides	Arrow-head Vine	Vulnerable	Not Sensitive	Not Listed	

Data does not include NSW category 1 sensitive species.
NSW BioNet: © State of NSW and Office of Environment and Heritage
Data obtained 13/07/2018

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Appendix B – Notice of determination of application for Construction Certificate" Application Number 10/2007/757/16 – Site regrading for Testers Hollow Rehabilitation Works

CESSNOCK
CITY COUNCIL

WINTEN
- 7 JUL 2014
PROPERTY GROUP

Winten (No. 23) Pty Ltd
CARE Mr M Cerone
PO Box 55
CAMMERAY NSW 2062

Contact: Mr Richard Forbes
Our Ref: CC 10/2007/757/16
Your Ref: 701-TESTERS HOLLO

Dear Mr Cerone

NOTICE OF DETERMINATION OF APPLICATION
for
CONSTRUCTION CERTIFICATE

Pursuant to Section 81A(5) of the Environmental Planning and Assessment Act 1979 notice is hereby given of the determination by Cessnock City Council of **Construction Certificate Application Number 10/2007/757/16** for building work on the subject land as described below. The application has been determined by:-

APPROVAL OF THE APPLICATION

Conditions of approval are contained in Schedule 1 of the Development Consent.

Date of Determination:	03/07/2014
Description of Building:	Civil Works - Bulk Earthworks of Future Open Space
Property Description:	LOT: 23 DP: 607899 19A Main Rd 195 CLIFTLEIGH
Applicant:	Winten (No. 23) Pty Ltd
Owner:	Winten (No 23) Pty Ltd
Plan Numbers approved:	Site Regrading For Testers Hollow Rehabilitation Works Testers Hollow – Main Road, Cliftleigh – Sheets 1 to 14 – Revision 1 – Ref No: 07/174– dated 02/06/14 – prepared by Monteath & Powys Pty Ltd as endorsed by Council

Right of Appeal

Section 109K of the Environmental Planning and Assessment Act, 1979 provides that where the certifying authority is a Council, an applicant may appeal to the Land and Environment Court against a decision by the Council to refuse to issue a Construction Certificate, within twelve (12) months from the date of the decision.

CONSTRUCTION CERTIFICATE

I certify that work completed in accordance with documentation accompanying the application for the certificate (with such modifications verified by the certifying authority as may be shown on that documentation) will comply with the requirements of the Environmental Planning and Assessment Regulation 2000, as are referred to in section 81A (5) of the *Environmental Planning and Assessment Act 1979.*

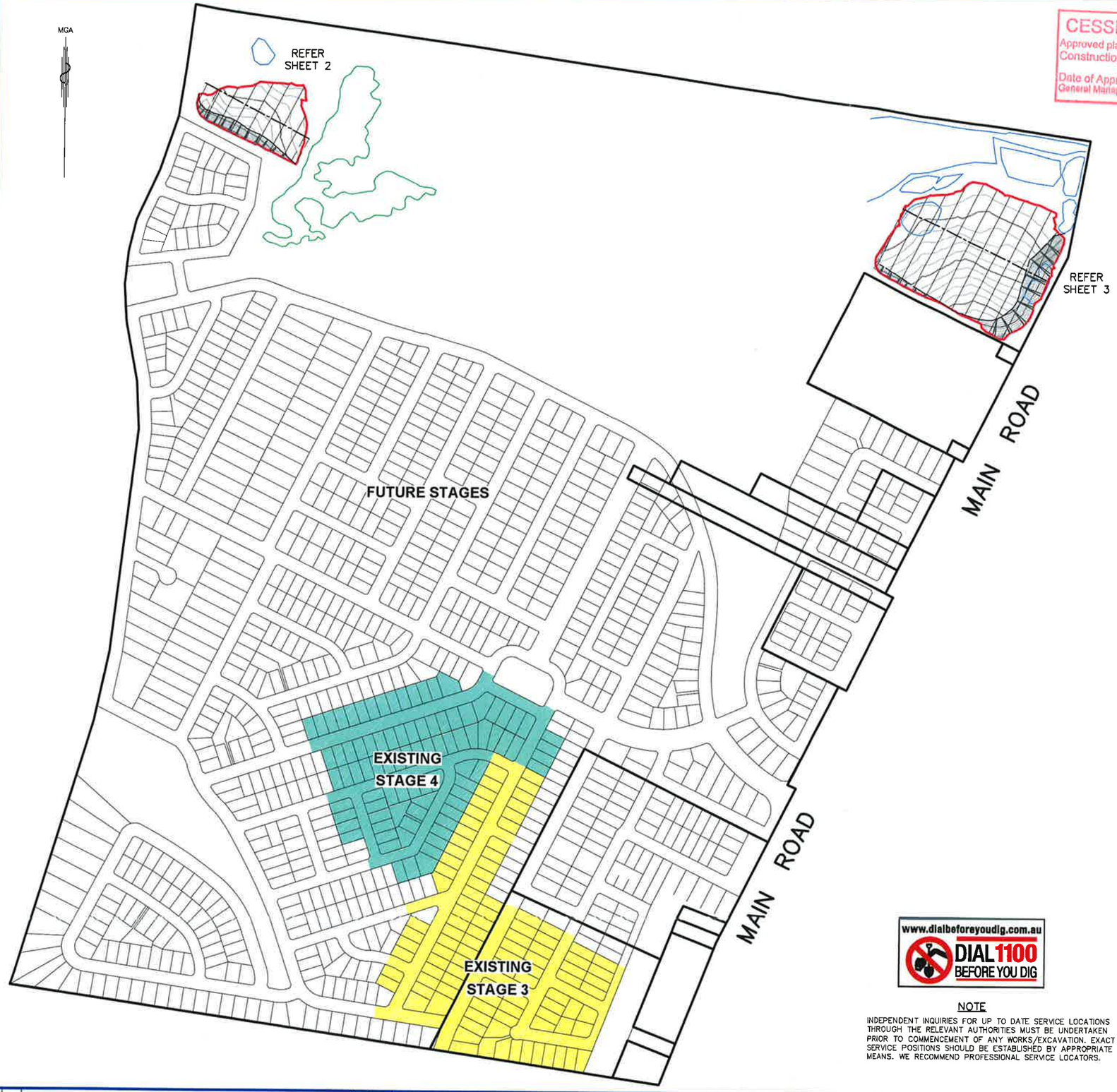
Signature:

Richard Forbes
Team Leader Development Services

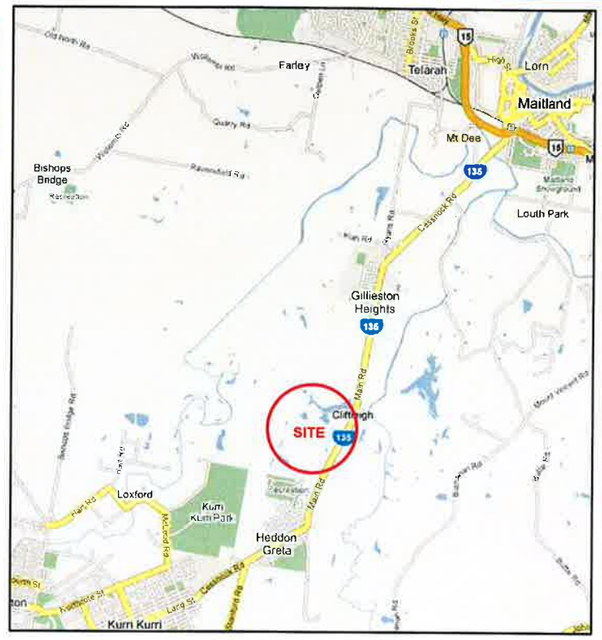
Date of Endorsement:	03/07/2014
Certificate No:	10/2007/757/16
Certifying Authority:	Cessnock City Council PO Box 152 CESSNOCK NSW 2325 Ph: (02) 4993 4300
Development Consent No:	8/2007/757/16
Date of Determination of D.A.	03/04/2014

Should you require any further information, please do not hesitate to contact Council on (02) 4993 4100.

klt



CESSNOCK CITY COUNCIL
Approved plans for Construction Certificate No. 10/2007/757/16
Date of Approval 3/7/14
General Manager Per CCT



LOCALITY SKETCH
IMAGE COURTESY OF GOOGLE MAPS

INDEX OF SHEETS

SHEET	DESCRIPTION
1	LOCALITY SKETCH
2	WEST REGRADE AREA DETAIL
3	EAST REGRADE AREA DETAIL
4	LONGITUDINAL SECTIONS OF REGRADE AREAS
5	EAST REGRADE AREA CROSS SECTIONS CH0.000 ~ CH40.000
6	EAST REGRADE AREA CROSS SECTIONS CH60.000 ~ CH100.000
7	EAST REGRADE AREA CROSS SECTIONS CH120.000 ~ CH180.000
8	EAST REGRADE AREA CROSS SECTIONS CH200.000 ~ CH222.334
9	WEST REGRADE AREA CROSS SECTIONS CH0.000 ~ CH120.000
10	WEST REGRADE AREA CROSS SECTIONS CH140.000 ~ CH163.132
11	VEGETATION CLEARING PLAN (WEST REGRADE AREA)
12	VEGETATION CLEARING PLAN (EAST REGRADE AREA)
13	EROSION & SEDIMENT CONTROL PLAN (WEST REGRADE AREA)
14	EROSION & SEDIMENT CONTROL PLAN (EAST REGRADE AREA)

CONSTRUCTION NOTES

1) THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH COUNCIL'S INFRASTRUCTURE SPECIFICATION AND WITH SUCH OTHER WRITTEN INSTRUCTIONS THAT SHALL BE ISSUED DURING THE COURSE OF CONSTRUCTION. ANY DISCREPANCY OR VARIATION SHALL BE REFERRED TO THE SUPERINTENDENT BEFORE PROCEEDING WITH WORK.
2) THE DRAWINGS ARE A DIAGRAMMATIC REPRESENTATION OF THE WORK TO BE CARRIED OUT AND DIMENSIONS SHALL NOT BE OBTAINED BY SCALING.
3) NO TOPSOIL TO BE REMOVED FROM THE SITE
4) NO WORK TO BE CARRIED OUT ON SUNDAYS AND PUBLIC HOLIDAYS AND ONLY BETWEEN THE HOURS OF 7:00am AND 6:00pm MONDAY TO FRIDAY INCLUSIVE AND 8:00am AND 1:00pm ON SATURDAYS.
5) VEHICULAR ACCESS AND ALL SERVICES TO BE MAINTAINED AT ALL TIMES TO ADJOINING PROPERTIES AFFECTED BY CONSTRUCTION WORKS.
6) PONDING OR CONCENTRATION OF STORMWATER ON ADJOINING PROPERTIES IS NOT PERMITTED.
7) SURVEY MARKS ARE TO BE CAREFULLY PRESERVED BY THE CONTRACTOR. DAMAGED, DESTROYED OR LOST MARKS WILL BE REPLACED BY THE SUPERVISING SURVEYOR – AT THE CONTRACTOR'S EXPENSE.
8) ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BENCHMARKS ONLY. STANDARD DATUM FOR ALL DRAWINGS IS AUSTRALIAN HEIGHT DATUM (AHD).

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REVISIONS

No	REVISION	SVY	DFT	CHK	DATE
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Surveyed	Drafted	Checked
TK	MAK	AP

REGISTERED SURVEYOR
Scale @A1 : 1:3000
@A3 : 1:6000
Original Size A1
DO NOT SCALE

Client: WINTER PROPERTY GROUP

Title: LOCALITY SKETCH
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 1/14
Revision 1

WEST REGRADE AREA

CESSNOCK CITY COUNCIL
Approved plans for Construction Certificate No. 10/2007/757/16
Date of Approval 3/7/14
General Manager Per

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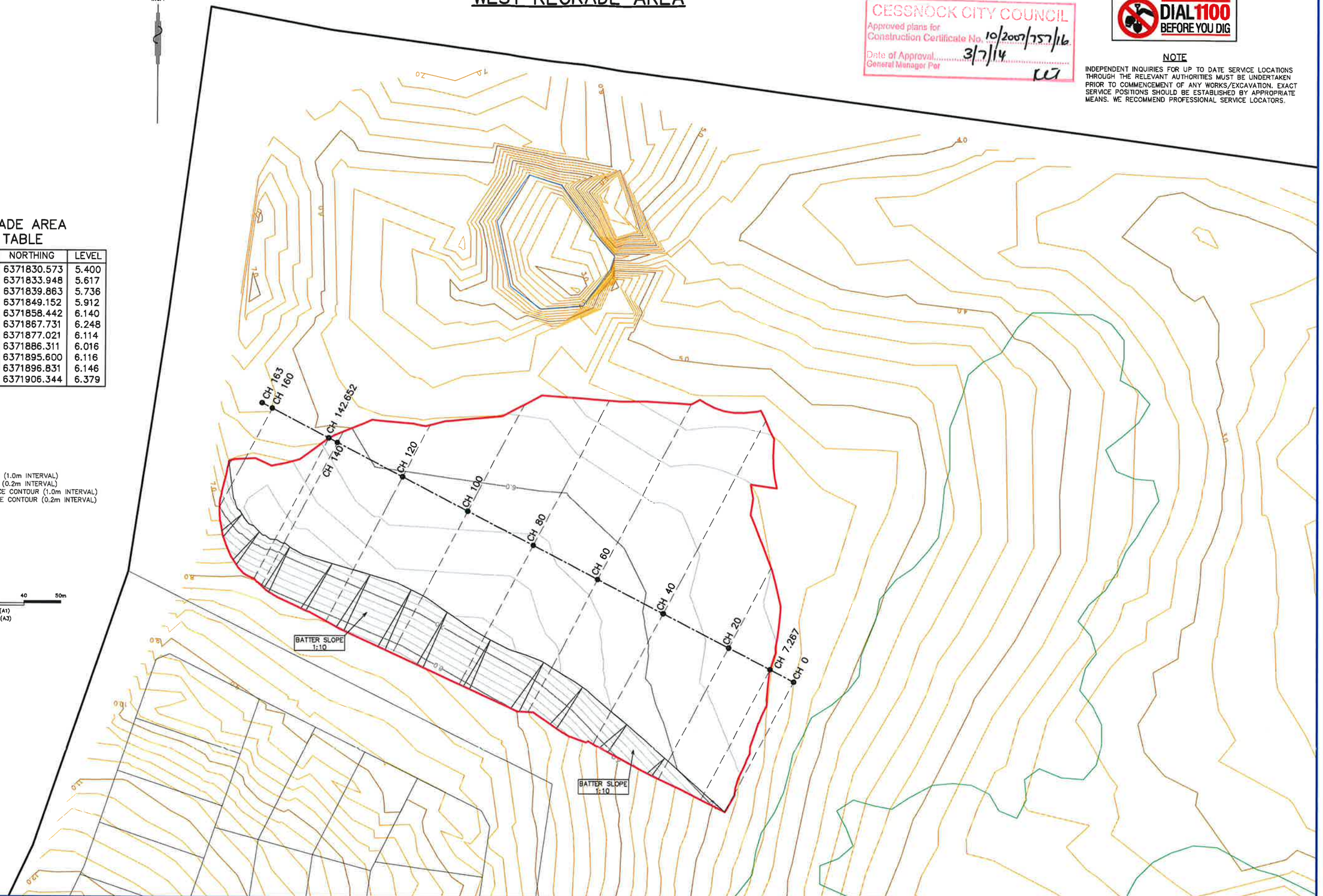
MGA



WEST REGRADE AREA SETOUT TABLE

CHAINAGE	EASTING	NORTHING	LEVEL
0.000	360684.028	6371830.573	5.400
7.267	360677.593	6371833.948	5.617
20.000	360666.317	6371839.863	5.736
40.000	360648.605	6371849.152	5.912
60.000	360630.893	6371858.442	6.140
80.000	360613.182	6371867.731	6.248
100.000	360595.470	6371877.021	6.114
120.000	360577.758	6371886.311	6.016
140.000	360560.046	6371895.600	6.116
142.652	360557.697	6371896.831	6.146
163.132	360539.561	6371906.344	6.379

LEGEND

- MAJOR DESIGN CONTOUR (1.0m INTERVAL)
- MINOR DESIGN CONTOUR (0.2m INTERVAL)
- MAJOR NATURAL SURFACE CONTOUR (1.0m INTERVAL)
- MINOR NATURAL SURFACE CONTOUR (0.2m INTERVAL)
- EDGE OF TREE CANOPY

0 10 20 30 40 50m

REDUCTION RATIO – 1:500 (A1)
REDUCTION RATIO – 1:1000 (A3)

REVISIONS

No	REVISION	SVY	DFT	CHK	DATE
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REGISTERED SURVEYOR
Scale @A1 : 1:500
@A3 : 1:1000
Original Size A1
DO NOT SCALE

Client: WINTEN PROPERTY GROUP

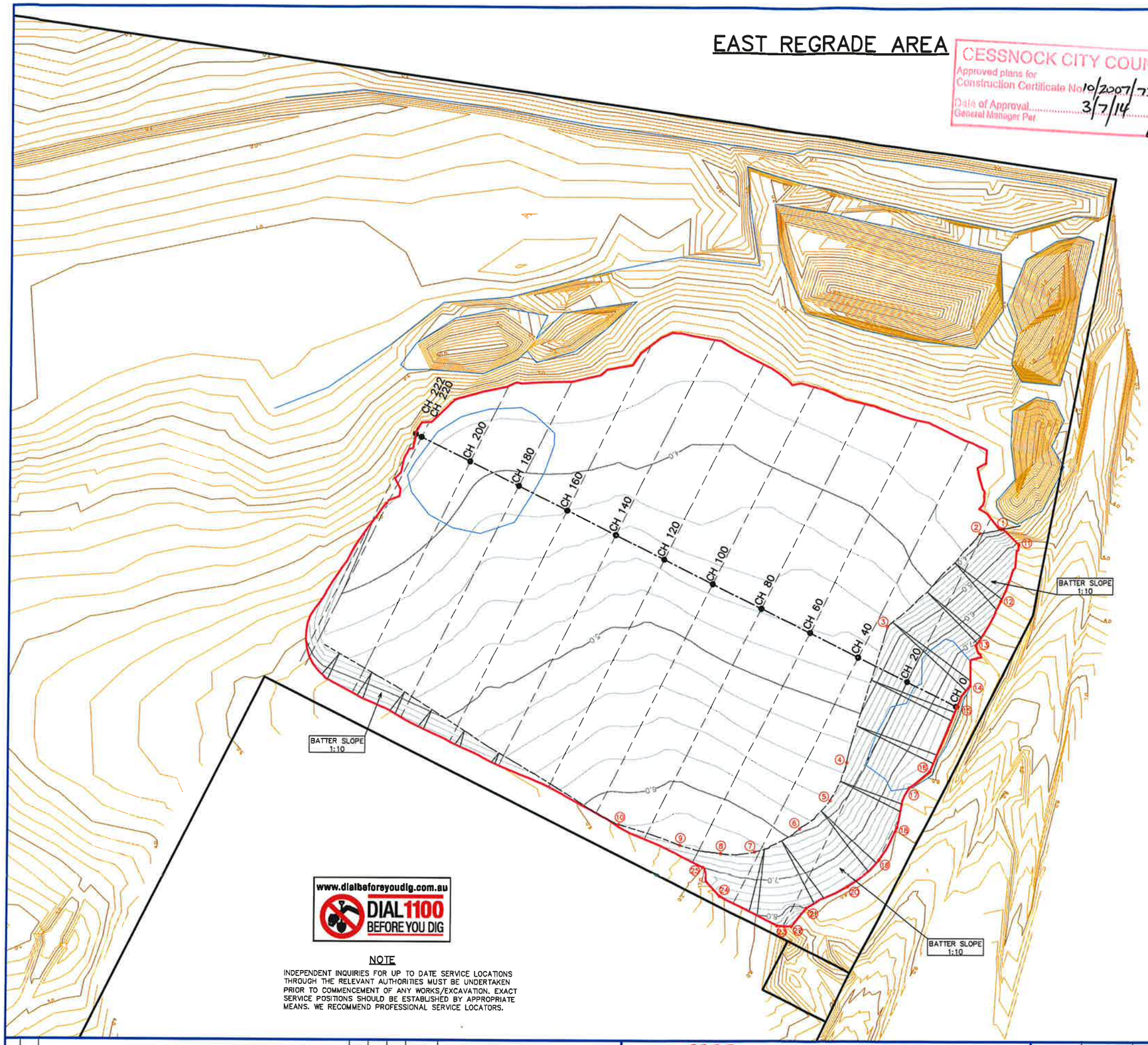
Title: WEST REGRADE AREA DETAIL
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 071740_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 2/14
Revision 1

EAST REGRADE AREA

CESSNOCK CITY COUNCIL
Approved plans for
Construction Certificate No 10/2007/757/16
Date of Approval 3/7/14
General Manager Per



LEGEND

- MAJOR DESIGN CONTOUR (1.0m INTERVAL)
- MINOR DESIGN CONTOUR (0.2m INTERVAL)
- MAJOR NATURAL SURFACE CONTOUR (1.0m INTERVAL)
- MINOR NATURAL SURFACE CONTOUR (0.2m INTERVAL)

MGA

BOTTOM OF BATTER SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
1	361722.708	6371705.279	3.665
2	361714.871	6371703.764	3.706
3	361681.092	6371669.346	4.437
4	361666.664	6371619.072	5.329
5	361660.370	6371605.060	5.612
6	361649.055	6371594.627	5.899
7	361632.660	6371586.084	6.268
8	361620.308	6371585.547	6.373
9	361605.269	6371588.448	6.402
10	361582.772	6371595.976	6.200

TOP OF BATTER SETOUT TABLE

PT No.	EASTING	NORTHING	LEVEL
11	361729.093	6371699.727	5.164
12	361722.622	6371678.894	6.393
13	361713.440	6371662.532	7.174
14	361711.484	6371647.785	7.600
15	361706.621	6371639.924	7.600
16	361696.822	6371615.891	7.600
17	361689.368	6371609.875	7.600
18	361684.913	6371595.184	7.980
19	361678.275	6371583.291	7.918
20	361667.214	6371573.289	7.843
21	361651.569	6371565.542	7.926
22	361646.183	6371558.731	8.921
23	361640.958	6371558.878	8.288
24	361619.993	6371569.780	7.641
25	361613.753	6371580.401	6.997

EAST REGRADE AREA SETOUT TABLE

CHAINAGE	EASTING	NORTHING	LEVEL
0.000	361706.360	6371639.995	8.001
12.876	361694.851	6371645.768	6.713
20.000	361688.483	6371648.962	6.001
33.095	361676.778	6371654.834	4.691
40.000	361670.606	6371657.930	4.678
60.000	361652.729	6371666.897	4.624
80.000	361634.852	6371675.864	4.575
100.000	361616.975	6371684.832	4.531
120.000	361599.098	6371693.799	4.513
140.000	361581.221	6371702.766	4.440
160.000	361563.344	6371711.734	4.199
180.000	361545.467	6371720.701	4.065
200.000	361527.590	6371729.668	3.919
222.334	361507.627	6371739.682	3.710

0 10 20 30 40 50m
REDUCTION RATIO – 1:750 (A1)
REDUCTION RATIO – 1:1500 (A3)

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@A3 : 1:1500
Original Size A1
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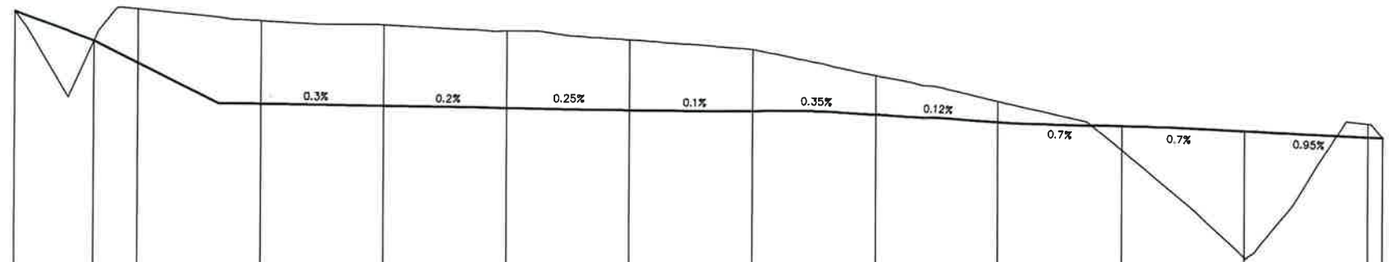
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 3/14
Revision 1



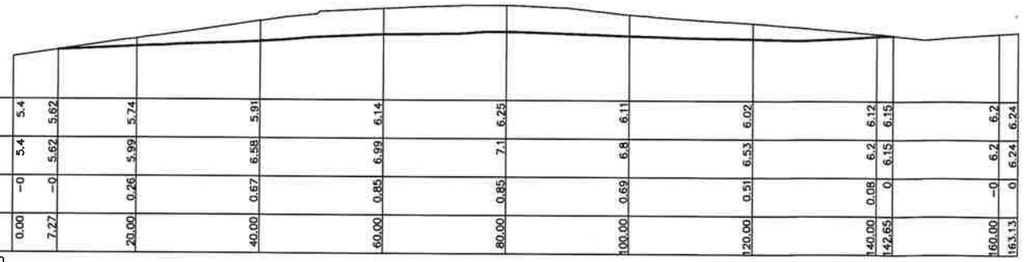
DATUM R.L. −2

DESIGN	7.67	6.71	6	4.68	4.62	4.58	4.53	4.51	4.44	4.2	4.06	3.92	3.73	3.71
NATURAL SURFACE	7.67	6.71	7.76	7.39	7.27	7.09	6.82	6.52	5.71	4.87	3.27	−0.22	4.16	3.71
DEPTH TO DESIGN	−0	−0	1.75	2.71	2.64	2.52	2.29	2	1.27	0.68	−0.8	−4.14	0.43	0
CHAINAGE	0.00	12.88	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	180.00	200.00	220.00	222.33

HORIZONTAL: 1:500
VERTICAL: 1:100

EAST REGRADE AREA

CESSNOCK CITY COUNCIL
Approved plans for Construction Certificate No. 10/2007/757/1A
Date of Approval 3/07/14
General Manager Per CLT



DATUM R.L. 4

DESIGN	5.4	5.62	5.74	5.91	6.14	6.25	6.11	6.02	6.12	6.15	6.2	6.24	
NATURAL SURFACE	5.4	5.62	5.99	6.58	6.99	7.1	6.8	6.53	6.2	6.15	6.2	6.24	
DEPTH TO DESIGN	−0	−0	0.26	0.67	0.85	0.85	0.69	0.51	0.08	0	−0	0	
CHAINAGE	0.00	7.27	20.00	40.00	60.00	80.00	100.00	120.00	140.00	142.65	160.00	163.13	

HORIZONTAL: 1:500
VERTICAL: 1:100

WEST REGRADE AREA

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Surveyed	Drafted	Checked
TK	MAK	AP

REGISTERED SURVEYOR
Scale @A1 : 1:500
@A3 : 1:1000
Original Size A1
DO NOT SCALE

Client: WINTEN PROPERTY GROUP

Title: LONGITUDINAL SECTIONS OF REGRADE AREAS
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 | Ref No: 07/174 | Date: 02/06/2014

Sheet No. 4/14
Revision 1

EAST REGRADE AREA

Datum −2

PROPOSED DESIGN R.L.	7.71	6.25	6.23	5.77	5.37	5.01	4.68	4.37	4.02	3.92	3.81	3.67	3.6
DESIGN DEPTH	0	2.3	2.26	1.69	2.07	2.42	2.71	2.86	2.52	2.37	1.55	0.39	0
EXISTING SURFACE	7.71	8.55	8.49	7.45	7.44	7.43	7.39	7.23	6.54	6.29	5.36	4.06	3.6
OFFSET	−101.589	−80.000	−79.710	−60.000	−40.000	−20.000	0.000	20.000	40.000	45.292	60.000	80.000	89.043

CHAINAGE 40.000

Datum −3

PROPOSED DESIGN R.L.	8.49	7.11	6.34	5.98	5.99	6	5.66	4.66	3.84	3.63
DESIGN DEPTH	−0	1.39	1.37	1.7	1.13	1.75	1.68	1.82	1.41	0
EXISTING SURFACE	8.49	8.5	7.7	7.66	7.12	7.76	7.34	6.49	5.25	3.63
OFFSET	−100.855	−80.000	−60.000	−40.000	−20.000	0.000	20.000	40.000	60.000	67.567

CHAINAGE 20.000

Datum −4

PROPOSED DESIGN R.L.	7.78	7.49	6.84	6.67	6.67	6.71	6.41	5.42	4.63	3.95
DESIGN DEPTH	0.14	0.35	0.94	1.01	−1.07	0	1.2	1.1	0.27	−0
EXISTING SURFACE	7.92	7.85	7.78	7.68	5.6	6.71	7.61	6.52	4.9	3.95
OFFSET	−86.238	−80.000	−60.000	−40.000	−20.000	0.000	20.000	40.000	60.000	65.702

CHAINAGE 12.880

Datum 2

PROPOSED DESIGN R.L.	7.88	7.91
DESIGN DEPTH	0.05	−0
EXISTING SURFACE	7.93	7.91
OFFSET	−60.000	−46.089

CHAINAGE 0.000

CESSNOCK CITY COUNCIL
Approved plans for
Construction Certificate No. 10/2007/757/1/6
Date of Approval 3/7/14
General Manager Per KLT

REVISIONS

No	REVISION	SVY	DFT	CHK	DATE
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125 Bull Street Newcastle NSW 2300
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T 61 2 4926 1388 F 61 2 4929 3475
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TK	MAK	AP

REGISTERED SURVEYOR
Scale @A1 : 1:500
@A3 : 1:1000
DO NOT SCALE
Original Size A1

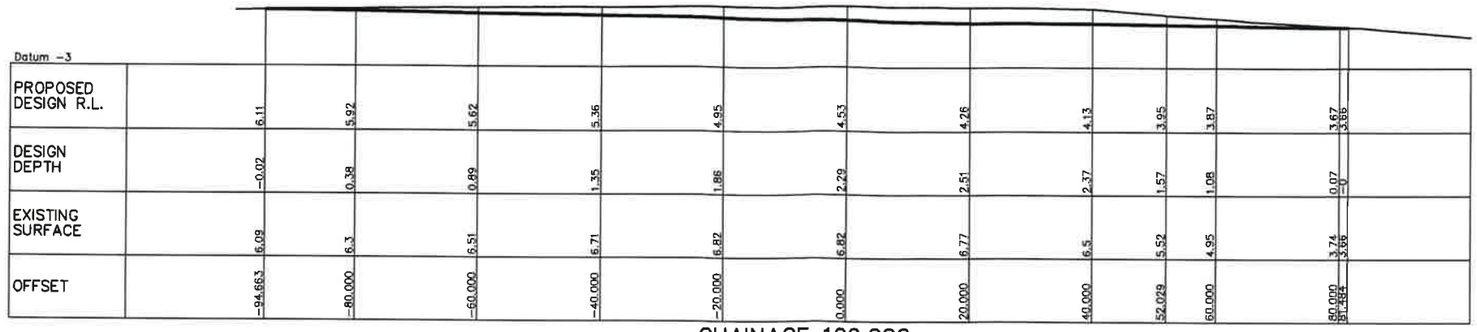
Client: WINTEN PROPERTY GROUP

Title: EAST REGRADE AREA CROSS SECTIONS
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 5/14
Revision 1

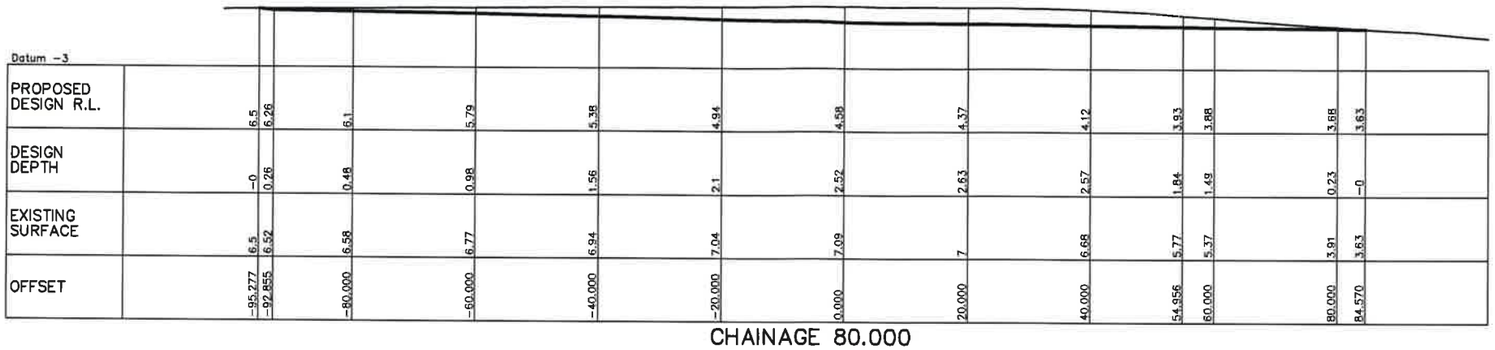
EAST REGRADE AREA



Datum -3

PROPOSED DESIGN R.L.	6.11	5.92	5.62	5.36	4.95	4.53	4.26	4.13	3.95	3.87	3.67	3.66			
DESIGN DEPTH	-0.02	0.38	0.89	1.35	1.86	2.29	2.51	2.37	1.57	1.08	0.07	-0			
EXISTING SURFACE	6.09	6.3	6.51	6.71	6.82	6.82	6.77	6.5	5.52	4.95	3.74	3.66			
OFFSET	-94.663	-80.000	-60.000	-40.000	-20.000	0.000	20.000	40.000	52.029	60.000	80.000	81.334			

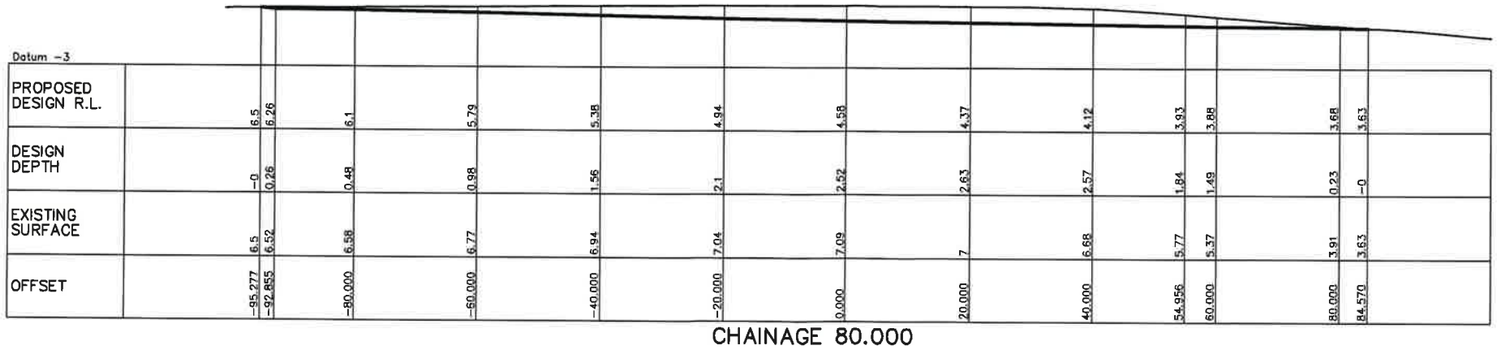
CHAINAGE 100.000



Datum -3

PROPOSED DESIGN R.L.	6.5	6.26	6.1	5.79	5.38	4.94	4.58	4.37	4.12	3.93	3.88	3.68	3.63		
DESIGN DEPTH	-0	0.26	0.48	0.98	1.56	2.1	2.52	2.63	2.57	1.84	1.49	0.23	-0		
EXISTING SURFACE	6.5	6.52	6.58	6.77	6.94	7.04	7.09	7	6.68	5.77	5.37	3.91	3.63		
OFFSET	-95.277	-92.855	-80.000	-60.000	-40.000	-20.000	0.000	20.000	40.000	54.956	60.000	80.000	84.570		

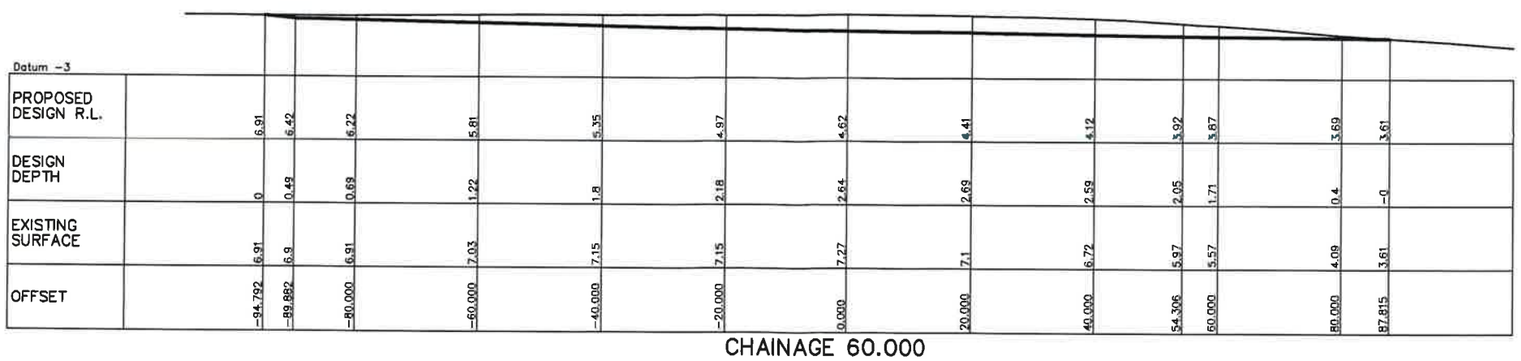
CHAINAGE 80.000



Datum -3

PROPOSED DESIGN R.L.	6.5	6.26	6.1	5.79	5.38	4.94	4.58	4.37	4.12	3.93	3.88	3.68	3.63		
DESIGN DEPTH	-0	0.26	0.48	0.98	1.56	2.1	2.52	2.63	2.57	1.84	1.49	0.23	-0		
EXISTING SURFACE	6.5	6.52	6.58	6.77	6.94	7.04	7.09	7	6.68	5.77	5.37	3.91	3.63		
OFFSET	-95.277	-92.855	-80.000	-60.000	-40.000	-20.000	0.000	20.000	40.000	54.956	60.000	80.000	84.570		

CHAINAGE 80.000



Datum -3

PROPOSED DESIGN R.L.	6.91	6.42	6.22	5.81	5.35	4.97	4.62	4.41	4.12	3.92	3.87	3.69	3.61		
DESIGN DEPTH	0	0.49	0.69	1.22	1.8	2.18	2.64	2.69	2.59	2.05	1.71	0.4	-0		
EXISTING SURFACE	6.91	6.9	6.91	7.03	7.15	7.15	7.27	7.1	6.72	5.97	5.57	4.09	3.61		
OFFSET	-94.792	-89.882	-80.000	-60.000	-40.000	-20.000	0.000	20.000	40.000	54.306	60.000	80.000	87.815		

CHAINAGE 60.000

CESSNOCK CITY COUNCIL
Approved plans for Construction Certificate No. 10/2007/757/16
Date of Approval 3/7/14
General Manager Per LCT

REVISIONS

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125 Bull Street Newcastle NSW 2300
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T 61 2 4926 1388 F 61 2 4929 3475
E survey@monteathpowys.com.au W www.monteathpowys.com.au
88 Marquis St Gunnedah NSW 2380
PO Box 328 Gunnedah NSW 2380
T 61 2 6742 0166

Surveyed	Drafted	Checked
TK	MAK	AP

REGISTERED SURVEYOR

Scale @A1 : 1:500
@A3 : 1:1000

Original Size A1

DO NOT SCALE

Client: WINTEN PROPERTY GROUP

Title: EAST REGRADE AREA CROSS SECTIONS
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 6/14

Revision 1

EAST REGRADE AREA

Datum -4

PROPOSED DESIGN R.L.	5.65	4.78	4.71	4.53	4.41	4.29	4.06	3.96	3.86	3.68	3.65	
DESIGN DEPTH	0	0.81	0.85	0.72	0.35	-0.41	-0.8	-1.13	-0.79	0.23	0	
EXISTING SURFACE	5.65	5.59	5.56	5.26	4.77	3.88	3.27	2.82	3.06	3.91	3.65	
OFFSET	-95.589	-86.900	-80.000	-60.000	-40.000	-20.000	0.000	9.277	20.000	40.000	43.216	

CHAINAGE 180.000

Datum -3

PROPOSED DESIGN R.L.	5.71	5.08	5	4.86	4.62	4.41	4.2	3.96	3.95	3.8	3.69	3.65	
DESIGN DEPTH	0	0.68	0.81	0.58	0.51	0.56	0.68	0.82	0.82	0.77	0.26	-0	
EXISTING SURFACE	5.71	5.76	5.81	5.44	5.14	4.96	4.87	4.78	4.76	4.58	3.94	3.65	
OFFSET	-95.494	-89.134	-80.000	-60.000	-40.000	-20.000	0.000	20.000	21.080	40.000	60.000	68.318	

CHAINAGE 160.000

Datum -3

PROPOSED DESIGN R.L.	5.8	5.39	5.28	5.09	4.87	4.65	4.44	4.1	3.95	3.93	3.83	3.68	3.67
DESIGN DEPTH	-0	0.45	0.59	0.68	0.79	0.96	1.27	1.52	1.44	1.35	1	0.03	0
EXISTING SURFACE	5.8	5.83	5.87	5.77	5.66	5.61	5.71	5.61	5.39	5.28	4.83	3.71	3.67
OFFSET	-95.255	-81.174	-80.000	-60.000	-40.000	-20.000	0.000	20.000	40.000	44.956	60.000	80.000	80.628

CHAINAGE 140.000

Datum -3

PROPOSED DESIGN R.L.	5.86	5.72	5.59	5.4	5.18	4.91	4.51	4.15	4.06	3.94	3.87	3.67	3.67
DESIGN DEPTH	0	0.15	0.43	0.82	1.16	1.56	2	2.21	1.88	1.39	1.12	0.04	0
EXISTING SURFACE	5.86	5.87	6.02	6.22	6.34	6.47	6.52	6.36	5.94	5.33	5	3.71	3.67
OFFSET	-94.023	-92.677	-80.000	-60.000	-40.000	-20.000	0.000	20.000	40.000	52.926	60.000	80.000	80.801

CHAINAGE 120.000

CESSNOCK CITY COUNCIL
Approved plans for
Construction Certificate No. 10/2007/757/16
Date of Approval 3/7/14
General Manager Per
LT

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TK	MAK	AP

REGISTERED SURVEYOR
Scale @A1 : 1:500
@A3 : 1:1000
DO NOT SCALE
Original Size A1

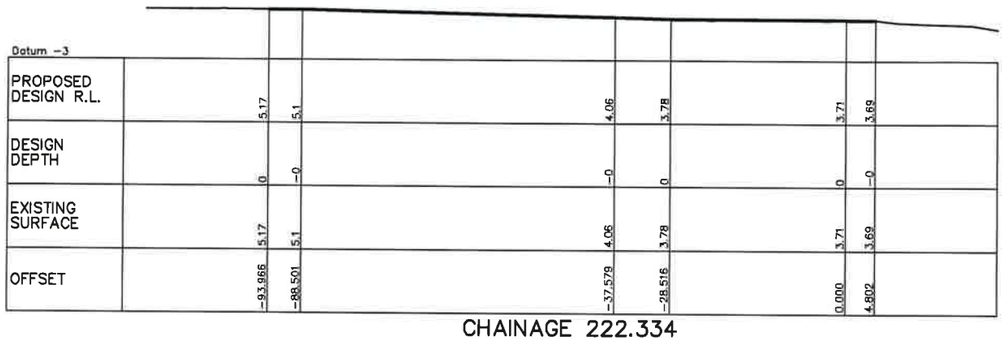
Client: WINTEN PROPERTY GROUP

Title: EAST REGRADE AREA CROSS SECTIONS
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

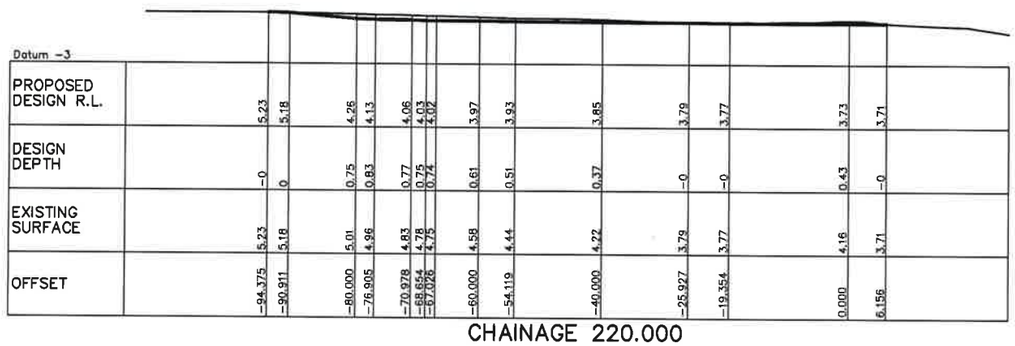
CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 7/14
Revision 1

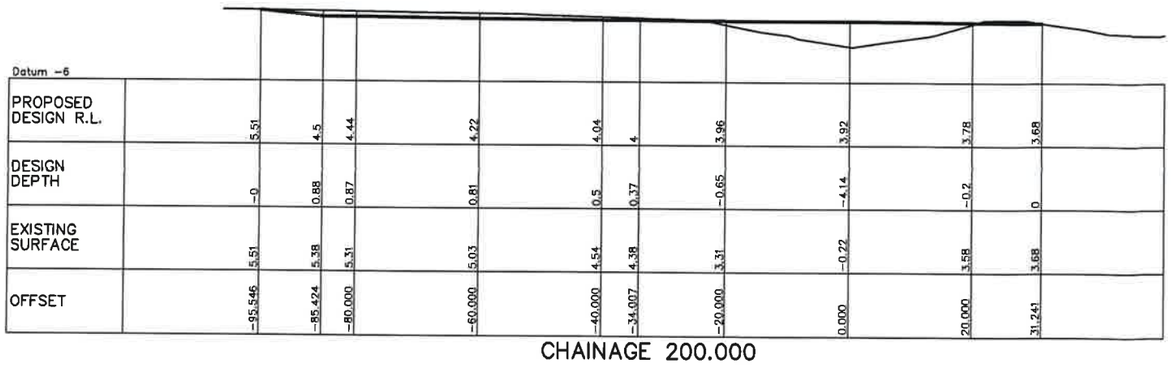
EAST REGRADE AREA



CHAINAGE 222.334



CHAINAGE 220.000



CHAINAGE 200.000

CESSNOCK CITY COUNCIL
Approved plans for Construction Certificate No. 10/2007/757/1L
Date of Approval 3/7/14
General Manager Per KLT

REVISIONS					
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TK	MAK	AP

REGISTERED SURVEYOR
Scale @A1 : 1:500 @A3 : 1:1000
Original Size A1
DO NOT SCALE

Client: WINTEN PROPERTY GROUP

Title: EAST REGRADE AREA CROSS SECTIONS
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 8/14
Revision 1

WEST REGRADE AREA

CESSNOCK CITY COUNCIL
Approved plans for
Construction Certificate No. 10/2007/757/16
Date of Approval 3/7/14
General Manager Per
CT

Datum −1

PROPOSED DESIGN R.L.	7.24	7.21	6.2	6.08	5.91	5.83	5.8	5.63	5.35	
DESIGN DEPTH	0	0.03	0.94	0.88	0.67	0.62	0.47	0.12	−0	
EXISTING SURFACE	7.24	7.24	7.14	6.96	6.58	6.45	6.27	5.75	5.35	
OFFSET	−40.297	−40.000	−30.084	−20.000	0.000	9.956	20.000	40.000	59.362	

CHAINAGE 40.000

Datum 0

PROPOSED DESIGN R.L.	8.19	7.74	6.61	6.37	6.26	6.13	6.08	6.02	5.86					
DESIGN DEPTH	−0	0.23	0.81	0.76	0.91	0.82	0.74	0.51	−0					
EXISTING SURFACE	8.19	7.97	7.42	7.13	7.17	6.95	6.82	6.53	5.86					
OFFSET	−44.450	−40.000	−28.617	−20.000	−14.996	−9.864	−6.905	0.000	15.943					

CHAINAGE 120.000

Datum 0

PROPOSED DESIGN R.L.	6.58	6.54	6.02	5.88	5.81	5.74	5.61	5.6		
DESIGN DEPTH	0	0.04	0.49	0.37	0.34	0.26	0.08	−0		
EXISTING SURFACE	6.58	6.58	6.52	6.25	6.15	5.99	5.69	5.6		
OFFSET	−40.412	−40.000	−34.907	−20.000	−14.182	0.000	20.000	24.665		

CHAINAGE 20.000

Datum 0

PROPOSED DESIGN R.L.	8.22	7.91	6.52	6.42	6.11	6.03	5.89	5.77						
DESIGN DEPTH	−0	0.21	1.14	1.04	0.69	0.6	0.29	0						
EXISTING SURFACE	8.22	8.12	7.65	7.46	6.8	6.64	6.18	5.77						
OFFSET	−43.184	−40.000	−28.060	−20.000	0.000	5.090	20.000	32.837						

CHAINAGE 100.000

Datum 0

PROPOSED DESIGN R.L.	6.13	6.11	5.93	5.76	5.62					
DESIGN DEPTH	0	0.01	0.19	0.1	0					
EXISTING SURFACE	6.13	6.13	6.11	5.86	5.62					
OFFSET	−40.111	−40.000	−38.150	−20.000	0.000					

CHAINAGE 7.267

Datum −1

PROPOSED DESIGN R.L.	8.12	7.85	6.66	6.54	6.25	5.99	5.95	5.56	5.47					
DESIGN DEPTH	−0	0.22	1.09	1.02	0.85	0.65	0.6	0.06	0					
EXISTING SURFACE	8.12	8.07	7.75	7.56	7.1	6.64	6.55	5.61	5.47					
OFFSET	−42.660	−40.000	−28.067	−20.000	0.000	17.084	20.000	40.000	44.550					

CHAINAGE 80.000

0.7% 1.26%

Datum 0

PROPOSED DESIGN R.L.	5.87	5.83	5.4		
DESIGN DEPTH	−0	0	0		
EXISTING SURFACE	5.87	5.83	5.4		
OFFSET	−40.000	−34.295	0.000		

CHAINAGE 0.000

Datum −1

PROPOSED DESIGN R.L.	7.82	7.23	6.44	6.37	6.14	5.9	5.87	5.54	5.28					
DESIGN DEPTH	0	0.06	1.02	1.01	0.85	0.47	0.41	0.18	−0					
EXISTING SURFACE	7.82	7.29	7.46	7.38	6.99	6.37	6.28	5.72	5.28					
OFFSET	−40.839	−40.000	−27.175	−20.000	0.000	20.000	22.021	40.000	53.985					

CHAINAGE 60.000

REVISIONS

No	REVISION	SVY	DFT	CHK	DATE
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REGISTERED SURVEYOR
Scale @A1 : 1:500
@A3 : 1:1000
DO NOT SCALE
Original Size A1

Client: WINTEN PROPERTY GROUP

Title: WEST REGRADE AREA CROSS SECTIONS
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 071740_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 9/14
Revision 1

WEST REGRADE AREA

Datum 1

PROPOSED DESIGN R.L.	6.49	6.42	6.42
DESIGN DEPTH	0	0.04	0
EXISTING SURFACE	6.49	6.46	6.42
OFFSET	-20.000	-18.950	-17.607

CHAINAGE 163.132

Datum 1

PROPOSED DESIGN R.L.	7.02	6.48	6.46	6.44	
DESIGN DEPTH	0	0.23	0.1	0	
EXISTING SURFACE	7.02	6.72	6.56	6.44	
OFFSET	-30.545	-23.548	-19.092	-15.512	

CHAINAGE 160.000

Datum 0

PROPOSED DESIGN R.L.	7.98	7.63	6.67	6.52	6.15	
DESIGN DEPTH	-0	0.21	0.8	0.45	0	
EXISTING SURFACE	7.98	7.84	7.46	6.97	6.15	
OFFSET	-43.334	-40.000	-31.316	-20.000	-0.001	

CHAINAGE 142.652

Datum 0

PROPOSED DESIGN R.L.	8.04	6.7	6.49	6.47	6.12	6.05
DESIGN DEPTH	-0	0.79	0.52	0.49	0.08	-0
EXISTING SURFACE	8.04	7.48	7.01	6.96	6.2	6.05
OFFSET	-44.136	-31.022	-20.000	-18.899	0.000	3.388

CHAINAGE 140.000

CESSNOCK CITY COUNCIL
Approved plans for Construction Certificate No. 10/2007/757/1b
Date of Approval 3/7/14
General Manager Per RT

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Surveyed	Drafted	Checked
TK	MAK	AP

REGISTERED SURVEYOR

Scale @A1 : 1:500
@A3 : 1:1000

Original Size A1

DO NOT SCALE

Client: WINTEN PROPERTY GROUP

Title: WEST REGRADE AREA CROSS SECTIONS
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

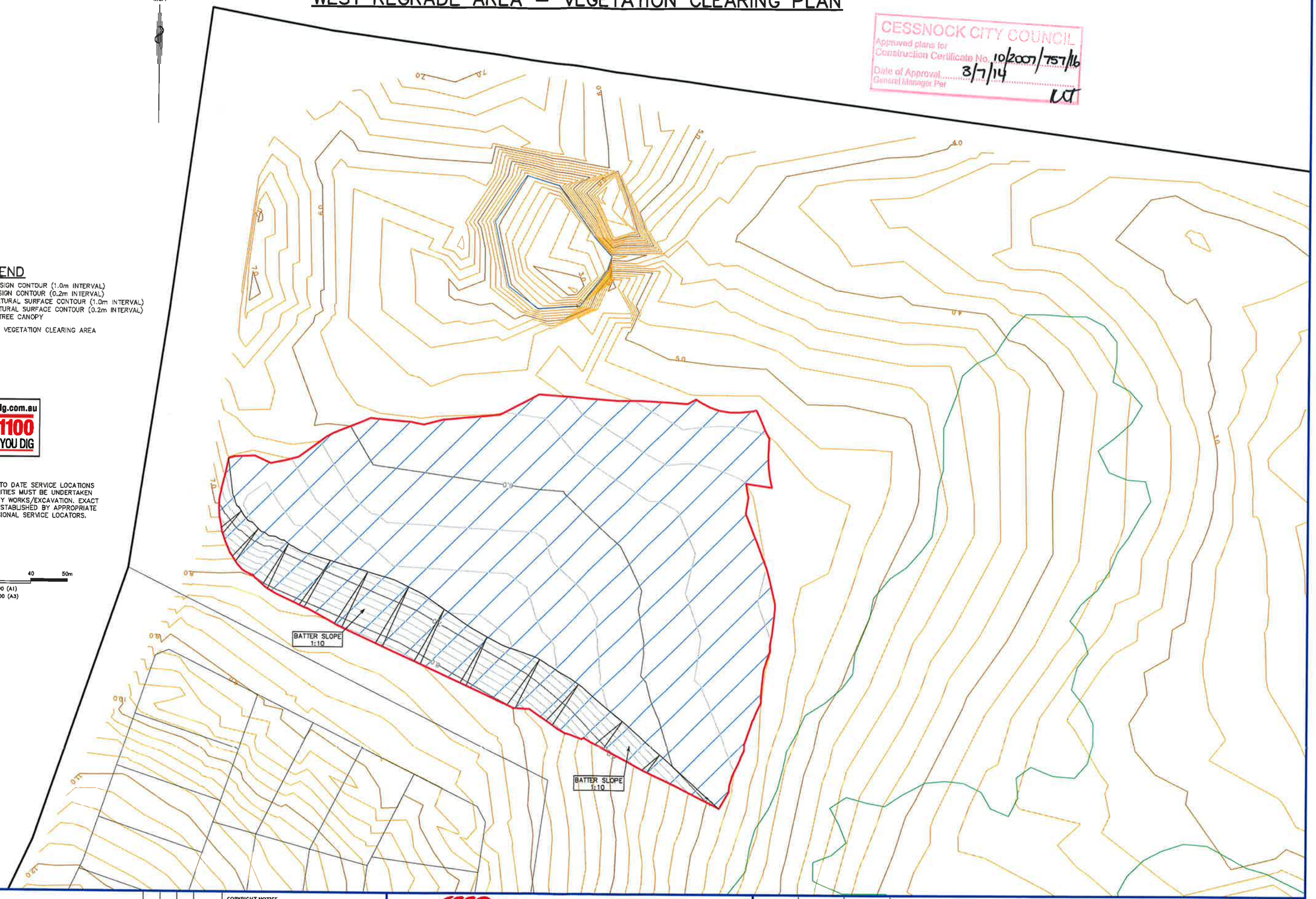
Sheet No. 10/14

Revision 1

WEST REGRADE AREA – VEGETATION CLEARING PLAN

CESSNOCK CITY COUNCIL
Approved plans for Construction Certificate No. 10/2007/757/16
Date of Approval 3/7/14
General Manager Per
LCT

MGA



LEGEND

- MAJOR DESIGN CONTOUR (1.0m INTERVAL)
- MINOR DESIGN CONTOUR (0.2m INTERVAL)
- MAJOR NATURAL SURFACE CONTOUR (1.0m INTERVAL)
- MINOR NATURAL SURFACE CONTOUR (0.2m INTERVAL)
- EDGE OF TREE CANOPY
- PROPOSED VEGETATION CLEARING AREA

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NOTE

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0 10 20 30 40 50m
REDUCTION RATIO – 1:500 (A1)
REDUCTION RATIO – 1:1000 (A3)

REVISIONS

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DO NOT SCALE
Original Size A1

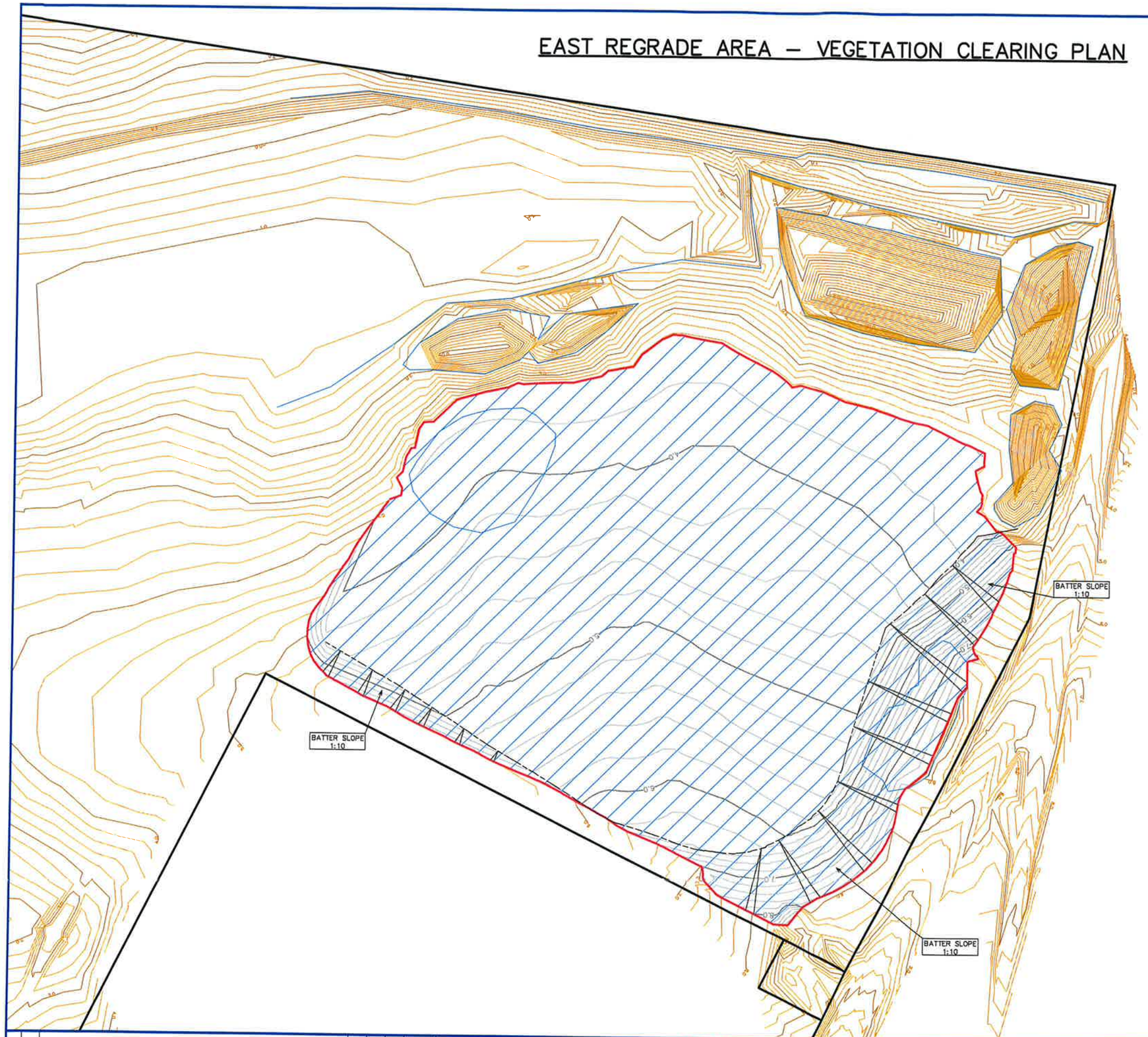
Client: WINTEN PROPERTY GROUP

Title: VEGETATION CLEARING PLAN
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 11/14
Revision 1

EAST REGRADE AREA – VEGETATION CLEARING PLAN



MGA

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LEGEND

- MAJOR DESIGN CONTOUR (1.0m INTERVAL)
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- MINOR NATURAL SURFACE CONTOUR (0.2m INTERVAL)
- PROPOSED VEGETATION CLEARING AREA

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0 10 20 30 40 50m
REDUCTION RATIO – 1:750 (A1)
REDUCTION RATIO – 1:1500 (A3)

REVISIONS

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Original Size A1

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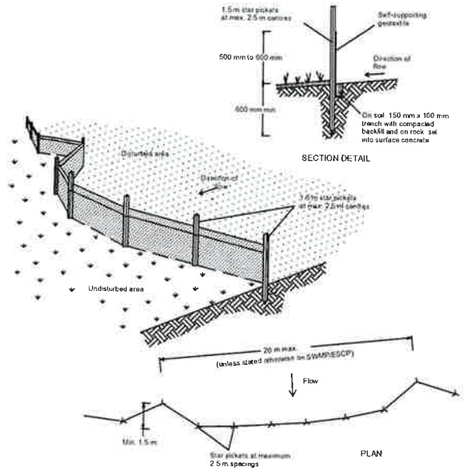
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 | Ref No: 07/174 | Date: 02/06/2014

Sheet No. 12/14
Revision 1

WEST REGRADE AREA – SEDIMENT EROSION CONTROL PLAN



SEDIMENT CONTROL FENCE

CONSTRUCTION NOTES

1. CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.
2. DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND, 3 METRES APART.
3. DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
4. BACKFILL TRENCH OVER BASE OF FABRIC.
5. FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF OF POSTS WITH WIRE TIES OR AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.
6. JOIN SECTIONS OF FABRIC AT SUPPORT POST WITH A 150mm OVERLAP.

MAINTENANCE NOTES

1. CHECK FENCE REGULARLY AND AFTER RAINFALL EVENTS. REINSTATE ANY DISLODGED GEOTEXTILE OR SUPPORT STAKES.
2. SEDIMENT IS TO BE REMOVED PERIODICALLY AS REQUIRED AFTER RAINFALL EVENTS.
3. THE SOURCE OF ANY EXCESSIVE SEDIMENT IS TO BE INVESTIGATED AND MEASURES UNDERTAKEN TO LIMIT EXCESSIVE BUILD UP.

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NOTE

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0 10 20 30 40 50m

REDUCTION RATIO – 1:500 (A1)
REDUCTION RATIO – 1:1000 (A3)

MGA

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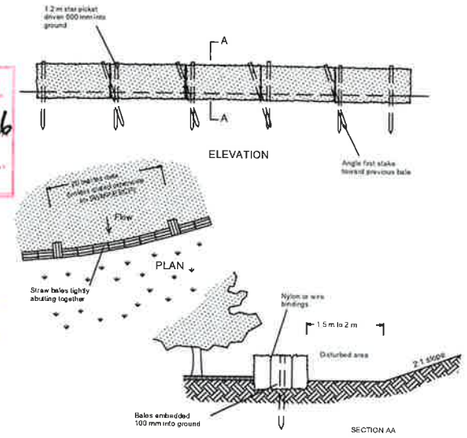
Approved plans for Construction Certificate No. 10/2007/757/16
Date of Approval 3/7/14
General Manager Per



SEDIMENT STRAW BALE

CONSTRUCTION NOTES

1. CONSTRUCT STRAW BALE FILTER AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE OR AT THE TOE OF A SLOPE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS TO BE PLACED PARALLEL TO GROUND.
3. MAXIMUM HEIGHT OF FILTER IS ONE BALE.
4. ON SOFT MATERIALS, EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 1.2m STAR PICKETS. ANGLE THE FIRST STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE STAKES 600mm INTO THE GROUND AND FLUSH WITH THE TOP OF THE BALES.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER THE BALES SHOULD BE LOCATED 1.5 TO 2 METRES DOWNSLOPE FROM THE TOE OF THE BATTER.

MAINTENANCE NOTES

1. INSPECT AFTER RAINFALL EVENTS TO ENSURE FUNCTIONALITY. REINSTATE ANY DISLODGED HAY BALES OR SUPPORT STAKES.
2. SEDIMENT IS TO BE REMOVED PERIODICALLY AS REQUIRED AFTER RAINFALL EVENTS.
3. THE SOURCE OF ANY EXCESSIVE SEDIMENT IS TO BE INVESTIGATED AND MEASURES UNDERTAKEN TO LIMIT EXCESSIVE BUILD UP.

NOTE:

ALL SEDIMENT BUILD UP THAT OCCURS BEHIND SEDIMENT CONTROL DEVICES IS TO BE REMOVED WEEKLY OR AS RAINFALL EVENTS DICTATE. IN PERIODS OF DRY WEATHER ALL EROSION AND SEDIMENT CONTROL DEVICES SHOULD BE INSPECTED WEEKLY TO ENSURE THAT THEY ARE FUNCTIONAL.

LEGEND

- MAJOR DESIGN CONTOUR (1.0m INTERVAL)
- MINOR DESIGN CONTOUR (0.2m INTERVAL)
- MAJOR NATURAL SURFACE CONTOUR (1.0m INTERVAL)
- MINOR NATURAL SURFACE CONTOUR (0.2m INTERVAL)
- EDGE OF TREE CANOPY
- SEDIMENT EROSION CONTROL FENCE
- TEMPORARY SITE STOCKPILE
- STRAW BALE

REVISIONS

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REGISTERED SURVEYOR
Scale @A1 : 1:500
@A3 : 1:1000
Original Size A1
DO NOT SCALE

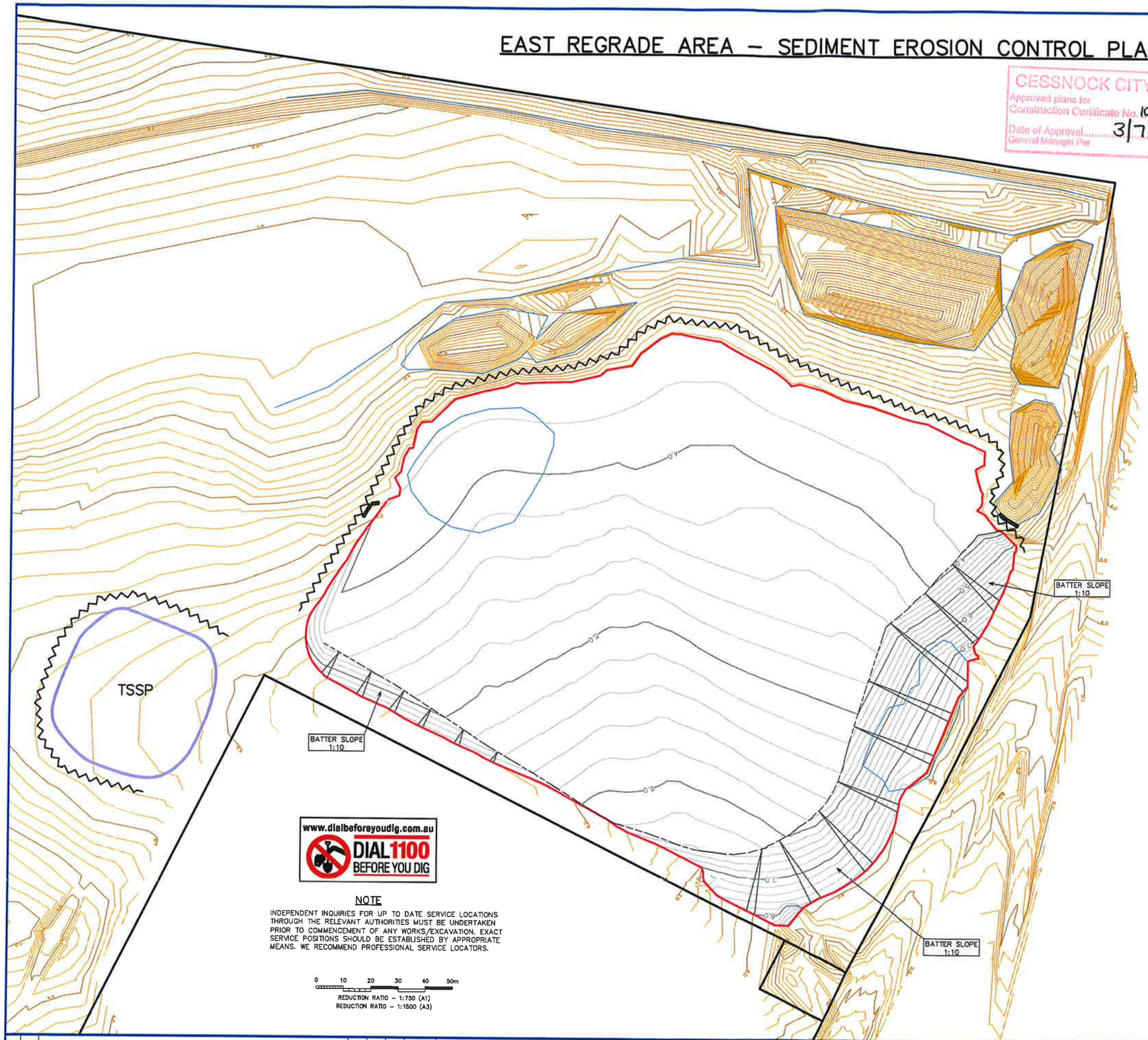
Client: WINTEN PROPERTY GROUP

Title: EROSION & SEDIMENT CONTROL PLAN
SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 13/14
Revision 1

EAST REGRADE AREA – SEDIMENT EROSION CONTROL PLAN



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LEGEND

- MAJOR DESIGN CONTOUR (1.0m INTERVAL)
- MINOR DESIGN CONTOUR (0.2m INTERVAL)
- MAJOR NATURAL SURFACE CONTOUR (1.0m INTERVAL)
- MINOR NATURAL SURFACE CONTOUR (0.2m INTERVAL)
- SEDIMENT EROSION CONTROL FENCE
- TEMPORARY SITE STOCKPILE
- STRAW BALE

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0 10 20 30 40 50m

REDUCTION RATIO – 1:750 (A1)
REDUCTION RATIO – 1:1500 (A3)

GENERAL EROSION AND SEDIMENT CONTROL NOTES

GENERAL

1. ALL WORK IS TO BE IN ACCORDANCE WITH THE PLAN AND CONSISTENT WITH LANDCOM – MANAGING URBAN STORMWATER – BLUE BOOK 4TH EDITION.
2. THE NOMINATED PROJECT MANAGER SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE EROSION AND SEDIMENT CONTROL PLAN.
3. THE PROJECT MANAGER SHALL INFORM ALL CONTRACTORS AND SUBCONTRACTORS OF THEIR OBLIGATIONS UNDER THE EROSION AND SEDIMENT CONTROL PLAN.
4. THE PLAN SHALL INCLUDE A WORKS PROGRAM (eg. GANTT CHART) INCLUDING ACCOUNTABILITY FOR EACH ACTION (ie. RESPONSIBILITY/SIGN OFF).
5. CONTROL MEASURES SHALL BE IN PLACE PRIOR TO EACH SITE DISTURBANCE.
6. SITE DISTURBANCE SHALL BE STAGED WHERE POSSIBLE AND RESTRICTED TO THE WORKS ZONE.
7. ALL WORKS TO BE INSPECTED, AND MAINTAINED WHERE NECESSARY ON A WEEKLY BASIS AND AFTER EACH RUNOFF EVENT.

TOPSOIL MANAGEMENT

1. TOPSOIL SHALL INCLUDE A MINIMUM OF THE FIRST 250mm OF THE SOIL SURFACE.
2. TOPSOIL IS TO BE PROGRESSIVELY STRIPPED FROM ALL AREAS THAT ARE TO BE CUT OR FILLED AND STOCKPILED IN AREAS AWAY FROM DRAINAGE FLOWPATHS.
3. ALL BATTERS ARE TO BE SPREAD WITH TOPSOIL AND GRASS SEEDED USING SEED MIX SPECIFIED IN THE DEPARTMENT OF HOUSING CONSTRUCTION SPECIFICATION. STEEP BATTERS ARE TO BE MULCHED WITH ONSITE MATERIAL TO A DEPTH OF 100mm MINIMUM.
3. TOPSOIL STOCKPILES ARE TO BE TRACK ROLLED AND WHERE STOCKPILED FOR PERIODS GREATER THAN 2 WEEKS FURTHER STABILISED (eg.SEEDED WITH AN APPROPRIATE VEGETATIVE COVER CROP OR MULCHED).
4. STOCKPILE SITES, BORROW PITS ETC, SHALL BE REVEGETATED IMMEDIATELY UPON DECOMMISSION.

EROSION CONTROL

1. ALL STORMWATER RUNOFF IS TO BE DIRECTED TO FILTRATION DEVICES.
2. SOIL MATERIAL STOCKPILES SHALL BE LOCATED AWAY FROM DEPRESSION FLOWLINES.
3. BARRIER OR SIMILAR FENCING IS TO BE USED TO PROTECT NON TRAFFICABLE AREAS.

REVEGETATION

1. REVEGETATION SHALL BE ONGOING AND PROGRESSIVE.
2. WHERE ANY BREAK IN OPERATIONS, OR WHERE WORK IS CEASED IN AN AREA FOR LONGER THAN 4 WEEKS, THE EXPOSED AREA SHALL BE STABILISED (eg.TEMPORARY TOPSOILING AND SEEDING WITH AN APPROPRIATE COVERCROP, MULCHES, BLANKETS/MATTINGS).

SEDIMENT CONTROL

1. SEDIMENT FENCING IS TO BE INSTALLED TO THE MANUFACTURERS SPECIFICATIONS AND: "BE INSTALLED TO THE CONTOUR" HAVE ENDS TURNED UPWARDS WHERE APPROPRIATE TO CREATE STORAGE
2. SEDIMENT CONTROLS ARE TO BE LOCATED AS CLOSE TO DISTURBED AREAS AS PRACTICABLE.
3. TRAPPED SEDIMENT TO BE REMOVED TO AN APPROPRIATE LOCATION.
4. TEMPORARY CONTROL MEASURES SHALL REMAIN IN PLACE UNTIL CATCHMENT THEY ARE SERVING IS STABILISED (FOR GRASS, 70% GROUNDCOVER)
5. ALL SEDIMENT CONTROL DEVICES ARE TO BE IN PLACE AT THE END OF EACH DAY.

REVISIONS

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SITE REGRADING FOR TESTERS HOLLOW REHABILITATION WORKS
TESTERS HOLLOW - MAIN ROAD, CLIFTLEIGH

CAD File: 07174o_01 Ref No: 07/174 Date: 02/06/2014

Sheet No. 14/14
Revision 1

Appendix C – Site Photographs (27 September 2018)

Photograph 1: View from East overlooking Main Road	**Photograph 2:** View from West overlooking Main Road and field boundaries within site area
Photograph 3: Paddock area which contained historic chicken sheds	**Photograph 4:** Area showing evidence of fly tipping and tree plantation
Photograph 5: Asbestos bonded cement found within paddock area (material tested and confirmed as ACM)	**Photograph 6:** Portion of the site in the centre submerged in water

Photograph 7: Photograph of existing highway western fill batter showing shotcreted section in vicinity of culvert	**Photograph 8:** North of the site, where unable to collect samples due to site designated as PAD.

Appendix D – Laboratory Results and Certificates

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
1A Dalmore Drive Scoresby VIC 3179
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: JACOBS	Client Project Name / Number / Site etc (ie report title): 1A182900
Contact Person: TAHER ALI	
Project Mgr: Robert Crawthier	PO No.:
Sampler: TAHER ALI	Envirolab Quote No. :
Address: 177 Pacific Highway North Sydney, 2060	Date results required: Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02-9032-1852 Mob: 469797607	Additional report format: esdat / equis /
Email: taher.ali@jacobs.com	Lab Comments:

Sample information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Metals	PAH	Halpiodes	Pesticides	Hydrocarbons	~~Fibre Asbestos~~	Groundwater Asbestos									Provide as much information about the sample as you can
~~[illegible]~~																				
1	RINSATE_TH		27.9	water.	X	↑	↑	↑	↑											
2	TH01_S			Soil	X						↑									
3	TH02_S			Soil	X															
4	TH03_S			Soil	X															
5	TH04_D			Soil	X															
6	TH05_S			Soil	X															
7	TH06_D			Soil	X															
8	TH07_S			Soil	X															
9	TH08_S			Soil	X															
10	TH09_S			Soil	X															
11	TH10_S			Soil	X															
12	DUP01			Soil.	X	↓	↓	↓	↓		↓									

Relinquished by (Company): JACOBS	Received by (Company): ALS	*Lab Use Only*	
Print Name: TAHER Ali	Print Name: Andy Stoney	Job number: 201900	Cooling: Ice / Ice pack / None
Date & Time: 28.9.18 9:00	Date & Time: 28/9 11:20	Temperature: 12.4	Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

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Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: JACOBS	Client Project Name / Number / Site etc (ie report title): 1A182900
Contact Person: Taher Ali	
Project Mgr: Robert Gauthier	PO No.:
Sampler: Taher Ali	Envirolab Quote No. :
Address: 177 Pacific Highway North Sydney, 2060	Date results required: Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 02-9032-1852 Mob:	Additional report format: esdat / equis /
Email: taher.ali@jacobs.com.	Lab Comments:

Sample information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Asbestos ID.															Provide as much information about the sample as you can
13	ACM1		27.9		x															
14	ACM 2		27.9		x															
15.	ACM 3		27.9		x.															

Relinquished by (Company): JACOBS	Received by (Company): ECS	Lab Use Only	
Print Name: TAHER Ali	Print Name: Andy Zhang	Job number: 201900	Cooling: Ice / Ice pack / None
Date & Time: 27.9.18 9:00	Date & Time: 28/9 10:30	Temperature:	Security seal: Intact / Broken /None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 201900

Client Details

Client	Jacobs Group (Australia) Pty Ltd
Attention	Taher Ali
Address	Level 7, 177 Pacific Highway, North Sydney, NSW, 2060

Sample Details

Your Reference	**IA182900**
Number of Samples	1 Water, 14 Soil
Date samples received	28/09/2018
Date completed instructions received	28/09/2018

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	09/10/2018
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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Long Pham, Team Leader, Metals
Lucy Zhu, Asbsestos Analyst
Nancy Zhang, Assistant Lab Manager
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	94	102	90	86	98

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	%	103	86	96	91	83

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date extracted	-	02/10/2018
Date analysed	-	03/10/2018
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH 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	%	80

svTRH (C10-C40) in Soil						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	110	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	120
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	150	<100	<100	<100	140
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	150	<50	<50	<50	140
Surrogate o-Terphenyl	%	101	101	104	104	105

svTRH (C10-C40) in Soil						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	110	150	<100	120
TRH C_{29} - C_{36}	mg/kg	<100	<100	370	<100	320
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	180	400	<100	360
TRH >C_{34} -C_{40}	mg/kg	<100	<100	440	<100	150
Total +ve TRH (>C10-C40)	mg/kg	<50	180	840	<50	510
Surrogate o-Terphenyl	%	99	102	100	98	113

svTRH (C10-C40) in Soil		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date extracted	-	02/10/2018
Date analysed	-	03/10/2018
TRH C_{10} - C_{14}	mg/kg	<50
TRH C_{15} - C_{28}	mg/kg	<100
TRH C_{29} - C_{36}	mg/kg	<100
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	110
TRH >C_{34} -C_{40}	mg/kg	<100
Total +ve TRH (>C10-C40)	mg/kg	110
Surrogate o-Terphenyl	%	107

PAHs in Soil						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	0.2	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	0.3	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	0.5	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	5.4	0.8	1.4	<0.1	0.3
Anthracene	mg/kg	1.2	<0.1	0.2	<0.1	<0.1
Fluoranthene	mg/kg	10	2.1	2.9	0.2	0.6
Pyrene	mg/kg	8.5	1.9	2.6	0.2	0.5
Benzo(a)anthracene	mg/kg	3.5	0.6	0.8	<0.1	0.2
Chrysene	mg/kg	3.4	0.8	1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	6.1	2	2	<0.2	0.4
Benzo(a)pyrene	mg/kg	3.8	0.95	1.0	0.07	0.2
Indeno(1,2,3-c,d)pyrene	mg/kg	2.3	0.6	0.7	<0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	0.5	0.1	0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	2.6	0.8	0.8	<0.1	0.2
Total +ve PAH's	mg/kg	49	10	13	0.4	2.6
Benzo(a)pyrene TEQ calc (zero)	mg/kg	5.6	1.4	1.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	5.6	1.4	1.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	5.6	1.4	1.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	92	91	92	93	94

PAHs in Soil						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
Naphthalene	mg/kg	<0.1	0.2	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	0.2	<0.1	<0.1	0.1
Acenaphthene	mg/kg	<0.1	0.5	<0.1	<0.1	0.2
Fluorene	mg/kg	<0.1	0.6	<0.1	<0.1	0.2
Phenanthrene	mg/kg	0.5	8.3	1.2	1.1	2.5
Anthracene	mg/kg	<0.1	1.4	0.1	0.2	0.4
Fluoranthene	mg/kg	1	13	2.9	2.0	4.5
Pyrene	mg/kg	0.9	12	2.6	1.7	3.9
Benzo(a)anthracene	mg/kg	0.3	3.6	1	0.6	1.4
Chrysene	mg/kg	0.4	4.2	1.3	0.7	1.6
Benzo(b,j+k)fluoranthene	mg/kg	0.6	7.7	2.8	1	3.4
Benzo(a)pyrene	mg/kg	0.4	5.1	1.8	0.89	2.2
Indeno(1,2,3-c,d)pyrene	mg/kg	0.2	3.1	1.1	0.5	1.3
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.6	0.3	0.1	0.2
Benzo(g,h,i)perylene	mg/kg	0.3	3.6	1.5	0.6	1.4
Total +ve PAH's	mg/kg	4.5	64	17	9.7	23
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	7.2	2.6	1.2	3.1
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.5	7.2	2.6	1.2	3.1
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.6	7.2	2.6	1.2	3.1
Surrogate p-Terphenyl-d14	%	90	93	85	88	98

PAHs in Soil		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date extracted	-	02/10/2018
Date analysed	-	03/10/2018
Naphthalene	mg/kg	<0.1
Acenaphthylene	mg/kg	<0.1
Acenaphthene	mg/kg	<0.1
Fluorene	mg/kg	<0.1
Phenanthrene	mg/kg	1.1
Anthracene	mg/kg	0.2
Fluoranthene	mg/kg	2.2
Pyrene	mg/kg	1.8
Benzo(a)anthracene	mg/kg	0.6
Chrysene	mg/kg	0.8
Benzo(b,j+k)fluoranthene	mg/kg	2
Benzo(a)pyrene	mg/kg	0.96
Indeno(1,2,3-c,d)pyrene	mg/kg	0.6
Dibenzo(a,h)anthracene	mg/kg	0.1
Benzo(g,h,i)perylene	mg/kg	0.7
Total +ve PAH's	mg/kg	11
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.4
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.4
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.4
Surrogate p-Terphenyl-d14	%	93

Organochlorine Pesticides in soil						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-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
beta-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
pp-DDD	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-DDT	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
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	100	96	103	95

Organochlorine Pesticides in soil						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-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
beta-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
pp-DDD	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-DDT	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
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	95	97	110	86	101

Organochlorine Pesticides in soil		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date extracted	-	02/10/2018
Date analysed	-	02/10/2018
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-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
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1
Surrogate TCMX	%	93

Organophosphorus Pesticides						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Azinphos-methyl (Guthion)	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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	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
Dichlorvos	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
Ethion	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
Parathion	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
Surrogate TCMX	%	89	100	96	103	95

Organophosphorus Pesticides						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Azinphos-methyl (Guthion)	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
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	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
Dichlorvos	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
Ethion	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
Parathion	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
Surrogate TCMX	%	95	97	110	86	101

Organophosphorus Pesticides		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date extracted	-	02/10/2018
Date analysed	-	02/10/2018
Azinphos-methyl (Guthion)	mg/kg	<0.1
Bromophos-ethyl	mg/kg	<0.1
Chlorpyriphos	mg/kg	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1
Diazinon	mg/kg	<0.1
Dichlorvos	mg/kg	<0.1
Dimethoate	mg/kg	<0.1
Ethion	mg/kg	<0.1
Fenitrothion	mg/kg	<0.1
Malathion	mg/kg	<0.1
Parathion	mg/kg	<0.1
Ronnel	mg/kg	<0.1
Surrogate TCMX	%	93

Acid Extractable metals in soil						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Arsenic	mg/kg	5	<4	<4	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	9	8	22	7	27
Copper	mg/kg	14	7	28	10	24
Lead	mg/kg	18	49	27	7	14
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	17	8	21	7	32
Zinc	mg/kg	59	190	68	24	55

Acid Extractable metals in soil						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Arsenic	mg/kg	8	4	<4	5	7
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	16	26	85	11	27
Copper	mg/kg	8	30	8	15	33
Lead	mg/kg	13	40	14	27	44
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	32	48	6	10	65
Zinc	mg/kg	51	100	43	42	94

Acid Extractable metals in soil		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date prepared	-	02/10/2018
Date analysed	-	02/10/2018
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.4
Chromium	mg/kg	23
Copper	mg/kg	25
Lead	mg/kg	34
Mercury	mg/kg	<0.1
Nickel	mg/kg	39
Zinc	mg/kg	69

Moisture						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
Moisture	%	21	15	44	27	21

Moisture						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
Moisture	%	19	34	8.6	26	62

Moisture		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date prepared	-	02/10/2018
Date analysed	-	03/10/2018
Moisture	%	46

Triazine Herbicides in Soil						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
Simazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Atrazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Propazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Terbuthylazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Metribuzin	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ametryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Prometryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Terbutryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Cyanazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Irgarol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Hexazinone	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	96	97	100	102	108

Triazine Herbicides in Soil						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	02/10/2018	02/10/2018	02/10/2018	02/10/2018	02/10/2018
Date analysed	-	03/10/2018	03/10/2018	03/10/2018	03/10/2018	03/10/2018
Simazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Atrazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Propazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Terbuthylazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Metribuzin	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ametryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Prometryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Terbutryn	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Cyanazine	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Irgarol	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Hexazinone	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	99	100	88	96	103

Triazine Herbicides in Soil		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date extracted	-	02/10/2018
Date analysed	-	03/10/2018
Simazine	mg/kg	<0.5
Atrazine	mg/kg	<0.5
Propazine	mg/kg	<0.5
Terbuthylazine	mg/kg	<0.5
Metribuzin	mg/kg	<0.5
Ametryn	mg/kg	<0.5
Prometryn	mg/kg	<0.5
Terbutryn	mg/kg	<0.5
Cyanazine	mg/kg	<0.5
Irgarol	mg/kg	<0.5
Hexazinone	mg/kg	<0.5
Surrogate p-Terphenyl-d14	%	91

Phenoxy Acid Herbicides in Soil						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/10/2018	04/10/2018	04/10/2018	04/10/2018	04/10/2018
Date analysed	-	06/10/2018	06/10/2018	06/10/2018	06/10/2018	06/10/2018
Clopyralid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
o-chlorophenoxy acetic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-CPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dicamba	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorprop	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoxynil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Triclopyr	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-TP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dinoseb	mg/kg	<1	<1	<1	<1	<1
2,4-DB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ioxynil	mg/kg	<1	<1	<1	<1	<1
Picloram	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acifluorfen	mg/kg	<2	<2	<2	<2	<2
2,4,6-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate 2.4- DCPA	%	100	100	99	95	100

Phenoxy Acid Herbicides in Soil						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	04/10/2018	04/10/2018	04/10/2018	04/10/2018	04/10/2018
Date analysed	-	06/10/2018	06/10/2018	06/10/2018	06/10/2018	06/10/2018
Clopyralid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
o-chlorophenoxy acetic acid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
4-CPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dicamba	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPA	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dichlorprop	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Bromoxynil	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Triclopyr	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-TP	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
MCPB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Dinoseb	mg/kg	<1	<1	<1	<1	<1
2,4-DB	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ioxynil	mg/kg	<1	<1	<1	<1	<1
Picloram	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Acifluorfen	mg/kg	<2	<2	<2	<2	<2
2,4,6-T	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
2,6-D	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate 2.4- DCPA	%	96	99	89	100	90

Phenoxy Acid Herbicides in Soil		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date extracted	-	04/10/2018
Date analysed	-	06/10/2018
Clopyralid	mg/kg	<0.5
3,5-Dichlorobenzoic acid	mg/kg	<0.5
o-chlorophenoxy acetic acid	mg/kg	<0.5
4-CPA	mg/kg	<0.5
Dicamba	mg/kg	<0.5
MCPP	mg/kg	<0.5
MCPA	mg/kg	<0.5
Dichlorprop	mg/kg	<0.5
2,4-D	mg/kg	<0.5
Bromoxynil	mg/kg	<0.5
Triclopyr	mg/kg	<0.5
2,4,5-TP	mg/kg	<0.5
2,4,5-T	mg/kg	<0.5
MCPB	mg/kg	<0.5
Dinoseb	mg/kg	<1
2,4-DB	mg/kg	<0.5
Ioxynil	mg/kg	<1
Picloram	mg/kg	<0.5
DCPA (Chlorthal) Diacid	mg/kg	<0.5
Acifluorfen	mg/kg	<2
2,4,6-T	mg/kg	<0.5
2,6-D	mg/kg	<0.5
Surrogate 2.4- DCPA	%	110

Asbestos ID - soils NEPM - ASB-001						
Our Reference		201900-2	201900-3	201900-4	201900-5	201900-6
Your Reference	UNITS	TH01_S	TH02_S	TH03_S	TH04_S	TH05_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018
Sample mass tested	g	393.45	452.74	491.35	282.5	395.16
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 (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	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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	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	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001						
Our Reference		201900-7	201900-8	201900-9	201900-10	201900-11
Your Reference	UNITS	TH06_S	TH07_S	TH08_S	TH09_S	TH010_S
Date Sampled		27/09/2018	27/09/2018	27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	09/10/2018	09/10/2018	09/10/2018	09/10/2018	09/10/2018
Sample mass tested	g	361.9	397.31	555.1	331.21	371.62
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 (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	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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected
Total Asbestos#1	g/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected	No visible asbestos detected	No visible asbestos detected	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	<0.01	<0.01	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001	<0.001	<0.001	<0.001	<0.001

Asbestos ID - soils NEPM - ASB-001		
Our Reference		201900-12
Your Reference	UNITS	DUP01
Date Sampled		27/09/2018
Type of sample		Soil
Date analysed	-	09/10/2018
Sample mass tested	g	317.2
Sample Description	-	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
Trace Analysis	-	No asbestos detected
Total Asbestos#1	g/kg	<0.1
Asbestos ID in soil <0.1g/kg*	-	No visible asbestos detected
ACM >7mm Estimation*	g	–
FA and AF Estimation*	g	–
ACM >7mm Estimation*	%(w/w)	<0.01
FA and AF Estimation*#2	%(w/w)	<0.001

Asbestos ID - materials				
Our Reference		201900-13	201900-14	201900-15
Your Reference	UNITS	ACM1	ACM2	ACM3
Date Sampled		27/09/2018	27/09/2018	27/09/2018
Type of sample		Soil	Soil	Soil
Date analysed	-	05/10/2018	05/10/2018	05/10/2018
Mass / Dimension of Sample	-	80x48x4mm	65x36x4mm	43x40x4mm
Sample Description	-	Grey compressed fibre cement material	Grey compressed fibre cement material	Grey compressed fibre cement material
Asbestos ID in materials	-	Chrysotile asbestos detected	Chrysotile asbestos detected	Chrysotile asbestos detected

vTRH(C6-C10)/BTEXN in Water		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date extracted	-	03/10/2018
Date analysed	-	04/10/2018
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	108
Surrogate toluene-d8	%	95
Surrogate 4-BFB	%	93

svTRH (C10-C40) in Water		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date extracted	-	03/10/2018
Date analysed	-	03/10/2018
TRH C_{10} - C_{14}	µg/L	<50
TRH C_{15} - C_{28}	µg/L	<100
TRH C_{29} - C_{36}	µg/L	<100
TRH >C_{10} - C_{16}	µg/L	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50
TRH >C_{16} - C_{34}	µg/L	<100
TRH >C_{34} - C_{40}	µg/L	<100
Surrogate o-Terphenyl	%	97

PAHs in Water		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date extracted	-	03/10/2018
Date analysed	-	04/10/2018
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b,j+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Benzo(a)pyrene TEQ	µg/L	<5
Total +ve PAH's	µg/L	NIL (+)VE
Surrogate p-Terphenyl-d14	%	95

OCP in water		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date extracted	-	03/10/2018
Date analysed	-	03/10/2018
HCB	µg/L	<0.2
alpha-BHC	µg/L	<0.2
gamma-BHC	µg/L	<0.2
beta-BHC	µg/L	<0.2
Heptachlor	µg/L	<0.2
delta-BHC	µg/L	<0.2
Aldrin	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
gamma-Chlordane	µg/L	<0.2
alpha-Chlordane	µg/L	<0.2
Endosulfan I	µg/L	<0.2
pp-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
pp-DDD	µg/L	<0.2
Endosulfan II	µg/L	<0.2
pp-DDT	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Surrogate TCMX	%	97

OP Pesticides in water		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date extracted	-	03/10/2018
Date analysed	-	03/10/2018
Azinphos-methyl (Guthion)	µg/L	<0.2
Bromophos ethyl	µg/L	<0.2
Chlorpyriphos	µg/L	<0.2
Chlorpyriphos-methyl	µg/L	<0.2
Diazinon	µg/L	<0.2
Dichlorovos	µg/L	<0.2
Dimethoate	µg/L	<0.2
Ethion	µg/L	<0.2
Fenitrothion	µg/L	<0.2
Malathion	µg/L	<0.2
Parathion	µg/L	<0.2
Ronnel	µg/L	<0.2
Surrogate TCMX	%	97

Metals in Water - Dissolved		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date digested	-	03/10/2018
Date analysed	-	03/10/2018
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	0.06

Triazine Herbicides in Water		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date extracted	-	03/10/2018
Date analysed	-	04/10/2018
Atrazine	mg/L	<0.002
Ametryn	mg/L	<0.002
Cyanazine	mg/L	<0.002
Hexazinone	mg/L	<0.002
Irgarol	mg/L	<0.002
Metribuzin	mg/L	<0.002
Prometryn	mg/L	<0.002
Propazine	mg/L	<0.002
Simazine	mg/L	<0.002
Terbutryn	mg/L	<0.002
Terbuthylazine	mg/L	<0.002
Surrogate p-Terphenyl-d14	%	82

Acid Herbicides in Water		
Our Reference		201900-1
Your Reference	UNITS	Rinsate_TH
Date Sampled		27/09/2018
Type of sample		Water
Date extracted	-	05/10/2018
Date analysed	-	08/10/2018
Clopyralid	µg/L	<0.5
3,5-Dichlorobenzoic acid	µg/L	<0.5
o-chlorophenoxy acetic acid	µg/L	<0.5
4-CPA	µg/L	<0.5
Dicamba	µg/L	<0.5
MCPP	µg/L	<0.5
MCPA	µg/L	<0.5
Dichlorprop	µg/L	<0.5
2,4-D	µg/L	<0.5
Bromoxynil	µg/L	<0.5
Triclopyr	µg/L	<0.5
2,4,5-TP	µg/L	<0.5
2,4,5-T	µg/L	<0.5
MCPB	µg/L	<0.5
Dinoseb	µg/L	<1
2,4-DB	µg/L	<0.5
Ioxynil	µg/L	<1
Picloram	µg/L	<1
Acifluorfen	µg/L	<2
2,4,6-T	µg/L	<0.5
2,6-D	µg/L	<0.5
Surrogate 2.4- DCPA	%	75

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) **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.
Ext-054	Analysed by MPL Envirolab
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-003	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-003	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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. 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-008	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-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-013	Water samples are analysed directly by purge and trap GC-MS.
Org-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	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)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	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)-BTEX 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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	201900-3
Date extracted	-			02/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Date analysed	-			03/10/2018	2	03/10/2018	03/10/2018		03/10/2018	03/10/2018
TRH C_6 - C_9	mg/kg	25	Org-016	<25	2	<25	<25	0	108	101
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	2	<25	<25	0	108	101
Benzene	mg/kg	0.2	Org-016	<0.2	2	<0.2	<0.2	0	101	95
Toluene	mg/kg	0.5	Org-016	<0.5	2	<0.5	<0.5	0	108	99
Ethylbenzene	mg/kg	1	Org-016	<1	2	<1	<1	0	108	102
m+p-xylene	mg/kg	2	Org-016	<2	2	<2	<2	0	111	104
o-Xylene	mg/kg	1	Org-016	<1	2	<1	<1	0	111	106
naphthalene	mg/kg	1	Org-014	<1	2	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	104	2	94	95	1	110	102

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]	12	02/10/2018	02/10/2018		[NT]	[NT]
Date analysed	-			[NT]	12	03/10/2018	03/10/2018		[NT]	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	[NT]	12	<25	<25	0	[NT]	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	[NT]	12	<25	<25	0	[NT]	[NT]
Benzene	mg/kg	0.2	Org-016	[NT]	12	<0.2	<0.2	0	[NT]	[NT]
Toluene	mg/kg	0.5	Org-016	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Ethylbenzene	mg/kg	1	Org-016	[NT]	12	<1	<1	0	[NT]	[NT]
m+p-xylene	mg/kg	2	Org-016	[NT]	12	<2	<2	0	[NT]	[NT]
o-Xylene	mg/kg	1	Org-016	[NT]	12	<1	<1	0	[NT]	[NT]
naphthalene	mg/kg	1	Org-014	[NT]	12	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	[NT]	12	80	88	10	[NT]	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	201900-3
Date extracted	-			02/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Date analysed	-			02/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	2	<50	<50	0	128	125
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	2	110	130	17	118	114
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	2	<100	100	0	104	120
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	2	<50	<50	0	128	125
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	2	150	200	29	118	114
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	2	<100	<100	0	104	120
Surrogate o-Terphenyl	%		Org-003	98	2	101	104	3	111	101

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Date analysed	-			[NT]	12	03/10/2018	03/10/2018		[NT]	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	[NT]	12	<50	<50	0	[NT]	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	[NT]	12	<100	<100	0	[NT]	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	[NT]	12	<100	160	46	[NT]	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	[NT]	12	<50	<50	0	[NT]	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	[NT]	12	110	190	53	[NT]	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	[NT]	12	<100	<100	0	[NT]	[NT]
Surrogate o-Terphenyl	%		Org-003	[NT]	12	107	108	1	[NT]	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	201900-3
Date extracted	-			02/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Date analysed	-			03/10/2018	2	03/10/2018	03/10/2018		03/10/2018	03/10/2018
Naphthalene	mg/kg	0.1	Org-012	<0.1	2	<0.1	<0.1	0	113	103
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	2	0.2	0.2	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	2	0.3	0.2	40	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	2	0.5	0.4	22	115	99
Phenanthrene	mg/kg	0.1	Org-012	<0.1	2	5.4	5.0	8	120	113
Anthracene	mg/kg	0.1	Org-012	<0.1	2	1.2	1	18	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	2	10	9.1	9	119	110
Pyrene	mg/kg	0.1	Org-012	<0.1	2	8.5	7.6	11	110	100
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	2	3.5	3.0	15	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	2	3.4	3.0	12	106	101
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	2	6.1	5.6	9	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	2	3.8	3.5	8	117	107
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	2	2.3	2.1	9	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	2	0.5	0.5	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	2	2.6	2.4	8	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	90	2	92	94	2	99	103

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Date analysed	-			[NT]	12	03/10/2018	03/10/2018		[NT]	[NT]
Naphthalene	mg/kg	0.1	Org-012	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Phenanthrene	mg/kg	0.1	Org-012	[NT]	12	1.1	1.6	37	[NT]	[NT]
Anthracene	mg/kg	0.1	Org-012	[NT]	12	0.2	0.3	40	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	[NT]	12	2.2	3.2	37	[NT]	[NT]
Pyrene	mg/kg	0.1	Org-012	[NT]	12	1.8	2.8	43	[NT]	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	[NT]	12	0.6	1	50	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	[NT]	12	0.8	1.2	40	[NT]	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	[NT]	12	2	2.4	18	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	[NT]	12	0.96	1.5	44	[NT]	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	[NT]	12	0.6	0.9	40	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	[NT]	12	0.1	0.2	67	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	[NT]	12	0.7	1.0	35	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	12	93	90	3	[NT]	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	201900-3
Date extracted	-			03/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Date analysed	-			03/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
HCB	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	89	103
gamma-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	83	93
Heptachlor	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	99	112
delta-BHC	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	86	97
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	91	102
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	91	106
Dieldrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	97	111
Endrin	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	107	128
pp-DDD	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	107	109
Endosulfan II	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	77	107
Methoxychlor	mg/kg	0.1	Org-005	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	105	2	89	95	7	112	128

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Date analysed	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
HCB	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-005	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-005	[NT]	12	93	88	6	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	201900-3
Date extracted	-			03/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Date analysed	-			03/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	99	100
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	95	93
Dimethoate	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	100	103
Fenitrothion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	103	104
Malathion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	74	66
Parathion	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	98	94
Ronnel	mg/kg	0.1	Org-008	<0.1	2	<0.1	<0.1	0	103	105
Surrogate TCMX	%		Org-008	105	2	89	95	7	94	93

QUALITY CONTROL: Organophosphorus Pesticides						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Date analysed	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Bromophos-ethyl	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Dichlorvos	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Dimethoate	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Fenitrothion	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Malathion	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Parathion	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-008	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-008	[NT]	12	93	88	6	[NT]	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	201900-3
Date prepared	-			02/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Date analysed	-			02/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Arsenic	mg/kg	4	Metals-020	<4	2	5	4	22	104	93
Cadmium	mg/kg	0.4	Metals-020	<0.4	2	<0.4	<0.4	0	100	94
Chromium	mg/kg	1	Metals-020	<1	2	9	9	0	105	97
Copper	mg/kg	1	Metals-020	<1	2	14	14	0	107	102
Lead	mg/kg	1	Metals-020	<1	2	18	18	0	105	102
Mercury	mg/kg	0.1	Metals-021	<0.1	2	<0.1	<0.1	0	93	80
Nickel	mg/kg	1	Metals-020	<1	2	17	16	6	103	97
Zinc	mg/kg	1	Metals-020	<1	2	59	62	5	102	105

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Date analysed	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Arsenic	mg/kg	4	Metals-020	[NT]	12	5	4	22	[NT]	[NT]
Cadmium	mg/kg	0.4	Metals-020	[NT]	12	<0.4	<0.4	0	[NT]	[NT]
Chromium	mg/kg	1	Metals-020	[NT]	12	23	15	42	[NT]	[NT]
Copper	mg/kg	1	Metals-020	[NT]	12	25	18	33	[NT]	[NT]
Lead	mg/kg	1	Metals-020	[NT]	12	34	23	39	[NT]	[NT]
Mercury	mg/kg	0.1	Metals-021	[NT]	12	<0.1	<0.1	0	[NT]	[NT]
Nickel	mg/kg	1	Metals-020	[NT]	12	39	48	21	[NT]	[NT]
Zinc	mg/kg	1	Metals-020	[NT]	12	69	65	6	[NT]	[NT]

QUALITY CONTROL: Triazine Herbicides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	201900-3
Date extracted	-			02/10/2018	2	02/10/2018	02/10/2018		02/10/2018	02/10/2018
Date analysed	-			03/10/2018	2	03/10/2018	03/10/2018		03/10/2018	03/10/2018
Simazine	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Atrazine	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	86	78
Propazine	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	94	73
Terbuthylazine	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Metribuzin	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Ametryn	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Prometryn	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	87	82
Terbutryn	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Cyanazine	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Irgarol	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Hexazinone	mg/kg	0.5	Org-012	<0.5	2	<0.5	<0.5	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	102	2	96	89	8	99	100

QUALITY CONTROL: Triazine Herbicides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	12	02/10/2018	02/10/2018		[NT]	[NT]
Date analysed	-			[NT]	12	03/10/2018	03/10/2018		[NT]	[NT]
Simazine	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Atrazine	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Propazine	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Terbuthylazine	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Metribuzin	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Ametryn	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Prometryn	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Terbutryn	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Cyanazine	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Irgarol	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Hexazinone	mg/kg	0.5	Org-012	[NT]	12	<0.5	<0.5	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	[NT]	12	91	97	6	[NT]	[NT]

QUALITY CONTROL: Phenoxy Acid Herbicides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-1	[NT]
Date extracted	-			04/10/2018	[NT]	[NT]	[NT]	[NT]	04/10/2018	[NT]
Date analysed	-			06/10/2018	[NT]	[NT]	[NT]	[NT]	06/10/2018	[NT]
Clopyralid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
3,5-Dichlorobenzoic acid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-chlorophenoxy acetic acid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-CPA	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dicamba	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	85	[NT]
MCPP	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	88	[NT]
MCPA	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	86	[NT]
Dichlorprop	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-D	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	91	[NT]
Bromoxynil	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Triclopyr	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,5-TP	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,5-T	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	81	[NT]
MCPB	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dinoseb	mg/kg	1	Ext-054	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-DB	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ioxynil	mg/kg	1	Ext-054	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Picloram	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
DCPA (Chlorthal) Diacid	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acifluorfen	mg/kg	2	Ext-054	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,6-T	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,6-D	mg/kg	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2.4- DCPA	%		Ext-054	110	[NT]	[NT]	[NT]	[NT]	94	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Date analysed	-			04/10/2018	[NT]	[NT]	[NT]	[NT]	04/10/2018	[NT]
TRH C_6 - C_9	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-016	<10	[NT]	[NT]	[NT]	[NT]	104	[NT]
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	105	[NT]
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	105	[NT]
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Naphthalene	µg/L	1	Org-013	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-016	108	[NT]	[NT]	[NT]	[NT]	110	[NT]
Surrogate toluene-d8	%		Org-016	96	[NT]	[NT]	[NT]	[NT]	100	[NT]
Surrogate 4-BFB	%		Org-016	97	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Date analysed	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	117	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	119	[NT]
Surrogate o-Terphenyl	%		Org-003	105	[NT]	[NT]	[NT]	[NT]	118	[NT]

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Date analysed	-			04/10/2018	[NT]	[NT]	[NT]	[NT]	04/10/2018	[NT]
Naphthalene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Acenaphthylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	98	[NT]
Phenanthrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	107	[NT]
Anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Benzo(a)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Benzo(b,j+k)fluoranthene	µg/L	2	Org-012	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	1	Org-012	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	111	[NT]	[NT]	[NT]	[NT]	102	[NT]

QUALITY CONTROL: OCP in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Date analysed	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
HCB	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	85	[NT]
gamma-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	81	[NT]
Heptachlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	94	[NT]
delta-BHC	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	83	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	87	[NT]
gamma-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	86	[NT]
Dieldrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	93	[NT]
Endrin	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	109	[NT]
pp-DDD	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	79	[NT]
Endosulfan II	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	87	[NT]
Methoxychlor	µg/L	0.2	Org-005	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	105	[NT]	[NT]	[NT]	[NT]	90	[NT]

QUALITY CONTROL: OP Pesticides in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Date analysed	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromophos ethyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	84	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dichlorovos	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	105	[NT]
Dimethoate	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	99	[NT]
Fenitrothion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	104	[NT]
Malathion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	78	[NT]
Parathion	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Ronnel	µg/L	0.2	Org-008	<0.2	[NT]	[NT]	[NT]	[NT]	88	[NT]
Surrogate TCMX	%		Org-008	105	[NT]	[NT]	[NT]	[NT]	92	[NT]

QUALITY CONTROL: Metals in Water - Dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date digested	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Date analysed	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Arsenic - Dissolved	mg/L	0.05	Metals-020	<0.05	[NT]	[NT]	[NT]	[NT]	101	[NT]
Cadmium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	109	[NT]
Chromium - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	105	[NT]
Copper - Dissolved	mg/L	0.01	Metals-020	<0.01	[NT]	[NT]	[NT]	[NT]	106	[NT]
Lead - Dissolved	mg/L	0.03	Metals-020	<0.03	[NT]	[NT]	[NT]	[NT]	104	[NT]
Mercury - Dissolved	mg/L	0.0005	Metals-021	<0.0005	[NT]	[NT]	[NT]	[NT]	97	[NT]
Nickel - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	104	[NT]
Zinc - Dissolved	mg/L	0.02	Metals-020	<0.02	[NT]	[NT]	[NT]	[NT]	106	[NT]

QUALITY CONTROL: Triazine Herbicides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			03/10/2018	[NT]	[NT]	[NT]	[NT]	03/10/2018	[NT]
Date analysed	-			04/10/2018	[NT]	[NT]	[NT]	[NT]	04/10/2018	[NT]
Atrazine	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	97	[NT]
Ametryn	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyanazine	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexazinone	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Irgarol	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Metribuzin	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Prometryn	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	106	[NT]
Propazine	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	97	[NT]
Simazine	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Terbutryn	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Terbuthylazine	mg/L	0.002	Org-012	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	97	[NT]	[NT]	[NT]	[NT]	100	[NT]

QUALITY CONTROL: Acid Herbicides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			05/10/2018	[NT]	[NT]	[NT]	[NT]	05/10/2018	[NT]
Date analysed	-			08/10/2018	[NT]	[NT]	[NT]	[NT]	08/10/2018	[NT]
Clopyralid	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
3,5-Dichlorobenzoic acid	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
o-chlorophenoxy acetic acid	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-CPA	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dicamba	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	72	[NT]
MCPP	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	78	[NT]
MCPA	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	72	[NT]
Dichlorprop	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-D	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	73	[NT]
Bromoxynil	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Triclopyr	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,5-TP	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,5-T	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	70	[NT]
MCPB	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dinoseb	µg/L	1	Ext-054	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4-DB	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ioxynil	µg/L	1	Ext-054	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Picloram	µg/L	1	Ext-054	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acifluorfen	µg/L	2	Ext-054	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,4,6-T	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2,6-D	µg/L	0.5	Ext-054	<0.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate 2.4- DCPA	%		Ext-054	76	[NT]	[NT]	[NT]	[NT]	87	[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.

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; 60-140% for organics (+/-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.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

vTRH & BTEXN in Water NEPM - Subsampled from amber bottle.

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.

Note: All samples analysed as received. However, samples 201900-2 to 12 are below the minimum 500mL sample volume as per National Environment Protection (Assessment of Site Contamination) Measure, Schedule B1, May 2013.

Acid Herbicides analysed by MPL. Report no. 216801

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: RMS / Jacobs

Contact Person: Owen Cooke

Project Mgr: Max Foweraker

Sampler: Owen Cooke

Address:

9032 1732 (Owen)

Phone: 9032 1217 (Max) Mob:

Email: Owen.Cooke@jacobs.com
Maxwell.foweraker@jacobs.com

Client Project Name / Number / Site etc (ie report title): Testers Hollow IA 182900

PO No.: IA 182900

Envirolab Quote No.:

Date results required:

Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply

Additional report format: esdat / equis /

Lab Comments: Client sample IDs filled in by Lab
J.E.

Sample Information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample	Comb SA	SPOCAS	Basic Asbestos ID (presence/absence)													Provide as much information about the sample as you can
1-8. 8x	Jars																			
1	BH01	0.2-0.3			X															
2	BH01	1.1-1.2				X														
3	BH02	0.1-0.2					X													
4	BH02	0.4-0.5				X														
5	BH03	0.2-0.4			X															
6	BH03	0.5-0.6				X														
7	DUPA				X															
8	DUPB				X															

Relinquished by (Company): Jacobs	Received by (Company): ELS	*Lab Use Only*	
Print Name: Owen Cooke	Print Name: KM	Job number: 196600	Cooling: Ice / Ice pack / None
Date & Time: 19/7/18 2:45pm	Date & Time: 19/7/18 1430	Temperature: 9.7	Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Analysis Recd 260718 15:10

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: RMS / Jacobs
Contact Person: Owen Cooke
Project Mgr: Max Fowerakker
Sampler: Owen Cooke
Address:
9032 1732 (Owen)
Phone: 9032 1217 (Max) Mob:
Email: Owen.Cooke@jacobs.com
Maxwell.fowerakker@jacobs.com

Client Project Name / Number / Site etc (ie report title): Testers Hollow IA182900
PO No.: IA 182900
Envirolab Quote No. :
Date results required:
Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply
Additional report format: esdat / equis /
Lab Comments: Client sample IDs filled in by Lab -J.E.

Sample Information					Tests Required															Comments
Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample																Provide as much information about the sample as you can
1-8.	8x jars																			
1	BH01	0.2-0.3																		
2	BH01	1.1-1.2																		
3	BH02	0.1-0.2																		
4	BH02	0.4-0.5																		
5	BH03	0.2-0.4																		
6	BH03	0.5-0.6																		
7	DUPA																			
8	DUPB																			

Relinquished by (Company): Jacobs	Received by (Company): ELS	*Lab Use Only*	
Print Name: Owen Cooke	Print Name: KM	Job number: 196600	Cooling: Ice / Ice pack / None
Date & Time: 19/7/18 2:45pm	Date & Time: 19/7/18 14:30	Temperature: 9.7	Security seal: Intact / Broken / None
Signature:	Signature:	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 196600

Client Details

Client	Jacobs Group (Australia) Pty Ltd
Attention	Owen Cooke, Maxwell Foweraker
Address	Level 7, 177 Pacific Highway, North Sydney, NSW, 2060

Sample Details

Your Reference	**IA182900, Testers Hollow**
Number of Samples	8 Soil
Date samples received	19/07/2018
Date completed instructions received	26/07/2018

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	02/08/2018
Date of Issue	02/08/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Jessica Hie
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Giovanni Agosti, Group Technical Manager
Jeremy Faircloth, Organics Supervisor
Lucy Zhu, Asbsestos Analyst
Priya Samarawickrama, Senior Chemist
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil					
Our Reference		196600-1	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH03	DUPA	DUPB
Depth		0.2-0.3	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Date analysed	-	30/07/2018	30/07/2018	30/07/2018	30/07/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1
naphthalene	mg/kg	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	90	72	80	72

svTRH (C10-C40) in Soil					
Our Reference		196600-1	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH03	DUPA	DUPB
Depth		0.2-0.3	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Date analysed	-	29/07/2018	29/07/2018	29/07/2018	29/07/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50
Surrogate o-Terphenyl	%	91	91	90	93

PAHs in Soil					
Our Reference		196600-1	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH03	DUPA	DUPB
Depth		0.2-0.3	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Date analysed	-	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	0.8	<0.1	0.5	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	2.4	<0.1	1.5	<0.1
Pyrene	mg/kg	2.1	<0.1	1.3	<0.1
Benzo(a)anthracene	mg/kg	0.7	<0.1	0.4	<0.1
Chrysene	mg/kg	1	<0.1	0.6	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	2	<0.2	1	<0.2
Benzo(a)pyrene	mg/kg	0.92	<0.05	0.53	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	0.6	<0.1	0.4	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	0.8	<0.1	0.5	<0.1
Total +ve PAH's	mg/kg	11	<0.05	6.6	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	1.2	<0.5	0.7	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	1.3	<0.5	0.8	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	1.3	<0.5	0.8	<0.5
Surrogate p-Terphenyl-d14	%	110	103	102	110

Organochlorine Pesticides in soil					
Our Reference		196600-1	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH03	DUPA	DUPB
Depth		0.2-0.3	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Date analysed	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	107	110	110	113

PCBs in Soil					
Our Reference		196600-1	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH03	DUPA	DUPB
Depth		0.2-0.3	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Date analysed	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCLMX	%	107	110	110	113

Acid Extractable metals in soil					
Our Reference		196600-1	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH03	DUPA	DUPB
Depth		0.2-0.3	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Date analysed	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Arsenic	mg/kg	4	<4	5	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	13	29	14	28
Copper	mg/kg	16	21	18	22
Lead	mg/kg	23	11	25	13
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	10	34	10	28
Zinc	mg/kg	39	50	41	46

Moisture					
Our Reference		196600-1	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH03	DUPA	DUPB
Depth		0.2-0.3	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil
Date prepared	-	27/07/2018	27/07/2018	27/07/2018	27/07/2018
Date analysed	-	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Moisture	%	19	23	19	25

Asbestos ID - soils						
Our Reference		196600-1	196600-3	196600-5	196600-7	196600-8
Your Reference	UNITS	BH01	BH02	BH03	DUPA	DUPB
Depth		0.2-0.3	0.1-0.2	0.2-0.4	-	-
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	30/07/2018	30/07/2018	30/07/2018	30/07/2018	30/07/2018
Sample mass tested	g	Approx. 30g	Approx. 35g	Approx. 25g	Approx. 30g	Approx. 25g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

sPOCAS + %S w/w				
Our Reference		196600-2	196600-4	196600-6
Your Reference	UNITS	BH01	BH02	BH03
Depth		1.1-1.2	0.4-0.5	0.5-0.6
Type of sample		Soil	Soil	Soil
Date prepared	-	30/07/2018	30/07/2018	30/07/2018
Date analysed	-	30/07/2018	30/07/2018	30/07/2018
pH $_{kcl}$	pH units	5.4	5.2	4.0
TAA pH 6.5	moles H^+ /t	<5	<5	520
s-TAA pH 6.5	%w/w S	<0.01	<0.01	0.84
pH $_{Ox}$	pH units	4.5	4.1	3.3
TPA pH 6.5	moles H^+ /t	<5	40	270
s-TPA pH 6.5	%w/w S	<0.01	0.06	0.44
TSA pH 6.5	moles H^+ /t	<5	36	<5
s-TSA pH 6.5	%w/w S	<0.01	0.06	<0.01
ANC_E	% $CaCO_3$	<0.05	<0.05	<0.05
a-ANC_E	moles H^+ /t	<5	<5	<5
s-ANC_E	%w/w S	<0.05	<0.05	<0.05
S_{KCl}	%w/w S	0.006	0.72	0.02
S_P	%w/w	0.01	0.56	0.05
S_{POS}	%w/w	0.005	<0.005	0.03
a-S_{POS}	moles H^+ /t	<5	<5	21
Ca_{KCl}	%w/w	0.12	0.95	0.20
Ca_P	%w/w	0.11	0.76	0.18
Ca_A	%w/w	<0.005	<0.005	<0.005
Mg_{KCl}	%w/w	0.047	0.12	0.15
Mg_P	%w/w	0.044	0.11	0.14
Mg_A	%w/w	<0.005	<0.005	<0.005
S_{HCl}	%w/w S	<0.005	<0.005	0.044
S_{NAS}	%w/w S	<0.005	<0.005	0.023
a-S_{NAS}	moles H^+ /t	<5	<5	11
s-S_{NAS}	%w/w S	<0.01	<0.01	0.02
Fineness Factor	-	1.5	1.5	1.5
a-Net Acidity	moles H^+ /t	7	<5	560
s-Net Acidity	%w/w S	0.01	<0.01	0.89
Liming rate	kg $CaCO_3$ /t	<0.75	<0.75	42
s-Net Acidity without -ANCE	%w/w S	0.011	<0.01	0.89
a-Net Acidity without ANCE	moles H^+ /t	6.8	<5	560
Liming rate without ANCE	kg $CaCO_3$ /t	<0.75	<0.75	42

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.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Inorg-064	sPOCAS determined using titrimetric and ICP-AES techniques. Based on Acid Sulfate Soils Laboratory Methods Guidelines, Version 2.1 - June 2004.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-003	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.
Org-003	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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. 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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	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)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	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)-BTEX 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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Date analysed	-			30/07/2018	[NT]	[NT]	[NT]	[NT]	30/07/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	105	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	105	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	103	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	109	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	111	[NT]	[NT]	[NT]	[NT]	128	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Date analysed	-			28/07/2018	[NT]	[NT]	[NT]	[NT]	28/07/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	104	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	93	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	92	[NT]
Surrogate o-Terphenyl	%		Org-003	92	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Date analysed	-			30/07/2018	[NT]	[NT]	[NT]	[NT]	30/07/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	112	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	116	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	117	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	105	[NT]	[NT]	[NT]	[NT]	133	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Date analysed	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	107	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	97	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	81	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	117	[NT]	[NT]	[NT]	[NT]	108	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date extracted	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Date analysed	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	117	[NT]	[NT]	[NT]	[NT]	113	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Date analysed	-			27/07/2018	[NT]	[NT]	[NT]	[NT]	27/07/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	100	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	103	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Date prepared	-			30/07/2018	[NT]	[NT]	[NT]	[NT]	30/07/2018	[NT]
Date analysed	-			30/07/2018	[NT]	[NT]	[NT]	[NT]	30/07/2018	[NT]
pH $_{kcl}$	pH units		Inorg-064	[NT]	[NT]	[NT]	[NT]	[NT]	91	[NT]
TAA pH 6.5	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	95	[NT]
s-TAA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pH $_{Ox}$	pH units		Inorg-064	[NT]	[NT]	[NT]	[NT]	[NT]	90	[NT]
TPA pH 6.5	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	114	[NT]
s-TPA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
TSA pH 6.5	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-TSA pH 6.5	%w/w S	0.01	Inorg-064	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
ANC_E	% $CaCO_3$	0.05	Inorg-064	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-ANC_E	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-ANC_E	%w/w S	0.05	Inorg-064	<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{KCl}	%w/w S	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_P	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{POS}	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-S_{POS}	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ca_{KCl}	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ca_P	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ca_A	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mg_{KCl}	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mg_P	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Mg_A	%w/w	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{HCl}	%w/w S	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
S_{NAS}	%w/w S	0.005	Inorg-064	<0.005	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-S_{NAS}	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-S_{NAS}	%w/w S	0.01	Inorg-064	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fineness Factor	-	1.5	Inorg-064	<1.5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity	%w/w S	0.01	Inorg-064	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Liming rate	kg $CaCO_3$/t	0.75	Inorg-064	<0.75	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
s-Net Acidity without -ANCE	%w/w S	0.01	Inorg-064	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
a-Net Acidity without ANCE	moles H^+/t	5	Inorg-064	<5	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: sPOCAS + %S w/w						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-7	[NT]
Liming rate without ANCE	kg $CaCO_3$/t	0.75	Inorg-064	<0.75	[NT]	[NT]	[NT]	[NT]	[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.

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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

Asbestos: A portion of the supplied sample was sub-sampled for asbestos analysis according to Envirolab procedures.
We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples 196600- 1, 3, 5, 7 & 8 were sub-sampled from jars provided by the client.

14:30

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
Ph: 08 7087 6800 / adelaide@envirolab.com.au

Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Wiles Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: Jacobs

Contact Person: Owen Cooke / Max Fowerakar

Project Mgr:

Sampler: OC

Address: 177 Pacific Hwy.

Phone: 9032 1732 Mob:

Email: Owen.Cooke@jacobs.com
Maxwell.Fowerakar@jacobs.com

Client Project Name / Number / Site etc (ie report title): IA182900 Testers Hollow

PO No.: IA182900

Envirolab Quote No.:

Date results required:

Or choose: standard / same day / 1 day / 2 day / 3 day
Note: Inform lab in advance if urgent turnaround is required - surcharges apply

Additional report format: esdat / equis /

Lab Comments:

Envirolab Sample ID	Client Sample ID or Information	Depth	Date sampled	Type of sample	Comb SA	[illegible]	Comments: Provide as much information about the sample as you can
1	PTP02A	0.4-0.5			X		
2	PTP02B	0.25-0.3					
3	PTP03B	0.4-0.5			X		
4	PTP04A	0.3-0.4					
5	PTP04B	0.3-0.4					
6	TP01	0.3-0.4			X		
7	TP02	0.2-0.3					
8	TP03	0.1-0.2			X		
9	TP03	0.3-0.4					
10	TP04	0.4-0.5			X		

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

Job No: 197704

Date Received: 3/8/2018

Time Received: 14.30

Received By: [illegible]

Temp: Cool/Ambient 1.2

Cooling: Ice/Icepack

Security: Intact/Broken/None

Relinquished by (Company): Jacobs	Received by (Company): EO
Print Name: Owen Cooke	Print Name: Ray
Date & Time: 3/8/18 2:30pm	Date & Time: 3/8/2018
Signature:	Signature: 14.30

Lab Use Only

Job number:	Cooling: Ice / Ice pack / None
Temperature:	Security seal: Intact / Broken / None
TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Analysis Recd 070818

O. Cooke
7/8/18

14:30

CHAIN OF CUSTODY - Client

ENVIROLAB GROUP - National phone number 1300 424 344

Sydney Lab - Envirolab Services
12 Ashley St, Chatswood, NSW 2067
Ph: 02 9910 6200 / sydney@envirolab.com.au

Perth Lab - MPL Laboratories
16-18 Hayden Crt, Myaree, WA 6154
Ph: 08 9317 2505 / lab@mpl.com.au

Melbourne Lab - Envirolab Services
25 Research Drive, Croydon South, VIC 3136
Ph: 03 9763 2500 / melbourne@envirolab.com.au

Adelaide Office - Envirolab Services
7a The Parade, Norwood, SA 5067
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Brisbane Office - Envirolab Services
20a, 10-20 Depot St, Banyo, QLD 4014
Ph: 07 3266 9532 / brisbane@envirolab.com.au

Darwin Office - Envirolab Services
Unit 7, 17 Willes Rd, Berrimah, NT 0820
Ph: 08 8967 1201 / darwin@envirolab.com.au

Client: Jacobs	Client Project Name / Number / Site etc (ie report title): IA182900 Testers Hollow
Contact Person: Owen Cooke / Max Foweraker	
Project Mgr:	PO No.: IA182900
Sampler: OC	Envirolab Quote No. :
Address: 177 Pacific Hwy.	Date results required:
	Or choose: standard / same day / 1 day / 2 day / 3 day *Note: Inform lab in advance if urgent turnaround is required - surcharges apply*
Phone: 9032 1732 Mob:	Additional report format: esdat / equis /
Email: Owen.Cooke@jacobs.com Maxwell.Foweraker@jacobs.com	Lab Comments:

Sample information

Envirolab Sample ID	Client Sample ID or information	Depth	Date sampled	Type of sample
1	PTP02A	0.4-0.5		
2	PTP02B	0.25-0.5		
3	PTP03B	0.4-0.5		
4	PTP04 A	0.3-0.4		
5	PTP04 B	0.3-0.4		
6	TP01	0.3-0.4		
7	TP02	0.2-0.3		
8	TP03	0.1-0.2		
9	TP03	0.3-0.4		
10	TP04	0.4-0.5		

Tests Required

Comments

Provide as much information about the sample as you can

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

Job No: 197704
Date Received: 3/8/2018
Time Received: 14.30
Received By: R
Temp: Cool/Ambient
Cooling: Ice/Icepack 1.2
Security: Intact/Broken/None

Relinquished by (Company): Jacobs	Received by (Company): EO	*Lab Use Only*	
Print Name: Owen Cooke	Print Name: Rlay	Job number:	Cooling: Ice / Ice pack / None
Date & Time: 3/8/18 2:30pm	Date & Time: 3/8/2018	Temperature:	Security seal: Intact / Broken / None
Signature:	Signature: 14.30	TAT Req - SAME day / 1 / 2 / 3 / 4 / STD	

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 197 7 04

Client Details

Client	Jacobs Group (Australia) Pty Ltd
Attention	Owen Cooke
Address	Level 7, 177 Pacific Highway, North Sydney, NSW, 2060

Sample Details

Your Reference	**IA18 2900 Testers Hollow**
Number of Samples	10 Soil
Date samples received	03/08/2018
Date completed instructions received	07/08/2018

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	14/08/2018
Date of Issue	13/08/2018

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Asbestos Approved By
Analysed by Asbestos Approved Identifier: Aida Marner
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Giovanni Agosti, Group Technical Manager
Jeremy Faircloth, Organics Supervisor
Lucy Zhu, Asbsestos Analyst
Steven Luong, Senior Chemist

Authorised By

Jacinta Hurst, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Date analysed	-	10/08/2018	10/08/2018	10/08/2018	10/08/2018	10/08/2018
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH 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	8
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	99	100	100	86	99

svTRH (C10-C40) in Soil						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Date analysed	-	09/08/2018	09/08/2018	09/08/2018	09/08/2018	09/08/2018
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	130	120	1,900	570
TRH C_{29} - C_{36}	mg/kg	<100	<100	130	950	740
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	79	52
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	78	<50
TRH >C_{16} -C_{34}	mg/kg	<100	170	200	2,600	1,100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	380	660
Total +ve TRH (>C10-C40)	mg/kg	<50	170	200	3,000	1,800
Surrogate o-Terphenyl	%	109	98	102	#	104

PAHs in Soil						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Date analysed	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Naphthalene	mg/kg	<0.1	0.2	0.1	8.6	8.0
Acenaphthylene	mg/kg	<0.1	0.2	0.5	3.0	0.9
Acenaphthene	mg/kg	<0.1	1.2	0.5	7.3	3.8
Fluorene	mg/kg	<0.1	1.2	1.3	15	5.1
Phenanthrene	mg/kg	0.3	11	7.6	170	49
Anthracene	mg/kg	<0.1	3.3	2.1	22	9.9
Fluoranthene	mg/kg	0.7	18	15	210	45
Pyrene	mg/kg	0.7	15	13	180	40
Benzo(a)anthracene	mg/kg	0.3	7.2	6.5	93	18
Chrysene	mg/kg	0.3	4.7	4.3	74	11
Benzo(b,j+k)fluoranthene	mg/kg	0.9	9.0	9.9	160	26
Benzo(a)pyrene	mg/kg	0.55	5.9	7.2	110	21
Indeno(1,2,3-c,d)pyrene	mg/kg	0.3	2.6	3.6	43	6.6
Dibenzo(a,h)anthracene	mg/kg	<0.1	0.4	0.5	6.7	1.0
Benzo(g,h,i)perylene	mg/kg	0.3	2.7	4.1	48	7.5
Total +ve PAH's	mg/kg	4.4	83	76	1,200	250
Benzo(a)pyrene TEQ calc (zero)	mg/kg	0.7	8.3	9.8	150	27
Benzo(a)pyrene TEQ calc(half)	mg/kg	0.8	8.3	9.8	150	27
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	0.8	8.3	9.8	150	27
Surrogate p-Terphenyl-d14	%	109	102	104	106	105

Organochlorine Pesticides in soil						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Date analysed	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-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
beta-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
pp-DDD	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-DDT	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
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
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	114	102	105	101	97

PCBs in Soil						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Date analysed	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<1	<0.2
Surrogate TCLMX	%	114	102	105	101	97

Acid Extractable metals in soil						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Date analysed	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Arsenic	mg/kg	6	7	7	5	4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	6	6	11	15	8
Copper	mg/kg	16	10	20	19	14
Lead	mg/kg	6	24	8	100	6
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	9	8	10	16	23
Zinc	mg/kg	36	37	27	130	26

Moisture						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	08/08/2018	08/08/2018	08/08/2018	08/08/2018	08/08/2018
Date analysed	-	09/08/2018	09/08/2018	09/08/2018	09/08/2018	09/08/2018
Moisture	%	14	14	16	9.6	12

Asbestos ID - soils						
Our Reference		197704-1	197704-3	197704-6	197704-8	197704-10
Your Reference	UNITS	PTP02A	PTP03B	TP01	TP03	TP05
Depth		0.4-0.5	0.4-0.5	0.3-0.4	0.1-0.2	0.4-0.5
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	09/08/2018	09/08/2018	09/08/2018	09/08/2018	09/08/2018
Sample mass tested	g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 35g	Approx. 35g
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
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

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.
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-003	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.
Org-003	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-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's. 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-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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.

Method ID	Methodology Summary
Org-012	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-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-014	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS.
Org-016	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)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.
Org-016	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)-BTEX 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.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Date analysed	-			10/08/2018	[NT]	[NT]	[NT]	[NT]	10/08/2018	[NT]
TRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	111	[NT]
TRH C_6 - C_{10}	mg/kg	25	Org-016	<25	[NT]	[NT]	[NT]	[NT]	111	[NT]
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	[NT]	[NT]	109	[NT]
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	[NT]	[NT]	111	[NT]
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	110	[NT]
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	[NT]	[NT]	113	[NT]
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	[NT]	[NT]	109	[NT]
naphthalene	mg/kg	1	Org-014	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-016	111	[NT]	[NT]	[NT]	[NT]	111	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Date analysed	-			09/08/2018	[NT]	[NT]	[NT]	[NT]	09/08/2018	[NT]
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	128	[NT]
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
TRH >C_{10} -C_{16}	mg/kg	50	Org-003	<50	[NT]	[NT]	[NT]	[NT]	128	[NT]
TRH >C_{16} -C_{34}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	118	[NT]
TRH >C_{34} -C_{40}	mg/kg	100	Org-003	<100	[NT]	[NT]	[NT]	[NT]	108	[NT]
Surrogate o-Terphenyl	%		Org-003	99	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Date analysed	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Naphthalene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	118	[NT]
Acenaphthylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluorene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	123	[NT]
Phenanthrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	110	[NT]
Anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	91	[NT]
Pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	96	[NT]
Benzo(a)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-012	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-012	<0.05	[NT]	[NT]	[NT]	[NT]	136	[NT]
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-012	91	[NT]	[NT]	[NT]	[NT]	105	[NT]

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Date analysed	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	100	[NT]
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	88	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	89	[NT]
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	95	[NT]
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	98	[NT]
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	74	[NT]
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-005	105	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date extracted	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Date analysed	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Aroclor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	102	[NT]
Aroclor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCLMX	%		Org-006	105	[NT]	[NT]	[NT]	[NT]	103	[NT]

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-4	[NT]
Date prepared	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Date analysed	-			08/08/2018	[NT]	[NT]	[NT]	[NT]	08/08/2018	[NT]
Arsenic	mg/kg	4	Metals-020	<4	[NT]	[NT]	[NT]	[NT]	107	[NT]
Cadmium	mg/kg	0.4	Metals-020	<0.4	[NT]	[NT]	[NT]	[NT]	103	[NT]
Chromium	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	104	[NT]
Copper	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Lead	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	106	[NT]
Mercury	mg/kg	0.1	Metals-021	<0.1	[NT]	[NT]	[NT]	[NT]	101	[NT]
Nickel	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	99	[NT]
Zinc	mg/kg	1	Metals-020	<1	[NT]	[NT]	[NT]	[NT]	101	[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.

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: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics (+/-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.

Measurement Uncertainty estimates are available for most tests upon request.

Report Comments

TRH Soil C10-C40 NEPM - (8 SURROGATE)# Percent recovery is not possible to report as the high concentration of analytes in the sample/s
have caused interference.

Asbestos: A portion of the supplied samples were sub-sampled for asbestos
analysis according to Envirolab procedures.
We cannot guarantee that these sub-samples are indicative of the entire sample.
Envirolab recommends supplying 40-50g of sample in its own container.
Note: Samples requested for asbestos testing were sub-sampled from jars
provided by the client.

PCBs in Soil - PQL has been raised due to interference from analytes(other than those being tested) in the sample 8,10.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Jacobs Group (Australia) Pty Ltd
Attention	Owen Cooke

Sample Login Details

Your reference	IA182900 Testers Hollow
Envirolab Reference	197704
Date Sample Received	03/08/2018
Date Instructions Received	07/08/2018
Date Results Expected to be Reported	14/08/2018

Sample Condition

Samples received in appropriate condition for analysis	YES
No. of Samples Provided	10 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	1.2
Cooling Method	Ice
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:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticidesin soil	PCBsin Soil	Acid Extractable metalsin soil	Asbestos ID - soils	On Hold
PTP02A-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	
PTP02B-0.25-0.5								✓
PTP03B-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	
PTP04A-0.3-0.4								✓
PTP04B-0.3-0.4								✓
TP01-0.3-0.4	✓	✓	✓	✓	✓	✓	✓	
TP02-0.2-03								✓
TP03-0.1-0.2	✓	✓	✓	✓	✓	✓	✓	
TP04-0.3-0.4								✓
TP05-0.4-0.5	✓	✓	✓	✓	✓	✓	✓	

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.

Appendix E – Relative Percentage Difference Table

PN: IA182900
Testers Hollow
RPD Table

			Lab Report Number	196600	196600		196600	196600		201900	201900	
			Field ID	BH01	DUPA	RPD	BH03	DUPB	RPD	TH010_S	DUP01	RPD
			Sampled Date							27/09/2018	27/09/2018	
Chemistry Group	**ChemName**	**Units**	**LOR**									
	Benzo(a)pyrene TEQ	mg/kg	0.5	1.2	0.7	53	<0.5	<0.5	0	3.1	1.4	76
	Benzo(a)pyrene TEQ	mg/kg	0.5	1.3	0.8	48	<0.5	<0.5	0	3.1	1.4	76
	Metribuzin	mg/kg	0.5							<0.5	<0.5	0
Metals	Arsenic	mg/kg	4	4	5	22	<4	4	0	7	5	33
	Cadmium	mg/kg	0.4	<0.4	<0.4	0	<0.4	<0.4	0	<0.4	<0.4	0
	Chromium (III+VI)	mg/kg	1	13	14	7	29	28	4	27	23	16
	Copper	mg/kg	1	16	18	12	21	22	5	33	25	28
	Lead	mg/kg	1	23	25	8	11	13	17	44	34	26
	Mercury	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Nickel	mg/kg	1	10	10	0	34	28	19	**65**	**39**	**50**
	Zinc	mg/kg	1	39	41	5	50	46	8	**94**	**69**	**31**
Inorganics	Moisture	%	0.1	19	19	0	23	25	8	62	46	30
TRH - NEPM 2013 Fractions	TRH >C6 - C10	mg/kg	25	<25	<25	0	<25	<25	0	<25	<25	0
	TRH >C10 - C16	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0
	TRH >C16 - C34	mg/kg	100	<100	<100	0	<100	<100	0	**360**	**110**	**106**
	TRH >C34 - C40	mg/kg	100	<100	<100	0	<100	<100	0	150	<100	40
	TRH >C10 - C40 (Sum	mg/kg	50	<50	<50	0	<50	<50	0	**510**	**110**	**129**
	TRH >C6 - C10 less B	mg/kg	25	<25	<25	0	<25	<25	0	<25	<25	0
	TRH >C10 - C16 less N	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0
TPH - NEPM 1999 Fractions	TPH C6 - C9	mg/kg	25	<25	<25	0	<25	<25	0	<25	<25	0
	TPH C10 - C14	mg/kg	50	<50	<50	0	<50	<50	0	<50	<50	0
	TPH C15 - C28	mg/kg	100	<100	<100	0	<100	<100	0	120	<100	18
	TPH C29-C36	mg/kg	100	<100	<100	0	<100	<100	0	**320**	**<100**	**105**
BTEXN	Benzene	mg/kg	0.2	<0.2	<0.2	0	<0.2	<0.2	0	<0.2	<0.2	0
	Ethylbenzene	mg/kg	1	<1	<1	0	<1	<1	0	<1	<1	0
	Naphthalene	mg/kg	1	<1	<1	0	<1	<1	0	<1	<1	0
	Naphthalene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	Toluene	mg/kg	0.5	<0.5	<0.5	0	<0.5	<0.5	0	<0.5	<0.5	0
	Xylene (m & p)	mg/kg	2	<2	<2	0	<2	<2	0	<2	<2	0
	Xylene (o)	mg/kg	1	<1	<1	0	<1	<1	0	<1	<1	0
	Xylene Total	mg/kg	1	<1	<1	0	<1	<1	0	<1	<1	0
PAHs	Acenaphthene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	0.2	<0.1	67
	Acenaphthylene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	0.1	<0.1	0
	Anthracene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	0.4	0.2	67
	Benz(a)anthracene	mg/kg	0.1	0.7	0.4	55	<0.1	<0.1	0	**1.4**	**0.6**	**80**
	Benzo(a) pyrene	mg/kg	0.05	**0.92**	**0.53**	**54**	<0.05	<0.05	0	**2.2**	**0.96**	**78**
	Benzo(a)pyrene TEQ	mg/kg	0.5	1.3	0.8	48	<0.5	<0.5	0	3.1	1.4	76
	Benzo(b+j) & Benzo(k	mg/kg	0.2	2	1	67	<0.2	<0.2	0	**3.4**	**2**	**52**
	Benzo(g,h,i)perylene	mg/kg	0.1	0.8	0.5	46	<0.1	<0.1	0	**1.4**	**0.7**	**67**
	Chrysene	mg/kg	0.1	1	0.6	50	<0.1	<0.1	0	**1.6**	**0.8**	**67**
	Dibenz(a,h)anthracen	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	0.2	0.1	67
	Fluoranthene	mg/kg	0.1	2.4	1.5	46	<0.1	<0.1	0	**4.5**	**2.2**	**69**
	Fluorene	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	0.2	<0.1	67
	Indeno(1,2,3-c,d)pyre	mg/kg	0.1	0.6	0.4	40	<0.1	<0.1	0	**1.3**	**0.6**	**74**
	Phenanthrene	mg/kg	0.1	0.8	0.5	46	<0.1	<0.1	0	**2.5**	**1.1**	**78**
	Pyrene	mg/kg	0.1	2.1	1.3	47	<0.1	<0.1	0	**3.9**	**1.8**	**74**
	Total +ve PAHs	µg/kg	50	**11000**	**6600**	**50**	<50	<50	0	**23000**	**11000**	**71**
Polychlorinated Biphenyls	Arochlor 1016	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
	Arochlor 1221	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
	Arochlor 1232	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
	Arochlor 1242	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
	Arochlor 1248	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
	Arochlor 1254	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
	Arochlor 1260	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
	PCBs (Sum of total)	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0			
Organochlorine Pesticides	4,4-DDE	mg/kg	0.1	<0.1	<0.1	0	<0.1	<0.1	0	<0.1	<0.1	0
	a-BHC	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Aldrin	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	b-BHC	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Chlordane (cis)	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Chlordane (trans)	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	d-BHC	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	DDD	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	DDT	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	DDT+DDE+DDD	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Dieldrin	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Endosulfan I	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Endosulfan II	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Endosulfan sulphate	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Endrin	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Endrin aldehyde	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	g-BHC (Lindane)	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Heptachlor	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Heptachlor epoxide	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
	Methoxychlor	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
Organophosphorous Pestic	Azinophos methyl	mg/kg	0.1							<0.1	<0.1	0
	Bromophos-ethyl	mg/kg	0.1							<0.1	<0.1	0
	Chlorpyrifos	mg/kg	0.1							<0.1	<0.1	0
	Chlorpyrifos-methyl	mg/kg	0.1							<0.1	<0.1	0
	Diazinon	mg/kg	0.1							<0.1	<0.1	0
	Dichlorvos	mg/kg	0.1							<0.1	<0.1	0
	Dimethoate	mg/kg	0.1							<0.1	<0.1	0
	Ethion	mg/kg	0.1							<0.1	<0.1	0
	Fenitrothion	mg/kg	0.1							<0.1	<0.1	0
	Malathion	mg/kg	0.1							<0.1	<0.1	0
	Parathion	mg/kg	0.1							<0.1	<0.1	0
	Ronnel	mg/kg	0.1							<0.1	<0.1	0
Non-Halogenated Phenols	Dinoseb	mg/kg	1							<1	<1	0
Halogenated Benzenes	Hexachlorobenzene	µg/kg	100	<100	<100	0	<100	<100	0	<100	<100	0
Herbicides	2,4,5-Trichlorophenoxy	mg/kg	0.5							<0.5	<0.5	0
	2,4,5-TP (Silvex)	mg/kg	0.5							<0.5	<0.5	0
	2,4-dichlorophenoxyb	mg/kg	0.5							<0.5	<0.5	0
	2,4-Dichlorprop	mg/kg	0.5							<0.5	<0.5	0
	2,6-D	mg/kg	0.5							<0.5	<0.5	0
	2,4,6-Trichlorophenoxy	mg/kg	0.5							<0.5	<0.5	0
	2-Chlorophenoxyace	mg/kg	0.5							<0.5	<0.5	0
	4-Chlorophenoxy ace	mg/kg	0.5							<0.5	<0.5	0
	3,5-Dichlorobenzoic a	mg/kg	0.5							<0.5	<0.5	0
	Ametryn	mg/kg	0.5							<0.5	<0.5	0
	Acifluorfen	mg/kg	2							<2	<2	0
	Actril (Ioxynil)	mg/kg	1							<1	<1	0
	Atrazine	mg/kg	0.5							<0.5	<0.5	0
	Bromoxynil	mg/kg	0.5							<0.5	<0.5	0
	Clopyralid	mg/kg	0.5							<0.5	<0.5	0
	Cyanazine	mg/kg	0.5							<0.5	<0.5	0
	DCPA (Chlorthal) Dia	mg/kg	0.5							<0.5	<0.5	0
	Dicamba	mg/kg	0.5							<0.5	<0.5	0
	Hedonal	mg/kg	0.5							<0.5	<0.5	0
	Hexazinone	mg/kg	0.5							<0.5	<0.5	0
	2-Methyl-4-chloroph	mg/kg	0.5							<0.5	<0.5	0
	2-Methyl-4-Chloroph	mg/kg	0.5							<0.5	<0.5	0
	Mecoprop	mg/kg	0.5							<0.5	<0.5	0
	Picloram	mg/kg	0.5							<0.5	<0.5	0
	Prometryn	mg/kg	0.5							<0.5	<0.5	0
	Propazine	mg/kg	0.5							<0.5	<0.5	0
	Simazine	mg/kg	0.5							<0.5	<0.5	0
	Terbutryn	mg/kg	0.5							<0.5	<0.5	0
	Terbutylazine	mg/kg	0.5							<0.5	<0.5	0
	Triclopyr	mg/kg	0.5							<0.5	<0.5	0
Pesticides	Irgarol	mg/kg	0.5							<0.5	<0.5	0
Asbestos	Asbestos fibres	-		0.0E0	0.0E0	0	0.0E0	0.0E0	0	0.0E0	0.0E0	0

*RPDs have only been considered where a concentration is greater than 1 times the EQL.
**High RPDs are in bold (Acceptable RPDs for each EQL multiplier range are: 80 (1-10 x EQL); 50 (10-30 x EQL); 30 (> 30 x EQL))
***Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory

Appendix F – Results in comparison to Site Assessment Criteria

						sPOCAS + %S w/w		Metals								Inorganics	TRH - NEPM 2013 Fractions							TPH - NEPM 1999 Fractions				BTEXN							PAHs										
			Benzo(a)pyrene TEQ calc (zero)	Benzo(a)pyrene TEQ calc(PQL)	Metribuzin	s-Net Acidity without -ANCE	s-TSA pH 6.5	Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	Moisture	TRH >C6 - C10	TRH >C10 - C16	TRH >C16 - C34	TRH >C34 - C40	TRH >C10 - C40 (Sum of total)	TRH >C6 - C10 less BTEX (F1)	TRH >C10 - C16 less Naphthalene (F2)	TPH C6 - C9	TPH C10 - C14	TPH C15 - C28	TPH C29-C36	Benzene	Ethylbenzene	Naphthalene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(a)pyrene TEQ (half LOR)	Benzo(b+j) & Benzo(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene
			mg/kg	mg/kg	mg/kg	%w/w S	%w/w S	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	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
EQL			0.5	0.5	0.5	0.01	0.01	4	0.4	1	1	1	0.1	1	1	0.1	25	50	100	100	50	25	50	25	50	100	100	0.2	1	0.1	0.5	2	1	1	0.1	0.1	0.1	0.1	0.05	0.5	0.2	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HIL C Soil								300	90		17000	600	80	1200	30000																															
Site ID	Location	Sampled Date Time																																												
Testers Hollow	ACM1	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	ACM2	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	ACM3	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH01		0.7	0.8	-	-	-	5	<0.4	14	18	25	<0.1	10	41	19	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	0.4	0.53	0.8	1	0.5	0.6	<0.1	1.5
Testers Hollow	BH01		1.2	1.3	-	-	-	4	<0.4	13	16	23	<0.1	10	39	19	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	0.7	0.92	1.3	2	0.8	1	<0.1	2.4
Testers Hollow	BH01		-	-	-	0.011	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH02		-	-	-	<0.01	0.06	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH03		<0.5	<0.5	-	-	-	4	<0.4	28	22	13	<0.1	28	46	25	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1
Testers Hollow	BH03		<0.5	<0.5	-	-	-	<4	<0.4	29	21	11	<0.1	34	50	23	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.5	<0.2	<0.1	<0.1	<0.1	<0.1
Testers Hollow	BH03		-	-	-	0.89	<0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	PTP02A		0.7	0.8	-	-	-	6	<0.4	6	16	6	<0.1	9	36	14	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	0.3	0.55	0.8	0.9	0.3	0.3	<0.1	0.7
Testers Hollow	PTP03B		8.3	8.3	-	-	-	7	<0.4	6	10	24	<0.1	8	37	14	<25	<50	170	<100	170	<25	<50	<25	<50	130	<100	<0.2	<1	<1 - 0.2	<0.5	<2	<1	<1	1.2	0.2	3.3	7.2	5.9	8.3	9	2.7	4.7	0.4	18
Testers Hollow	TH01 S	27/09/2018	5.6	5.6	<0.5	-	-	5	<0.4	9	14	18	<0.1	17	59	21	<25	<50	150	<100	150	<25	<50	<25	<50	110	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	0.3	0.2	1.2	3.5	3.8	5.6	6.1	2.6	3.4	0.5	10
Testers Hollow	TH010 S	27/09/2018	1.4	1.4	<0.5	-	-	5	<0.4	23	25	34	<0.1	39	69	46	<25	<50	110	<100	110	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	0.2	0.6	0.96	1.4	2	0.7	0.8	0.1	2.2
Testers Hollow	TH010 S	27/09/2018	3.1	3.1	<0.5	-	-	7	<0.4	27	33	44	<0.1	65	94	62	<25	<50	360	150	510	<25	<50	<25	<50	120	320	<0.2	<1	<0.1	<0.5	<2	<1	<1	0.2	0.1	0.4	1.4	2.2	3.1	3.4	1.4	1.6	0.2	4.5
Testers Hollow	TH02 S	27/09/2018	1.4	1.4	<0.5	-	-	<4	<0.4	8	7	49	<0.1	8	190	15	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	0.6	0.95	1.4	2	0.8	0.8	0.1	2.1
Testers Hollow	TH03 S	27/09/2018	1.5	1.5	<0.5	-	-	<4	<0.4	22	28	27	<0.1	21	68	44	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	0.2	0.8	1	1.5	2	0.8	1	0.1	2.9
Testers Hollow	TH04 S	27/09/2018	<0.5	<0.5	<0.5	-	-	5	<0.4	7	10	7	<0.1	7	24	27	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	<0.1	0.07	<0.5	<0.2	<0.1	<0.1	<0.1	0.2
Testers Hollow	TH05 S	27/09/2018	<0.5	<0.5	<0.5	-	-	<4	<0.4	27	24	14	<0.1	32	55	21	<25	<50	140	<100	140	<25	<50	<25	<50	<100	120	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	0.2	0.2	<0.5	0.4	0.2	0.2	<0.1	0.6
Testers Hollow	TH06 S	27/09/2018	<0.5	0.6	<0.5	-	-	8	<0.4	16	8	13	<0.1	32	51	19	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	<0.1	0.3	0.4	0.5	0.6	0.3	0.4	<0.1	1
Testers Hollow	TH07 S	27/09/2018	7.2	7.2	<0.5	-	-	4	<0.4	26	30	40	<0.1	48	100	34	<25	<50	180	<100	180	<25	<50	<25	<50	110	<100	<0.2	<1	<1 - 0.2	<0.5	<2	<1	<1	0.5	0.2	1.4	3.6	5.1	7.2	7.7	3.6	4.2	0.6	13
Testers Hollow	TH08 S	27/09/2018	2.6	2.6	<0.5	-	-	<4	<0.4	85	8	14	<0.1	6	43	8.6	<25	<50	400	440	840	<25	<50	<25	<50	150	370	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	0.1	1	1.8	2.6	2.8	1.5	1.3	0.3	2.9
Testers Hollow	TH09 S	27/09/2018	1.2	1.2	<0.5	-	-	5	<0.4	11	15	27	<0.1	10	42	26	<25	<50	<100	<100	<50	<25	<50	<25	<50	<100	<100	<0.2	<1	<0.1	<0.5	<2	<1	<1	<0.1	<0.1	0.2	0.6	0.89	1.2	1	0.6	0.7	0.1	2
Testers Hollow	TP01		9.8	9.8	-	-	-	7	<0.4	11	20	8	<0.1	10	27	16	<25	<50	200	<100	200	<25	<50	<25	<50	120	130	<0.2	<1	<1 - 0.1	<0.5	<2	<1	<1	0.5	0.5	2.1	6.5	7.2	9.8	9.9	4.1	4.3	0.5	15
Testers Hollow	TP03		150	150	-	-	-	5	<0.4	15	19	100	<0.1	16	130	9.6	<25	79	2600	380	3000	<25	78	<25	<50	1900	950	<0.2	<1	1 - 8.6	<0.5	<2	<1	<1	7.3	3	22	93	110	150	160	48	74	6.7	210
Testers Hollow	TP05		27	27	-	-	-	4	<0.4	8	14	6	<0.1	23	26	12	<25	52	1100	660	1800	<25	<50	<25	<50	570	740	<0.2	<1	8	<0.5	<2	<1	<1	3.8	0.9	9.9	18	21	27	26	7.5	11	1	45
Statistical Summary																																														
Maximum Concentration			150	150	<0.5	0.89	0.06	8	<0.4	85	33	100	<0.1	65	190	62	<25	79	2600	660	3000	<25	78	<25	<50	1900	950	<0.2	<1	8.6	<0.5	<2	<1	<1	7.3	3	22	93	110	150	160	48	74	6.7	210
Average Concentration			11	11	0.25	0.3	0.023	4.6	0.2	20	18	25	0.05	22	61	24	13	29	296	122	368	13	28	13	25	191	167	0.1	0.5	0.73	0.25	1	0.5	0.5	0.72	0.29	2.1	6.9	8.2	11	12	3.8	5.5	0.55	17
Standard Deviation			33	33	0	0.51	0.032	1.9	0	17	7.5	22	0	16	40	14	0	13	594	169	749	0	12	0	0	419	251	0	0	2	0	0	0	0	1.8	0.67	5.2	21	24	33	35	11	16	1.5	47

Site ID	Location	Sampled Date Time	Fluorene	Indeno(1,2,3-c,d)pyrene	Phenanthrene	Pyrene	Total +ve PAHs	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion	Fenitrothion	Malathion	Parathion
			Polychlorinated Biphenyls													Organochlorine Pesticides																					Organophosphorous Pesticides										
			mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.1	0.1	0.1	0.1	50	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1A(1) HIL C Soil															1										400000					20000			10000		400000			250									
Testers Hollow	ACM1	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	ACM2	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	ACM3	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH01		<0.1	0.4	0.5	1.3	6600	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH01		<0.1	0.6	0.8	2.1	11,000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH03		<0.1	<0.1	<0.1	<0.1	<50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH03		<0.1	<0.1	<0.1	<0.1	<50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	PTP02A		<0.1	0.3	0.3	0.7	4400	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	PTP03B		1.2	2.6	11	15	83,000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH01 S	27/09/2018	0.5	2.3	5.4	8.5	49,000	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH010 S	27/09/2018	<0.1	0.6	1.1	1.8	11,000	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH010 S	27/09/2018	0.2	1.3	2.5	3.9	23,000	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH02 S	27/09/2018	<0.1	0.6	0.8	1.9	10,000	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH03 S	27/09/2018	<0.1	0.7	1.4	2.6	13,000	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH04 S	27/09/2018	<0.1	<0.1	<0.1	0.2	400	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH05 S	27/09/2018	<0.1	0.1	0.3	0.5	2600	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH06 S	27/09/2018	<0.1	0.2	0.5	0.9	4500	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH07 S	27/09/2018	0.6	3.1	8.3	12	64,000	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH08 S	27/09/2018	<0.1	1.1	1.2	2.6	17,000	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TH09 S	27/09/2018	<0.1	0.5	1.1	1.7	9700	-	-	-	-	-	-	-	-	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Testers Hollow	TP01		1.3	3.6	7.6	13	76,000	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TP03		15	43	170	180	1,200,000	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TP05		5.1	6.6	49	40	250,000	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																																															
Maximum Concentration			15	43	170	180	1200000	<1	<1	<1	<1	<1	<1	<1	<1	<0.1	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Average Concentration			1.2	3.4	13	14	91763	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.05	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Standard Deviation			3.4	9.5	38	40	267027	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

				Non-Halogenated Phenols	Halogenated Benzenes	Herbicides																															Pesticides	Asbestos		
			Ronnel	Dinoseb	Hexachlorobenzene	2,4,5-Trichlorophenoxy Acetic Acid	2,4,5-TP (Silvex)	2,4-dichlorophenoxybutanoic acid	2,4-Dichlorprop	2,6-D	2,4,6-Trichlorophenoxy-acetic acid	2-Chlorophenoxyacetic acid	4-Chlorophenoxy acetic acid	3,5-Dichlorobenzoic acid	Ametryn	Acifluorfen	Actril (Ioxynil)	Atrazine	Bromoxynil	Clopyralid	Cyanazine	DCPA (Chlorthal) Diacid	Dicamba	Hedonal	Hexazinone	2-Methyl-4-chlorophenoxyacetic acid	2-Methyl-4-Chlorophenoxy Butanoic Ac	Mecoprop	Picloram	Prometryn	Propazine	Simazine	Terbutryn	Terbutylazine	Triclopyr	Irgarol	Asbestos fibres	Acidity - Excess Acid Neutralising Capaci	Acidity - Peroxide Oxidisable Sulfur
			mg/kg	mg/kg	µg/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	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	-	mole H+/t	mole H+/t
EQL			0.1	1	100	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5		5	5
NEPM 2013 Table 1A(1) HIL C Soil					10000	800												400						1300		800	800	800	5700											
Site ID	Location	Sampled Date Time																																						
Testers Hollow	ACM1	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-
Testers Hollow	ACM2	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-
Testers Hollow	ACM3	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Y	-	-
Testers Hollow	BH01		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	BH01		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	BH01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5
Testers Hollow	BH02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	BH02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5
Testers Hollow	BH03		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	BH03		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	BH03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	21
Testers Hollow	PTP02A		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	PTP03B		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	TH01 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH010 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH010 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH02 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH03 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH04 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH05 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH06 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH07 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH08 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TH09 S	27/09/2018	<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	N	-	-
Testers Hollow	TP01		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	TP03		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Testers Hollow	TP05		-	-	<100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	N	-	-
Statistical Summary																																								
Maximum Concentration			<0.1	<1	<100	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0	<5	21
Average Concentration			0.05	0.5	50	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	1	0.5	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25		2.5	8.7
Standard Deviation			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	11

			SPOCAS																									
			ANC Fineness Factor	a-Net Acidity without ANCE	Calcium in Peroxide	Excess Acid Neutralising Capacity	KCl Extractable Calcium	KCl Extractable Magnesium	KCl Extractable Sulfur	Liming Rate	Liming Rate excluding ANC	Magnesium in Peroxide	Net Acidity (acidity units)	Net Acidity (sulfur units)	HCl Extractable Sulfur	Peroxide Oxidisable Sulfur	pH (KCl)	pH (Ox)	sulfidic - Excess Acid Neutralising Capaci	sulfidic - Titratable Actual Acidity	sulfidic - Titratable Peroxide Acidity	Net Acid Soluble Sulfur	Sulfur in Peroxide	Net Acid Soluble Sulfur (in acid units)	Net Acid Soluble Sulfur (in sulfur units)	Titratable Actual Acidity	Titratable Peroxide Acidity	Titratable Sulfidic Acidity
			-	moles H+/t	%	% CaCO3	%	%	%	kg CaCO3/t	kg CaCO3/t	%	mole H+/t	%S	%S	%	pH units	pH units	%S	%S	%S	%S	%	mole H+/t	%S	mole H+/t	mole H+/t	moles H+/t
EQL			1.5	5	0.005	0.05	0.005	0.005	0.005	0.75	0.75	0.005	5	0.01	0.005	0.005			0.05	0.01	0.01	0.005	0.005	5	0.01	5	5	5
NEPM 2013 Table 1A(1) HIL C Soil																												
Site ID	Location	Sampled Date Time																										
Testers Hollow	ACM1	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	ACM2	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	ACM3	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH01		1.5	6.8	0.11	<0.05	0.12	0.047	0.006	<0.75	<0.75	0.044	7	0.01	<0.005	0.005	5.4	4.5	<0.05	<0.01	<0.01	<0.005	0.01	<5	<0.01	<5	<5	<5
Testers Hollow	BH02		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH02		1.5	<5	0.76	<0.05	0.95	0.12	0.72	<0.75	<0.75	0.11	<5	<0.01	<0.005	<0.005	5.2	4.1	<0.05	<0.01	0.06	<0.005	0.56	<5	<0.01	<5	40	36
Testers Hollow	BH03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	BH03		1.5	560	0.18	<0.05	0.2	0.15	0.02	42	42	0.14	560	0.89	0.044	0.03	4	3.3	<0.05	0.84	0.44	0.023	0.05	11	0.02	520	270	<5
Testers Hollow	PTP02A		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	PTP03B		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH01_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH010_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH010_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH02_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH03_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH04_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH05_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH06_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH07_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH08_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TH09_S	27/09/2018	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TP01		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TP03		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Testers Hollow	TP05		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Statistical Summary																												
Maximum Concentration			1.5	560	0.76	<0.05	0.95	0.15	0.72	42	42	0.14	560	0.89	0.044	0.03	5.4	4.5	<0.05	0.84	0.44	0.023	0.56	11	0.02	520	270	36
Average Concentration			1.5	190	0.35	0.025	0.42	0.11	0.25	14	14	0.098	190	0.3	0.016	0.013	4.9	4	0.025	0.28	0.17	0.0093	0.21	5.3	0.01	175	104	14
Standard Deviation			0	321	0.36	0	0.46	0.053	0.41	24	24	0.049	321	0.51	0.024	0.015	0.76	0.61	0	0.48	0.24	0.012	0.31	4.9	0.0087	299	145	19