Preliminary Site Investigation

Landcom via
Hughes Trueman

Airds Bradbury Renewal Project
Airds, NSW

March 2009
JBS 40719-12908
JBS Environmental Pty Ltd

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List of Abbreviations

A list of the common abbreviations used throughout this report is provided below.

AHD	Australian Height Datum
As	Arsenic
bgs	below ground surface
Cd	Cadmium
CSM	Conceptual site model
Cr	Chromium
Cu	Copper
BTEX	Benzene, toluene, ethylbenzene and xylenes
B(a)P	Benzo(a)pyrene
DECC	NSW Department of Environment and Climate Change
DQOs	Data Quality Objectives
DWE	NSW Department of Water and Energy
EMP	Environmental Management Plan
EPA	NSW Environment Protection Authority
GILs	Groundwater investigation levels
Ha	Hectare
Hg	Mercury
HIL	Health based investigation level
JBS	JBS Environmental
LOR	Limit of Reporting
Mn	Manganese
Ni	Nickel
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PBIL	Phytotoxicity based investigation level
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RAP	Remedial Action Plan
RPD	Relative Percentage Difference
SAQP	Sampling, Analysis and Quality Plan
SPLP	Synthetic Precipitation Leaching Procedure
TCLP	Toxic Characteristic Leaching Potential
TPH	Total Petroleum Hydrocarbons
WQOs	Water Quality Objectives
Zn	Zinc

Executive Summary

Introduction and Objectives

JBS Environmental Pty Ltd was engaged by Landcom via Hughes Trueman to conduct a Preliminary Site Investigation for the Airds Bradbury Renewal Project, NSW (the site). The site forms part of the area bound by Georges River Rd, St Johns Rd, Greengate Rd and Georges River Parkway Reserve and is proposed to be redeveloped for a range of standard residential and open space uses. The site has a total area in the order of 200 hectares (ha) and includes the Smiths Creek Bypass Corridor, and the entire Airds Bradbury public housing area (1,550 dwellings).

The objectives of the investigation are:

- to document the history of the site to identify areas of environmental concern and contaminants of potential concern associated with the current and former landuses;
- to conduct limited sampling and analysis to confirm the findings of the site history review; and
- to draw preliminary conclusions regarding the likely suitability of the site from a contamination viewpoint, for the proposed uses, or, make recommendations to enable such conclusions to be drawn.

The investigation was conducted in general accordance with relevant NSW Department of Environment and Climate Change guidelines.

Site Description

The site is predominantly residential areas situated around a number of reserves, parks and open spaces. A shallow depression runs north-south through the western portion of the site in the vicinity of former Smiths Creek, and a ridge runs through the central portion of the site. Airds Village, several schools, a juvenile justice centre and other commercial properties are located in the central Airds area but are considered to be outside of the site boundary.

Site History

The area was used for farming from the early 1800s to the 1970s, with an occasional residence or commercial property. In the 1970s, much of the area was subdivided into housing estate, with a number of schools established. In the 1980s, residential development continued, as did the development of the commercial area within Airds.

Conclusions

Based on the findings of this investigation and subject to the limitations in **Section 10**, the following conclusions are made:

- Based on the site history and site inspection, the following areas of environmental concern and associated contaminants of potential concern have been identified (**Table 1**).

Table 1 Areas of Environmental Concern and Associated Contaminants of Potential Concern

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Areas in the vicinity of the (offsite) Service Station on Riverside Dr	Heavy metals, TPH/BTEX, PAHs
Dam adjacent to Airds High School	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, asbestos
Baden Powell Reserve, Riley Park, Kevin Wheatley Reserve, KL Jarvis Field and Merino Park	Heavy metals, OCP/OPPs, asbestos
Current residential buildings across the site	Heavy metals, asbestos
Fill material historically used across the site	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, PCBs, asbestos
Former dams and creeklines along the western portion of the site, adjacent to Woolwash Rd, Boonoke Wy and Peppin Cr.	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, PCBs, asbestos
Former market gardens in the northern central portion of the site	Heavy metals, OCPs
Former orchards in the central eastern and southern portions of the site	Heavy metals, OCPs
Former sheds and buildings circa 1970	Heavy metals, asbestos

- The service station on Riverside Dr, the bus depot and substation adjacent to the western site boundary are considered to be potential offsite sources of contamination. Based on the likely presence of petroleum storage in aboveground or underground tanks at the service station and depot, and of potential PCBs in transformers and capacitors at the substation, these facilities have to potential to impact the site predominantly via migration of potentially contaminated groundwater. Given the inferred easterly groundwater flow in the western portion of the site, the bus depot and substation may potentially impact the northwestern portion of the site. The service station is located on a slope with a westerly aspect, and inferred groundwater flow in this area is to the west towards the Smiths Creek Bypass Corridor. Thus the area which may be potentially impacted is the area west of the service station, in the vicinity of the dam.
- Single fragments of suspected asbestos containing material (ACM) were identified on the ground surface in Baden Powell Reserve and in Merino Park. Suspected ACM was identified in surficial fill material in the vicinity of the Prell Precinct. No asbestos fibres were identified in soil at the site. Building rubble was identified in the central portion of the site, in Kevin Wheatley Reserve, Southdown Precinct, Prell Precinct, Creigan Precinct, Faithfull Precinct, and in testpits within the Smiths Creek Bypass Corridor and Baden Powell Reserve indicating a likelihood of further potential ACM impact. It is noted that limited sampling was able to be conducted within the residential precincts, which are considered to be the main areas of concern with respect to the potential presence of asbestos at the site.
- The site did not report any concentrations of metals, TPH/BTEX, PAHs, OCP/OPPs or PCBs above the adopted criteria indicating that these do not pose a widespread contamination issue in the parts of the site which were accessible for sampling.
- The investigation has identified that the main contamination issue at the site is asbestos, which is present as fragments of ACM on the ground surface and in fill materials. The extent of asbestos impact at the site will require to be assessed through a detailed site investigation process, and appropriate remediation/ management plans developed to outline the steps required to make the site suitable for the proposed development.

Recommendations

It is recommended that, at each stage of the proposed development, a detailed site investigation be undertaken based on the findings of this preliminary investigation. Where a detailed site investigation identifies contamination at levels which pose a risk under the proposed land use(s), then these are required to be addressed through the planning process in accordance with current regulatory requirements.

1 Introduction

1.1 Background and Objectives

JBS Environmental Pty Ltd was engaged by Landcom via Hughes Trueman to conduct a Preliminary Site Investigation for the Airds Bradbury Renewal Project, NSW (the site). The site forms part of the area bound by Georges River Rd, St Johns Rd, Greengate Rd and Georges River Parkway Reserve and is proposed to be redeveloped for a range of standard residential and open space uses. The site has a total area in the order of 200 hectares (ha) and includes the Smiths Creek Bypass Corridor, and the entire Airds Bradbury public housing area (1,550 dwellings).

The objectives of the investigation are:

- to document the history of the site to identify areas of environmental concern and contaminants of potential concern associated with the current and former landuses;
- to conduct limited sampling and analysis to confirm the findings of the site history review; and
- to draw preliminary conclusions regarding the likely suitability of the site from a contamination viewpoint, for the proposed uses, or, make recommendations to enable such conclusions to be drawn.

The investigation was conducted in general accordance with relevant NSW Department of Environment and Climate Change (DECC) guidelines (**Section 6**).

1.2 Scope of Work

The scope of work comprised:

- Review of available information relating to the historic and current uses of the site, to identify areas of environmental concern and associated contaminants of potential concern (COPCs);
- A detailed inspection of accessible areas of the site, to confirm the findings of the historical review and identify any additional areas of concern;
- Limited soil sampling via testpits and hand augers from 77 currently accessible locations targeting identified areas of concern and associated COPCs;
- Analysis of selected soil samples at a laboratory NATA certified for total petroleum hydrocarbons (TPH), benzene, toluene, ethylbenzene and xylenes (BTEX) compounds, polycyclic aromatic hydrocarbons (PAHs), heavy metals, organochlorine and organophosphate pesticides (OCP/OPPs), polychlorinated biphenyls (PCBs) and asbestos; and
- Preparation of a Preliminary Site Investigation report in general accordance with relevant DECC Guidelines.

2 Site Condition & Surrounding Environment

2.1 Site Identification

The Airds Bradbury Renewal Project is located approximately 3 km south east of Campbelltown. The project covers an irregular shaped area of approximately 200 ha. The project area is bound by Georges River Rd to the north, Saint Johns Rd to the west, Greengate Rd to the south and Georges River Parkway Reserve to the east.

The location of the site is shown in **Figure 1**. The site layout is shown in **Figure 2**. The site details are summarised in **Table 2.1** and described in detail in the following sections.

Table 2.1 Summary Site Details

Address	Between Georges River Rd, St Johns Rd, Greengate Rd and Georges River Parkway Reserve.
Lot / DP	Consists of over 700 separate Lots. Refer to **Appendix A** for specific Lot and DP identification.
Local Government Authority	Campbelltown City Council
Site Zoning	2(b) – Residential B Zone 5(e) – Special Uses Public Purposes Corridor Zone 6(a) – Local Open Space Zone 9 – Community Uses 10(c) - Local Comprehensive Centre Zone
Current Use	Mixed medium and low density housing and open spaces.
Previous Use	Prior to be developed for residential and open space purposes, the area was primarily rural land with occasional residential or commercial properties.
Proposed Use	Mix of standard residential and open space.
Site Area	Approximately 200 ha

The site does not include the following privately owned properties located within the area:

- Reiby Juvenile Justice Centre (Lot 1 DP499776)
- Briar Rd Public School (Lot 1 DP223302)
- Airds High School (Lots 1 and 2 DP792129)
- Petrol station (Lot 748 DP259553)
- Indoor Sports Centre (Lot 751 DP259553)
- Hotel adjacent to Airds Village (Lots 745 and 747 DP259553)
- Airds Village Shopping Centre (Lot 744 DP259553)
- Tennis Court adjacent to Airds Village (Lot 302 DP1000732)
- Tharawal Aboriginal Cooperative (Lot 2 DP537620)
- Privately owned residential area west of Templeton Precinct (Lots 6601 to 6613 DP251263, Lots 8201 to 8218 DP251262, Lots 8301 to 8321 DP251264)
- Privately owned residential area west of Rawdon Precinct (Lots 8059 to 8079 DP1063276).

A small number of privately owned residential properties are located scattered amongst the public housing areas. As these properties are located within the public housing Precincts (as described below), they have been considered to be within the site boundaries.

2.2 Site Description

The initial site inspection was conducted in February 2009 in accessible areas of the site, which included all parks and reserves, public roadways and the Smiths Creek Bypass Corridor. Access was only permitted to seven of the public housing properties[1] which were temporarily vacant. The remaining public housing properties at the site were observed from outside the boundary fences.

The housing estate was constructed on the Radburn subdivision layout, where houses are turned away from the street to create a focus on open spaces and walkways, and main streets are located around the perimeter of the estate to minimise traffic. The site comprises residential areas (including approximately 30 privately owned properties scattered throughout the area, as well as 1,550 public housing residences), and a number of parks and reserves.

The public housing areas of the site have been divided into 28 precincts as described below. Remaining areas including adjacent parks and reserves are also described below.

Argo Precinct

Argo Precinct is bound by Argo Walk and John Warby Public School to the north, Elizabeth Walk and Kevin Wheatley Memorial Reserve to the west and Riverside Drive to the southeast. It is made up of 33 allotments.

The residences are comprised of free standing one storey brick and weatherboard homes with tile roofing. The fences comprise 2m tall timber pickets along the rear and sides of properties with 1m tall metal fencing at the front front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat and sits approximately 1m higher than the Memorial Reserve, which appears to have been cut and levelled.

Cardew Precinct

Cardew Precinct is bound by Docharty Rd to the south and east, Carr Precinct to the east, Saint Johns Rd to the west and Baden Powell Reserve to the north. It is made up of 30 allotments. The residences are two storey town houses comprised of brick and weatherboard with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a gentle slope towards Baden Powell Reserve in the northern portion of the precinct and a gentle slope towards Docharty Rd in the central and southeastern portion. A number of large eucalyptus trees were noted within the Precinct.

[1] The public housing properties accessed included 1 Elmslea Pl (Elmslea Precinct), 5 Prell Pl (Prell Precinct), 25 Heathfield Pl (Heathfield Precinct), 18 Teeswater Pl (Southdown Precinct), 2 Wallinga Pl (Katella Precinct), 86 Greengate Rd (Mamre Precinct), and 26 Dalkeith Pl (Dalkeith Precinct). Access was granted by Department of Housing to 18 Cardew Pl (Cardew Precinct) but occupants present at the time of works denied access.

Photo 1. Rear of Cardew Precinct properties, as they back onto Baden Powell Reserve.

Carr Precinct

Carr Precinct is bound by Saint Thomas More Primary School to the north, Baden Powell Reserve and Cardew Precinct town houses to the west, Docharty Rd to the south and Creigan Rd to the east. The precinct comprises 22 allotments.

The residences are comprised of two storey townhouses and one story free standing brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a gentle slope east towards Creigan Rd.

Creigan Precinct

Creigan Precinct is bound by Creigan Rd and Croft Pl to the west, the Smiths Creek Bypass Corridor to the east and Briar Rd to the south. It is made up of 74 allotments and a number of grassed open spaces providing access from Creigan Rd to the Bypass Corridor. The town houses are comprised of two storey brick, fibre cement sheeting and weatherboard with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be rundown, with some general household rubbish strewn in some areas. There are no significant areas of bare soil or stressed vegetation.

During the site inspection, demolition works had been completed on a number of the town houses, and were continuing on other townhouses within the Precinct. The properties where demolition had been completed were covered with building rubble, with no aboveground structures remaining.

The precinct is generally flat and with a gentle slope to the east towards Creigan Rd.

Photo 2. Properties in Creigan Precinct.

Photo 3. Grassed open space area in Creigan Precinct.

Croft Precinct

Croft Precinct is bound by Creigan Rd to the north, Saint Johns Rd to the west, Croft Pl to the east and Briar Rd to the south. It is made up of 18 allotments and adjoins a small grassed area to the southeast.

The residences comprise well maintained one storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m timber fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation. The precinct is generally flat.

Dalkeith Precinct

Dalkeith Precinct is bound by the Georges River Parkway Reserve to the east, Greengate Rd to the northwest, Pottoroo Ave to the south and Hagan Reserve to the northeast. The precinct is made up of 22 allotments.

The residences comprise one and two storey town houses and stand alone brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The Precinct slopes generally to the east with the surrounding topography.

Photo 4. Hagan Reserve and storm water drain running down the south end.

Davidson Precinct

Davidson Precinct is bound by Davidson Walk and Riley Park to the west, Riverside Dr to the south and east and Davidson Pl to the north. It is made up of 15 allotments.

The residences are comprised of two storey brick and weatherboard town houses with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m brick and timber fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat and has some large gum trees along the western boundary.

Deans Precinct

Deans Precinct is bounded by Deans Rd to the south and east and Riverside Dr to the north and west. It is made up of 70 allotments. Kevin Wheatley Memorial Reserve is located to the south and John Warby Public School to the east.

The residences are comprised of well maintained one storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m picket fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation. The Precinct is generally flat.

Photo 5. Properties in Deans Precinct across the Kevin Wheatley Memorial Reserve and Deans Rd.

Elmslea Precinct

Elmslea Precinct is bound by Georges River Rd to the north, Riverside Dr to the south and west, and Peppin Cr to the east. It is made up of 53 allotments. At the rear of the properties is an open space with some sporting equipment (described further below).

The residences are comprised of two storey brick and weatherboard town houses with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be reasonably tidy, with only a small amount of general rubbish identified. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a gentle slope to the south towards Riverside Dr.

Photo 6. Properties in Elmslea Precinct backing on to a large open space.

Faithfull Precinct

Faithfull Precinct is bounded by Davidson Pl to the south, Riverside Dr to the east, residences in the Fonthill Precinct to the northwest and Riley Park to the southwest. It is made up of 38 allotments.

The residences are comprised of one storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas

of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

Several eucalyptus trees are present along the Riley Park boundary of the Precinct. The Precinct is generally flat.

A park is located in the eastern portion of Faithfull Precinct, fronting onto Riverview Dr. The park is flat and grassed with no infrastructure identified.

Fonthill Precinct

Fonthill Precinct is bound by residences in Faithfull Precinct to the east, Riley Park and John Warby Public School to the south, Riverside Dr to the north and Deans Rd to the west. It is made up of 66 allotments.

The residences are comprised of one storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat.

Foxlow Precinct

Foxlow Precinct is bound by the Georges River Parkway Reserve to the east, Riverside Dr to the northwest, Haddon Rig Pl to the southwest and Peppin Cr to the north. It is made up of 28 allotments.

The residences are comprised of one storey brick and weatherboard homes with tile roofing. The fences generally consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat.

Greengate Precinct

Greengate Precinct is bounded by Greengate Rd to the southeast, Merino Cr to the northeast and Smiths Creek Bypass Corridor to the west. It is made up of 115 allotments.

The residences are comprised of one storey brick and weatherboard homes with tile roofing on large blocks of land. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

Several large eucalyptus trees are present in the properties along Greengate Rd. The Precinct is generally flat with a gentle slope to the south.

Heathfield Precinct

Heathfield Precinct is bound by Riverside Dr to the east and southeast, the Smiths Creek Bypass Corridor to the west, open space to the south and Gundowringa Pl to the northeast. It is made up of 67 allotments.

The residences are comprised of two storey brick and weatherboard town houses with tile roofing. The fences consist of 1m brick and timber picket fencing aacross the front and sides of properties with 2m picket fencing at the rear. The exterior of the houses and visible areas of the yards appear to be rundown with general rubbish identified in yards and in the street. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat with a gentle slope towards the northwest.

Katella Precinct

Katella Precinct is bound by the Georges River Parkway Reserve to the south east, Greengate Rd to the west, Riverside Dr and Samuel Pl to the north, and residences in Rawdon Precinct to the southwest. It is made up of 41 allotments.

The residences are comprised of one and two storey brick and weatherboard town houses with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat with a gentle slope to the southeast.

Kingston Precinct

Kingston Precinct is bound by Briar Rd to the north, the Smiths Creek Bypass Corridor to the west, Waterhouse Pl and the Reiby Juvenile Justice Centre to the east and Merino Cr to the south. It is made up of 43 allotments.

The residences are comprised of two storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

Some minor localised general household rubbish and ash is present behind the residences along the Bypass Corridor. The precinct is generally flat with a gentle slope west towards the Bypass Corridor.

Photo 7. The Reiby Juvenile Justice Centre.

Photo 8. Ash and burnt rubbish behind properties in the Kingston Precinct.

Mamre Precinct

Mamre Precinct is bound by Briar Road Public School and a strip of open space to the west, Greengate Rd to the southeast and Riverside Dr to the north. It is made up of 44 allotments.

The residences are comprised of one and two storey brick and weatherboard town houses and stand alone homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat with a gentle slope to the east.

Photo 9. Briar Road Public School

Photo 10. Properties in Mamre Precinct

Open Area West of Mamre Precinct

A small open grassed area is located west of Mamre Precinct, adjacent to the Briar Rd Public School. There is no infrastructure identified in the area, and it appears to be used as an access to the school.

Merino Precinct

Merino Precinct is bound by Greengate Rd to the southeast, Merino Park and private residential properties to the east, the Reiby Juvenile Justice Centre to the north, Waterhouse Pl to the west and Merino Cr to the south. It is made up of 77 allotments.

The residences are comprised of one storey brick, fibre cement sheeting and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a gentle slope to the south.

Merino Park

Merino Park is bound by Merino Precinct and private residential properties to the east, west and south, and the Reiby Juvenile Justice Centre to the north. The Park is a flat grassed area which appears to have been cut and filled historically.

A single suspected asbestos containing material (ACM) fragment was identified on the ground surface in the northern end of Merino Park (see **Figure 3**).

Photo 11. Merino Park and the south side of The Reiby Juvenile Justice Centre

Photo 12. An ACM fragment identified in the northern portion of Merino Park

Moonbria Precinct

Moonbria Precinct is bounded by Riverside Dr to the north, Foxlow Pl to the northeast and Georges River Parkway Reserve to the southeast and southwest. It is made up of 84 allotments.

The residences are comprised of one storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat with a gentle slope to the east.

Peppin Precinct

Peppin Precinct is bound by Peppin Cr to the north, east and south and Riverside Dr to the west. It is made up of 48 allotments and lies adjacent to the Georges River Parkway Reserve.

The residences are comprised of one storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat.

Prell Precinct

Prell Precinct is bound by Georges River Rd to the north, Heathfield Precinct to the southwest, Riverside Dr to the southeast and the Smiths Creek Bypass Corridor to the west. It is made up 41 allotments.

The residences are comprised of one and two storey attached and freestanding brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. General household rubbish was identified at the rear of the properties. There are no significant areas of bare soil or stressed vegetation.

The Precinct is generally flat with a slight slope to the northwest.

Photo 13. Properties and open space in Prell Precinct

Rawdon Precinct

Rawdon Precinct is bound by Hagan Reserve to the southwest, Georges River Parkway Reserve to the southeast, Greengate Rd to the northwest and Katella Precinct to the northeast. It is made up of 51 allotments.

The residences are comprised of two storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m picket fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a slight slope to the east.

Photo 14. Properties in Rawdon Precinct

Romney Precinct

Romney Precinct is bound by Ryeland Precinct to the north, Brindley Park to the east, Riverside Dr to the west and Southdown Pl to the south. It is made up of 18 allotments.

The residences are comprised of two storey attached and free standing brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat.

Ryeland Precinct

Ryeland Precinct is bound by Deans Rd to the north, Riverside Dr to the west, the Kevin Wheatley Memorial Reserve to the east and Romney Precinct to the south. It is made up of 56 allotments.

The residences are comprised of two storey brick and weatherboard attached homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m timber picket fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat.

Southdown Precinct

Southdown Precinct is bound by Romney Precinct and Brindley Park to the north, Riverside Dr to the south and west and Oldbury Walk to the east. It is made up of 77 allotments.

The residences are comprised of one storey brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

A small (<1m^3) pile of building rubble was identified in the vicinity of TP56 in the central portion of the Precinct. The rubble comprised bricks and concrete. The source of the rubble was not able to be identified.

The Precinct is generally flat.

Summers Precinct

Summers Precinct is bound by Docharty St to the north, Saint Johns Rd to the west and Creigan Rd to the southeast. It is made up of 86 allotments.

The residences are comprised of one storey brick and weatherboard homes with tile roofing. The property sizes are larger generally larger than other properties in the area. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front and some terraced gardens. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a gentle slope east towards Creigan Rd.

Templeton Precinct

Templeton Precinct is bound by Riverside Dr to the west, Katella Precinct to the south and the Georges River Parkway Reserve to the north and east. It is made up of 21 allotments.

The residences are comprised of one storey brick free standing homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with no fencing across the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a gentle slope to the east.

Tiverton Precinct

Tiverton Precinct is bound by a reserve adjacent to Georges River Rd to the north, Peppin Cr to the south and west and the Georges River Parkway Reserve to the east. It is made up of 48 allotments.

The residences are comprised of one storey freestanding brick and weatherboard homes with tile roofing. The fences consist of 2m timber picket fencing along the rear and sides of properties with 1m metal fencing at the front. The exterior of the houses and visible areas of the yards appear to be generally neat and tidy. There are no significant areas of bare soil or stressed vegetation.

The precinct is generally flat with a gentle slope to the north in the northern portion and to the east in the eastern portion.

Kevin Wheatley Memorial Reserve / KL Jervis Field

The Kevin Wheatley Memorial Reserve/ KL Jervis Field are bound by Deans Rd to the north, Ryeland Precinct to the west, Southdown Precinct, Brindley Park and privately owned residences to the south, and Argo Precinct, Tharawal Aboriginal Cooperative and Riverside Dr to the east.

Kevin Wheatley Reserve/KL Jervis Field comprise four grassed terraced playing fields, stepping up approximately 1m from north to south between each field. The playing surfaces appear to have been cut and filled to create flat playing fields. A gravelled car parking area is located in the eastern portion adjacent to the Tharawal Aboriginal

Cooperative. A children's play area is located in the northern side of the park adjacent to Deans Road.

Photo 15. The south eastern corner of the Kevin Wheatley Memorial Reserve.

Photo 16. A children's play area at the northern end of the Kevin Wheatley Memorial Reserve

Brindley Park

Brindley Park lies adjacent to the southern portion of the Kevin Wheatley Reserve. The Park slopes gently to the east towards the rear fencelines of the privately owned residential properties fronting onto Riverside Dr. Brindley Park is a grassed area with no site infrastructure apparent.

The Smiths Creek Bypass Corridor

The Smiths Creek Bypass Corridor runs from the south western portion of the site to the northern site boundary. Residential properties back onto the Corridor. General rubbish identified within the Corridor indicates that the area is subject to fly tipping of general household rubbish.

The Corridor south of Briar Rd is predominantly short cut grass with a shallow open drain/ephemeral creek through the middle. Minor general household rubbish was identified in the Corridor at the rear of residences in the Kingston Precinct.

The Corridor north of Briar Rd to Heathfield Precinct comprises partially cleared bushland, with long grass, wattle shrubs, privet and well established eucalyptus trees. Rubbish such

as aluminium cans, plastic, tyres, shopping trolleys, glass bottles and carpet was identified in this area.

A soil stockpile was identified in the western portion of the Corridor, along the northern end of Creigan Rd. The stockpile appeared to be placed to prevent surface water runoff from the Corridor onto the road, or to prevent vehicular access to the Corridor. The stockpile was approximately 1 m high 2 m wide and 30 m long, and appeared to comprise gravelly silty clay. Minor amounts of roadbase, sandstone and ironstone gravels were identified on the surface of the stockpile. The stockpile was covered in grass which prevented a detailed visual inspection. No suspected ACM was identified on visible areas of the surface of the stockpile, or at the footing of the stockpile.

The northern section of the Corridor lies adjacent to a bus terminal and a substation on the western side. This section of the Corridor comprises partially cleared bushland, with evidence of tipping of general household rubbish.

Photo 17. Smiths Creek Bypass Corridor north of Briar Road.

Photo 18. General rubbish in the central portion of the Smiths Creek Bypass Corridor.

Photo 19. Stockpiled material adjacent to Creigan Rd.

West of Airds High School and Airds Village

The area lies adjacent to the Smiths Creek Bypass Corridor and comprises open grassed areas with a gentle slope to the west towards the Corridor. A dam with visibly healthy water plants is located to the west of the Sports Centre. The dam banks appear to be comprised of gravelly silty sand fill material on the western and northern sides. A number of pipes are located in the northern and southern portions of the dam, providing inflows presumably from local surface drainage, and an outlet for any overflowing water.

General rubbish was identified in the western portion of this area, near to the Smiths Creek Bypass.

Photo 20. Dam to the west of the Indoor Sports Centre.

Photo 21. Overflow pipe from the dam.

Photo 22. Smiths Creek running north from the site, in the vicinity of Creigan Rd.

Baden Powell Reserve

Baden Powell Reserve is bound by Saint Johns Rd to the west, Cardew Precinct to the southeast, Carr Precinct to the east and private residential properties to the north. The Reserve is grassed with a number of groves of Casuarinas present across the area. Vehicular access to the Reserve is generally prevented by low timber fences along the roads and parking areas. The Reserve slopes gently to the east in line with the topography of the surrounding land.

A single fragment of suspected ACM was identified on the surface in the western corner of the reserve. There are no significant areas of bare soil or stressed vegetation.

Photo 23. The Baden Powell Reserve

Photo 24. ACM identified in the western corner of the Baden Powell Reserve

Riley Park

Riley Park is bound by Fonthill Precinct to the north, Davidson Precinct to the east, Riverside Dr to the south and John Warby Public School to the west. Riley Park comprises a large grassed playing field, a car park and a maintenance building in the southern corner. The park has a sprinkler system around the periphery.

The Park is generally flat with a steep 1m rise to the playing field area, which appears to be fill material imported to create a flat playing surface.

Photo 25. Riley Park

Georges River Parkway Reserve

The Georges River Parkway Reserve is located along the eastern site boundary, extending from south of Tiverton Precinct to Hagan Reserve near the southern boundary. The Reserve includes a reserve located east of KL Jervis Field, on Riverside Dr. The Reserve comprises partially cleared natural bushland. In general, the topography of the Reserve follows the surrounding areas of rolling hills, but with a general slope to the east towards the Georges River.

Minor amounts of general household rubbish were identified in several locations along the Reserve. General rubbish, ashes and burnt grass were identified at the eastern end of Woolwash Rd. A second (apparently older) burnt area was identified in the northern portion adjacent to Peppin Cr.

Photo 26. Rubbish, ashes and burnt grass at the end of Woolwash Road in the Georges River Parkway Reserve.

Photo 27. Burnt area adjacent to Peppin Cr in the northern portion of the Georges River Parkway Reserve.

Hagan Reserve

Hagan Reserve is located adjacent to the Dalkeith Precinct in the southern portion of the site. Hagan Reserve is comprised of partially cleared bushland with an easterly slope. A storm water drain runs along the south end of the park to a pump station in the southern corner of the Reserve.

There were no significant amounts of rubbish or dumped material in the Reserve. There was no evidence of stressed vegetation.

Photo 28. Stormwater Drain in Hagan Reserve.

Northern Portion of Site Adjacent to Georges River Rd

A cleared grassed area with occasional trees is located along the northern site boundary. The area is relatively flat with some small rolling hills. Properties in the Elmslea and Tiverton Precincts back onto the area. A volleyball net is constructed in the western portion adjacent to Riverside Dr. The area was generally clear of household rubbish and dumped materials.

Photo 29. Grassed area along northern site boundary.

2.3 Surrounding Landuse

The current landuse of adjacent properties or properties across adjacent roads is shown in **Figure 3** and summarised below.

- North – Residential areas are located across Georges River Rd to the north of the central and eastern portions of the site. In the western portion, residential properties, St Patricks College and St Thomas More Primary School are located north of Baden Powell Reserve. Smiths Creek Reserve is located north of the Smiths Creek Bypass Corridor across Georges River Rd.
- East – Vacant open space and partially cleared bushland are located east of the site down to the Georges River, approximately 250m east.
- South – Residential properties are located to the south of the site, along with Lynwood Rd Waste Management Centre (now closed) located on Lynwood Rd, approximately 500m south of the site.
- West – Low and medium density residential properties are located west of the site, along with the Smiths Creek Bypass Corridor. A Busways Depot and substation are located west of the Smiths Creek Bypass Corridor in the northern portion.
- A residential area west of Templeton Precinct comprised of brick and weatherboard homes with timber or metal fences is not included within the site boundaries.
- A residential area west of Rawdon Precinct comprised of brick and weatherboard homes with timber and metal fences is not included within the site boundaries.
- Reiby Juvenile Justice Centre and Briar Rd Public School are located north of Merino Precinct.
- Airds High School is located north of Briar Rd.
- Airds Village Shopping Centre, tennis courts, Hotel, Indoor Sports Centre are located north of Airds High School.
- A service station is located adjacent to Airds High School to the west of the dam.
- Tharawal Aboriginal Cooperative is located west of Kevin Wheatley Reserve.

Based on review of the surrounding land uses, potential offsite sources of contamination include the service station located adjacent to Airds High School, the Busways depot and the substation located to the west of the northern portion of the site.

There are no other significant potential offsite sources of contamination identified in the vicinity of the site.

Lynwood Rd Waste Management Centre is not considered to be a potential offsite source of contamination based on the topography (land sloping to the east towards Georges River), and the distance of the closed landfill from the site (approximately 500m).

2.4 Topography

The regional topographic map (DNR 1975[2]) indicates that the site has an elevation of between 130 m and 150 m Australian Height Datum (AHD). The site is generally higher in the northwest portion as well as along a ridge running northeast through the central portion of the site. A shallow valley is associated with Smiths Creek, which runs through the western portion of the site. Remaining areas of the site comprise gently rolling hills with a steep slope east of the site towards Georges River, located at approximately 50 mAHD.

Some filling is assumed to have occurred across the site during the establishment of the Housing Estate, for construction purposes, and within the boundaries of former creek bed (Smiths Creek) located in the western portion of the site. Embankments of fill material were identified within the Smiths Creek Bypass Corridor, north of Creigan Precinct (1.5 m wide by 30 m long by 0.7 m high), and also in the western portion of Airds Village, in the vicinity of the dam (up to 2 m high in some locations) (as described in **Section 2.2**).

Further evidence of cutting and filling was identified with several playing fields being of higher or lower elevation to the surrounding area, including Riley Park, Kevin Wheatley Reserve, KL Jervis Field and Merino Park.

The trends shown in the topographic map are generally consistent with the elevation as observed during the detailed site inspection.

2.5 Geology

The regional geological map (DOM 1966)[3], the site is underlain with shales and sandstones of the Wianamatta Group of Triassic Age. The regional soils map (SCSNSW 2006)[4] indicates that the site is located on:

- Blacktown Soil Landscape Group across the majority of the site;
- Hawkesbury Soil Landscape Group at lower slopes along the eastern site boundary and in the vicinity of the Smiths Creek Bypass Corridor; and
- Lucas Heights Landscape Group in parts of the eastern portion of the site.

Soils at the site are generally derived from the weathering of the underlying shales and sandstones of the Wianamatta Group. Soils typically have low fertility and are often strongly acidic. This is consistent with observations from the intrusive investigations (as detailed in testpit and handauger logs in **Appendix H**).

[2] NSW Department of Lands (2006). National Topographic Map Series. Campbelltown Sheet 9029-1N.
[3] *Wollongong 1:250 000 Geological Series Sheet SI 56-9.* NSW Department of Mines, 1966 (DOM 1966)
[4] *Soil Landscape Series Sheet 9030 1:100 000,* Soil Conservation Service of NSW, 2006 (SCSNSW 2006)

Fill material identified across the site was generally clay or silt with gravel in some areas, ranging from surficial topsoil only, to depths of 2 m in the vicinity of the former Smiths Creek (TP3). In general, the fill was less than 0.5 m deep in those parts of the site which were accessible for sampling. Building rubble (including concrete, glass, pipes) was identified in fill material in the central portion of the site (in Kevin Wheatley Reserve and the Southdown Precinct), in testpits adjacent to Creigan Precinct (TP6) and Prell Precinct (TP32, TP35, TP36), and also in the southern portion of the Smiths Creek Bypass Corridor (TP12) and the northwestern portion of Baden Powell Reserve (TP28).

Fill material encountered within the residential properties which were accessed during this investigation (at HA1, HA2, HA4-8) comprised silt with some sandstone gravels, and was generally less than 0.3 m in depth.

Suspected ACM was identified in fill material in TP32, located in the northern portion of the site adjacent to Prell Precinct.

Fill material is underlain by either natural red, brown or grey silty or clay soil with occasional gravel inclusions. Several testpits in the northern portion of the Smiths Creek Bypass Corridor encountered natural sandy clays and silts underneath fill material. Bedrock was generally encountered between 1 m and 3 m across the site and comprised either shale or sandstone.

The fill stockpile in the Smiths Creek Bypass Corridor (north of Creigan Precinct) appeared to comprise gravelly silty clay. Minor amounts of roadbase, sandstone and ironstone gravels were identified on the surface of the stockpile. The stockpile was covered in grass which prevented a detailed visual inspection. No suspected ACM was identified on visible areas of the surface of the stockpile, or at the footing of the stockpile.

Fill in the dam embankment appear to be comprised of gravelly silty sand fill material on the western and northern sides. No suspected ACM or building rubble was identified on the surface of the embankment or within testpits excavated within the embankment.

Based on the Acid Soil Sulphate Risk Map (1997)[5], the site and immediate surrounds have no known occurrence of acid sulphate soil materials.

2.6 Hydrology

A small dam is located to the west of Airds Village. The dam collects water from land to the east and south, with the dam embankment being built predominantly on the west and north.

The nearest moving surface water receptor is Smiths Creek, a small waterway which collects stormwater from the site, and drains from Creigan Precinct towards Bow Bowing Creek approximately 3 km north of the site. The portion of Smiths Creek running through the western portion of the site is ephemeral, with the majority of the Bypass Corridor being levelled.

The Georges River is located approximately 250 m east of the eastern site boundary. Natural gullies run from the eastern site boundary east of Peppin Cr in the north, south of Boonoke Pl, and east of Woolwash Rd.

[5] *Acid Sulphate Soil Risk Map (Edition 2)*. Department of Land and Water Conservation, 1999. (DLWC 1997).

Stormwater infrastructure is in place at the site and is expected to collect the majority of the precipitation falling upon sealed surfaces. Infiltration is expected to occur in unsealed areas into the relatively permeable surface soils.

Surface runoff would be expected following periods of heavy rainfall. Surface water not collected by the stormwater system would be expected to flow towards Smiths Creek in the western and central portions of the site, and to the east towards the Georges River in the eastern portion of the site.

2.7 Hydrogeology

Based on local topography, shallow groundwater flow is anticipated towards Smiths Creek in the western portion of the site, and to the east towards Georges River in the eastern portion of the site. Groundwater occurring in the shale, sandstone and clays underlying the site is expected to be confined to zones of relatively higher permeability (i.e. fractures in bedrock and within interbedded sands and sandy clays) and therefore limited in extent.

Registered groundwater bore information from the Department of Water and Energy (DWE) is included in **Appendix B**.

The search identified one registered bore (GW103996) approximately 1.5 km west, and four registered bores (GW109212-5) approximately 2 km northwest of the site.

Groundwater bore GW103996 was installed in 1998 to a depth of 3.9 m, and is registered as a monitoring bore. The bore was installed through clayey sand into sandstone at 0.8 m. No water bearing zones, static water levels or groundwater characteristics were detailed in the bore information.

Groundwater bores GW109212-5 were installed in 2008 to depths between 4 and 5 m. The bores were registered for monitoring purposes at a Caltex-owned property. The bores were installed through sandy clay fill to approximately 0.5 m, silty clay to 3.5 m, and into shale at approximately 5 m. No water bearing zones, static water levels or groundwater characteristics were detailed in the bore information.

Based on the information provided by the Department of Natural Resources and considering the relative elevation of the site, groundwater is expected to be contained within the fractures and bedding planes of the shale and sandstone. However there may be localised areas of seepage. The presence of the relatively impermeable sub-surface clay and shale layers at the site limits the potential for groundwater contamination, ultimately limiting the potential for contamination (if any) at the site to migrate via groundwater.

3 Site History

3.1 Researched History and Anecdotal Evidence

The area was established circa 1810 and comprised small farms amongst bushland until the early 1970s, when the Housing Commission tabled plans for a large housing estate. The established main streets of Airds (then referred to as Kentlyn) were redirected on the development of the housing estate later in the 1970s.

The Woolwash Reserve is a bushland park which was once a source of water mainly for cattle. Anecdotal evidence indicates that sheep being herded to Sydney markets were scoured at the river banks to lighten the load for the continuing journey.

Briar Rd Public School and Airds High School were opened in 1974. John Warby Public School was opened in 1978. Mary Reiby School was opened in 1973 as an institution for delinquent girls. Kevin Wheatley Memorial Reserve was opened in 1978.

3.2 Aerial Photographs

Aerial photographs from 1947, 1961, 1970, 1979, 1984, 1994 and 2005 were obtained from the Land and Property Information Centre, and are included in **Appendix C**.

The aerial photograph review identified the following features in relation to the history of the site:

- In 1947, the site is generally rural properties with some residences, with bushland areas along the Georges River to the east and Smiths Creek in the western portion of the site. Georges River Rd is clearly identified north of the site. Remaining roads through the site are rural access roads, and are generally straight with sharp corners at the edges of paddocks. A large tract of bushland is identified in the central portion of the site. A number of small orchards are identified to the south and east of this tract of bushland. In the western portion of the site, Smiths Creek is identified by a line of small ponds or dams through open paddocks. Former Woolwash Rd is identified winding from the site down to the Georges River. Land on the eastern side of the River appears to be natural bushland.
- In 1961, residential areas are being developed to the northwest and west of the site, south of Georges River Rd. Some residential areas appear to extend within the northwestern portion of the site, in the vicinity of Baden Powell Reserve, Cardew and Carr Precincts. The remainder of the site is predominantly rural land, with occasional residential properties. Smiths Creek in the central portion of the site remains as a number of dams and ponds in open paddocks. Bushland remains in the central portion of the site. Small orchards remain south and east of the bushland, and have been developed to the northeast of the bushland area. Two dams are located in the central northern portion, within the current Heathfield, Prell and Deans Precinct. Three dams are also located within the central southern portion of the site, in the vicinity of the Merino and Rawdon Precincts. Rural properties have extended further south from the site.
- In 1970, four long sheds (possibly poultry sheds) are located in the northeastern portion of the site, in the vicinity of the (current) Faithfull Precinct. Remaining areas in the northeastern portion are rural paddocks with an occasional shed or residence. A small area of market gardens is identified in the central northern portion of the site, adjacent to the dams identified in the previous photo.

Properties in this portion of the site appear to be generally rural/residential. The northwestern portion of the site remains as open paddocks. Smiths Creek remains as a line of small dams through the western portion of the site. A small square field is identified within the Tharawal Aboriginal Cooperative in the central portion of the site, in the former bushland area. The central southern portion of the site remains as rural properties with occasional sheds or residences. A small orchard remains in the southeastern portion of the site, in the vicinity of Katella and Rawdon Precinct. The southwestern portion of the site remains as open paddocks with an occasional shed. Dams previously identified in the southern portion remain at the site. Residential development to the west of the site extends to St Johns Rd, the western site boundary. A large water tank or silo is identified to the southwest of the site. Areas south of the site remain as either rural (orchards, crops) or bushland.

- In 1979, major development works have been completed at the site. Former farm access roads have been redirected into the current formation, accessing residential units and houses which have been constructed across the majority of the site. The Smiths Creek Bypass Corridor remains undeveloped, and the numerous small dams and ponds along its length through the site have been filled. The dam south of Airds Village remains in the central portion of the site. Dams formerly located in the northern and southern portion of the site are no longer identified. A pedestrian underpass has been built at the corner of Briar Rd and Riverside Dr. The parks and reserved currently located across the site (Baden Powell Reserve, Kevin Wheatley Memorial Reserve, Riley Park, KL Jervis) are identified, as are John Warby Public School, Airds High School, Briar Rd Public School and Mary Reiby Juvenile Justice Centre. A building is identified in the Tharawal Aboriginal Cooperative, along with two small playing fields. Areas to the north and west of the site are primarily residential, while areas to the south remain as a mix of rural and bushland. Bushland remains east of the site across the Georges River.
- In 1984, residential development continues in the Elmsea Precinct, and west of the Templeton Precinct. Other residential areas remain similar to the previous photo. The service station, sports hall and hotel are identified adjacent to Airds Village and the dam in the central portion of the site. The bus depot and substation are identified to the northwest of the site adjacent to the Smiths Creek Bypass Corridor.
- In 1994, the site and surrounding areas appear similar to the previous photograph.
- In 2005, the site and surrounding areas appear similar to the previous photograph.

3.3 DECC Records

A search of the DECC's public register under the *Protection of the Environment Operations Act 1997* was undertaken, and results are included in **Appendix D**. The search identified that, for the site, there were:

- No prevention, clean-up or prohibition notices;
- No transfer, variation, suspension, surrender or revocation of an environment protection licence.

A search was also undertaken through the DECC's public contaminated land register (**Appendix D**). The search identified that there have been no notices issued under the *Contaminated Land Management Act 1997* for the site.

3.4 Australian and NSW Heritage Register

A search of the Australian Heritage Trust database and the NSW Heritage Inventory identified one Heritage listed item at the site, Briar Cottage.

Briar Cottage was previously known as Dorchester Farm, and is located in Briar Rd. The cottage was built prior to 1915, and is thought to be one of the original farm buildings. Briar Cottage is currently used as a child care centre, and as such, the aesthetic significance of the exterior has been maintained. Few structural changes have been made to the building. It is noted that Briar Cottage has lost its orientation due to significant subdivision for housing estates in the surrounding areas.

No other Heritage items were identified at the site. Search results are included in **Appendix E**.

3.5 Title Records

A historical title search has been undertaken on selected lots at the site. Targeted lots were based on the aerial photographic evidence for potential areas of contamination hotspots (rural, residential, industrial areas). The selected lots included Lot 1 DP541678, Lot 54 DP261258 and Lot 104 DP716138. A brief summary of the title chains is provided below, for the full records refer to **Appendix F**.

Lot 1 DP541678

In 1932, Lot 1 was transferred to Campbell Williams Bocking , a gentleman. In 1964, Lot 1 was transferred to the Trustees Executors and Agency Company Board, and in 1967 to the Housing Commission of NSW. In 1977 Lot 1 was transferred to the NSW Planning and Environment Commission, and in 1995, to the Minister Administering the EPA Act 1979.

Lot 54 DP261258

In 1924, Lot 54 was transferred to Albert John Giffin, a farmer from Campbelltown. In 1946, Lot 54 was transferred to William Ernest Reeves and Thelma May Reeves, a caterer and his wife. In 1955, Lot 54 was transferred to William Bradley, a grazier, and in 1960, to Cecec (No 15) Pty Ltd. In 1978, Lot 54 was transferred to The Housing Commission of NSW.

Lot 104 DP716138

In 1896, a portion of Lot 104 was transferred to William Smith, a farmer from Campbelltown. In 1972, the Council of the City of Campbelltown acquired this portion of Lot 104. In 1976, this portion of Lot 104 was transferred to the Housing Commission of NSW.

A second portion of Lot 104 was transferred in 1946 to Wallace Andrew Winkler. In 1963, this portion of Lot 104 was transferred to Cocklebury Chicks Pty Ltd. In 1970, this portion of Lot 104 was transferred to The State Planning Commission of NSW, and in 1975 to the Housing Commission of NSW.

A third portion of Lot 104 was transferred directly to the Housing Commission of NSW in 1976.

In 1988, the whole of Lot 104 was declared Public Reserve and vested in the Council of the City of Campbelltown.

3.6 Council Records

The site includes the following zoned areas:

- 2(b) Residential B;
- 5(a) Special Uses A;
- 5(e) Public Purpose Corridor;
- 10(c) Local Comprehensive Centre;
- Local Open Space; and
- 9 Community Uses.

A zoning map of the site is included in **Appendix A**.

A 149 Planning Certificate review has been undertaken on selected lots at the site. Targeted lots were based on the aerial photographic evidence for potential areas of contamination hotspots (rural, residential, industrial areas). The selected lots included Lot 1 DP541678, Lot 54 DP261258 and Lot 104 DP716138.

The planning certificates from Campbelltown City Council are included in **Appendix G**, and include the following information regarding the selected Lots:

Lot 1 DP541678 (Part of Smiths Creek Bypass Corridor)

- The site is zoned 5(e) – Special Uses Public Purposes Corridor and 10(c) - Local Comprehensive Centre Zone;
- The land does not include or comprise critical habitat. The land is not in a conservation area and there are no known items of environmental heritage on the land;
- The land is affected by road widening or road realignment under the Roads Act1993, an environmental planning instrument or a resolution by Council;
- The land is not affected by a policy which restricts development because of the likelihood of acid sulfate soils or tidal inundation;
- Development at the land is not subject to flood related controls;
- Some of the land is identified as being bush fire prone land;

- The land is affected by provisions under an environmental planning instrument applying to the land that provides for acquisition by a public authority;
- The land is not a declared investigation area or remediation site, or the subject of an investigation order or remediation order under the CLM Act 1997. The land is not the subject of a voluntary investigation or remediation proposal or a site audit statement within the meaning of the CLM Act 1997.

Lot 54 DP261258 (Part of Rawdon Precinct)

- The site is zoned 2(b) – Residential B Zone;
- The land does not include or comprise critical habitat. The land is not in a conservation area and there are no known items of environmental heritage on the land;
- The land is not affected by road widening or road realignment;
- The land is not affected by a policy which restricts development because of the likelihood of acid sulfate soils or tidal inundation;
- Development at the land is not subject to flood related controls;
- All of the land is identified as being bush fire prone land;
- The land is affected by provisions under an environmental planning instrument applying to the land that provides for acquisition by a public authority;
- The land is not a declared investigation area or remediation site, or the subject of an investigation order or remediation order under the CLM Act 1997. The land is not the subject of a voluntary investigation or remediation proposal or a site audit statement within the meaning of the CLM Act 1997.

Lot 104 DP716138 (Riley Park)

- The site is zoned 6(a) – Local Open Space Zone;
- The land does not include or comprise critical habitat. The land is not in a conservation area and there are no known items of environmental heritage on the land;
- The land is not affected by road widening or road realignment;
- The land is not affected by a policy which restricts development because of the likelihood of acid sulfate soils or tidal inundation;
- Development at the land is not subject to flood related controls;
- None of the land is identified as being bush fire prone land;
- The land is not affected by provisions under an environmental planning instrument applying to the land that provides for acquisition by a public authority;
- The land is not a declared investigation area or remediation site, or the subject of an investigation order or remediation order under the CLM Act 1997. The land is not the subject of a voluntary investigation or remediation proposal or a site audit statement within the meaning of the CLM Act 1997.

3.7 Site History Summary

A summary of the site history is provided in **Table 3.1**.

Table 3.1 Summary Site History

Period	Activity	Source
Circa 1810	The Airds/Bradbury area was established as small farms amongst bushland.	Campbelltown Council website
1915	Briar Cottage (part of Dorchester Farm) is located on Briar Rd.	NSW Heritage Register
1947	The site is generally rural with occasional residences, and bushland along Georges River to the east and Smiths Creek in the northwestern portion. To the south, Smiths Creek is a line of ponds or dams through open paddocks. Small orchards are located in the southern portion.	Aerial photo (1947)
1961	Residential areas are being developed to the northwest of the site, which extend into the northwestern portion. A number of dams are located in the northern and southern portions of the site.	Aerial photo (1961)
1963 to 1970	Part of Riley Park (Lot 104 DP716138) was owned by Cocklebury Chicks Pty Ltd.	Title documentation
1970	Four long sheds are located in the northeastern portion of the site. Remaining areas of the site are rural paddocks with an occasional shed or residence. A small area of market gardens is located in the central northern portion of the site. The Tharawal Aboriginal Cooperative is identified in the central portion of the site.	Aerial photo (1970)
Late 1960s to 1970s	The Housing Commission of NSW purchased much of the land in the vicinity for the purpose of public housing.	Title documentation, Campbelltown Council website
1979	Major residential development works have occurred at the site. Dams formerly located in the northern and southern portions are no longer identified. Parks, reserves and schools are identified, as is the Airds Village shopping centre.	Aerial photo (1979)
1984	Residential development continues at the site. The service station, sports hall and hotel are identified adjacent to Airds Village in the central portion. The bus depot and substation are identified to the northwest of the site.	Aerial photo (1984)
1988	Riley Park (Lot 104 DP716138) was declared a Public Reserve and vested in Campbelltown City Council.	Title documentation
1994	The site appears similar to the previous photograph.	Aerial photo (1994)
2005	The site appears similar to the previous photograph.	Aerial photo (2005)

3.8 Integrity Assessment

Given the preliminary nature of the investigation, and the widespread development across the large site generally occurring within a single period, a review of Development Application/Building Application (DA/BA) records was not conducted as part of the current investigation.

Workcover Dangerous Goods Records were not reviewed as part of the current investigation. Based on the consistency of the historical site uses, and the absence of any documentation or other evidence indicating the potential presence of storage of dangerous goods anywhere at the site, a review of information from this source was not considered necessary.

Based on the amount of historical information available for the site, and the consistency of the reported historical site uses, review of these data sources was considered unnecessary to obtain additional property specific information regarding the site. It is therefore considered that the information provided in this historical assessment has an acceptable level of accuracy for the purposes of undertaking a preliminary assessment of contamination at the site.

4 Potential Contamination Issues

4.1 Potential Areas of Environmental Concern

Based on the history review and field observations from the site, areas of environmental concern have been identified and are presented in **Table 4.1**.

Table 4.1 Areas of Environmental Concern and Associated Contaminants of Potential Concern

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Areas in the vicinity of the (offsite) Service Station on Riverside Dr	Heavy metals, TPH/BTEX, PAHs
Dam adjacent to Airds High School	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, asbestos
Baden Powell Reserve, Riley Park, Kevin Wheatley Reserve, KL Jarvis Field and Merino Park	Heavy metals, OCP/OPPs, asbestos
Current residential buildings across the site	Heavy metals, asbestos
Fill material historically used across the site	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, PCBs, asbestos
Former dams and creeklines along the western portion of the site, adjacent to Woolwash Rd, Boonoke Wy and Peppin Cr.	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, PCBs, asbestos
Former market gardens in the northern central portion of the site	Heavy metals, OCPs
Former orchards in the central eastern and southern portions of the site	Heavy metals, OCPs
Former sheds and buildings circa 1970	Heavy metals, asbestos

It is noted that the service station on Riverside Dr is not within the current site boundaries, and as such, was not accessed directly for sampling purposes. The buildings associated with Airds High School, Briar Rd Public School, Airds Village, Tharawal Aboriginal Cooperative are not considered to be areas of concern, as these are located outside of the current site boundaries. These areas have been discussed in **Section 2.3**, where potential offsite sources of contamination have been considered.

4.2 Potentially Contaminated Media

Potentially contaminated media present at the site include:

- Potential piles of dumped materials;
- Fill material;
- Natural soils; and
- Groundwater.

Piles of dumped material at the site are considered to be potentially contaminated based on the potential for ACM, hydrocarbons and other contaminating substances to be contained within the material.

Fill material has been identified in a number of areas across the site. The source of fill material is unknown, however it is likely that fill would have been used for levelling purposes, or for embankments. As the fill material underlying the site has unknown origin it must be considered a potentially contaminated medium.

Based on the potential leachability of the contaminants in the fill and the historical uses of the site, vertical migration of contaminants through the fill into the underlying natural soils may occur.

Groundwater is identified as a potentially contaminated medium due to the likely shallow nature of groundwater in the area (from **Section 2.7**), the generally unsurfaced nature of the site and the historical uses of the site. However, the potential for groundwater to be contaminated media is dependant upon the potential mobility of any soil contamination identified at the site.

Surface water in the dam is identified as a potentially contaminated medium based on the dam receiving runoff from upgradient areas at the site. In remaining areas of the site, the stormwater infrastructure would limit the potential for surface water runoff. In open grassed areas, the majority of rainfall is likely to infiltrate the silty clay soil in the area.

4.3 Potential for Migration

Contaminants generally migrate from site via a combination of windblown dusts, rainwater infiltration, groundwater migration and surface water runoff. The potential for contaminants to migrate is a combination of:

- The nature of the contaminants (solid/liquid and mobility characteristics);
- The extent of the contaminants (isolated or widespread);
- The location of the contaminants (surface soils or at depth); and
- The site topography, geology, hydrology and hydrogeology.

The potential contaminants identified as part of the site history review and site inspection are generally in solid form (eg. asbestos) and liquid form (eg. pesticides, etc).

The majority of the site is developed, sealed or vegetated which significantly reduces the potential for windblown contaminants to migrate from the site.

The potential for contaminants to migrate via surface water runoff from the site is considered low, based on absence of a flowing water body which dissects the site. Also, stormwater infrastructure is in place which would limit runoff, and infiltration is expected to be significant in unsealed areas.

Rainfall infiltration at the site is expected to be significant in unsealed areas and this indicates a potential for vertical contaminant migration through the surface soils. Based on the potential for shallow groundwater (from **Section 2.9**), there is the potential for shallow groundwater within the clay/shale/sandstone formation. Hence, there is a potential migration pathway via groundwater flow.

5 Sampling and Analysis Plan

5.1 Data Quality Objectives

Data quality objectives (DQOs) were developed for the investigation, as discussed in the following sections.

5.1.1 State the Problem

A Master Plan is to be submitted to Campbelltown City Council for approval, which will guide further planning approvals for infrastructure and subdivision of the site for a ranges of uses included standard residential and open space. A preliminary contamination assessment is required to support the Master Plan.

5.1.2 Identify the Decision

The following decisions have been identified:

- Are there any areas of environmental concern identified at the site?
- Are there any contaminants of potential concern (COPCs) associated with areas of environmental concern identified at the site?
- Is there any evidence of concentrations of the identified COPCs in the areas of concern exceeding DECC endorsed guidelines?
- Are there any issues relating to background soil concentrations?
- Are there any potential aesthetic issues?
- Is there any evidence of, or potential for, migration of contaminants either to or from the site?

5.1.3 Identify Inputs to the Decision

Inputs to the decisions are:

- Site condition information and site historical information; and
- Soil analytical data.

5.1.4 Define the Study Boundaries

The boundaries of the site are as shown in **Figure 2**. The site includes Lots identified in **Appendix A**. The study targeted the potential contamination issues detailed in **Section 4.1**. The site does not include the following privately owned properties:

- Reiby Juvenile Justice Centre (Lot 1 DP499776)
- Briar Rd Public School (Lot 1 DP223302)
- Airds High School (Lots 1 and 2 DP792129)
- Petrol station (Lot 748 DP259553)
- Indoor Sports Centre (Lot 751 DP259553)
- Hotel adjacent to Airds Village (Lots 745 and 747 DP259553)
- Airds Village Shopping Centre (Lot 744 DP259553)
- Tennis Court adjacent to Airds Village (Lot 302 DP1000732)
- John Warby Public School (Lot 110 DP569480)

- Tharawal Aboriginal Cooperative (Lot 2 DP537620)
- Residential area west of Templeton Precinct (Lots 6601 to 6613 DP251263, Lots 8201 to 8218 DP251262, Lots 8301 to 8321 DP251264)
- Residential area west of Rawdon Precinct (Lots 8059 to 8079 DP1063276).

The vertical extent of the investigation was approximately 2.2 m below ground surface. Due to the nature of potential contaminants identified, seasonality was not assessed as part of this investigation.

5.1.5 Develop a Decision Rule

Soil analytical data was assessed against DECC endorsed criteria including:

- *National Environment Protection (Assessment of Site Contamination) Measure,* National Environment Protection Council, 1999 (NEPC 1999)
- *Contaminated Sites: Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (EPA 1994)

The decisions rules adopted to answer the decisions identified in **Section 5.1.2** are summarised in **Table 5.1**.

Table 5.1 Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are there any areas of environmental concern identified at the site?	If an area of concern is identified based on the site inspection and the historical review, the decision is Yes. Otherwise, the decision is No.
2. Are there any COPCs associated with areas of environmental concern identified at the site?	If COPCs associated with an area of concern are identified based on the site inspection and the historical review, the decision is Yes. Otherwise, the decision is No.
3. Is there any evidence of concentrations of the identified COPCs in the areas of concern exceeding DECC endorsed guidelines?	Soil analytical data was compared directly against DECC endorsed criteria. If the soil data was reported below the adopted criteria, the decision is No. If the soil data was reported above the adopted criteria, the decision is Yes.
4. Are there any issues relating to background soil concentrations?	If contaminant concentrations in soils exceeds published background concentrations (NEPC 1999), the decision is Yes. Otherwise, the decision is No.
5. Are there any potential aesthetic issues?	If there are any unacceptable odours or soil discolouration, the decision is Yes. Otherwise, the decision is No.
6. Is there any evidence of, or potential for, migration of contaminants either to or from the site?	Are there any potential offsite sources of contamination? Are contaminants present at concentrations exceeding published background concentrations (NEPC 1999)? If yes, the decision is Yes. Otherwise, the decision is No.

5.1.6 Specify Limits of Decision Error

This step is to establish the decision maker's tolerable limits on decision errors, which are used to establish performance goals for limiting uncertainty in the data. Data generated during this project must be appropriate to allow decisions to be made with confidence.

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW DECC, NEPC (1999), ANZECC/ARMCANZ (2000), DEC (2007), appropriate indicators of data quality (DQIs used to assess quality assurance / quality control) and standard JBS Environmental procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data was assessed against pre-determined Data Quality Indicators (DQIs) for completeness, comparability, representativeness, precision and accuracy. The acceptable limit on decision error is 100% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are discussed below in relation to precision, accuracy, representativeness, comparability and completeness (PARCC parameters), and are shown in **Table 5.2**.

- **Precision** - measures the reproducibility of measurements under a given set of conditions. The precision of the laboratory data and sampling techniques is assessed by calculating the Relative Percent Difference (RPD) of duplicate samples.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that is generated during this study is a measure of the closeness of the analytical results obtained by a method to the 'true' value. Accuracy is assessed by reference to the analytical results of laboratory control samples, laboratory spikes and analyses against reference standards.
- **Representativeness** –expresses the degree which sample data accurately and precisely represents a characteristic of a population or an environmental condition. Representativeness is achieved by collecting samples on a representative basis across the site, and by using an adequate number of sample locations to characterise the site to the required accuracy.
- **Comparability** - expresses the confidence with which one data set can be compared with another. This is achieved through maintaining a level of consistency in techniques used to collect samples; ensuring analysing laboratories use consistent analysis techniques and reporting methods.
- **Completeness** – is defined as the percentage of measurements made which are judged to be valid measurements. The completeness goal is set at there being sufficient valid data generated during the study.

Table 5.2 Summary of Quality Assurance / Quality Control Program

Data Quality Objective	Frequency	Data Quality Indicator
Precision		
Blind duplicates (intra laboratory)	1 / 20 samples	<30-50% RPD[1]
Blind duplicates (inter laboratory)	1 / 20 samples	<30-50% RPD[1]
Accuracy		
Surrogate spikes	All organic samples	70-130%
Laboratory control samples	1 per lab batch	<LOR
Matrix spikes	1 per lab batch	70-130%
Representativeness		
Sampling appropriate for media and analytes		-
Samples extracted and analysed within holding times.	-	organics (14 days), inorganics (6 months)
Trip spike	1 / sampling event	70-130% recovery
Trip blank	1 / sampling event	<LOR
Comparability		
Standard operating procedures for sample collection & handling	All Samples	All samples
Standard analytical methods used for all analyses	All Samples	All samples
Consistent field conditions, sampling staff and laboratory analysis	All Samples	All samples
Limits of reporting appropriate and consistent	All Samples	All samples
Completeness		
Soil description and COCs completed and appropriate	All Samples	All samples
Appropriate documentation	All Samples	All samples
Satisfactory frequency and result for QC samples	All QA/QC samples	-
Data from critical samples is considered valid	-	Critical samples valid

(1) If the RPD between duplicates is greater than the pre-determined data quality indicator, a judgment will be made as to whether the excess is critical in relation to the validation of the data set or unacceptable sampling error is occurring in the field.

5.1.7 Optimise the Design for Obtaining Data

Various strategies for developing a sampling plan are identified in EPA (1995)[6], including judgemental, random, systematic and stratified sampling patterns. Ideally, a stratified targeted sampling strategy would be adopted for this large site, however, the limited access to a number of the identified areas of concern (in particular the residential properties) precluded intrusive investigations in all parts of the site, and as such, sampling was conducted within accessible areas in locations as close as possible to the identified areas of concern.

Due to the preliminary nature of this investigation, the objective to identify potentially widespread contamination and, due to the limited number of samples able to be collected, similar areas of concern were grouped for sampling purposes (as shown in **Table 4.1**). Samples were then collected from a representative selection of the grouped areas of concern.

Given the predominantly residential nature of the site, testpitting locations were placed generally in open space areas to cause minimal disturbance to residents. The only investigation locations which were permitted by the client to be placed within residential properties were HA1, HA2 and HA4-HA8, which were hand auger locations installed in yards of properties which had been vacated[7]. No other residential properties were available for intrusive investigations, so there remains some uncertainty as to the nature and extent of contamination in close proximity to, and beneath, the residential parts of the site.

Testpits were installed at several locations downgradient of the service station, which was identified as a potential offsite source of contamination. The testpit locations (TP18, TP68, TP69) were placed within approximately 50 m of the service station, as access to closer areas was precluded by the presence of a dam as well as private property (the Sports Centre). Testpit TP18 was installed to bedrock (and refusal) at 1.2m below ground surface. Testpits TP68 and TP69 were installed to 1.6 m and 1.9 m, respectively, but within an embankment of material more than 1 m above the surrounding ground level. Groundwater was not encountered in any of the three testpits, and there was no evidence of soil staining or odour in the testpits. Additional investigations (including groundwater assessments) in the vicinity of the petrol station were considered to be outside the scope of this preliminary investigation, but will be required during subsequent detailed investigations.

Intrusive investigations included targeted samples collected from a stockpile of material located within the Smiths Creek Bypass Corridor, to the north of the Creigan Precinct (HA9), and the embankment of the dam west of Airds Village (TP68 and TP69).

Soil samples were collected from 77 locations across the site (including 69 testpits and 8 handauger locations, as shown in **Table 5.3** and on **Figure 3**), targeting as far as practicable (within the limitations of site access constraints) identified areas of environmental concern.

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[6] *Sampling Design Guidelines.* NSW EPA. September 1995. (EPA 1995)

[7] The public housing properties accessed included 1 Elmslea Pl (Elmslea Precinct), 5 Prell Pl (Prell Precinct), 25 Heathfield Pl (Heathfield Precinct), 18 Teeswater Pl (Southdown Precinct), 2 Wallinga Pl (Katella Precinct), 86 Greengate Rd (Mamre Precinct), and 26 Dalkeith Pl (Dalkeith Precinct). Access was granted by Department of Housing to 18 Cardew Pl (Cardew Precinct) but occupants present at the time of works denied access.

Potential hotspot diameters were not calculated due to the targeted nature of the sampling, as these are based on systematic sampling programs. However, the targeted nature of the sampling program introduces a conservative bias, where samples are collected (where access allowed) from the areas most likely to be contaminated. Given the preliminary nature of this report, with the objective to identify potentially widespread contamination at the site, the sampling strategy is considered adequate for the purposes of the investigation.

5.2 Soil Sampling Methodology

All sampling was undertaken by appropriately trained and experienced personnal, in accordance with JBS Environmental's Quality Management System, which is externally certified to ISO AS/NZS 9001:2008.

Soil samples across the site were collected via test pits (TP1-TP69) and handauger locations (HA1, HA2 and HA4-HA9). Testpit locations extended where possible into natural material, up to a maximum depth of 2.2 m. Handauger locations extended where possible into natural material, to maximum depths of 0.6 m below ground surface.

Samples were collected from the surface (0-0.1 m), 0.3 m, 0.5 m and every 0.5 m thereafter until natural material, in an attempt to identify any impacted material from previous or current site uses.

Sufficient sample material was collected to allow both field and laboratory analyses. Additional samples were collected from any soil horizons, which exhibit staining, odours, or other physical evidence of potential contamination.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination were noted on field sheets. Collected soil samples were immediately transferred to laboratory supplied sample jars. The sample containers were transferred to an esky for sample preservation prior to and during shipment to the testing laboratory. A chain-of-custody form was completed and forwarded with the samples to the testing laboratory.

Not all soil samples collected were analysed. Samples were analysed in accordance with the analytical schedule (**Section 5.3**). All samples remain at the primary laboratory for a period of two months if future analysis (provided analysis of analytes is within holding times) is required following the receipt of sample results.

5.3 Laboratory Analyses

JBS Environmental used Envirolab Service Pty Ltd (Envirolab) as the primary laboratory for the required analyses. The secondary laboratory used for the works was SGS Environmental (SGS). Both laboratories are NATA registered for the required analyses. In addition, the laboratories were required to meet JBS Environmental's internal QA/QC requirements. Laboratory analysis of samples was conducted with reference to COPCs listed in **Table 5.3**.

Table 5.3 Analytical Schedule

Media	Sampling Locations	No. of Analyses (incl QA/QC Samples)
Areas in the vicinity of the (offsite) Service Station on Riverside Dr Dam adjacent to Airds High School	TP18, TP68, TP69	Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) – 7 samples TPH/BTEX – 3 samples PAHs – 3 samples Asbestos – 2 samples
Baden Powell Reserve, Riley Park, Kevin Wheatley Reserve, KL Jarvis Field and Merino Park	TP22-TP24, TP27-TP29, TP42-TP44, TP48, TP50-TP52, TP62-TP64	Heavy metals – 20 samples OCP/OPPs – 9 samples Asbestos – 3 samples
Current residential buildings across the site	HA1, HA2, HA4-HA8	Heavy metals – 8 samples Asbestos – 7 samples
Fill material historically used across the site	TP3, TP5-TP22, TP24-TP38, TP42, TP44-TP47, TP49-TP58, TP61-TP64, TP66-TP69, HA1-HA9	Heavy metals – 44 samples TPH/BTEX – 29 samples PAHs – 34 samples OCP/OPPs – 23 samples PCBs – 21 samples Asbestos – 30 samples
Former dams and creeklines along the western portion of the site, adjacent to Woolwash Rd, Boonoke Wy and Peppin Cr.	TP10, TP11, TP13, TP14, TP26, TP53	Heavy metals – 6 samples TPH/BTEX – included elsewhere PAHs – included elsewhere OCP/OPPs – 2 samples PCBs – 2 samples Asbestos – 1 samples
Former market gardens in the northern central portion of the site	TP26-TP58, HA5	Heavy metals – 19 samples OCP/OPPs – included elsewhere
Former orchards in the central eastern and southern portions of the site	TP21, TP26, TP33, TP34, HA1, HA6, HA7	Heavy metals – 7 samples OCP/OPPs – included elsewhere
Former sheds and buildings circa 1970	TP62-TP64, TP67	Heavy metals – 1 sample Asbestos – included elsewhere

6 Assessment Criteria

6.1 Regulatory Guidelines

The investigation was undertaken with consideration to aspects of the following guidelines, as relevant:

- *Contaminated Sites: Guidelines for Assessing Service Station Sites,* NSW EPA, 1994 (EPA 1994)
- *Contaminated Sites: Sampling Design Guidelines,* NSW EPA, 1995 (EPA 1995)
- Contaminated Sites: Guidelines for the Vertical Mixing of Soil on Former Broad-Acre Agricultural Land, NSW EPA, 1995 (EPA 1995b)
- *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*, NSW EPA, 1997 (EPA 1997)
- *Contaminated Sites: Guidelines for Assessing Banana Plantation Sites,* NSW EPA, 1997 (EPA 1997b)
- *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme, 2nd Edition,* NSW EPA, 2006 (DEC 2006)
- *Contaminated Sites: Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report,* NSW EPA, 1999 (EPA 1999)
- *National Environment Protection (Assessment of Site Contamination) Measure,* National Environment Protection Council, 1999 (NEPC 1999)
- *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites,* Australian and New Zealand Environment and Conservation Council and the National Health and Medical Research Council, 1992 (ANZECC/NHMRC 1992)
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality.* Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand, Paper No 4, 2000 (ANZECC/ARMCANZ 2000)
- *Australian Drinking Water Guidelines,* National Health and Medical Research Council and Agriculture and Resource Management Council of Australia and New Zealand, 2004 (NHMRC/NRMMC 2004)
- *Composite Sampling,* Lock, W. H., National Environmental Health Forum Monographs, Soil Series No.3, 1996, SA Health Commission, (NEHF 1996)
- *Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards,* Department of Health and Ageing and EnHealth Council, Commonwealth of Australia, June 2002 (EnHealth 2002)
- *Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination,* NSW DECC, March 2007 (DECC 2007)

6.2 Soil Criteria

Based on the proposed mixture of standard residential use and open space, and in accordance with the decision process for assessment of urban redevelopment sites (DEC 2006), concentrations of contaminants in the soil were compared against investigation levels for standard residential use with gardens and accessible soil (HIL-A), parks and open space (HIL-E) as well as the phytotoxicity based investigation levels (PILs) (**Table 6.1**).

It is noted that the phytotoxicity-based criteria are provisional in nature only, and have "significant limitations because phytotoxicity depends on soil and species parameters in ways that are not fully understood" (DEC 2006).

Table 6.1 Soil Criteria (all units in mg/kg)

	Limit of Reporting	Laboratory Method	Health-Based Investigation Level (residential) (HIL – A)[1]	Health-Based Investigation Level (Open Space) (HIL – E)[1]	Ecological-based Investigation Level[3]
METALS					
Arsenic	4.0	ICP-AES (USEPA 200.7)	100	200	20
Cadmium	1.0	ICP-AES (USEPA 200.7)	20	40	3
Chromium (VI)	1.0	ICP-AES (USEPA 200.7)	100	200	1
Copper	1.0	ICP-AES (USEPA 200.7)	1,000	2,000	100
Nickel	1.0	ICP-AES (USEPA 200.7)	600	600	60
Lead	1.0	ICP-AES (USEPA 200.7)	300	600	600
Zinc	1.0	ICP-AES (USEPA 200.7)	7,000	14,000	200
Mercury (inorganic)	0.1	ICP-AES (USEPA 200.7)	15	30	1
PETROLEUM HYDROCARBONS					
C_6–C_9 Fraction	25	Purge Trap-GCMS (USEPA8260)	65[4]		-
C_{10}–C_{36} Fraction	250	Purge Trap-GCFID (USEPA8000)	1,000[4]		-
BTEX					
Benzene	1.0	Purge Trap-GCMS (USEPA8260)	1[4]		-
Toluene	1.0	Purge Trap-GCMS (USEPA8260)	130[4]		1.4
Ethylbenzene	1.0	Purge Trap-GCMS (USEPA8260)	50[4]		3.1
Total Xylenes	3.0	Purge Trap-GCMS (USEPA8260)	25[4]		14
POLYCYCLIC AROMATIC HYDROCARBONS					
Benzo(a)pyrene	0.05	GCMS (USEPA8270)	1	2	-
Total PAHs	1.55	GCMS (USEPA8270)	20	40	-
ORGANOCHLORINE PESTICIDES					
Aldrin + Dieldrin	0.2	GCECD (USEPA8140,8080)	10	20	-
Chlordane	0.1	GCECD (USEPA8140,8080)	50	100	-
DDT + DDD + DDE	0.3	GCECD (USEPA8140,8080)	200	400	-
Heptachlor	0.1	GCECD (USEPA8140,8080)	10	20	-
PCBs					
PCBs (total)	0.9	GCECD (USEPA8140,8080)	10	20	-
OTHER					
Asbestos	Presence	PLM / Dispersion Staining	No ACM fragments and no fibres observed using NATA accredited analysis		-

[1] Column 1 (NEHF - A), Health-based Investigation Levels (DEC 2006)
[2] Colum 3 (NEHF-E), Health-based Investigation Levels (DEC 2006)
[3] Column 5 (PIL), Soil Investigation Levels for Urban Redevelopment Sites (DEC 2006)
[4] Table 3 (EPA 1994)

7 Quality Assurance / Quality Control

7.1 Soil QA/QC Results

The QA/QC results for soil are summarised in **Table 7.1** and discussed in **Section 7.2** below. Detailed QA/QC results are included the laboratory reports in **Appendix E**.

Table 7.1 - Soil QA/QC Results Summary

Data Quality Objective	Results	DQI met?
Precision		
Soil Blind duplicates (intra laboratory)	0 - 129% RPD	Partial[1]
Soil Blind triplicates (inter laboratory)	1 - 141% RPD	Partial[1]
Trip spike	89 - 119%	Yes
Trip blank	<LOR	Yes
Accuracy		
Surrogate spikes	71 - 114% recovery	Yes
Matrix spikes	62 - 142% recovery	Partial[1]
Representativeness		
Sampling appropriate for media and analytes	All sampling conducted in accordance with JBS procedures	Yes
Laboratory blanks	<LOR	Yes
Samples extracted and analysed within holding times.	All samples were extracted and analysed within 10 days of sampling.	Yes
Comparability		
Standard operating procedures used for sample collection & handling	A single field staff member used same standard operating procedures throughout works	Yes
Standard analytical methods used	Standard analytical methods used as listed in **Table 6.1**.	Yes
Consistent field conditions, sampling staff and laboratory analysis	Sampling was conducted by a single field staff member using standard operating procedures in similar conditions throughout the works. Primary and secondary labs remained consistent throughout the investigation.	Yes
Limits of reporting appropriate and consistent	Limits of reporting were consistent and appropriate.	Yes
Completeness		
Soil description & COCs completed	All bore logs and COCs were completed appropriately.	Yes
Appropriate documentation	All appropriate field documentation is included in the Appendices.	Yes
Satisfactory frequency/result for QC samples	The QC results are considered adequate for the purposes of the investigation.	Yes
Data from critical samples is considered valid	Data from critical samples is considered valid.	Yes

[1] See discussion of DQI exceedances below.

7.2 Soil QA/QC Discussion

Field duplicates had relative percentage differences (RPDs) generally within the acceptable range of less than 50%, with the following exceptions:

- Nickel in primary sample TP15-0.1 and triplicate sample QC3a, with an RPD of 51%;
- Arsenic, chromium, copper, lead, nickel and zinc in primary sample TP17-0.1 and triplicate sample QC4a, with RPDs of 57%, 67%, 80%, 72%, 78% and 78%, respectively;
- Copper, nickel and zinc in primary sample TP66-0.1 and duplicate sample QC8, with RPDs of 129%, 111% and 94%, respectively; and
- Arsenic, chromium, copper, lead, nickel and zinc in primary sample TP66-0.1 and triplicate sample QC8a, with RPDs of 55%, 52%, 141%, 82%, 137% and 113%, respectively.

The elevated RPDs noted are due primarily to the reported concentrations being close to the limit of reporting. Elevated RPDs may also be partially due to the heterogenous nature of fill material. The elevated RPDs are not considered to affect the reliability of the data set, especially given that all reported results were well below the adopted assessment criteria.

Matrix spikes were detected slightly outside the target range for several OPP compounds (64-69%) and several OCP compounds (135-142%) in Batch 26609. Matrix spikes were detected slightly outside the target range for an OPP compound (62%) and ortho-xylene (133%) in Batch 26853. Matrix spikes were detected slightly above the target range for ortho-xylene (135%) in Batch 27285. The matrix spike recoveries outside the target range are not considered to affect the analytical dataset significantly, as all BTEX compounds, OCPs and OPPs across the site were reported either below the laboratory limit of reporting or well below the adopted assessment criteria.

7.3 QA/QC Conclusion

The field sampling and handling procedures produced QA/QC results which indicate that the soil data is of an acceptable quality and is suitable for use in site characterisation.

The NATA certified laboratory results sheets indicate that the project laboratory was generally achieving levels of performance within its recommended control limits during the period when the samples from this program were analysed.

On the basis of the results of the field and laboratory QA/QC program, the soil data is of an acceptable quality upon which to draw conclusions regarding the environmental condition of the site.

8 Discussion of Soil Results

8.1 Field Observations

Geology encountered at the site during the field works is summarised below. Bore logs are included in **Appendix H**.

A single suspected ACM fragment was identified on the ground surface in the northern portion of Baden Powell Reserve. Another single suspected ACM fragment was identified on the ground surface in the western portion of Merino Park. No other suspected ACM was identified on the surface in areas accessed during the investigation.

Fill material identified across the site was generally clay or silt with gravel in some areas, ranging from surficial topsoil only, to depths of 2 m in the vicinity of the former Smiths Creek (TP3), although in general the fill was less than 0.5 m deep. Building rubble (including concrete, glass, pipes) was identified in fill material in the central portion of the site (in Kevin Wheatley Reserve and the Southdown precinct), in testpits adjacent to Creigan Precinct (TP6) and Prell Precinct (TP32, TP35, TP36), and also in the southern portion of the Smiths Creek Bypass Corridor (TP12) and the northwestern portion of Baden Powell Reserve (TP28). A small pile (<1 m3) of building rubble comprising bricks and concrete was identified in the central portion of Southdown Precinct, in the vicinity of TP56.

Suspected ACM was identified in shallow fill material in TP32, located in the northern portion of the site adjacent to Prell Precinct. The fill in this location also contained sandstone fragments and wood pieces.

Fill material across the site is generally underlain by either natural red, brown or grey silty or clay soil with occasional gravel inclusions. Several testpits in the northern portion of the Smiths Creek Bypass Corridor (TP38, TP39) encountered natural sandy clays and silts underneath fill material. Bedrock was generally encountered between 1 m and 3 m and comprised either shale or sandstone.

Fill material encountered within the residential properties which were accessed during this investigation (at HA1, HA2, HA4-8) comprised silt with some sandstone gravels, and was generally less than 0.3 m in depth.

The fill stockpile in the Smiths Creek Bypass Corridor (north of Creigan Precinct) appeared to comprise gravelly silty clay. Minor amounts of roadbase, sandstone and ironstone gravels were identified on the surface of the stockpile. The stockpile was covered in grass which prevented a detailed visual inspection. No suspected ACM was identified on visible areas of the surface of the stockpile, or at the footing of the stockpile.

Fill in the dam embankment appear to be comprised of gravelly silty sand fill material on the western and northern sides. No suspected ACM or building rubble was identified on the surface of the embankment or within testpits excavated within the embankment.

8.2 Soil Analytical Results

The soil sampling locations are shown on **Figure 3** and summarised laboratory results are presented in **Tables B** and **C**. Detailed laboratory reports and chain of custody documentation is provided in **Appendix I**.

The summary laboratory results are discussed in the following sections.

8.2.1 Metals

There were no concentrations of any heavy metals reported above the adopted health based criteria for standard residential use with gardens and accessible soil (HIL-A) or parks/ open space (HIL-E) in any soil sample selected for analysis. There were no concentrations of heavy metals reported exceeding the phytotoxicity-based investigation levels (PILs) in any soil sample selected for analysis.

Based on this, heavy metals are not considered to pose a widespread contamination issue in the parts of the site which were accessible for sampling.

8.2.2 TPH / BTEX

There were no reported concentrations of TPH /BTEX compounds above the human health and ecologically based threshold criteria detected in any soil sample selected for analysis. On this basis, TPH/BTEX compounds are not considered to pose a widespread contamination issue in the parts of the site which were accessible for sampling.

It is noted, however, that samples were unable to be collected in close proximity to the service station located south of Airds Village, and that the service station is considered to be a potential offsite source of contamination.

8.2.3 PAHs

There were no reported concentrations of PAHs above the adopted HIL-A criteria in any sample selected for analysis. On this basis, PAH compounds are not considered to pose a widespread contamination issue in the parts of the site which were accessible for sampling.

It is noted, however, that samples were unable to be collected in close proximity to the service station located south of Airds Village, and that the service station is considered to be a potential offsite source of contamination.

8.2.4 OCP / OPP / PCBs

There were no reported concentrations of OCP/OPP/PCBs above the adopted criteria in any sample selected for analysis. On this basis, OCP/OPP/PCB compounds are not considered to pose a widespread contamination issue in the parts of the site which were accessible for sampling.

8.2.5 Asbestos

Single fragments of suspected ACM were identified on the ground surface in the northern portion of Baden Powell Reserve, and in the western portion of Merino Park. Suspected ACM was identified in shallow fill material at TP32, in the vicinity of the Prell Precinct.

Asbestos fibres were not reported in any soil sample selected for analysis.

It is noted that limited sampling was able to be conducted within the residential precincts, which are considered to be the main areas of concern with respect to the potential presence of asbestos at the site.

9 Conclusions and Recommendations

9.1 Conclusions

Based on the findings of this investigation and subject to the limitations in **Section 10**, the following conclusions are made:

- Based on the site history and site inspection, the following areas of environmental concern and associated contaminants of potential concern have been identified (**Table 9.1**).

Table 9.1 Areas of Environmental Concern and Associated Contaminants of Potential Concern

Area of Environmental Concern (AEC)	Contaminants of Potential Concern (COPC)
Areas in the vicinity of the (offsite) Service Station on Riverside Dr	Heavy metals, TPH/BTEX, PAHs
Dam adjacent to Airds High School	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, asbestos
Baden Powell Reserve, Riley Park, Kevin Wheatley Reserve, KL Jarvis Field and Merino Park	Heavy metals, OCP/OPPs, asbestos
Current residential buildings across the site	Heavy metals, asbestos
Fill material historically used across the site	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, PCBs, asbestos
Former dams and creeklines along the western portion of the site, adjacent to Woolwash Rd, Boonoke Wy and Peppin Cr.	Heavy metals, TPH/BTEX, PAHs, OCP/OPPs, PCBs, asbestos
Former market gardens in the northern central portion of the site	Heavy metals, OCPs
Former orchards in the central eastern and southern portions of the site	Heavy metals, OCPs
Former sheds and buildings circa 1970	Heavy metals, asbestos

- The service station on Riverside Dr, the bus depot and substation adjacent to the western site boundary are considered to be potential offsite sources of contamination. Based on the likely presence of petroleum storage in aboveground or underground tanks at the service station and depot, and of potential PCBs in transformers and capacitors at the substation, these facilities have to potential to impact the site predominantly via migration of potentially contaminated groundwater. Given the inferred easterly groundwater flow in the western portion of the site, the bus depot and substation may potentially impact the northwestern portion of the site. The service station is located on a slope with a westerly aspect, and inferred groundwater flow in this area is to the west towards the Smiths Creek Bypass Corridor. Thus the area which may be potentially impacted is the area west of the service station, in the vicinity of the dam.
- Single fragments of suspected asbestos containing material (ACM) were identified on the ground surface in Baden Powell Reserve and in Merino Park. Suspected ACM was identified in surficial fill material in the vicinity of the Prell Precinct. No asbestos fibres were identified in soil at the site. Building rubble was identified in the central portion of the site, in Kevin Wheatley Reserve, Southdown Precinct, Prell Precinct, Creigan Precinct, Faithfull Precinct, and in testpits within the Smiths Creek Bypass Corridor and Baden Powell Reserve indicating a likelihood of further potential ACM impact. It is noted that limited sampling was able to be conducted within the residential precincts, which are considered to be the main areas of concern with respect to the potential presence of asbestos at the site.
- The site did not report any concentrations of metals, TPH/BTEX, PAHs, OCP/OPPs or PCBs above the adopted criteria indicating that these do not pose a widespread contamination issue in the parts of the site which were accessible for sampling.

- The investigation has identified that the main contamination issue at the site is asbestos, which is present as fragments of ACM on the ground surface and in fill materials. The extent of asbestos impact at the site will require to be assessed through a detailed site investigation process, and appropriate remediation/ management plans developed to outline the steps required to make the site suitable for the proposed development.

9.2 Recommendations

It is recommended that, at each stage of the proposed development, a detailed site investigation be undertaken based on the findings of this preliminary investigation. Where a detailed site investigation identifies contamination at levels which pose a risk under the proposed land use(s), then these are required to be addressed through the planning process in accordance with current regulatory requirements.

10 Limitations

This report has been prepared for use by the client who commissioned the works in accordance with the project brief only and has been based in part on information obtained from other parties. The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

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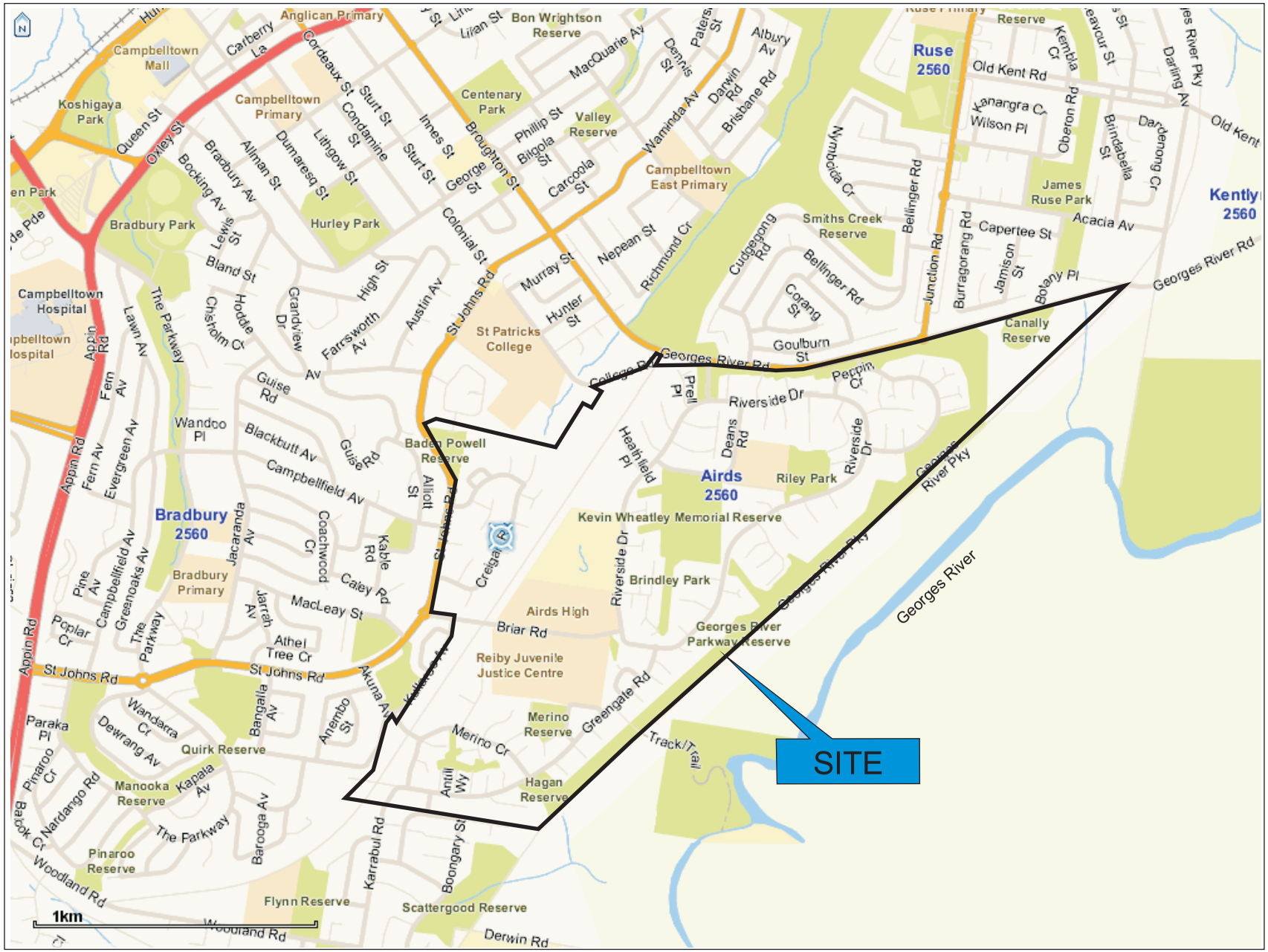
Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements and site history, not on sampling and analysis of all media at all locations for all potential contaminants.

Limited sampling and laboratory analyses were undertaken as part of the investigations, as described herein. Ground conditions between sampling locations may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the sites, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS Environmental Pty Ltd reserves the right to review the report in the context of the additional information.

Figures



Legend

Approximate site boundary

Client: Landcom

Site Address: Airds Bradbury Redevelopment

Job Number: 40645

File Name: Figure 1

Figure 1 Site Location

Rev	Description	By	Date
0	Original Issue	KMJ	27.02.09

Legend

Site Boundary

Properties not included in site area

FIGURE 2 Site Layout

Client : Landcom

Project Name : Airds Bradbury Renewal Project

File Name : 40719-001	Scale : AS	Project Number : 40719	A3

Rev	Description	By	Date
0	Original Issue	KMJ	27.02.09

Legend

- Indicative Testpit/Handauger Location (67)
- Site Boundary
- Properties not included in site area

JBS ENVIRONMENTAL

FIGURE 3 Sample Locations

Client : Landcom

Project Name : Airds Bradbury Renewal Project

File Name : 40719-002	Scale : AS	Project Number : 40719	A3

Tables

Job No. 40719
Landcom, Airds Bradbury, NSW
Table A - Sample Register and Selected Analysis

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table A - Sample

Soil Sample ID /Depth (m)	Sampling Date	Soil Description (See bore logs for more detailed notes)	8 Metals	TPH	BTEX	PAHs	OCP / OPPs	PCBs	Asbestos
TP1-0.1	10-Feb-09	Topsoil	X						X
TP1-0.3	10-Feb-09	Silt	X						
TP1-0.6	10-Feb-09	Clay							
TP1-1.0	10-Feb-09	Clay							
TP2-0.1	10-Feb-09	Topsoil	X						
TP2-0.3	10-Feb-09	Silt							
TP2-0.5	10-Feb-09	Clay							
TP2-1.0	10-Feb-09	Sandy Silt							
TP3-0.1	10-Feb-09	Fill	X	X	X	X	X	X	X
TP3-0.3	10-Feb-09	Fill	X						
TP3-0.5	10-Feb-09	Fill							
TP3-1.0	10-Feb-09	Fill							
TP3-1.5	10-Feb-09	Fill							
TP3-2.0	10-Feb-09	Fill							
TP4-0.1	10-Feb-09	Topsoil	X						X
TP4-0.3	10-Feb-09	Silt							
TP4-0.5	10-Feb-09	Clay							
TP5-0.1	10-Feb-09	Fill	X						
TP5-0.3	10-Feb-09	Fill							
TP5-0.5	10-Feb-09	Clay							
TP5-1.0	10-Feb-09	Clay							
TP6-0.1	10-Feb-09	Fill	X			X	X	X	X
TP6-0.3	10-Feb-09	Fill	X						
TP6-0.5	10-Feb-09	Clay							
TP6-1.0	10-Feb-09	Clay							
TP7-0.1	10-Feb-09	Fill	X						
TP7-0.3	10-Feb-09	Fill							
TP7-0.5	10-Feb-09	Clay							
TP7-1.0	10-Feb-09	Clay							
TP8-0.1	10-Feb-09	Fill	X	X	X	X	X	X	X
TP8-0.3	10-Feb-09	Fill							
TP8-0.6	10-Feb-09	Clay							
TP8-1.0	10-Feb-09	Clay							
TP9-0.1	10-Feb-09	Fill	X						
TP9-0.3	10-Feb-09	Clay							
TP9-0.5	10-Feb-09	Clay							
TP10-0.1	10-Feb-09	Fill	X						
TP10-0.3	10-Feb-09	Fill							
TP10-0.5	10-Feb-09	Clay							
TP10-1.0	10-Feb-09	Clay							
TP11-0.1	10-Feb-09	Fill	X						X
TP11-0.3	10-Feb-09	Fill							
TP11-0.5	10-Feb-09	Clay							
TP11-1.0	10-Feb-09	Clay							
TP12-0.1	10-Feb-09	Fill	X	X	X	X	X	X	X
TP12-0.3	10-Feb-09	Fill							
TP12-0.5	10-Feb-09	Fill	X	X	X	X	X	X	
TP12-1.0	10-Feb-09	Clay							
TP12-1.5	10-Feb-09	Clay	X	X	X	X			
TP13-0.1	10-Feb-09	Fill	X						
TP13-0.3	10-Feb-09	Fill							
TP13-0.5	10-Feb-09	Clay							
TP13-1.0	10-Feb-09	Clay							
TP14-0.1	10-Feb-09	Fill	X						
TP14-0.3	10-Feb-09	Clay							
TP14-0.5	10-Feb-09	Clay							
TP14-1.0	10-Feb-09	Clay							
TP15-0.1	10-Feb-09	Fill	X	X	X	X			X
TP15-0.3	10-Feb-09	Silty Clay							
TP15-0.5	10-Feb-09	Silty Clay							
TP15-1.0	10-Feb-09	Gravelly Silty Clay							
TP16-0.1	10-Feb-09	Fill	X	X	X	X			
TP16-0.3	10-Feb-09	Silty Clay							
TP16-0.5	10-Feb-09	Silty Clay							
TP16-1.0	10-Feb-09	Clay							
TP17-0.1	11-Feb-09	Fill	X	X	X	X	X	X	X
TP17-0.3	11-Feb-09	Fill							
TP17-0.6	11-Feb-09	Silty Clay							
TP17-1.0	11-Feb-09	Silty Clay							
TP18-0.1	11-Feb-09	Fill	X						
TP18-0.3	11-Feb-09	Silt							
TP18-0.5	11-Feb-09	Silty Clay							
TP18-1.0	11-Feb-09	Silty Clay							
TP19-0.1	11-Feb-09	Fill	X	X	X	X	X	X	X
TP19-0.3	11-Feb-09	Silty Clay							
TP19-0.5	11-Feb-09	Silty Clay							
TP19-1.0	11-Feb-09	Clay							
TP20-0.1	11-Feb-09	Fill	X						
TP20-0.3	11-Feb-09	Silty Clay							
TP20-0.9	11-Feb-09	Clay							
TP21-0.1	11-Feb-09	Fill	X						
TP21-0.3	11-Feb-09	Silty Clay							
TP21-0.5	11-Feb-09	Silty Clay							
TP21-1.0	11-Feb-09	Clay							
TP22-0.1	23-Feb-09	Fill	X				X	X	
TP22-0.4	23-Feb-09	Clay							
TP23-0.1	23-Feb-09	Silty Clay	X				X	X	
TP23-0.3	23-Feb-09	Silty Clay							

Job No. 40719
Landcom, Airds Bradbury, NSW
Table A - Sample Register and Selected Analysis

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table A - Sample

Soil Sample ID /Depth (m)	Sampling Date	Soil Description (See bore logs for more detailed notes)	8 Metals	TPH	BTEX	PAHs	OCP / OPPs	PCBs	Asbestos
TP23-0.5	23-Feb-09	Clay							
TP24-0.1	23-Feb-09	Fill	X				X	X	
TP24-0.3	23-Feb-09	Fill							
TP24-0.5	23-Feb-09	Fill							
TP24-1.1	23-Feb-09	Fill							
TP24-2.0	23-Feb-09	Fill							
TP25-0.1	11-Feb-09	Fill	X	X	X	X			X
TP25-0.3	11-Feb-09	Fill							
TP25-0.5	11-Feb-09	Fill							
TP25-1.0	11-Feb-09	Fill							
TP25-1.3	11-Feb-09	Clay							
TP26-0.1	11-Feb-09	Fill	X				X	X	
TP26-0.3	11-Feb-09	Silty Clay							
TP26-0.5	11-Feb-09	Silty Clay							
TP26-1.0	11-Feb-09	Clay							
TP27-0.1	11-Feb-09	Fill	X				X	X	
TP27-0.3	11-Feb-09	Silty Clay							
TP27-0.5	11-Feb-09	Silty Clay							
TP27-1.0	11-Feb-09	Clay							
TP28-0.1	11-Feb-09	Fill	X						X
TP28-0.3	11-Feb-09	Fill	X						X
TP28-0.5	11-Feb-09	Fill	X						
TP28-1.0	11-Feb-09	Clay							
TP29-0.1	11-Feb-09	Fill	X						
TP29-0.3	11-Feb-09	Silty Clay							
TP29-0.5	11-Feb-09	Silty Clay							
TP29-1.0	11-Feb-09	Clay							
TP30-0.1	12-Feb-09	Fill	X						
TP30-0.3	12-Feb-09	Silt							
TP30-0.6	12-Feb-09	Silty Clay							
TP31-0.1	12-Feb-09	Fill	X						
TP31-0.3	12-Feb-09	Silty Clay							
TP31-0.5	12-Feb-09	Silty Clay							
TP31-1.0	12-Feb-09	Gravelly Silty Clay							
TP32-0.1	12-Feb-09	Fill	X						X
TP32-0.3	12-Feb-09	Silt							
TP32-0.5	12-Feb-09	Silt							
TP32-1.0	12-Feb-09	Silty Clay							
TP33-0.1	12-Feb-09	Fill	X						
TP33-0.3	12-Feb-09	Silt							
TP33-0.7	12-Feb-09	Silty Clay							
TP34-0.1	12-Feb-09	Fill	X			X	X	X	
TP34-0.3	12-Feb-09	Silt							
TP34-0.5	12-Feb-09	Silty Clay							
TP34-1.0	12-Feb-09	Gravelly Silty Clay							
TP35-0.1	12-Feb-09	Fill	X	X	X	X	X	X	X
TP35-0.3	12-Feb-09	Fill							
TP35-0.5	12-Feb-09	Fill							
TP35-1.0	12-Feb-09	Fill	X	X	X	X			
TP35-1.5	12-Feb-09	Clay							
TP36-0.1	12-Feb-09	Fill	X	X	X	X			
TP36-0.3	12-Feb-09	Silt							
TP37-0.1	12-Feb-09	Fill	X						
TP37-0.3	12-Feb-09	Gravelly Silty Clay							
TP37-0.5	12-Feb-09	Silty Clay							
TP37-1.0	12-Feb-09	Silty Clay							
TP38-0.1	12-Feb-09	Fill	X						
TP38-0.4	12-Feb-09	Sandy Clay							
TP38-0.5	12-Feb-09	Sandy Clay							
TP38-0.9	12-Feb-09	Gravelly Silty Clay							
TP39-0.1	12-Feb-09	Silt	X						
TP39-0.3	12-Feb-09	Silt							
TP39-0.5	12-Feb-09	Sandy Silt							
TP40-0.1	12-Feb-09	Topsoil	X						X
TP40-0.3	12-Feb-09	Gravelly Sandy Silt	X						
TP40-0.5	12-Feb-09	Silty Clay							
TP40-1.0	12-Feb-09	Gravelly Silty Clay							
TP41-0.1	12-Feb-09	Topsoil	X						
TP41-0.3	12-Feb-09	Sandy Silt							
TP41-0.5	12-Feb-09	Silty Clay							
TP42-0.1	13-Feb-09	Fill	X	X	X	X	X	X	X
TP42-0.3	13-Feb-09	Fill	X						
TP42-1.0	13-Feb-09	Fill							
TP42-1.5	13-Feb-09	Silty Clay							
TP42-2.0	13-Feb-09	Silty Clay							
TP43-0.1	13-Feb-09	Silt	X						
TP43-0.3	13-Feb-09	Silty Clay							
TP43-0.5	13-Feb-09	Silty Clay							
TP43-1.0	13-Feb-09	Silty Clay							
TP44-0.1	13-Feb-09	Fill	X						
TP44-0.3	13-Feb-09	Fill							

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Table A - Sample Register and Selected Analysis

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table A - Sample

Soil Sample ID /Depth (m)	Sampling Date	Soil Description (See bore logs for more detailed notes)	8 Metals	TPH	BTEX	PAHs	OCP / OPPs	PCBs	Asbestos
TP44-0.5	13-Feb-09	Clay							
TP45-0.1	13-Feb-09	Fill	X						X
TP45-0.3	13-Feb-09	Fill							
TP45-0.4	13-Feb-09	Silty Clay	X						
TP45-1.2	13-Feb-09	Silty Clay							
TP46-0.1	13-Feb-09	Fill	X						X
TP46-0.3	13-Feb-09	Fill	X						
TP46-0.5	13-Feb-09	Silty Clay							
TP46-0.8	13-Feb-09	Silty Clay							
TP47-0.1	13-Feb-09	Fill	X						
TP47-0.3	13-Feb-09	Silt							
TP47-0.5	13-Feb-09	Silty Clay							
TP47-0.8	13-Feb-09	Silty Clay							
TP48-0.1	13-Feb-09	Silt	X	X	X	X			
TP48-0.3	13-Feb-09	Silt							
TP48-0.4	13-Feb-09	Silty Clay	X						
TP48-0.6	13-Feb-09	Gravelly Silty Clay							
TP49-0.1	13-Feb-09	Fill	X			X	X	X	X
TP49-0.3	13-Feb-09	Fill							
TP49-0.5	13-Feb-09	Silty Clay							
TP49-0.6	13-Feb-09	Gravelly Silty Clay							
TP50-0.1	13-Feb-09	Fill	X			X			
TP50-0.3	13-Feb-09	Silty Clay							
TP50-0.5	13-Feb-09	Silty Clay							
TP50-1.0	13-Feb-09	Silty Clay							
TP51-0.1	13-Feb-09	Fill	X						
TP51-0.3	13-Feb-09	Fill							
TP51-1.0	13-Feb-09	Silty Clay							
TP52-0.1	23-Feb-09	Fill	X				X	X	
TP52-0.3	23-Feb-09	Silt							
TP52-0.6	23-Feb-09	Silty Clay							
TP52-1.0	23-Feb-09	Silty Clay							
TP53-0.1	23-Feb-09	Fill	X				X	X	
TP53-0.3	23-Feb-09	Fill							
TP53-0.6	23-Feb-09	Silty Clay							
TP54-0.1	12-Feb-09	Fill	X	X	X	X			
TP54-0.3	12-Feb-09	Fill	X						
TP54-0.5	12-Feb-09	Fill							
TP55-0.1	12-Feb-09	Fill	X						X
TP55-0.3	12-Feb-09	Fill	X						
TP55-0.5	12-Feb-09	Fill							
TP55-1.0	12-Feb-09	Silty Clay							
TP55-1.5	12-Feb-09	Silty Clay							
TP56-0.1	12-Feb-09	Fill	X	X	X	X	X	X	X
TP56-0.3	12-Feb-09	Fill							
TP56-0.5	12-Feb-09	Fill							
TP56-1.0	12-Feb-09	Silty Clay	X						
TP56-1.5	12-Feb-09	Silty Clay							
TP57-0.1	12-Feb-09	Fill	X			X	X	X	X
TP57-0.3	12-Feb-09	Silty Clay							
TP57-0.5	12-Feb-09	Silty Clay							
TP57-1.0	12-Feb-09	Silty Clay							
TP58-0.1	12-Feb-09	Fill	X	X	X	X	X	X	X
TP58-0.65	12-Feb-09	Silt	X						
TP58-1.1	12-Feb-09	Silty Clay							
TP58-1.6	12-Feb-09	Silty Clay							
TP59-0.1	12-Feb-09	Silt	X						
TP59-0.3	12-Feb-09	Silty Clay							
TP59-0.5	12-Feb-09	Silty Clay							
TP59-1.0	12-Feb-09	Gravelly Silty Clay							
TP60-0.1	12-Feb-09	Silt	X						
TP60-0.3	12-Feb-09	Silty Clay							
TP60-0.5	12-Feb-09	Silty Clay							
TP61-0.1	12-Feb-09	Fill	X	X	X	X	X	X	X
TP61-0.3	12-Feb-09	Silt	X				X	X	
TP61-0.5	12-Feb-09	Silty Clay							
TP61-1.0	12-Feb-09	Gravelly Silty Clay							
TP62-0.1	23-Feb-09	Fill	X				X	X	
TP62-0.3	23-Feb-09	Fill							
TP62-0.5	23-Feb-09	Fill							
TP62-1.0	23-Feb-09	Fill							
TP62-1.5	23-Feb-09	Silty Clay							
TP63-0.1	23-Feb-09	Fill	X				X	X	
TP63-0.3	23-Feb-09	Fill							
TP63-1.2	23-Feb-09	Silty Clay							
TP63-1.5	23-Feb-09	Silty Clay							
TP64-0.1	23-Feb-09	Fill	X				X	X	
TP64-0.3	23-Feb-09	Silty Clay							
TP64-0.7	23-Feb-09	Silty Clay							
TP64-1.0	23-Feb-09	Silty Clay							
TP65-0.1	12-Feb-09	Silt	X						
TP65-0.3	12-Feb-09	Silty Clay							
TP65-0.6	12-Feb-09	Silty Clay							
TP66-0.1	12-Feb-09	Fill	X	X	X	X	X	X	X
TP66-0.3	12-Feb-09	Silt	X						
TP66-0.5	12-Feb-09	Silty Clay							

Job No. 40719
Landcom, Airds Bradbury, NSW
Table A - Sample Register and Selected Analysis

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table A - Sample

Soil Sample ID /Depth (m)	Sampling Date	Soil Description (See bore logs for more detailed notes)	8 Metals	TPH	BTEX	PAHs	OCP/OPPs	PCBs	Asbestos
TP66-1.0	12-Feb-09	Silty Sandy Clay							
TP67-0.1	12-Feb-09	Fill	X						
TP67-0.3	12-Feb-09	Silt							
TP67-0.5	12-Feb-09	Silty Clay							
TP67-1.1	12-Feb-09	Gravelly Silty Clay							
TP68-0.1	13-Feb-09	Fill	X	X	X	X	X	X	X
TP68-0.3	13-Feb-09	Fill							
TP68-0.5	13-Feb-09	Fill							
TP68-1.0	13-Feb-09	Silty Clay							
TP68-1.5	13-Feb-09	Silty Clay							
TP69-0.1	13-Feb-09	Fill	X	X	X	X	X	X	X
TP69-0.3	13-Feb-09	Fill	X						
TP69-0.5	13-Feb-09	Fill	X						
TP69-1.2	13-Feb-09	Silty Clay	X						
TP69-1.7	13-Feb-09	Silty Clay							
HA1-0.1	23-Feb-09	Fill	X						X
HA1-0.3	23-Feb-09	Silt							
HA2-0.1	23-Feb-09	Fill	X						X
HA2-0.3	23-Feb-09	Silty Clay							
HA2-0.5	23-Feb-09	Silty Clay							
HA4-0.1	23-Feb-09	Fill	X						X
HA4-0.3	23-Feb-09	Silty Clay							
HA4-0.5	23-Feb-09	Silty Clay							
HA5-0.1	23-Feb-09	Fill	X						X
HA5-0.3	23-Feb-09	Silty Clay							
HA5-0.5	23-Feb-09	Silty Clay							
HA6-0.1	23-Feb-09	Fill	X						X
HA6-0.3	23-Feb-09	Silty Clay							
HA6-0.5	23-Feb-09	Silty Clay							
HA7-0.1	23-Feb-09	Fill	X						X
HA7-0.3	23-Feb-09	Silty Clay							
HA7-0.5	23-Feb-09	Silty Clay							
HA8-0.1	23-Feb-09	Fill	X						X
HA8-0.3	23-Feb-09	Silty Clay							
HA9-0.1	12-Mar-09	Fill	X	X	X	X	X	X	X
AS32	12-Feb-09	Material							
AS66	12-Feb-09	Material							
Soil QA/QC									
QC1	10-Feb-09	Duplicate of TP3-0.1	X	X	X	X	X	X	X
QC1A	10-Feb-09	Triplicate of TP3-0.1	X	X	X	X			X
QC2	10-Feb-09	Duplicate of TP9-0.1							
QC2A	10-Feb-09	Triplicate of TP9-0.1							
QC3	10-Feb-09	Duplicate of TP15-0.1	X	X	X	X			
QC3A	10-Feb-09	Triplicate of TP15-0.1	X	X	X	X			X
QC4	11-Feb-09	Duplicate of TP17-0.1	X	X	X	X	X	X	X
QC4A	11-Feb-09	Triplicate of TP17-0.1	X	X	X	X			X
QC5	11-Feb-09	Duplicate of TP18-0.1							
QC5A	11-Feb-09	Triplicate of TP18-0.1							
QC6	11-Feb-09	Duplicate of TP39-0.1							
QC6A	11-Feb-09	Triplicate of TP39-0.1							
QC7	12-Feb-09	Duplicate of TP31-0.1							
QC7A	12-Feb-09	Triplicate of TP31-0.1							
QC8	12-Feb-09	Duplicate of TP66-0.1	X	X	X	X	X		X
QC8A	12-Feb-09	Triplicate of TP66-0.1	X	X	X	X			X
QC9	12-Feb-09	Duplicate of TP57-0.1							
QC9A	12-Feb-09	Triplicate of TP57-0.1							
QC10	13-Feb-09	Duplicate of TP48-0.1							
QC10A	13-Feb-09	Triplicate of TP48-0.1	X	X	X	X			
QC11	13-Feb-09	Duplicate of TP43-0.1							
QC11A	13-Feb-09	Triplicate of TP43-0.1							
QC12	13-Feb-09	Duplicate of TP50-0.1							
QC12A	13-Feb-09	Triplicate of TP50-0.1							
QC13	23-Feb-09	Duplicate of TP63-0.3	X				X	X	
QC13A	23-Feb-09	Triplicate of TP63-0.3	X				X	X	
QC14	23-Feb-09	Duplicate of HA2-0.1							
QC14A	23-Feb-09	Triplicate of HA2-0.1							
Trip Spike	13-Feb-09	Transported with samples collected 13/02/09			X				
Trip blank	13-Feb-09				X				
Trip Spike	23-Feb-09	Transported with samples collected 23/02/09			X				
Trip blank	23-Feb-09				X				
Soil Total			**110**	**32**	**36**	**37**	**35**	**34**	**43**

Note: HA3 was not collected as access to that particular residential property was not allowed by the site occupant.

Job No. 40719
Landcom, Airds Bradbury, NSW
Table B - Summary Soil Results

(1) Phytotoxicity Based Investigation Levels (Column 5, DEC 2006)
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(5) Commercial or Industrial (Column 4, DEC 2006)
(6) Threshold concentrations for sensitive land use - soils (Table 3. EPA 1994)

bold above PILs
bold above HIL (A) / Threshold Concentrations
bold above HIL (E) / Threshold Concentrations

All units in mg/kg unless indicated.

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table B - Summary Results Soil

Sample number	Metals								BTEX				TPH		PAHs		Organochlorine Pesticides				OPPs	PCBs	Asbestos
	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethyl-benzene	Xylenes	C6 - C9	C10 - C36	Benzo (a) pyrene	Total PAHs	Aldrin + Dieldrin	Chlordane	Heptachlor	DDT + DDD + DDE	OPPs	Total PCBs	Asbestos
LOR	4.0	1.0	1.0	1.0	1.0	0.1	1.0	1.0	0.5	0.5	1.0	3.0	25	250	0.05	1.55	0.2	0.2	0.1	0.3	0.8	0.6	-
Landuse criteria (mg/kg)																							
PIL (1)/ TC (6)	20	3	400 (CrIII)	100	600	1	60	200	-	1.4	3.1	14	-	-	-	-	-	-	-	-	-	-	-
Residential (HIL - A) (2) / TC (6)	100	20	12% (CrIII)	1000	300	15	600	7000	1	130	50	25	65	1000	1	20	10	50	10	200	-	10	NIL
Residential (HIL - D) (3)	400	80	48% (CrIII)	4,000	1,200	60	2,400	28,000	-	-	-	-	65	1000	4	80	40	200	40	800	-	40	NIL
Parks/Open Space (HIL - E) (4)	200	40	24% (CrIII)	2,000	600	30	600	14,000	-	-	-	-	65	1000	2	40	20	100	20	400	-	20	NIL
Commercial/ Industrial (HIL - F) (5)	500	100	60% (CrIII)	5,000	1,500	75	3,000	35,000	-	-	-	-	65	1000	5	100	50	250	50	1000	-	50	NIL
TP1-0.1	8	<0.5	21	5	28	<0.1	5	15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP1-0.3	8	<0.5	23	5	24	<0.1	7	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP2-0.1	7	<0.5	16	3	18	<0.1	2	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP3-0.1	8	<0.5	19	10	24	<0.1	8	29	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP3-0.3	7	<0.5	15	8	21	<0.1	6	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP4-0.1	5	<0.5	12	12	47	<0.1	7	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP5-0.1	9	<0.5	21	5	21	<0.1	7	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP6-0.1	10	<0.5	23	18	31	<0.1	12	49	-	-	-	-	-	-	0.4	2.8	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP6-0.3	8	<0.5	16	24	27	<0.1	11	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP7-0.1	11	0.5	19	16	31	<0.1	15	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP8-0.1	10	<0.5	26	15	34	<0.1	17	46	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP9-0.1	5	<0.5	12	18	28	<0.1	17	42	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP10-0.1	7	<0.5	18	21	34	<0.1	17	61	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP11-0.1	8	<0.5	17	20	29	<0.1	12	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP12-0.1	5	<0.5	14	26	27	<0.1	12	47	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP12-0.5	6	<0.5	12	48	34	<0.1	12	81	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP12-1.5	8	<0.5	8	47	31	<0.1	9	75	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
TP13-0.1	6	<0.5	18	20	35	<0.1	12	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP14-0.1	6	<0.5	16	34	51	<0.1	13	51	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP15-0.1	8	<0.5	16	22	27	<0.1	22	100	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	NIL
TP16-0.1	9	<0.5	12	17	26	<0.1	11	56	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
TP17-0.1	9	<0.5	20	23	34	<0.1	20	75	<0.5	<0.5	<1	<3	<25	<250	<0.05	<155	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP18-0.1	6	<0.5	22	9	28	<0.1	9	33	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP19-0.1	8	0.6	28	10	32	<0.1	14	50	<0.5	<0.5	<1	<3	<25	<250	<0.05	<155	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP20-0.1	7	0.5	28	11	37	<0.1	16	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP21-0.1	7	<0.5	16	16	32	<0.1	8	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP22-0.1	4	<0.5	7	17	18	<0.1	3	16	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP23-0.1	8	<0.5	15	24	28	<0.1	4	26	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP24-0.1	9	<0.5	18	11	19	<0.1	14	28	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP25-0.1	<4	<0.5	14	12	9	<0.1	22	13	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	NIL
TP26-0.1	<4	<0.5	7	5	20	<0.1	6	43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL

Job No. 40719
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bold above PILs
bold above HIL (A) / Threshold Concentrations
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Sample number	Metals								BTEX				TPH		PAHs		Organochlorine Pesticides				OPPs	PCBs	Asbestos
	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethyl-benzene	Xylenes	C6 - C9	C10 - C36	Benzo (a) pyrene	Total PAHs	Aldrin + Dieldrin	Chlordane	Heptachlor	DDT + DDD + DDE	OPPs	Total PCBs	Asbestos
LOR	4.0	1.0	1.0	1.0	1.0	0.1	1.0	1.0	0.5	0.5	1.0	3.0	25	250	0.05	1.55	0.2	0.2	0.1	0.3	0.8	0.6	-
Landuse criteria (mg/kg)																							
PIL (1)/ TC (6)	20	3	400 (CrIII)	100	600	1	60	200	-	1.4	3.1	14	-	-	-	-	-	-	-	-	-	-	-
Residential (HIL - A) (2) / TC (6)	100	20	12% (CrIII)	1000	300	15	600	7000	1	130	50	25	65	1000	1	20	10	50	10	200	-	10	NIL
Residential (HIL - D) (3)	400	80	48% (CrIII)	4,000	1,200	60	2,400	28,000	-	-	-	-	65	1000	4	80	40	200	40	800	-	40	NIL
Parks/Open Space (HIL - E) (4)	200	40	24% (CrIII)	2,000	600	30	600	14,000	-	-	-	-	65	1000	2	40	20	100	20	400	-	20	NIL
Commercial/ Industrial (HIL - F) (5)	500	100	60% (CrIII)	5,000	1,500	75	3,000	35,000	-	-	-	-	65	1000	5	100	50	250	50	1000	-	50	NIL
TP27-0.1	5	<0.5	36	29	29	<0.1	36	50	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP28-0.1	4	<0.5	17	11	19	<0.1	7	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP28-0.3	<4	<0.5	9	6	11	<0.1	7	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP28-0.5	6	<0.5	19	26	22	<0.1	7	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP29-0.1	8	<0.5	18	24	40	<0.1	23	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP30-0.1	8	<0.5	26	9	26	<0.1	5	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP31-0.1	8	<0.5	24	1	18	<0.1	2	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP32-0.1	8	<0.5	24	10	82	<0.1	4	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP33-0.1	8	<0.5	20	17	32	<0.1	7	68	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP34-0.1	11	0.6	30	15	38	<0.1	9	68	-	-	-	-	-	-	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP35-0.1	6	<0.5	12	5	16	<0.1	7	33	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP35-1.0	8	<0.5	14	5	18	<0.1	6	31	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
TP36-0.1	8	<0.5	12	17	41	<0.1	4	49	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
TP37-0.1	7	<0.5	22	6	42	<0.1	5	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP38-0.1	<4	0.5	13	6	32	<0.1	10	85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP39-0.1	<4	<0.5	15	5	23	<0.1	4	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP40-0.1	<4	<0.5	17	16	23	<0.1	4	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP40-0.3	4	<0.5	18	4	13	<0.1	2	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP41-0.1	8	<0.5	26	9	39	<0.1	10	62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP42-0.1	6	<0.5	16	7	18	<0.1	6	31	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP42-0.3	6	<0.5	20	11	28	<0.1	9	58	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP43-0.1	10	0.7	30	8	26	<0.1	7	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP44-0.1	5	<0.5	11	17	22	<0.1	5	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP45-0.1	9	<0.5	19	10	27	<0.1	10	54	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP45-0.4	9	<0.5	24	11	26	<0.1	6	27	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP46-0.1	6	<0.5	16	11	21	<0.1	9	55	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP46-0.3	11	0.6	26	14	32	<0.1	16	94	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP47-0.1	10	<0.5	21	19	29	<0.1	8	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP48-0.1	6	<0.5	14	17	29	<0.1	10	39	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
TP48-0.4	7	<0.5	16	24	30	<0.1	8	39	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP49-0.1	7	<0.5	17	21	30	<0.1	9	60	-	-	-	-	-	-	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP49-0.3	10	<0.5	16	20	29	<0.1	8	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP50-0.1	7	<0.5	16	19	31	<0.1	9	35	-	-	-	-	-	-	<0.05	<1.55	-	-	-	-	-	-	-

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bold above PILs
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Sample number	Metals								BTEX				TPH		PAHs		Organochlorine Pesticides				OPPs	PCBs	Asbestos
	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethyl-benzene	Xylenes	C6 - C9	C10 - C36	Benzo (a) pyrene	Total PAHs	Aldrin + Dieldrin	Chlordane	Heptachlor	DDT + DDD + DDE	OPPs	Total PCBs	Asbestos
LOR	4.0	1.0	1.0	1.0	1.0	0.1	1.0	1.0	0.5	0.5	1.0	3.0	25	250	0.05	1.55	0.2	0.2	0.1	0.3	0.8	0.6	-
Landuse criteria (mg/kg)																							
PIL (1)/ TC (6)	20	3	400 (CrIII)	100	600	1	60	200	-	1.4	3.1	14	-	-	-	-	-	-	-	-	-	-	-
Residential (HIL - A) (2) / TC (6)	100	20	12% (CrIII)	1000	300	15	600	7000	1	130	50	25	65	1000	1	20	10	50	10	200	-	10	NIL
Residential (HIL - D) (3)	400	80	48% (CrIII)	4,000	1,200	60	2,400	28,000	-	-	-	-	65	1000	4	80	40	200	40	800	-	40	NIL
Parks/Open Space (HIL - E) (4)	200	40	24% (CrIII)	2,000	600	30	600	14,000	-	-	-	-	65	1000	2	40	20	100	20	400	-	20	NIL
Commercial/ Industrial (HIL - F) (5)	500	100	60% (CrIII)	5,000	1,500	75	3,000	35,000	-	-	-	-	65	1000	5	100	50	250	50	1000	-	50	NIL
TP51-0.1	6	<0.5	17	11	25	<0.1	11	52	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP52-0.1	7	<0.5	27	6	17	<0.1	7	27	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP53-0.1	<4	<0.5	17	4	12	<0.1	4	10	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP54-0.1	8	<0.5	26	5	39	<0.1	4	70	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
TP54-0.3	6	<0.5	23	2	17	<0.1	3	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP55-0.1	<4	<0.5	2	1	4	<0.1	2	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
TP55-0.3	5	<0.5	17	11	23	<0.1	3	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP56-0.1	<4	<0.5	11	10	22	<0.1	6	70	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	1.2	0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP56-1.0	8	<0.5	29	17	31	<0.1	20	66	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP57-0.1	9	<0.5	18	24	30	<0.1	9	61	-	-	-	-	-	-	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP58-0.1	5	<0.5	14	18	27	<0.1	7	40	<0.5	<0.5	<1	<3	<25	<250	<0.05	0.6	2.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP58-0.65	9	<0.5	21	22	34	<0.1	19	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP59-0.1	8	<0.5	18	16	30	<0.1	8	32	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP60-0.1	6	<0.5	19	13	29	<0.1	8	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP61-0.1	<4	<0.5	9	16	60	<0.1	5	61	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP61-0.3	10	0.5	31	7	31	<0.1	4	13	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP62-0.1	<4	<0.5	12	8	23	<0.1	5	21	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP63-0.1	11	<0.5	15	17	32	<0.1	6	46	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP64-0.1	6	<0.5	18	16	30	<0.1	5	33	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
TP65-0.1	5	<0.5	17	<1	11	<0.1	2	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP66-0.1	7	<0.5	17	14	23	<0.1	7	50	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP66-0.3	6	<0.5	14	2	18	<0.1	2	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP67-0.1	9	<0.5	20	3	17	<0.1	2	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP68-0.1	8	<0.5	18	11	30	<0.1	9	60	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP69-0.1	8	<0.5	19	13	30	<0.1	12	54	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
TP69-0.3	7	<0.5	17	11	26	<0.1	10	45	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP69-0.5	7	<0.5	8	11	16	<0.1	3	28	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TP69-1.2	7	<0.5	19	7	22	<0.1	8	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HA1-0.1	9	0.6	25	7	26	<0.1	5	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
HA2-0.1	6	<0.5	29	8	14	<0.1	4	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
HA4-0.1	<4	<0.5	11	10	15	<0.1	6	38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
HA5-0.1	<4	<0.5	8	9	18	<0.1	4	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
HA6-0.1	6	<0.5	8	19	28	<0.1	10	57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL

Job No. 40719
Landcom, Airds Bradbury, NSW
Table B - Summary Soil Results

(1) Phytotoxicity Based Investigation Levels (Column 5, DEC 2006)
(2) Residential with gardens and accessible soil (Column 1, DEC 2006)
(3) Residential with minimal soil access (Column 2, DEC 2006)
(4) Parks/Open Space (Column 3, DEC 2006)
(5) Commercial or Industrial (Column 4, DEC 2006)
(6) Threshold concentrations for sensitive land use - soils (Table 3. EPA 1994)

bold above PILs
bold above HIL (A) / Threshold Concentrations
bold above HIL (E) / Threshold Concentrations

All units in mg/kg unless indicated.

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table B - Summary Results Soil

	Metals								BTEX				TPH		PAHs		Organochlorine Pesticides				OPPs	PCBs	Asbestos
Sample number	**Arsenic**	**Cadmium**	**Chromium (Total)**	**Copper**	**Lead**	**Mercury**	**Nickel**	**Zinc**	**Benzene**	**Toluene**	**Ethyl-benzene**	**Xylenes**	**C6 - C9**	**C10 - C36**	**Benzo (a) pyrene**	**Total PAHs**	**Aldrin + Dieldrin**	**Chlordane**	**Heptachlor**	**DDT + DDD + DDE**	**OPPs**	**Total PCBs**	**Asbestos**
LOR	4.0	1.0	1.0	1.0	1.0	0.1	1.0	1.0	0.5	0.5	1.0	3.0	25	250	0.05	1.55	0.2	0.2	0.1	0.3	0.8	0.6	-
Landuse criteria (mg/kg)																							
PIL [(1)]/ TC [(6)]	20	3	400 (CrIII)	100	600	1	60	200	-	1.4	3.1	14	-	-	-	-	-	-	-	-	-	-	-
Residential (HIL - A) [(2)] / TC [(6)]	100	20	12% (CrIII)	1000	300	15	600	7000	1	130	50	25	65	1000	1	20	10	50	10	200	-	10	NIL
Residential (HIL - D) [(3)]	400	80	48% (CrIII)	4,000	1,200	60	2,400	28,000	-	-	-	-	65	1000	4	80	40	200	40	800	-	40	NIL
Parks/Open Space (HIL - E) [(4)]	200	40	24% (CrIII)	2,000	600	30	600	14,000	-	-	-	-	65	1000	2	40	20	100	20	400	-	20	NIL
Commercial/ Industrial (HIL - F) [(5)]	500	100	60% (CrIII)	5,000	1,500	75	3,000	35,000	-	-	-	-	65	1000	5	100	50	250	50	1000	-	50	NIL
HA7-0.1	6	<0.5	18	16	23	<0.1	11	34	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
HA8-0.1	6	<0.5	17	5	15	<0.1	3	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NIL
HA9-0.1	7	<0.5	12	24	29	<0.1	13	54	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
QA/QC																							
QC1 (Duplicate of TP3 - 0.1)	9	<0.5	21	14	32	<0.1	11	42	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
QC1A (Triplicate of TP3 - 0.1)	7	0.4	17	12	21	<0.05	8.1	33	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-	NIL
QC3 (Duplicate of TP15 - 0.1)	6	<0.5	15	21	26	<0.1	22	98	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
QC3A (Triplicate of TP15 - 0.1)	6	<0.3	12	15	17	<0.05	13	69	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-	NIL
QC4 (Duplicate of TP17 - 0.1)	10	<0.5	22	20	37	<0.1	20	73	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
QC4A (Triplicate of TP17 - 0.1)	5	<0.3	10	9.8	16	<0.05	8.8	33	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-	NIL
QC8 (Duplicate of TP66 - 0.1)	7	<0.5	19	3	14	<0.1	2	18	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	NIL
QC8A (Triplicate of TP66 - 0.1)	4	<0.3	10	2.4	9.6	<0.05	1.3	14	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-	NIL
QC10 (Duplicate of TP48 - 0.1)	7	<0.5	14	16	29	<0.1	9	36	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-	-
QC10A (Triplicate of TP48 - 0.1)	6	0.5	12	11	18	<0.05	6	31	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-	-
QC13 (Duplicate of TP63-0.1)	17	0.5	18	16	38	<0.1	5	49	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6	-
QC13A (Triplicate of TP63-0.1)	8	0.7	19	18	44	0.07	9.3	73	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.9	-
Trip Spike	-	-	-	-	-	-	-	-	89%	96%	96%	96%	-	-	-	-	-	-	-	-	-	-	-
Trip Blank	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<3	-	-	-	-	-	-	-	-		-	-
Trip Spike	-	-	-	-	-	-	-	-	109%	119%	104%	90%	-	-	-	-	-	-	-	-	-	-	-
Trip Blank	-	-	-	-	-	-	-	-	<1.0	<1.0	<1.0	<3	-	-	-	-	-	-	-	-		-	-

Job No. 40719
Landcom, Airds Bradbury, NSW
Table C - Relative Percentage Difference Calculations

Bold Exceeds 30-50% RPD

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table B - Summary Results Soil

		Metals								BTEX				TPH		PAHs		Organochlorine Pesticides				OPPs	PCBs
	Sample ID	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethyl-benzene	Xylenes	C6 - C9	C10 - C36	Benzo (a) pyrene	Total PAHs	Aldrin + Dieldrin	Chlordane	Heptachlor	DDT + DDD + DDE	OPPs	Total PCBs
Laboratory LOR		3.0	1.0	1.0	1.0	1.0	0.05	1.0	1.0	0.5	0.5	0.5	1.5	25	-	0.05	1.55	0.2	0.2	0.1	0.3	0.1	0.6
Blind Duplicate Pairs																							
Primary	TP3 - 0.1	8	<0.5	19	10	24	<0.1	8	29	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Duplicate	QC1 (duplicate of TP3-0.1)	9	<0.5	21	14	32	<0.1	11	42	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
	RPDs (Dup.)	12%	NA	10%	33%	29%	NA	32%	37%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Primary	TP3-0.1	8	<0.5	19	10	24	<0.1	8	29	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Triplicate	QC1A (triplicate of TP3-0.1)	7	0.4	17	12	21	<0.05	8.1	33	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-
	RPDs (Dup.)	13%	NA	11%	18%	13%	NA	1%	13%	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-
Primary	TP15 - 0.1	8	<0.5	16	22	27	<0.1	22	100	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-
Duplicate	QC3 (duplicate of TP15-0.1)	6	<0.5	15	21	26	<0.1	22	98	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-
	RPDs (Dup.)	29%	NA	6%	5%	4%	NA	0%	2%	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-
Primary	TP15-0.1	8	<0.5	16	22	27	<0.1	22	100	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-
Triplicate	QC3A (triplicate of TP15-0.1)	6	<0.3	12	15	17	<0.05	13	69	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-
	RPDs (Dup.)	29%	NA	29%	38%	45%	NA	**51%**	37%	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-
Primary	TP17-0.1	9	<0.5	20	23	34	<0.1	20	75	<0.5	<0.5	<1	<3	<25	<250	<0.05	<155	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Triplicate	QC4 (duplicate of TP17-0.1)	10	<0.5	22	20	37	<0.1	20	73	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
	RPDs (Dup.)	NA	NA	10%	14%	8%	NA	0%	3%	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Primary	TP17-0.1	9	<0.5	20	23	34	<0.1	20	75	<0.5	<0.5	<1	<3	<25	<250	<0.05	<155	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Duplicate	QC4A (triplicate of TP17-0.1)	5	<0.3	10	9.8	16	<0.05	8.8	33	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-
	RPDs (Dup.)	**57%**	NA	**67%**	**80%**	**72%**	NA	**78%**	**78%**	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-
Primary	TP66 - 0.1	7	<0.5	17	14	23	<0.1	7	50	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Duplicate	QC8 (duplicate of TP66-0.1)	7	<0.5	19	3	14	<0.1	2	18	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	0.2	<0.2	<0.1	<0.3	<0.8	<0.6
	RPDs (Dup.)	0%	NA	11%	**129%**	49%	NA	**111%**	**94%**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Primary	TP66 - 0.1	7	<0.5	17	14	23	<0.1	7	50	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Duplicate	QC8A (triplicate of TP66-0.1)	4	<0.3	10	2.4	9.6	<0.05	1.3	14	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-
	RPDs (Dup.)	**55%**	NA	**52%**	**141%**	**82%**	NA	**137%**	**113%**	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-

Job No. 40719
Landcom, Airds Bradbury, NSW
Table C - Relative Percentage Difference Calculations

Bold Exceeds 30-50% RPD

FILE REF: G:\JBS Environmental\Projects\Landcom\40719 - Airds Bradbury\40719 Phase 1 Entire Precinct\Reports\[40719 Summary Tables.xls]Table B - Summary Results Soil

		Metals								BTEX				TPH		PAHs		Organochlorine Pesticides				OPPs	PCBs
	Sample ID	Arsenic	Cadmium	Chromium (Total)	Copper	Lead	Mercury	Nickel	Zinc	Benzene	Toluene	Ethyl-benzene	Xylenes	C6 - C9	C10 - C36	Benzo (a) pyrene	Total PAHs	Aldrin + Dieldrin	Chlordane	Heptachlor	DDT + DDD + DDE	OPPs	Total PCBs
Primary	TP48 - 0.1	6	<0.5	14	17	29	<0.1	10	39	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-
Duplicate	QC10 (dupllicate of TP48-0.1)	7	<0.5	14	16	29	<0.1	9	36	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-
RPDs (Dup.)		15%	NA	0%	6%	0%	NA	11%	8%	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-
Primary	TP48 - 0.1	6	<0.5	14	17	29	<0.1	10	39	<0.5	<0.5	<1	<3	<25	<250	<0.05	<1.55	-	-	-	-	-	-
Duplicate	QC10A (triplicate of TP48-0.1)	6	0.5	12	11	18	<0.05	6	31	<0.5	<0.5	<0.5	<1.5	<20	<120	<0.05	<0.90	-	-	-	-	-	-
RPDs (Dup.)		0%	NA	15%	43%	47%	NA	50%	23%	NA	NA	NA	NA	NA	NA	NA	NA	-	-	-	-	-	-
Primary	TP63 - 0.1	11	<0.5	15	17	32	<0.1	6	46	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Duplicate	QC13 (duplicate of TP63-0.1)	17	0.5	18	16	38	<0.1	5	49	-	-	-	-	-	-	-	-	0.2	<0.2	<0.1	<0.3	<0.8	<0.6
RPDs (Dup.)		43%	NA	18%	6%	17%	NA	18%	6%	-	-	-	-	-	-	-	-	NA	NA	NA	NA	NA	NA
Primary	TP63 - 0.1	11	<0.5	15	17	32	<0.1	6	46	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.6
Duplicate	QC13A (triplicate of TP63-0.1)	8	0.7	19	18	44	0.07	9.3	73	-	-	-	-	-	-	-	-	<0.2	<0.2	<0.1	<0.3	<0.8	<0.9
RPDs (Dup.)		32%	NA	24%	6%	32%	NA	43%	45%	-	-	-	-	-	-	-	-	NA	NA	NA	NA	NA	NA