Architectus Sydney Pty Ltd

2 MacArthur Drive, Holsworthy, NSW 2173 (Lot 5 DP 825745)

Preliminary Site Investigation

July 2017

Executive summary

GHD Pty Ltd (GHD) was commissioned by Architectus Sydney Pty Ltd, on behalf of Holsworthy Shopping Centre Pty Ltd, to carry out a preliminary site investigation (PSI) for potential contamination at Lot 5 in DP 825745 located at 2 MacArthur Drive, Holsworthy, NSW 2173 (the 'site').

We understand that the site is to be redeveloped for mixed high density residential and commercial use with basement parking and that a PSI is required to support the planning process.

The objective of the investigation was to provide information on the current and historical setting of the site and assess the potential for pre-existing contamination to be present at the site associated with current or historical land use, and establish whether the contamination (if present) would pose a potential risk to human health and/or the environment for the proposed development.

GHD completed a site inspection and a desktop review of available historical aerial photographs, previous investigation reports, regulatory information, as well as a search of accessible NSW EPA environmental database for information related to the contamination status of the site.

Based on the findings of our investigation, the following key conclusions have been made:

- At the time of this investigation, the site comprised a vacant parcel of land surrounded by a chain wire fence and bound by roads and a railway line. Approximately 60% of the footprint of the site was covered by compacted gravels, with remaining area of the site being generally overgrown grassland with a few scattered trees.
- Review of historical aerial photographs, indicated the property had remained primarily vacant, traversed by a road to the west of the site until the 1970' s when a possible Post Office building was constructed on site. The road previously transecting the site appeared to have been relocated to the west outside the boundary of the site around the 1980s' and the building (possible Post Office) demolished by 1990s'. The site appears to have remained vacant since this time.
- The *Liverpool City Council Local Environmental Plan 2008* indicates the site is within an area of Class 5 Acid Sulfate Soils. Acid sulfate soils are not typically found in Class 5 areas. Works in a class 5 area that are likely to lower the water table below 1 metre AHD on adjacent class 1, 2, 3 or 4 land will trigger the requirement for assessment and may require management.
- A site inspection by GHD on 13 December 2016 did not identify any obvious indication of significant contamination at the site, although minor illegal dumping of rubbish was noted in places. Parts of the site were inaccessible for inspection due to dense vegetation cover.
- Previous investigation of the site identified potential for hydrocarbon impact of soil and groundwater at the site related to historical fuel storage in underground storage tanks (USTs) on land to the south of the site (however, no plans were available during this PSI for GHD to confirm the exact location of the former USTs)
- Previous investigation of the site identified polycyclic aromatic hydrocarbons (PAH) in soils in the southwest portion of the site above the NEPM 1999 health investigation levels for residential use; however, these investigation levels have since been superseded by NEPM 2013. A previous audit of the site by an EPA-accredited Site Auditor (Ryal, 2000) concluded that the elevated concentration of PAH identified in soil exceeded the health-

based investigation level for residential land for a scenario where occupiers would have access to soil. They suggested that additional investigation and possible remediation would be required in this part of the site before it could be used for residential purposes.

- It was the opinion of the Site Auditor that Lot 5 could be developed for residential use where occupiers have minimal access to soil, such as high-rise apartments, flats or town houses, where the existing soil is covered by permanent structures such as building slabs, roadways and pavements. However, NSW EPA environmental guidelines have been updated since the auditor completed their review

Based on the current information, GHD considers there is potential for contamination to be present at the site and complete source-pathway-receptors linkages for future residential/commercial development.

GHD recommend that further assessment and/or intrusive investigation be carried out at the site to confirm the contamination status with regard to the findings of our PSI.

*This executive summary is subject to, and must be read in conjunction with, the remainder of the report, the limitations set out in **Section 11** and the assumptions and qualifications contained throughout the report.*

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1. Introduction

1.1 Introduction

GHD Pty Ltd (GHD) was commissioned by Architectus Sydney Pty Ltd, on behalf of Holsworthy Shopping Centre Pty Ltd, to carry out a preliminary site investigation (PSI) for potential contamination at Lot 5 in DP 825745 located at 2 MacArthur Drive, Holsworthy, NSW 2173 (the 'site').

The location of the site is shown on **Figure 1** in **Appendix A**.

We understand that the site is to be redeveloped for mixed high density residential and commercial use with basement parking and that a PSI is required to support the planning process.

1.2 Objective

The objective of this PSI is to provide information on the current and historical setting of the site and assess the potential for pre-existing contamination to be present at the property associated with current or historical land use, and establish whether the contamination (if present) would pose a potential risk to human health and/or the environment for the proposed development.

1.3 Regulatory guidelines

This PSI has been completed with consideration of guidelines made or approved by the NSW EPA under Section 105 of the *Contaminated Land Management Act, 1997*. These guidelines include the following key documents:

- National Environment Protection Council (NEPC) (1999, Amended 2013). National Environment Protection (Assessment of Site Contamination) Amendment Measure (No. 1).
- NSW Office of Environment and Heritage (OEH) (2011). *Guidelines for Consultants Reporting on Contaminated Sites.*
- NSW Environment Protection Authority (EPA) (2015). *Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997*

1.4 Scope of work

In order to meet the objectives stated in **Section 1.2**, GHD completed the following scope of work:

- A review of background information on the site provided in the following:
  - WR Ryal, Accredited Site Auditor No 9809 (NSW EPA), Kokoda Fields Holsworthy, *Summary Site Audit Report*, Ref. 56432 WRR, dated, 7 February 2000.
  - Council information including the Liverpool City Council *Local Environmental Plan* (2008)
  - Published geology, hydrogeology, hydrology and topography records
  - Historical aerial photographs of the site from 1930 to 2016
- A search and review of information available from the following sources:
  - The NSW EPA Contaminated Land Register
  - The EPA Protection of the Environment Operations (POEO) database

  - Water bore records held by the NSW Office of Water
  - WorkCover NSW Dangerous Goods Records
- A site inspection to understand the current environmental setting of the site and check for obvious visual signs of potential contamination (e.g. stressed vegetation, surface staining etc.)
- Preparation of this PSI report documenting the findings of our investigation and recommendations

1.5 Limitations

Limitations associated with this PSI are provided in **Section 11**, which should be read in conjunction with the entirety of this report. It should be noted that no intrusive soil sampling or groundwater sampling was carried out as part of our investigation.

2. Site information

2.1 Site identification

A site location plan showing the location of the site is provided as **Figure 1** in **Appendix A**. A summary of available information pertaining to the site identification is presented in **Table 1.**

Table 1 – Site summary

Information	Details
Local Government Area	Liverpool City Council
Site address	2 MacArthur Drive, Holsworthy NSW 2173
Site area	Approximately 1.8 hectares
Description	Lot 5 DP 825745
Current Land Zoning	B2 – Local Centre (Liverpool City Council Local Environmental Plan 2008)
Geographic Coordinates	311515.571 E, 6240128.322 N (GDA 94-MGA 56)
Current Land Use	Vacant land with sparse tree coverage on the northern side of the site.

2.2 Surrounding land use

Land immediately adjacent to the site consists of the following:

- North: Heathcote Road and MacArthur Drive, with bushland further to the northeast and a residential development to the northwest.
- East: Heathcote Road with bushland beyond.
- South: Rail corridor then the Australian Army Museum of Military Engineering (Department of Defence)
- West: MacArthur Drive then residential properties to the northwest and a car park to the west.

2.3 Site Inspection

A suitably qualified GHD Environmental Scientist conducted a site inspection on Tuesday 13 December 2016. The site layout is shown on **Figure 2** (**Appendix A**) and photographs are provided in **Appendix B**. In summary, the following key observations were made:

- At the time of the inspection the site was vacant, bound by Heathcote Road to the north, the T2 Inner West rail corridor to the south, Heathcote Road to the east, and MacArthur Drive to the west.
- The site was surrounded by a chain link fence, restricting access to the property.
- A sewer main was noted along the western boundary of the site adjacent to MacArthur Drive.
- An area of about 1 hectare in the mid-section of the site was approximately 3 metres lower than the surrounding area. This area was covered with compact gravel. Previous investigations indicated that the site had been excavated to the level of a basement of a

proposed retail and residential development. No further information regarding these works was available at the time of this PSI.

- The remaining area of the site was generally overgrown grassland with a few scattered trees. The overgrown vegetation limited GHD access to parts of the site.
- The topography of the site was undulating and uneven, but generally sloped downwards to the north.
- Fill material appeared to be present along the north and west boundary of the site, adjacent to MacArthur Drive and Heathcote Road, presumably used to construct the roads. It was unclear whether the fill material was sourced from the mid-section of the site or from an offsite source.
- There was no obvious evidence of chemical storage or building structures at the site.
- Illegally dumped scrap materials comprising plastic, metal, a redundant oven and a hot water system were noted near the eastern boundary of the site.

3. Environmental setting

3.1 Topography and drainage

The site generally slopes gradually downwards towards the north. Surface water is expected to flow to the north following localised topography towards Harris Creek located approximately 400 metres to the northeast of the site.

3.2 Soils and landscapes

The *Soil Conservation Service of NSW Soil Landscapes of the Sydney 1:100,000 Sheet (1989*), indicates the site overlies a Richmond (ri) alluvial landscape. This landscape is described as being mainly flat (slopes <1%) with local relief (<3 metres).

Soils are described as poorly structured orange to red clay loams, clays and sands, limitations include localised flood hazard, localised seasonal waterlogging and localised water erosion hazard on terrace edges.

3.3 Geology

The *Soil Conservation Service of NSW 1:250,000 Soil Landscape Series Sheet S1 56-5*, indicates the site is underlain by (Rwl), which typically comprises shale with some sandstone beds as outlined in **Table 2**.

Table 2 – Published geology

Period	Group	Description
Triassic	Bringelly Shale, Minchinbury Sandstone, Ashfield Shale	Shale with some sandstone beds.

3.4 Hydrogeology

The *1:2,000,000 Groundwater in New South Wales, Assessment of Pollution Risk Map* indicates that the site is likely to be underlain by shale with low potential for groundwater movement.

Groundwater salinity is described as being greater than 14,000 mg/L, which is unsuitable for stock watering.

GHD conducted a review of existing groundwater bore records using the NSW Water Information Database. The search was conducted to identify registered groundwater bores in close proximity and to record information such as use and standing water level. There were no groundwater bores identified within a 500 metre radius of the site. The nearest bore is situated 679 m north of the site and is used as a test bore, as described in **Table 3**. The bore search results are included in **Appendix C.**

Table 3 – Review of existing groundwater data

Bore ID	Authorised Purpose	Depth (m)	Standing Water Level (m)	Approx. distance from property	Drillers Log
GW107018	Test Bore	150	5.5	679 m NE	Clay (0 -3 mbgl) underlain by Shale (3 - 8 mbgl) and sandstone (8 – 11.3 mbgl)

NB: mbgl –metres below ground level

3.5 Hydrology

The closest receiving water body from the site is Harris Creek, located approximately 400 m northeast of the site. Harris Creek flows into Georges River draining into Botany Bay located 18 km to the east of the site.

The ground surface of the site is primarily compacted soils and surface water would be expected to infiltrate through these unsealed areas. Due to the urban environment surrounding the site, excess surface water from surrounding land and adjacent roads would likely enter the existing offsite roadway stormwater drainage system prior to discharge.

3.6 Acid sulphate soils

The *Liverpool Local Environmental Plan 2008* indicates the site is within an area of Class 5 Acid Sulfate Soils. Acid sulfate soils are not typically found in Class 5 areas. Areas classified as Class 5 are located within 500 metres of adjacent class 1,2,3 or 4 land. Works in a class 5 area that are likely to lower the water table below 1 metre AHD on adjacent class 1, 2, 3 or 4 land will trigger the requirement for assessment and may require management.

4. Site history

4.1 Historical aerial photographs

A selection of aerial photographs was examined in order to ascertain past activities and land uses at the property. The years examined were 1930, 1951, 1965, 1975, 1979, 1982, 1986, 1991, 2004 and 2016. Summaries are provided in **Table 4** and the current aerial photograph is also provided in **Appendix D.**

A summary of the information gained from the review of historical aerial photography is provided in **Table 4**.

Table 4 – Review of historical aerial photographs

Year	Observations
1930	The site appeared to be vacant with a few trees, an unnamed road appears to traverse the site to the west, a few scattered trees were noted across the site. Surrounding properties to the east and west of the site appeared to be vacant occupied by forestland. A few structures from what appeared to be agricultural land were noted further to the north and south.
1943 Source Imagery (source http://maps.six.nsw.gov.au/)	The site and surrounding land remained primarily unchanged since the 1930 aerial photograph.
1951 Lands photo	The site remained primarily unchanged since the 1943 aerial photograph. A few newly constructed structures from what appeared to be the Defence site were situated to the west following the road. A few residential properties appeared to have been constructed west of the site. What appeared to be a new residential development was noted further to the east following Williams Creek.
1965 Lands photo	The site remained primarily unchanged since the 1951 aerial. A higher density of residential properties was noted to the northwest. A higher density of structures from what appear to be the Defence site was noted south. What appeared to be the tanks of a Water Treatment Plant was noted to the north east of the site adjacent to Williams Creek.
1975 Lands photo	A structure appeared to have been constructed on site. (Previous investigations indicated it could possibly have been a post office). Surrounding properties remained primarily unchanged.
1979 Lands photo	The site and surrounding properties remained primarily unchanged since the 1975 aerial.

Year	Observations
1982 Lands photo	Previously noted structure (post office) remained on site. Structures to the west of the site from what appeared to be part of the Defence site appeared to have been demolished. Previously noted military building structures south of the site remained primarily unchanged.
1986 Lands photo	Previously noted road transecting the site to the west appeared to have been relocated to the west. Previously noted structure remained on site. Surrounding properties remained primarily unchanged.
1991 Lands photo	A new road MacArthur Drive and roundabout was situated north of the property; previously noted structure appeared to have been demolished. A few trees were noted on the western boundary of the site. Surrounding land use remained primarily unchanged.
2004 Aerometrex Imagery (accessed on Google Earth)	A second roundabout was noted west of the site, a newly constructed ground level concrete paved carpark and a multistorey carpark was noted to the west adjacent to the rail corridor. A high density residential development was noted to the north west, newly constructed structures appear to be situated on the Defence site. A high density residential development was noted to the east and north of the site.
2016 Aerometrex Imagery (accessed on Google Earth)	The capping layer on the mid-section of the site appeared to have been excavated. Previous investigations indicated that the site had been excavated to the level of the basement of an approved retail and residential development.

Based on the review of historical aerial photographs, the site has remained primarily vacant with a road transecting the western part of the site until the 1970s when a structure (presumed to be a post office according to previous investigations) appears to have been constructed on site.

The road transecting the site appears to have been redirected further west outside the boundary of the site around the 1980s. The building structure appears to have been demolished sometime between 1986 and 1991. Since then the property has remained vacant.

Surrounding allotments appeared to have been mainly residential and part of Defence land.

5. Regulatory information overview

5.1 Overview

As part of the desk based review, information was obtained from a number of sources to enable a greater understanding of historical land use at the property, including former site practices which may have the potential to cause contamination. The desk based review included the following sources of information:

- SafeWork NSW documentation;
- Council information including land zoning, and permissible use;
- NSW Office of Environment and Heritage (OEH) contaminated sites register (notifications or incidents
- NSW OEH Protection of the Environment Operations (POEO) licence register; and
- State Environment Protection Policy 55 (SEPP 55) – Remediation of Land.

5.2 Council information

The Liverpool City Council Development Application (DA) database accessed on 8 December 2016 for current and approved DAs on exhibition, indicated a few DAs had been lodged for the site. Lodged DAs are presented on **Table 5.**

Table 5 – Council information

Reference	Details	Date Lodged	Date Approved
DA -1839/2005	DA - mixed use retail and residential development	17/06/2005	20/12/2005
DA - 1839/2005/A	DA - modification - mixed use retail and residential development	15/02/2006	29/03/2006
DA – 1839/2005 /B	DA - Section 96 modification development: modification to wording of conditions	27/10/2006	14/02/2007
DA – 1839/2005/C	DA - Section 96 modification development: modification to wording of conditions	31/10/2006	21/12/2006
DA – 1839/2005/D	Development Application - modification - mixed use retail and residential development	20/09/2007	21/12/2007

GHD note that DAs supporting documents were not available on the Liverpool City Council database at the time of reporting.

5.2.1 Local Environment Plan (LEP)

The site is located within the Liverpool City Council. Reference to the Liverpool City Council Local Environmental Plan 2008 indicates that the current land zoning for the site is B2 Local Centre.

5.3 Safe Work NSW - Dangerous Goods Search

A search of site dangerous goods records was submitted to Safe Work NSW on 28 November 2016. Response from Safe Work NSW on 13 December 2016 (Ref. D16/720160) did not locate any records pertaining to the site.

5.4 NSW EPA data base search

A site will be on the Contaminated Land: 'Record of Notices' only if the EPA has issued a regulatory notice in relation to the site under the *Contaminated Land Management Act 1997*. Sites appearing on this 'List of NSW contaminated sites notified to the EPA' indicate that the notifiers consider that the sites are contaminated and warrant reporting to EPA. However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review and, if necessary, obtain more information before it can make a determination as to whether the site warrants regulation.

5.4.1 Contaminated land record

A search of the NSW EPA record of notices for contaminated sites for the property on 9 December 2016 did not return any results within 1 km of the site. The nearest property was situated 4 km north east:

- ABB Australia Pty Ltd with an ongoing maintenance order.

This property is not regarded as potential contamination sources as it is located at more than 1 km from the site and in an inferred cross gradient location relative to the site.

5.4.2 List of NSW contaminated sites notified to EPA

The sites appearing on the EPA "List of NSW contaminated sites notified to the EPA" indicate that the notifiers consider that the sites are contaminated and warrant reporting to EPA.

However, the contamination may or may not be significant enough to warrant regulation by the EPA. The EPA needs to review information before it can make a determination as to whether the site warrants regulation.

GHD undertook a search of the listing on 9 December 2016. There were no sites identified on the List of NSW Contaminated Sites notified to the EPA, in proximity to the site.

5.4.3 POEO environment protection license register

The NSW EPA issues environment protection licences to the owners or operators of various industrial premises under the Protection of the Environment Operations Act 1997 (POEO Act). GHD has reviewed the public register under the POEO Act. The public register, contains information on licence reviews, prosecutions and other issues.

GHD undertook a search of the register on 9 December 2016. The search did not show any records for the property.

5.4.4 NSW heritage register

GHD undertook a search of the register on 9 December 2016. The search did not return any records in the database for the property.

5.5 State Environmental Planning Policies

5.5.1 State Environmental Planning Policy No 55 – Remediation of Land

The aims and objectives of *State Environmental Planning Policy No 55 – Remediation of Land* (SEPP 55) are to provide a state-wide planning approach to contaminated land remediation. SEPP 55 also promotes the remediation of contaminated land to reduce the risk of harm.

Clause 9 of SEPP 55 provides a list of situations when remediation of contamination requires consent from the local authority (e.g. Category 1). The list includes the following:

a) Remediation of a designated development, or

b) Remediation carried out or to be carried out on land declared to be a critical habitat, or

c) Remediation that is likely to have a significant effect on a critical habitat or a threatened species, population or ecological community, or

d) A development for which another State environmental planning policy or a regional environmental plan requires development consent, or

e) Remediation carried out or to be carried out in an area or zone to which any classifications to the following effect apply under an environmental planning instrument:

   i. Coastal protection,

   ii. Conservation or heritage conservation,

   iii. Habitat area, habitat protection area, habitat or wildlife corridor,

   iv. Environmental protection,

   v. Escarpment, escarpment protection or preservation,

   vi. Floodway,

   vii. Littoral rainforest,

   viii. Nature reserve,

   ix. Scenic area or scenic protection,

   x. Wetland, or

f) Remediation carried out or to be carried out on any land in a manner that does not comply with a policy made under the contamination land planning guidelines by the Council for any local government area in which the land is situated (or if the land is within the unincorporated area).

In general, all other remediation work may be carried out without development consent and is known at Category 2 works. However, if the remediation work is to be carried out in a manner that is inconsistent with the Council's policy on contaminated land, then the remediation work will become Category 1 works and requires development consent. SEPP55 requires that local Council be notified 30 days before any Category 2 remediation works commence.

6. Previous Investigations

In preparing this PSI, GHD has reviewed the following previous investigation reports relevant to the site:

- WR Ryal, Accredited Site Auditor No 9809 (NSW EPA), Kokoda Fields Holsworthy, *Summary Site Audit Report*, Ref. 56432 WRR, dated, 7 February 2000.

The Summary Site Audit (Ryal 2000) provides details of Site Audit Statements WRR55 and WRR68, which were prepared for Lot 4 and Lot 5 of DP 825745, respectively. It should be noted that current cadastral information indicates that Lot 4 no longer exists and GHD assume that Lot 4 of DP 825745 relates the residential block of land to the northwest of the site.

Site Audit Statements WRR55 and WRR68 were not available for GHD to review as part of this PSI, and our review of the Summary Site Audit (Ryal 2000) was restricted to the available text only. Supporting documents including figures, sample location plans, borehole logs or relevant appendix documents were not provided for review at the time of this investigation.

6.1 Summary Site Audit (Ryal 2000)

The Summary Site Audit (Ryal 2000) contains a review of the following site investigations:

- *Phase 1, Preliminary Phase 2 and Geotechnical Investigations* – Kokoda Fields, Holsworthy by AGC Woodward-Clyde Pty Ltd (WC) dated 26 October 1999
- *Supplementary Environmental Investigations* – Kokoda Fields, Holsworthy by WC dated 14 January 2000.

Key findings of these previous investigations are provided as follows.

6.1.1 Preliminary site investigation

A preliminary site investigation was carried out in Lot 4 and Lot 5 of DP 825745 by Woodward-Clyde in 1999. No figures or plans are available at the time of this review to confirm the extent of the investigation or sampling locations. Information provided in the Summary Site Audit (Ryal 2000) indicates that the objective of the work was to provide a review of the history of Lots 4 and 5, supplemented with limited soil and groundwater sampling of areas of potential concern. The scope of the Woodward-Clyde investigation comprised:

- A desktop review of site history using aerial photographs
- A site inspection and interviews of people familiar with the current and past land uses
- Review of local geology and groundwater to evaluate the possibility of the presence and migration of potential contaminants
- Assessment of potential risks from/ to neighbouring properties

The desktop review identified the following:

- A building is described as being present on Lot 4 or Lot 5 from 1970s' until the early 1990s', described as being a possible post office. No plans were available to confirm the exact location of the building, although its location is evident on the historical aerial photographs provided in **Appendix D** of this report
- Stockpiles of unknown material were located adjacent to Lot 4 or Lot 5, presumably material associated with the construction of nearby MacArthur Road
- Stressed vegetation in the northern part Lot 4 or 5, possibly attributed to the soils being waterlogged due to changes in drainage following construction of the nearby road
- There are limited environmental records available relating to land to the south that is

owned by the Defence Estate Organisation

- There is potential for contamination of soil and groundwater from possible petroleum fuel storage in underground storage tanks (USTs) believed to be present on land adjacent to Lot 4 or 5. However, given the absence of available figures and plans, the location of the USTs in relation to Lot 4 and 5 is unclear.
- Areas of potential environmental concern identified by the desktop review included:
  - possible demolition materials across the site
  - stressed vegetation in the northern part of the site
  - Potential hydrocarbon impact in the southern part of the site

A limited soil and groundwater sampling investigation was carried out as part of the preliminary investigation that included the following:

- Collection and laboratory analysis of soil samples from 24 locations across Lots 4 and 5
- Installation of groundwater monitoring wells to assess the condition of shallow groundwater flowing towards Harris Creek and Heathcote Road

No details of the soil and groundwater sampling were available for review in the Site Audit Summary (Ryal 2000).

6.1.2 Detailed site investigation

Site Audit Summary (Ryal 2000) provided details of an intrusive investigation carried out in Lots 4 and 5 by Woodward-Clyde in 2000. The investigation included the following:

- Collection of soil samples from 93 locations. No plans are available to confirm the sample locations
- Screening of all samples in the field using a photoionisation detector (PID) to detect the presence of volatile organic compounds (VOCs)
- Samples were chemically analysed for a suite of contaminants of potential concern including heavy metals, organochlorine pesticides (OCPs), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), petroleum hydrocarbons, and benzene, toluene, ethylbenzene and xylenes (BTEX).
- All soil samples analysed during the investigation contained concentrations of heavy metals. One of the samples contained arsenic that exceeded the provisional phytotoxicity-based investigation level for residential use (NEPM 1999), which has since been superseded by NEPM 2013.
- On Lot 5, petroleum hydrocarbons were detected in two soil samples (L5TP01 and PT021) at concentrations of 616 mg/kg for C15-C36 and 210 mg/kg for C15-C36, respectively. No plans are available to confirm the location of these samples.
- No BTEX compounds were detected in any of the soil samples submitted for analysis.
- No concentrations above the laboratory limit of detection were identified for OCPs, OPPs, PCBs and SVOCs in soil samples analysed.
- Concentrations of PAHs were detected in three soil samples from Lot 5, of which the peak concentration was identified in soil form the southwest part of Lot 5 at 19.5 mg/kg for total PAHs and 4.2 mg/kg for benzo(a)pyrene, which were less than the adopted criteria of 100 mg/kg total PAHs and 5 mg/kg benzo(a)pyrene for residential land use (NEPM 1999, which has since been superseded by NEPM 2013)
- No asbestos fibres were detected in any of the soil samples submitted for analysis
- Analysis of groundwater samples did not identify any significant concentrations of contaminants of potential concern.

6.1.3 Conclusions of Site Audit Summary (Ryal 2000)

In summary, the Site Audit Summary (Ryal 2000) provided the following conclusions:

- The scope of works completed during the preliminary and detailed site investigations conform with the requirements of NSW EPA (1997) *Guidelines for Consultants Reporting on Contaminated Sites* (which has since been superseded by EPA guidelines published in 2011)
- With respect to Lot 5, Woodward-Clyde concluded that "…*this area, currently proposed to be rezoned to commercial usage with the potential for some/all of the Lot to be rezoned to allow residential dwellings, is suitable for these purposes without the need for further environmental investigation or remedial works*".
- The Site Auditor, in regards to Lot 5, indicated that the elevated concentration of benzo(a)pyrene of 4.2 mg/kg detected in the southwest part of Lot 5 exceeded the health-based investigation level of 1 mg/kg for residential land for a scenario where occupiers would have access to soil. The Auditor suggested that additional investigation and possible remediation would be required in this part of the site before it could be used for residential purposes.
- It was the opinion of the Site Auditor that Lot 5 could be developed for residential use where occupiers have minimal access to soil, such as high-rise apartments, flats or town houses, where the existing soil is covered by permanent structures such as building slabs, roadways and pavements.

7. Preliminary conceptual site model

Based on the current information, the following preliminary contamination conceptual site model (CSM) has been developed for the site.

7.1 Sources

- Potential historical use of uncontrolled fill materials at the site of unknown origin and quality including:
  - Potential unclassified fill material imported to the site and used for possible construction of the nearby road. Information contained on the *Site Audit Report* (Ryal, 2000) noted that stockpiles part of the MacArthur Drive construction may have been deposited on site.
  - Review of historical aerial photographs, indicated the property had remained primarily vacant traversed by a road to the west of the site until the 1970s when a structure (possible Post Office) appears to have been constructed on site. The road transecting the site appears to have been realigned to the west, outside the boundary of the site, around the 1980s.
  - PAHs in soil in the southwest part of the site
- Potential hazardous building materials including, potential asbestos-containing materials from uncontrolled demolition of former structures on-site;
  - A possible Post Office building was constructed on site around the 1970s and demolished in 1990s'.
- Potential off-site sources of contamination:
  - Possible hydrocarbon impact of soil and groundwater related to historical fuel storage in USTs on land to the south of the site (however, no plans are available to confirm the exact location of the former USTs)
  - Contamination associated historical railway activities adjacent to the site to the south.

7.2 Contaminants of potential concern

Contaminants of potential concern associated with the sources of contamination listed above include:

- Heavy metals
- Total Recoverable Hydrocarbons (TRH)
- Benzene Toluene Ethylbenzene and Xylenes (BTEX)
- Polycyclic Aromatic Hydrocarbons (PAH)
- Asbestos

7.3 Potential receptors

When evaluating potential adverse health and environmental effects from exposure to a contaminated site, all potentially exposed populations should be considered. For this site, the key populations and receptors of interest are considered to include:

- Onsite future residential and commercial occupants of the site

- Future construction workers during the development;
- Future intrusive maintenance workers;
- Neighbouring property users (residential / commercial); and
- Ecological receptors (Williams Creek, flora and fauna within the site).

7.4 Potential exposure pathways

The primary potential pathways by which receptors could be exposed to potential sources of contamination at the site are considered to be:

- Direct contact or inhalation with contaminated fill materials
- Ingestion of soils and dust
- Vertical and horizontal migration through the unsaturated zone into the saturated zone and horizontal migration into the groundwater/surface waters

7.5 Potential Source-Pathway-Receptor Linkages

Based on the current information, a preliminary conceptual site model (CSM) has been developed as presented in **Table 6**. The CSM shows the source-pathway-receptors linkages identified for the site and a discussion on where they are likely to be complete.

Table 6 – Conceptual site model

Source	Contaminants of potential concern (CoPC)	Potential Pathways	Potential Receptors	Linkage complete?
Fill material beneath the site	• Heavy metals, TRHs, BTEX, PAHs, OCPs, OPPs and asbestos.	Human exposure: • Direct contact or inhalation with contaminated soils • Ingestion of soils and dust. • Direct contact with groundwater Environmental exposure: • Surface Water runoff (on and off site). • Vertical migration through the unsaturated zone into groundwater and migration to Williams Creek.	Human: • Onsite future residential occupants of the site; • Construction workers during the development; • Future intrusive maintenance workers; • Neighbouring property users (residential / commercial with gardens); and Environmental: • Ecological receptors (Williams Creek, flora and fauna within the site).	**Potential** – Heavy metals, petroleum hydrocarbons, PAHs and benzo(a)pyrene, were detected on soil samples in the southwest part of Lot 5 during previous investigations. GHD note site plans of sampling locations or laboratory analytical from previous investigations were not available at the time of reporting. There is a potential linkage to contaminated soils on site for accessible soils (if any) of the proposed development.

8. Conclusions

GHD was commissioned by to conduct a PSI for Lot 5 of DP 825745 located at 2 MacArthur Drive, Holsworthy, NSW 2173.

GHD conducted a site inspection on Tuesday 13 December 2016 and a desktop review of available historical aerial photographs, previous investigation reports, regulatory information, as well as a search of accessible NSW EPA environmental database for information related to the contamination status of the site.

In accordance with the objectives detailed in **Section 1.2**, and based on the information contained within this assessment, the following conclusions are made (subject to the limitations outlines in **Section 11**):

- Review of historical aerial photographs, indicated the property had remained primarily vacant traversed by a road to the west of the site until the 1970' s when a possible Post Office building was constructed on site.
- The road transecting the site appears to have been relocated to the west outside the boundary of the site around the 1980s' and the building (possible Post Office) demolished by 1990s'. The site has reportedly remained vacant since this time.
- The *Liverpool City Council Local Environmental Plan 2008* indicates the site is within an area of Class 5 Acid Sulfate Soils. Acid sulfate soils are not typically found in Class 5 areas. Works in a class 5 area that are likely to lower the water table below 1 metre AHD on adjacent class 1, 2, 3 or 4 land will trigger the requirement for assessment and may require management.
- A search of the SafeWork NSW dangerous goods database on 13 December 2016 did not identified any records pertaining to the site
- Approximately 1 hectare of the midsection of the site has been excavated to approximately 3 metres below the surround ground level and surface compacted with gravelly material. Previous investigations indicated that the site had been excavated to the level of a basement of a proposed retail and residential development
- A site inspection by GHD on 13 December 2016 did not identify any obvious indication of significant contamination at the site, although minor illegal dumping of rubbish was noted in places. Parts of the site were inaccessible for inspection due to dense vegetation cover.
- Previous investigation of the site undertaken in 2000 identified PAH in soils in the southwest portion of the site above the NEPM 1999 health investigation levels for residential use; however, given the lapse in time since the previous investigation it is unclear whether these concentrations are still present in the soil.
- Previous investigation of the site identified potential for hydrocarbon impact of soil and groundwater at the site related to historical fuel storage in USTs on land to the south of the site. No plans were available during this PSI for GHD to confirm the exact location of the former USTs and as such the potential impact on the site.
- A *Summary Site Audit* (Ryal, 2000) has previously been prepared for Lots 4 and 5 of DP 825745. Current cadastral plans indicate Lot 4 no longer exists and we assume it forms part of the residential development located to the northwest of Lot 5. Also, only a partial copy of the Summary Site Audit was available for review by GHD as part of this PSI.

- The site audit concluded that the elevated concentration of PAH identified in soil in the south-western part of Lot 5 exceeded the health-based investigation level for residential land for a scenario where occupiers would have access to soil. The auditor suggested that additional investigation and possible remediation would be required in this part of the site before it could be used for residential purposes.
- It was the opinion of the Site Auditor that Lot 5 could be developed for residential use where occupiers have minimal access to soil, such as high-rise apartments, flats or town houses, where the existing soil is covered by permanent structures such as building slabs, roadways and pavements. GHD notes that NSW EPA environmental guidelines have been updated since the auditor completed their review.
- Based on the current information, GHD considers there is a potential for contamination to be present at the site and complete source-pathway-receptors linkages for future residential/commercial development.

9. Recommendations

Based on the findings of this PSI, GHD recommend the following be completed:

- A review of the following previous investigation reports be carried out if the entire reports, including analytical results, figures and appendix, become available:
  - *Phase 1, Preliminary Phase 2 and Geotechnical Investigations (Woodward-Clyde 1999)*
  - *Supplementary Environmental Investigations (Woodward-Clyde 2000)*
  - *Site Audit Statement WRR55 (Ryal 2000)*
  - *Site Audit Statement WRR68 (Ryal 2000)*
- Comparison of previous analytical results (if available) with current health and ecological investigation levels (NEPC 2013) suitable for the proposed residential and commercial land use
- In the absence of recent investigation data, an intrusive investigation should be carried out to confirm whether contamination is present at the site. The investigation should focus on the areas of potential contamination identified during this PSI with the findings of the investigation reporting in accordance with the *NSW OEH Guidelines for Consultants Reporting on Contaminated* Sites (2011)
- If contamination is identified at the site that could pose a significant risk to human health or the environment, an Environmental Management Plan (EMP) or Remediation Action Plan (RAP) should be prepared with measures to mitigate that risk
- If remediation of contamination is to be carried out at the site, it is likely that the work will be classified as Category 1 under SEPP55, since it is being completed as part of a designated development. Category 1 remediation works requires consent from the local planning authority
- Any contaminated soil removed from the site during the proposed development should be classified in accordance with *NSW EPA Waste Classification Guidelines (2014)* and disposed of at a suitable licensed waste facility

10. References

- National Environment Protection Council (NEPC) (1999, Amended 2013). National Environment Protection (Assessment of Site Contamination) Amendment Measure (No. 1)
- Soil Conservation Service of NSW 1:100,000 Soil Landscape Series Sheet S1 56-5
- The 1:2,000,000 Groundwater in New South Wales, Assessment of Pollution Risk Map
- WR Ryal (2000), Kokoda Fields Holsworthy, Summary Site Audit, dated, 7 February 2000
- The Liverpool City Council Local Environmental Plan (2008), Acid Sulfate Soils Map
- NSW OEH (2011). Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites
- NSW EPA (2015). Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997
- Department of Urban Affairs and Planning (1998), State Environment Protection Policy 55 (SEPP 55) – Remediation of Land

11. Limitations

This report: has been prepared by GHD for Architectus Sydney Pty Ltd and may only be used and relied on by Architectus Sydney Pty Ltd for the purpose agreed between GHD and Architectus Sydney Pty Ltd as set out in **Section 1.2** of this report.

GHD otherwise disclaims responsibility to any person other than Architectus Sydney Pty Ltd arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by Architectus Sydney Pty Ltd and others who provided information to GHD (including Government authorities)], which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

Appendices

Appendix A – Figures

Figure 1 – Site Location Plan

Figure 2 – Site Layout Plan

Figure 3 – Acid Sulfate Soil Risk Map

Figure 4 – Soil Landscape

Figure 5 - Geology

LEGEND

- Site Boundary (Approximate)
- Streets
- Waterways

Paper Size A4

0 35 70 140 210 280

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Holsworthy Shopping Centre Pty Ltd
Preliminary Site Investigation
2 Macarthur Drive, Holsworthy, NSW, 2173

Job Number 21-26038
Revision 0
Date 07 Dec 2016

Site Location

Figure 1

\\ghdnet\ghd\AU\Sydney\Projects\21\26038\GIS\Maps\Deliverables\21_26038_Z001_SiteLocation.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - ©Land and Property Information (Extracted: 07/12/16); Streets, Waterways - NSW LPI 2012 DTDB. Created by:fcheong

LEGEND

- Site Boundary (Approximate)
- Streets
- Waterways

Paper Size A4

0 5 10 20 30 40

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Holsworthy Shopping Centre Pty Ltd
Preliminary Site Investigation
2 Macarthur Drive, Holsworthy, NSW, 2173

Job Number 21-26038
Revision 0
Date 07 Dec 2016

Site Layout

Figure 2

\\ghdnet\ghd\AU\Sydney\Projects\21\26038\GIS\Maps\Deliverables\21_26038_Z002_SiteLayout.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - ©Land and Property Information (Extracted: 07/12/16); Streets, Waterways - NSW LPI 2012 DTDB. Created by:fcheong

LEGEND

- Site Boundary (Approximate)
- Waterways
- Streets

Paper Size A4

0 35 70 140 210 280

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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2 Macarthur Drive, Holsworthy, NSW, 2173

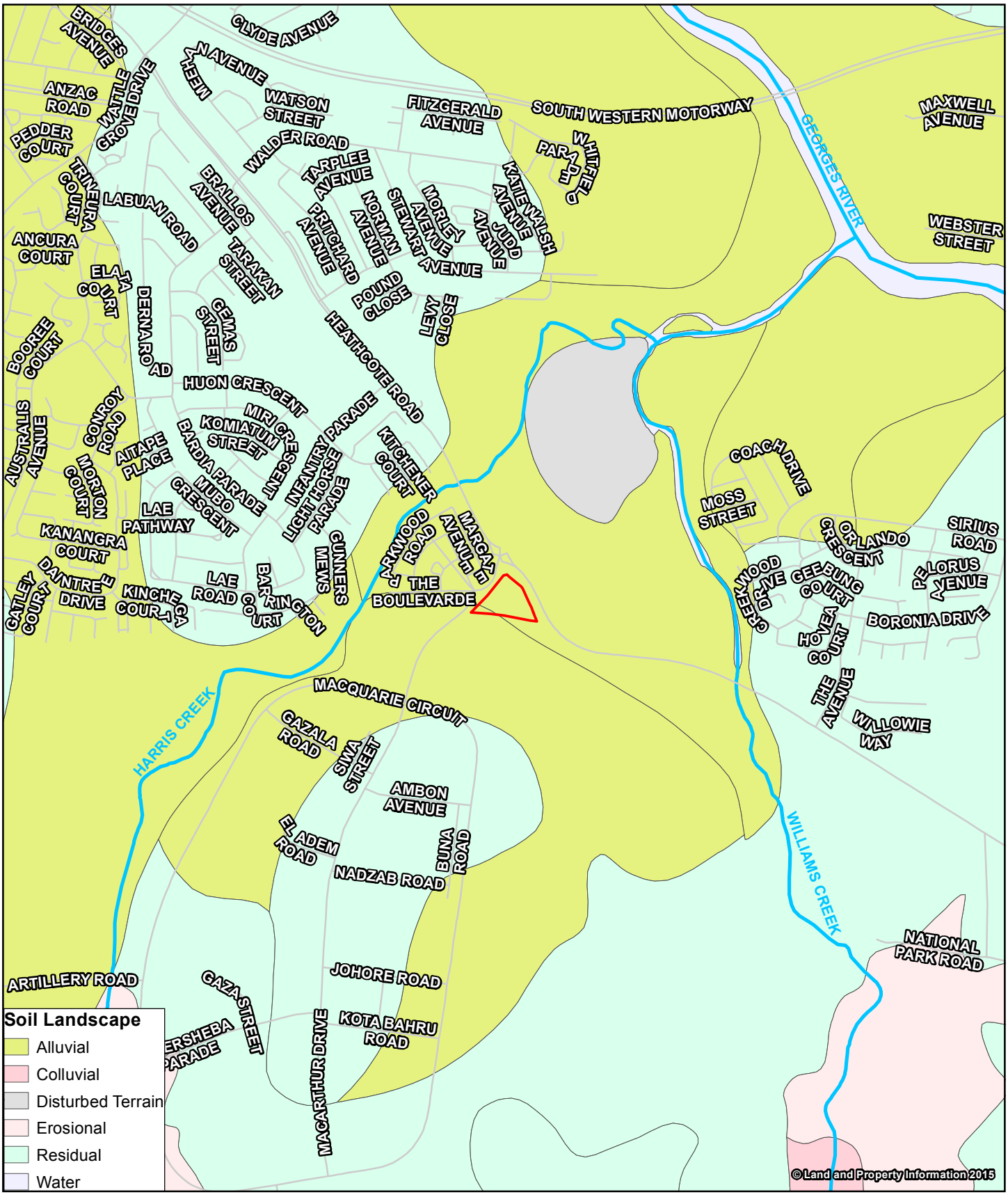
Job Number 21-26038
Revision 0
Date 07 Dec 2016

Acid Sulfate Soil Risk

Figure 3

\\ghdnet\ghd\AU\Sydney\Projects\21\26038\GIS\Maps\Deliverables\21_26038_Z003_AcidSulfateSoils.mxd Level 15, 133 Castlereagh Street Sydney NSW 2000 T 61 2 9239 7100 F 61 2 9239 7199 E sydmail@ghd.com.au W www.ghd.com.au

Data source: Imagery - ©Land and Property Information (Extracted: 07/12/16); Streets, Waterways - NSW LPI 2012 DTDB; ASS - NSW OEH 2013. Created by:fcheong



LEGEND

- Streets
- Site Boundary (Approximate)
- Waterways

Paper Size A4

0 65 130 260 390 520

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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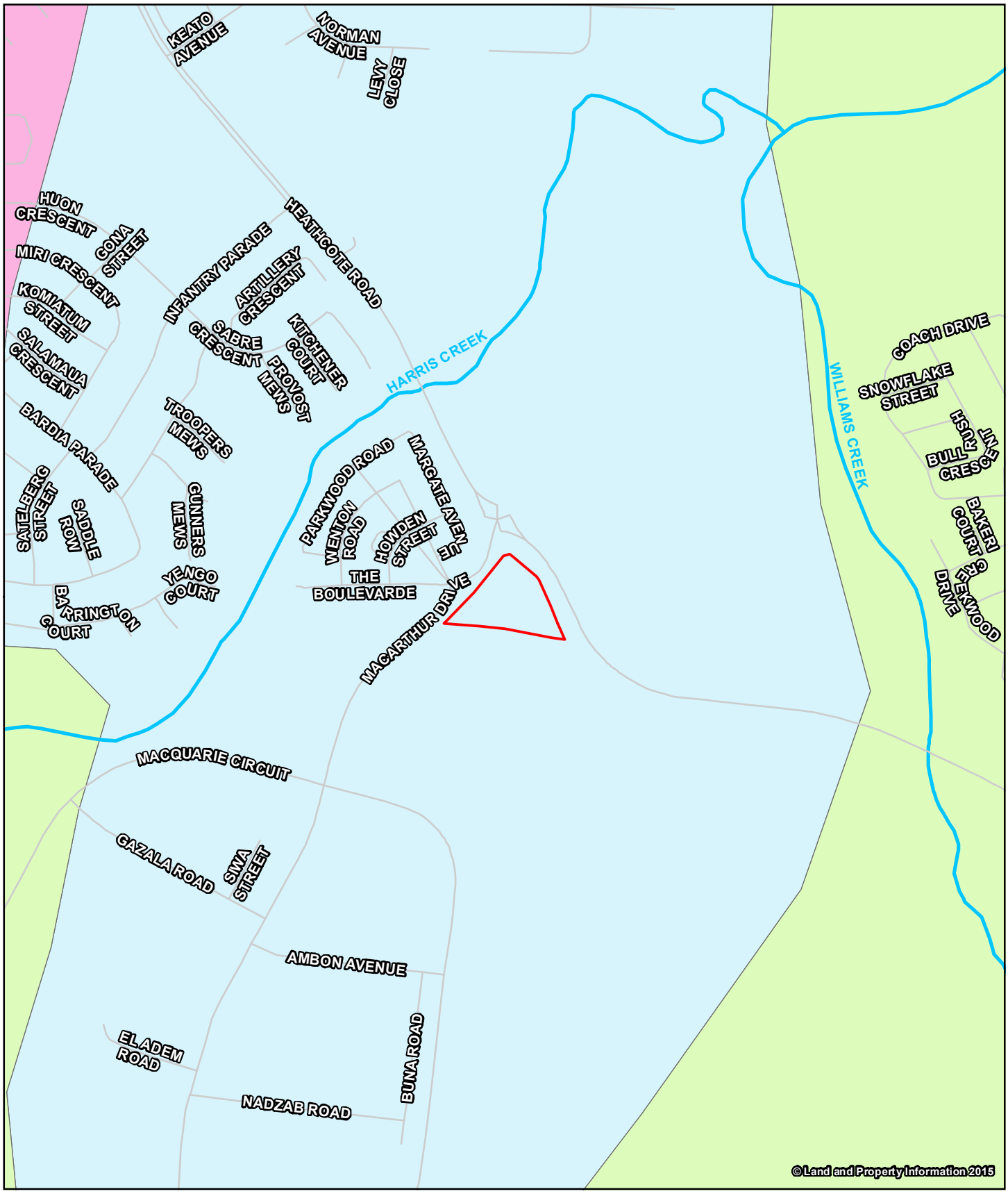
Date 07 Dec 2016

Soil Landscape

Figure 4

Data source: Imagery - ©Land and Property Information (Extracted: 07/12/16); Streets, Waterways - NSW LPI 2012 DTDB; Soil Landscape - NSW OEH 2010. Created by:fcheong



LEGEND

Site Boundary (Approximate)

Streets

Waterways

Geology

Hawkesbury Sandstone - *Sandstone, quartz, with some shale*

Bringelly Shale, Minchinbury Sandstone, Ashfield Shale - *Shale with some sandstone beds*

Tertiary - *Sand, silt, clay and gravel*

Paper Size A4

0 35 70 140 210 280

Metres

Map Projection: Transverse Mercator

Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 56

N

Holsworthy Shopping Centre Pty Ltd

Preliminary Site Investigation

2 Macarthur Drive, Holsworthy, NSW, 2173

Job Number 21-26038

Revision 0

Date 10 Jan 2017

Geology

Figure 5

N:\AU\Sydney\Projects\21\26038\GIS\Maps\Deliverables\21_26038_Z005_Geological.mxd

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Data source: Imagery - ©Land and Property Information (Extracted: 10/01/17); Streets, Waterways - NSW LPI 2012 DTDB; Geology - NSW DPI. Created by:mking3

Appendix B – Site Inspection Photographs

Photograph 1 – Excavated and compacted gravel on the midsection of the site (Eastern view).

Photograph 2 – Excavated and compacted gravel on the midsection of the site (Southern view).

Photograph 3 – Western boundary of the site scrap materials.

Photograph 4 – Western boundary of the site redundant hot water system.

Photograph 5 – Heathcote Road in distance (Northern view).

Photograph 6 – Overgrown vegetation (Northern view).

Appendix C – Groundwater Bore Search

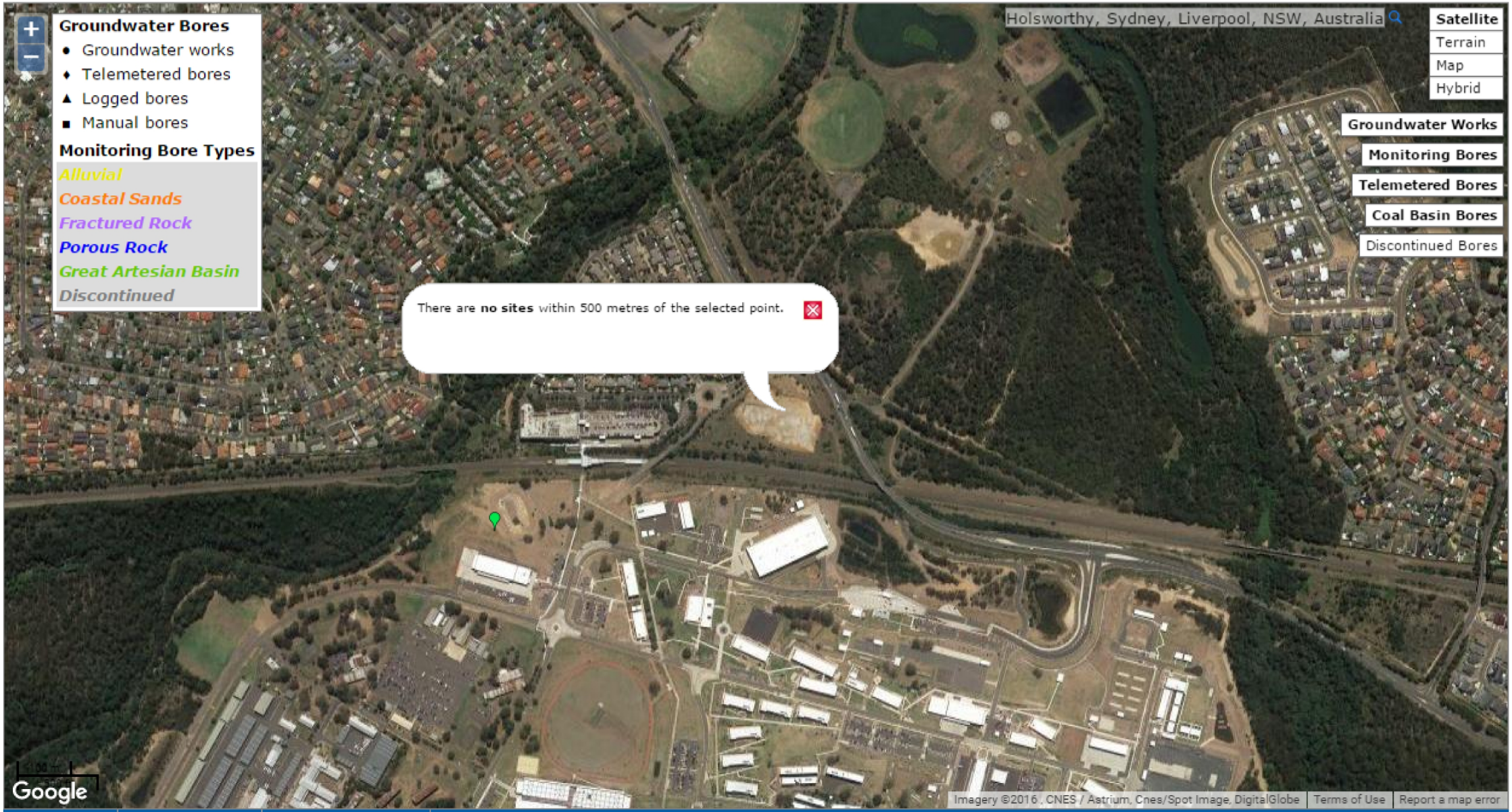
All Groundwater

All Groundwater Map

bookmark this page

All data times are Eastern Standard Time

Map | Info



Scale = 1 : 6771

NSW Office of Water
Work Summary

GW107018

Licence: 10BL164983 **Licence Status:** LAPSED

Authorised Purpose(s): TEST BORE
Intended Purpose(s): RECREATION (GROUNDWATER)

Work Type: Bore
Work Status:
Construct.Method: Rotary
Owner Type:

Commenced Date: **Final Depth:** 150.00 m
Completion Date: 12/04/2005 **Drilled Depth:** 180.50 m

Contractor Name: INTERTEC DRILLING SERVICES
Driller: William Crump
Assistant Driller:

Property: HAMMONDVILLE SPORT COMPLEX HEATHCOTE RD HAMMONDVILLE 2170 NSW **Standing Water Level:** 5.500
GWMA: - **Salinity:**
GW Zone: - **Yield:** 1.200

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	CUMBE	CUMBE.24	2 747513
Licensed:	CUMBERLAND	HOLSWORTHY	Whole Lot 2//747513

Region: 10 - Sydney South Coast **CMA Map:**
River Basin: - Unknown **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6240818.0 **Latitude:** 33°57'22.4"S
Elevation Source: Unknown **Easting:** 311237.0 **Longitude:** 150°57'25.8"E

GS Map: - **MGA Zone:** 0 **Coordinate Source:** Unknown

Construction

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

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	2.50	203			Rotary Air
1		Hole	Hole	2.50	138.00	165			Down Hole Hammer
1		Hole	Hole	138.00	180.50	161			Down Hole Hammer
1	1	Casing	Steel	-0.50	0.00	168	158		Other, Welded
1	1	Casing	Steel	-0.40	63.80	127	117		Suspended in Clamps, Welded

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
11.30	11.40	0.10	Unknown			0.30	12.50		8470.00
25.50	27.00	1.50	Unknown			0.55	30.50		6850.00
66.20	67.00	0.80	Unknown	5.50		2.15	72.50		4310.00
79.00	79.20	0.20	Unknown			1.20	84.50		3950.00
105.50	105.80	0.30	Unknown			0.80	120.50		3800.00

Geologists Log

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.00	3.00	Clay brown	Clay	
3.00	8.00	5.00	SHALE	Shale	
8.00	11.30	3.30	SANDSTONE GREY	Sandstone	
11.30	11.40	0.10	SANDSTONE FRACTURED	Sandstone	
11.40	25.50	14.10	SANDSTONE/SHALE BANDS	Sandstone	
25.50	27.00	1.50	SANDSTONE/QUARTZ	Sandstone	
27.00	34.00	7.00	SANDSTONE/SHALE BEDDING	Sandstone	
34.00	57.00	23.00	SANDSTONE GREY	Sandstone	
57.00	58.00	1.00	SANDSTONE/SOFT CLAY	Sandstone	
58.00	61.00	3.00	SANDSTONE/SHALE BEDDING	Sandstone	
61.00	66.20	5.20	SANDSTONE GREY	Sandstone	
66.20	67.00	0.80	SANDSTONE V/FRACTURED	Sandstone	
67.00	69.00	2.00	SANDSTONE SOFT	Sandstone	
69.00	71.50	2.50	SANDSTONE SHALE BEDDING	Sandstone	
71.50	79.00	7.50	SANDSTONE GREY	Sandstone	
79.00	79.20	0.20	SANDSTONE FRACTURED	Sandstone	
79.20	102.50	23.30	SANDSTONE GREY	Sandstone	
102.50	102.60	0.10	SANDSTONE FRACTURED	Sandstone	
102.60	105.50	2.90	SANDSTONE GREY	Sandstone	
105.50	105.80	0.30	SANDSTONE FRACTURED	Sandstone	
105.80	110.50	4.70	SANDSTONE GREY	Sandstone	
110.50	111.00	0.50	SANDSTONE QUARTZ	Sandstone	
111.00	146.00	35.00	SANDSTONE GREY	Sandstone	
146.00	147.00	1.00	SANDSTONE FINE QUARTZ	Sandstone	
147.00	180.50	33.50	SANDSTONE GREY	Sandstone	

Remarks

18/12/2008: Previous Lic No:10BL164983

***** End of GW107018 *****

Appendix D – Historical Aerial Photographs

LEGEND

Site Boundary (Approximate)

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

GHD

Holsworthy Shopping Centre Pty Ltd
Preliminary Site Investigation
2 Macarthur Drive, Holsworthy, NSW, 2173

Job Number 21-26038
Revision 0
Date 08 Dec 2016

Aerial Photograph - 1930

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - NSW Department of Lands. Created by:fcheong

LEGEND

Site Boundary (Approximate)

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Job Number 21-26038
Revision 0
Date 08 Dec 2016

Aerial Photograph - 1951

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - NSW Department of Lands. Created by:fcheong

LEGEND

Site Boundary (Approximate)

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Job Number 21-26038
Revision 0
Date 08 Dec 2016

Aerial Photograph - 1965

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - NSW Department of Lands. Created by:fcheong

LEGEND

Site Boundary (Approximate)

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Job Number 21-26038
Revision 0
Date 08 Dec 2016

Aerial Photograph - 1979

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - NSW Department of Lands. Created by:fcheong

LEGEND

Site Boundary (Approximate)

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Job Number 21-26038
Revision 0
Date 08 Dec 2016

Aerial Photograph - 1982

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

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Data source: Imagery - NSW Department of Lands. Created by:fcheong

LEGEND

Site Boundary (Approximate)

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Date 08 Dec 2016

Aerial Photograph - 1986

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

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Data source: Imagery - NSW Department of Lands. Created by:fcheong

LEGEND

Site Boundary (Approximate)

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Job Number	21-26038
Revision	0
Date	08 Dec 2016

Aerial Photograph - 1991

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - NSW Department of Lands. Created by:fcheong

Paper Size A4

0 25 50 100 150 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

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Job Number	21-26038
Revision	0
Date	08 Dec 2016

Aerial Photograph - 2016

G:\21\26038\GIS\Maps\Deliverables\21_26038_Z006_HistoricalAerials.mxd

Level 15, 133 Castlereagh Street Sydney NSW 2000 **T** 61 2 9239 7100 **F** 61 2 9239 7199 **E** sydmail@ghd.com.au **W** www.ghd.com.au

Data source: Imagery - NSW Department of Lands. Created by:fcheong

Appendix E – EPA / OEH Regulatory Searches

Contaminated land

+ Management of contaminated land
+ Consultants and site auditor scheme
+ Underground petroleum storage systems
Guidelines under the CLM Act
NEPM amendment
+ Further guidance
– Record of notices
About the record
Search the record
Search tips
Disclaimer
List of NSW contaminated sites notified to EPA
Frequently asked questions
Forms
+ Other contamination issues
+ Contaminated Land Management Program

Search results

Your search for: LGA: Liverpool City Council

Matched 12 notices relating to 2 sites.

Search Again Refine Search

Suburb	Address	Site Name	Notices related to this site
CHIPPING NORTON	85-107 Alfred STREET	Former ACR	3 current
MOOREBANK	(a) 1 Bapaume ROAD	ABB Australia Pty Ltd	1 current and 8 former

Page 1 of 1

9 December 2016

GHD

Level 15
133 Castlereagh Street
T: 61 2 9239 7100 F: 61 2 9239 7199 E: sydmail@ghd.com

https://projects.ghd.com/oc/Sydney/kokodafieldspsi/Delivery/Documents/2126038 - REP_PSI_Kokoda Fields_Final.docx

Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
Draft	M. Torres V. Wilton	J. Hallchurch	-	J. Hallchurch	-	11 Jan 2016
Final	M. Torres V. Wilton	J. Hallchurch		J. Hallchurch		17 July 2017

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