Validation Report
Office of Strategic Lands within the
Department of Planning and Infrastructure

Willoughby Rd,
Artarmon, NSW, 2064

29 October 2013
43079-55844
JBS&G

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List of Abbreviations

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

ACM	Asbestos Containing Material
AHD	Australian Height Datum
As	Arsenic
bgs	below ground surface
BTEX	Benzene, toluene, ethylbenzene and xylenes
B(a)P	Benzo(a)pyrene
Cd	Cadmium
CSM	Conceptual site model
Cr	Chromium
Cu	Copper
DECCW	NSW Department of Environment, Climate Change and Water
DQIs	Data Quality Indicators
DQOs	Data Quality Objectives
EPA	NSW Environment Protection Authority
GPS	Ground Positioning System
Ha	Hectare
Hg	Mercury
HIL	Health based investigation level
JBS&G	JBS&G (NSW & WA) Pty Ltd
LOR	Limit of Reporting
Ni	Nickel
NSW	New South Wales
OEH	Office of Environment and Heritage
OCP	Organochlorine Pesticides
PAHs	Polycyclic aromatic hydrocarbons
Pb	Lead
PCBs	Polychlorinated Biphenyls
PPE	Personal Protective Equipment
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percentage Difference
TPH	Total Petroleum Hydrocarbons
w/w	by weight (weight for weight)

Executive Summary

JBS&G (NSW & WA) Pty Ltd (JBS&G) was engaged by the Office of Strategic Lands within the NSW Department of Planning & Infrastructure (the Depertment) to conduct remedial works at a property located on Willoughby Road, Artarmon, NSW (the site) as shown in **Figure 1**. The site is legally defined as Lot 2 DP586037 and has an area of approximately 1,682 m^2.

The site is to be zoned R3 Medium Density Residential under the Willoughby Local Environmental Plan 2012. The site is currently owned by the Minister Administering the EPA Act 1979 (and managed by the Department) and will be sold in the near future.

The site has previously been the subject of a Preliminary Site Investigation (PSI) (JBS 2013a[1]), which identified an area of surface soil impact, which are required to be addressed in order for the site to be considered suitable for future residential land uses.

The PSI report concluded that remediation was required to make the site suitable for its residential landuse. A subsequent Remedial Action Plan (RAP) (JBS&G 2013b[2]) was prepared to provide the procedures for the management, excavation and removal of the impacted material offsite and validation. The extent of remediation is shown in **Figure 2**.

The objectives of the remediation and validation works were to make the site suitable for its proposed landuse(s) subject to remediation of asbestos impacted fill materials, in accordance with the RAP (JBS&G 2013).

The following scope of works was conducted;

- Excavate the material present at one location with friable asbestos impacted surface soils;
- Transport impacted material to an appropriate waste facility licensed to accept asbestos waste;
- Visually validate excavated areas and collect validation soil samples of the excavation floor; and
- Prepare this validation report detailing remediation and validation procedures and conclusions.

Remedial and validation works were conducted 14th of October 2013 in accordance with the RAP (JBS&G 2013b). The validation sample locations are shown on **Figure 2**. A summary of the remedial and validation works conducted is provided below:

- Friable asbestos impacted fill material identified in HA03 has been appropriately removed and validated;
- No ACM was observed in the HA03 excavation once the impacted fill material had been appropriately removed and validated;
- Air monitoring was completed during the remediation works, with no respirable asbestos fibres being detected (**Appendix E**);

[1] *Preliminary Site Investigation. Department of Planning and Infrastructure, Willoughby Road Artarmon, NSW, 2064*. JBS Environmental Pty Ltd dated February 2013 reference number 42374-52090 (JBS 2013a)
[2] *Remediation Action Plan, Lot 2 DP586037 Willoughby Rd, Artarmon , NSW, for Office of Strategic Plans within the Department of Planning and Infrastructure, 27 September 2013*, 42374-55495 JBS&G (JBS&G 2013b)

- All waste material was classified as per the *Waste Classification Guidelines, Part 1: Classifying Waste* 2009 (DECCW 2009) and disposed of to an appropriately licensed landfill; and
- The resultant excavations formed by the remediation were backfilled with appropriate imported material from Benedict Sand Menangle.

On the basis of the current remedial and validation activities, and subject to the limitations contained in **Section 12**, the surface soils within the site have been remediated and validated in accordance with the RAP (JBS&G 2013b), as well as guidelines made or approved by the NSW Environment Protection Authority (EPA) and relevant Australian Standards. The site is considered suitable for the proposed residential landuse without further investigation or remediation.

1 Introduction

1.1 Background

JBS Environmental Pty Ltd (JBS) was engaged by the Office of Strategic Lands within the NSW Department of Planning & Infrastructure (the Department) to conduct remedial works at a property located on Willoughby Road, Artarmon, NSW (the site). The site is legally defined as Lot 2 DP586037 and has an area of approximately 1,682 m^2.

It is understood that the site is proposed to be zoned R3 Medium Density Residential under the *Willoughby Draft Local Environmental Plan* (2012). The site is currently owned by the Minister Administering the EPA Act 1979 (and managed by the Department) and is proposed to be sold after it has been rezoned.

The site has previously been the subject of a Preliminary Site Investigation (PSI) (JBS 2013a[3]) which identified areas of surface soil impact which required to be addressed for the site to be considered suitable for rezoning.

The PSI (JBS 2013a) report concluded that remediation was required to make the site suitable for its proposed rezoning. A subsequent Remedial Action Plan (RAP) (JBS&G 2013b[4]) was prepared to provide the procedures for the excavation and removal of the impacted material offsite and validation.

The objectives of the remediation and validation works were to make the site suitable for its proposed rezoning subject to remediation of asbestos impacted fill materials, in accordance with the RAP (JBS&G 2013).

1.2 Objectives

The objectives of the validation works were to;

- Remove unacceptable risks to human health and the environment, relevant to the proposed rezoning of the site;
- Validate the remedial works in accordance with the relevant NSW EPA guidelines;
- Transport impacted material to an appropriate waste facility licensed to accept the waste;
- Visually validate excavated areas and collect validation samples; and
- Prepare this validation report detailing remediation and validation procedures and conclusions.

[3] *Preliminary Site Investigation (PSI), Department of Planning and Infrastructure, Willoughby Rd, Artarmon, NSW.* JBS Environmental Pty Ltd dated February 2013 reference number 42374-52090 (JBS 2013)
[4] *Remediation Action Plan, Lot 2 DP586037 Willoughby Rd, Artarmon , NSW, for Office of Strategic Plans within the Department of Planning and Infrastructure, 27 September 2013*, 42374-55495 JBS&G (JBS&G 2013)

2 Summary Site Condition and Site History

2.1 Site Identification and Condition

Detailed information of the site condition, physical characteristics, history and surrounding land uses are provided in JBS (2013a). The location of the site is shown in **Figure 1**. Site details are summarised in **Table 2.1**.

The following is a summary of relevant information

Table 2.1 Summary Site Details

Lot/DP	Lot 2 DP586037
Address	Willoughby Road, Artarmon, NSW
Local Government Authority	Willoughby City Council
Site Zoning	R3 Medium Density Residential under the Draft Willoughby Local Environmental Plan 2012
Approximate co-ordinates of the centre of the site	E: 333317.90 N: 6257260.36
Current Use	Vacant land
Previous Use	Commercial/Industrial (Mechanics, Bakery and Ice Works)
Proposed Use	Residential
Site Area	Approximately 1682 m^2

2.1.1 Pre-Remediation Site Condition

The site inspection was conducted by one of JBS's trained and experienced environmental consultants on 17 October 2012. The site layout is shown in **Figure 2**.

The site, comprising Lot 2 in Deposited Plan (DP) 586037, occupied a triangular shaped parcel of land west of Willoughby Road, with surrounding development comprising largely residential properties. Hallstrom Park was identified to the east of the site opposite Willoughby Road. TCN Channel Nine Studios are located approximately 200 m west of the site.

Entry to the site can be obtained via a driveway fronting Willoughby Road providing vehicle and pedestrian access to the site. A concrete pavement ran along the southern boundary and was noted to be in generally good condition with minor cracks present.

The site was secured on the north western boundary by a sheet metal fence and on the southern boundary by a bricked wall, separating the site from the neighbouring property to the south.

Remaining areas comprised largely grassed, vacant land. Several large mature trees were observed to the north of the driveway. Several small stockpiles of sand, scrap material and rubbish comprising bricks, loose concrete, sand and plastic were identified within the south western portion of the site along the western portion of the paved concrete driveway.

The site appeared to be raised in slightly compared to the neighbouring property to the south, with the southern boundary acting as a retaining wall. A large mound within the central portion of the site appeared to be elevated in comparison to the remainder of the site and comprised building rubble within the surface soils. The undulating nature of the site does not follow the regional topography of the area which slopes generally to the south, south east. The raised nature of the site and presence of some building rubble within surface soils would indicate the likelihood of previous cut and / or fill activities at the site.

2.1.2 Post-Remediation Site Condition

Following remediation works the site appeared similar to that described above apart from the remediated area which had been backfilled with topsoil.

A photographic log is provided in **Appendix A**.

2.2 Surrounding Landuse

The current landuse of adjacent properties is shown in Figures 1 and 2 and summarised below.

- North – The site is bound immediately to the north by a childcare centre, beyond which are residential unit complexes. A BP petrol station is located approximately 170 m north of the site on the north west corner of Artarmon Rd and Willoughby Rd.
- East – The site is bound to the east by Willoughby Road, across which is Hallstrom Park.
- South – The site is bound to the south by low density residential properties. Further afield is the Gore Hill Freeway which runs in a north west to south east orientation.
- West – The site is bound to the west by residential unit complexes, beyond which is Scott St and TCN Channel 9 Studios.

The BP service station located on the corner of Artarmon Rd and Willoughby Rd is considered a low to moderate potential source of contamination given its proximity to the site, up gradient nature and shallow depth to groundwater.

2.3 Topography

Review of the regional topographic map (DMR 1976[5]) indicated that the site lies between 55 and 60 m Australian Height Datum (AHD). The general area slopes down to the south, south east towards Flat Rock Creek, situated approximately 100 m south of the site.

The site itself appeared to be convex in appearance with the placement of fill material identified within the central portion of the site. The site is approximately 2 metres above Willoughby Road at its highest point and the neighbouring residential property to the south appeared approximately 1 to 2 metres lower in elevation than the site. Gentle slopes to the south east were observed within the site, following the regional topography of the area.

2.4 Hydrology

The nearest surface water receptor is Flat Rock Creek located approximately 100 m south of the site. Flat Rock Creek flows to the east before entering into Long Bay, located approximately 2.1 km to the southeast.

Infiltration of precipitation is expected to be low to moderate, reflecting the soil permeability and generally un-sealed nature of the site. During heavy or prolonged periods of rain, runoff is anticipated to flow typically to the south, south east following the regional topography to be collected by storm water infrastructure along Willoughby Road.

[5] *Sydney 1:100 000 Topographic Survey Sheet 9130 (Edition 1).* Department of Mineral Resources, 1976 (DMR 1976)

2.5 Geology

Review of the regional geological map (DMR 1983[6]) indicated the site lies within Triassic Hawkesbury Sandstone of the Wianamatta Group. The Hawkesbury Sandstone is characterised by medium to coarse grained quartz sandstones with very minor shales and laminate lenses.

Review of the regional soil map (DLWC 1983[7]) indicated that the site lies within the Gymea soil landscape group.

The typical Gymea landscape is characterised by undulating to rolling rises and low hills on Hawkesbury Sandstone. Local relief is between 20-80 m with gentle slopes (10-25%), broad convex crests, moderately inclined sideslopes with benches, and localised rock outcrop on broken scarps. Soils are generally shallow to moderately deep yellow earths and earthy sands on crests and inside of benches, gleyed podzolic soils and yellow podzolic soils on shale lenses and shallow to moderately deep siliceous sands and leached sands along drainage lines.

Limitations of the Gymea landscape group are localised steep slopes, high soil erosion hazards, rock outcrops, shallow highly permeable soil with very low soil fertility.

Review of the Natural Resource Atlas (DNR website[8]) indicated that there no known occurrence of acid sulfate soils in the vicinity of the site.

2.6 Hydrogeology

A review of information obtained from the Natural Resource Atlas database indicated that there were 8 registered groundwater bores within a 1.5 km radius of the site. Details of the registered bores are included in (JBS 2013) and summarised below:

- Groundwater bore (GW026513) was identified to be located approximately 1.5 km north of the site within a private property. The bore was installed in 1966 for recreational purposes. The bore was drilled to a depth of 64.0 m passing through clay, sand and shale. No details were registered regarding standing water levels however, water bearing zones were observed at 13.70 m – 13.70 m below ground surface (bgs) and 57.90 m – 59.40 m bgs.
- Groundwater bore (GW072478) was identified to be located approximately 1.2 km south west of the site. The bore was installed in 1995 for domestic purposes. The bore was drilled to a depth of 180.50 m passing through clay, sandstone and shale. No details were registered regarding standing water levels however, water bearing zones were observed at 29.70 m – 30.10 m bgs, 138.00 m – 139.80 m bgs and 143.80 m – 144.50 m bgs.
- Groundwater bore (GW103591) was identified to be located approximately 1.0 km west, south west of the site within a REIL Dealership. The bore was installed in 2001 for monitoring purposes. The bore was drilled to a depth of 5.80 m passing through road base and clay. No details were registered regarding standing water levels however, a water bearing zone was observed at 4.00 m – 5.80 m bgs.
- Groundwater bore (GW108224) was identified to be located approximately 800 m south of the site within a private property. The bore was installed in 2006 for domestic purposes. The bore was drilled to a depth of 132.40 m passing through clay, sandstone, shale and siltstone. The standing water level was recorded at

[6] *Sydney 1:100 000 Soil Landscape Series Sheet 9130*. Department of Land and Water Conservation, 1983 (DLWC 1983)
[7] *Sydney 1:100 000 Soil Landscape Series Sheet 9130*. Department of Land and Water Conservation, 1983 (DLWC 1983)
[8] *Department of Natural Resources Atlas, www.nratlas.nsw.go.au* accessed 5 January 2012

35.00 m bgs. Water bearing zones were observed at 29.00 m – 35.00 m bgs and 98.00 m – 100.00 m bgs.

- Groundwater bore (GW111332) was identified to be located approximately 1.5 km north west of the site within a Chatswood Auto Repairs. The bore was installed in 2011 for monitoring purposes. The bore was drilled to a depth of 3.20 m passing through clay and shale. No details regarding standing water levels or water bearing zones were registered.
- Three groundwater bores (GW111232 – GW111234) were located approximately 1.3 km north east of the site and owned by the Urban Transport Authority. The bores were installed in 2010 and registered for monitoring purposes. The bores ranged in depths between 4.30 m and 4.50 m passing through concrete, fill, clay and sand. Standing water levels were recorded between 1.80 m and 2.40 m bgs with varying water bearing zones.

Based on the data from the registered bores, groundwater depth in the vicinity of the site is likely to be shallow to moderate and situated within unconsolidated clay, sandstone and shale layers beneath the site. Based on local topography, groundwater flow is anticipated to be to the southeast towards Long Bay.

3 Site History

Detailed information of the site history is provided in JBS (2013). A summary of relevant information is provided below.

Period	Activity	Source
1928	Part leased to White Transit Company Limited (Motor Garage) for a term of 10 years and option to purchase. Expired 21/09/1933.	Title Documentation
1928	Part leased to James Bowen Miller of Windsor, a Gentleman; Albert Ernest Abbott of Chatswood, an Engineer and Celia Martha Alice Miller, wife of William Miller of Willoughby, an ice Vendor (Ice Works) for a term of 10 years and option to purchase. Expired 11/11/1940.	Title Documentation
1929	Leased to B.G. Nicholas Limited for a term of 5 years with option to purchase. Cancelled 11/07/1933.	Title Documentation
1930	The poor quality of the aerial photograph precluded a thorough review of the site however, it can be discerned that the site forms part of a larger parcel of land on the corner of Willoughby Road and Artarmon Road. Several large structures can be observed within the larger land parcel to the north of the site presumably commercial/industrial properties. The remainder of the site and greater parcel of land appeared disturbed, with areas of shading indicative of ground disturbance apparent.	1930 Aerial Photograph
1931	James Benjamin Stephens and Alexander Anderson, both of Willoughby, Contractors.	Title Documentation
1933	Part leased to John Matthew Caulfield, a Master Baker and William Herbert Gilmore, a Bread Carter, both of Willoughby. Expired 11/11/1940.	Title Documentation
1936	Edward John Lees Hallstrom of Willoughby, a Contractor.	Title Documentation
1950	Part leased to the Sydney City Council, expired 10/09/1969.	Title Documentation
1951	The large parcel of land on the corner of Willoughby Road and Artarmon Road, for which the site is part, was identified to have undergone significant development with the inclusions of numerous commercial/industrial properties. Several small commercial/industrial structures can be observed across the site with the remainder comprising generally impervious surfaces.	1951 Aerial Photograph
1961	The site and surrounding areas appeared similar to the previous photograph with the exception of the development of several small commercial/industrial structures situated across the south east corner of the site.	1961 Aerial Photograph
1969	Part leased to the Sydney City Council.	Title Documentation
1972	The site appears similar to the previous photograph.	1972 Aerial Photograph
1974	John Edward Hallstrom of Willoughby, a Contractor.	Title Documentation
1974	Mirvac Pty. Ltd.	Title Documentation
1980	The site appeared to occupy a single, triangular parcel of land fronting Willoughby Road. The several commercial/industrial structures previously identified across the site appear to have been demolished with the site now comprising lightly grassed, vacant land.	1980 Aerial Photograph
1982	Minister Administering the Environmental Planning and Assessment Act 1979.	Title Documentation
1991	The site appears similar to the previous photograph with the exception of increased vegetation density within the site and in the areas separating the individual residential unit complexes to the north.	1991 Aerial Photograph
2002	The site appears similar to the previous photograph.	2002 Aerial Photograph
2005	The site appears similar to the previous photograph.	2005 Aerial Photograph
2012	The site, comprising Lot 2 in Deposited Plan (DP) 586037, occupied a triangular shaped parcel of land west of Willoughby Road, with surrounding development comprising largely residential properties.	Site Inspection

4 Previous Environmental Investigations

The reports detailed below have previously been completed for the site.

JBS Environmental, Preliminary Site Investigation (JBS 2013a)

JBS Environmental Pty Ltd (JBS) was engaged by the NSW Department of Planning & Infrastructure to conduct a Preliminary Site Investigation (PSI) at a property located on Willoughby Road, Artarmon, NSW (the site). The site was legally defined as Lot 2 DP586037 and has an area of approximately 1,682 m2.

It was understood that the site is proposed to be zoned R3 Medium Density Residential under the Willoughby Draft Local Environmental Plan (2012). The site is currently owned by the Minister Administering the EPA Act 1979 (and managed by the Office of Strategic Lands within the Department) and is proposed to be sold after it has been rezoned. As such, a PSI was required to support the rezoning of the site.

The objective of the investigation was to characterise the potential for contamination at the site and to draw preliminary conclusions regarding the suitability of the site for the proposed use, or make recommendations to enable such conclusions to be made.

The results of the investigation were that material encountered at sampling locations across the site comprised fill material consisting of brown to grey-brown silty sandy gravels and sand with inclusions of igneous gravel, concrete and charcoal. No odours, staining or visible ACM (asbestos containing material) was observed at the locations investigated.

Concentrations of the heavy metals (As, Cd, Cr, Cu, Hg, Ni, Pb and Zn) were below both the Health-Based Investigation Level (residential) (HIL-A) (Dec 2006)[9] and Phytotoxicity-based Investigation level (PIL) in all samples analysed (DEC 2006).

Concentrations of benzene, toluene, ethylbenzene and xylenes (BTEX compounds), were below the laboratory limit of reporting and within the HIL – A (DEC 2006) and PIL (DEC 2006) in all samples analysed.

Concentrations of total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbons (PAHs), organochlorine pesticides (OCPs) and organophosphate pesticides (OPPs) were all below the laboratory limit of reporting and within the HIL-A (DEC 2006)1 in all samples analysed.

Chrysotile asbestos fibres were detected in soil sample QA01 collected from sample location HA03, although no asbestos fibres were detected above the reporting limit of 0.1 g/kg and no respirable fibres detected in any of the other soil samples selected for asbestos analysis.

Based on the results of this investigation and subject to the limitations, asbestos impacts were identified to be restricted to the site's surface (<0.2 m bgs) at sample location HA03 (Figure 2). Intrusive investigations did not identify ACM impacts within the site's sub-surface soils or at any other sample locations across the site. Delineation sampling conducted around HA03 provided pre-validation sample locations (C1, C2, C3 and C4) around HA03 as detailed on **Figure 2, Attached**. Some minor amounts of anthropogenic material was identified within the south western portion of the site along the western portion of the paved concrete driveway.

[9] Contaminated Sites: Guidelines for NSW Site Auditor Scheme, Department of Environment and Climate Change, April 2006 (DEC 2006)

It was recommended that a RAP be developed in accordance with relevant regulatory requirements and implemented to address the identified impact in order to render the site suitable for residential use. The RAP would detail the methodology required to remove and validate the asbestos impacted surface materials (approximately 7.2 m^3 adjacent sample location HA03) and anthropogenic materials from the western boundary of the site. The remedial works would need to be undertaken by a suitably licensed and experienced Class 'A' contractor with the validation and analysis program to be undertaken by a trained and experienced environmental scientist.

JBS&G, RAP, 2013 (JBS&G 2013b)

JBS&G prepared an appropriate RAP (JBS&G 2013b), detailing appropriate operations and safety procedures for the excavation, removal and offsite disposal of asbestos impacted material at the identified location.

The RAP also detailed required validation procedures and appropriate validation criteria, the *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPC 2013)* guidelines, and data quality objectives (DQOs).

5 Remedial Works

5.1 Remedial Overview

Prior to the commencement of remedial works, Willoughby City Council was provided with notification of category 2 remediation works on 11 September 2013, consistent with State Environmental Planning Policy (SEPP 55) (**Appendix B**).

Remedial works were conducted in accordance with guidelines made or approved by the NSW EPA on 14th October 2013 by CPA Contracting Pty Ltd, a Class A licensed asbestos removal contractor (WorkCover NSW licence No. 211128) supervised by JBS&G. JBS&G conducted validation works at the site, as documented in this report.

Plans of remedial excavations are shown in **Figure 2**. Field documentation is included in **Appendix C**. Waste disposal documentation for asbestos impacted material is included in **Appendix D**.

An overview of the remedial works conducted at the site is included in **Sections 5.2** below.

5.2 Remedial Excavations

5.2.1 Preliminary Works

Prior to commencement of remedial works the impacted area was identified using GPS data from previous investigation (JBS 2013a).

Appropriate asbestos notification signage was placed on the site boundaries prior to the commencement remedial works.

5.2.2 Friable Asbestos Remedial Works

The following remedial works were required to be undertaken:

- Excavation of friable ACM impacted soils, across a 6 m x 6 m x 0.2 m area centred around HA03;
- Offsite disposal of excavated material to a licensed waste facility in accordance with DECCW 2009[10] guidelines; and
- Reinstatement of excavation with imported material (VENM).

A photograph log of remedial works is included in **Appendix A** with field notes included in **Appendix C**.

5.3 Offsite Disposal

All material requiring offsite disposal was classified and disposed as General Solid Waste (Special -Asbestos) in accordance with DECCW (2009). During the remedial works, approximately 8.22 tonnes of fill material was disposed of at the Veolia Environmental Services Horsely Park Waste Management Facility (Licence number 11798), located at 716-752 Wallgrove Road, Horsley Park, NSW as per the waste classification provided in **Appendix D**.

5.4 Air Monitoring

Air monitoring was undertaken by JBS&G in accordance with the requirements of the he Safe work Australia ‘’*How to manage and control asbestos in the workplace: Code of*

[10] *Waste Classification Guidelines, Part 1: Classifying Waste,* NSW DECCW, JDecember 2009 (DECCW 2009)

Practice", Workplace Health and Safety Regulation 2011, NSW WorkCover Guidelines was conducted to monitor the amount of airborne asbestos fibres released.

Air monitoring was conducted on site on 14th October 2013 in three locations around the excavation. All air monitoring results were less than the limit of reporting (0.001 fibres/mL) and less than the adopted action level (0.001 fibres/mL). Detailed air monitoring reports are provided in **Appendix E** and the locations of the air monitors are shown on **Figure 2**.

6 Validation Plan

6.1 Data Quality Objectives

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

6.1.1 State the Problem

Asbestos fibre impacted fill material was present at one location of the site, which required removal. The preferred remediation method was the excavation and off-site disposal of impacted fill materials to a landfill licensed to accept the waste.

Validation data was required to be collected to verify the effectiveness of the remediation works and document the condition of the site as being suitable for the proposed future residential land use.

6.1.2 Identify the Decision

The following decisions were required to be made during the validation works:

- Are there any unacceptable risks to future on-site or off-site receptors or off-site receptors from any impacted fill following the removal of asbestos?
- Was the impacted soil suitably classified and disposed off-site to a facility licensed to accept the classified waste?

6.1.3 Identify Inputs to the Decision

The inputs to the decisions are:

- Physical observations, including visual and olfactory results during site activities;
- Documentation to verify appropriate removal and disposal of waste;
- Visual inspection of the area to verify that no ACM fragments were present;
- Soil analytical data from samples collected from the base of the excavation formed by the removal of the impacted soil;
- Waste Classification and Disposal Documentation; and
- Air monitoring results.

6.1.4 Define the Study Boundaries

The remediation work area is located in the north eastern portion of the site. The remedial work area is shown on **Figure 2**.

The vertical extent of the remediation works was predicted from depths of impact reported during the PSI (JBS 2013a). The impacted material was reported to be present to depth of between 0.0 m to 0.1 m.

Due to the nature of potential contaminants identified, seasonality was not assessed as part of this investigation.

6.1.5 Develop a Decision Rule

It is noted that the adopted soil remediation acceptance criteria, as detailed below, are selected from criteria published as investigation levels. Consequently, the levels selected are conservative. However, in the absence of a risk assessment to derive site specific remediation acceptance criteria the levels are considered appropriate.

Soil analytical data was assessed against relevant EPA endorsed criteria including health and ecological based levels, from the following guidelines as per the RAP (JBS&G 2013):

- *National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1) (NEPC 2013)*.
- *Contaminated Sites: Guidelines for NSW Site Auditor Scheme, April 2006* (DEC 2006).
- *Waste Classification Guidelines. Part 1: Classifying Waste*, NSW DECCW, December 2009 (DECCW 2009).

Validation of Soils

Soils from the base of excavation were assessed against criteria provided for 'standard' residential use with garden/accessible soil in DEC (2006) and NEPC (2013).

NSW EPA endorsed NEPC 2013 thresholds for asbestos were adopted for the purposes of this assessment.

Generally, if an excavation validation sample fails the clean-up criteria, further remediation (by excavation of soils) and subsequent validation of the affected area was required.

Off-site Disposal Soils

Soils/wastes that were disposed of off-site (i.e. chased out of the remedial excavations) was compared against the criteria provided in DECCW (2009) guidelines.

Imported Topsoil

Soils were imported onto the site to fill validated excavations and to make up volumes of any excavated material that must be disposed off-site. Imported topsoil was accompanied by documentation verifying that it was appropriate for use on site. The imported soil documentation is provided in **Appendix F** and was imported from Benedict Sands, Menangle Quarry.

Air Monitoring

Air monitoring was conducted at 3 locations throughout the day around the remedial works area as shown on **Figure 4.**

Table 6.1 Summary of Decision Rules

Decision Required to be Made	Decision Rule
1. Are there any unacceptable risks to future on-site or off-site receptors from any fill contamination following the removal of friable ACM?	Prior to soil sample collection and analysis, a walkover inspection will be undertaken to confirm that all visible ACM fragments, if any, have been removed. Material potentially containing asbestos fibres, will be chased out of the excavation. This 'chase out' will be directed by an experienced environmental field staff person. Following visual, soil samples will be collected and analysed at a NATA accredited laboratory. Soil analytical data will be compared against EPA endorsed criteria as summarised in Table 7.4. If the criteria stated above are satisfied, the decision is No and the site is suitable for use without further management. If the criteria are not satisfied, the decision is Yes and is not suitable for use and subject to further management.
2. Was the impacted soil suitably classified and disposed off-site to a facility licensed to accept the classified waste?	Soil analytical data will be compared against DECCW (2009) *Waste Classification Guidelines*. If the criteria stated above are satisfied, the decision is Yes, or if receipts are provided recording the disposal of material to an off-site licensed facility, the decision is Yes.

Decision Required to be Made	Decision Rule
	If the material fails the criteria, and no disposal receipts are provided, the answer is No.

Based on the findings of the previous investigation (JBS2013a), groundwater remediation is not required at the site.

6.1.6 Specify Limits of Decision Error

Specific limits for this project have been adopted in accordance with the appropriate guidance from the NSW EPA, NEPC 2013 appropriate indicators of data quality (DQIs used to assess quality assurance / quality control) and standard JBS&G procedures for field sampling and handling.

To assess the usability of the data prior to making decisions, the data will be assessed against pre-determined Data Quality Indicators (DQIs) for completeness, comparability, representativeness, precision and accuracy. The acceptable limit on decision error is 95% compliance with DQIs.

The pre-determined Data Quality Indicators (DQIs) established for the project are discussed below in relation to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS parameters), and are shown in **Table 6.2**.

- **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)[11] of duplicate samples for chemical COPCs. For asbestos precision is assessed by whether the identification results for duplicate samples were in agreement with the original sample.
- **Accuracy** - measures the bias in a measurement system. The accuracy of the laboratory data that are 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. Note only applied to chemical COPC.
- **Representativeness** –expresses the degree which sample data accurately and precisely represent 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; and 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.

[11] $$RPD\,(\%) = \frac{|C_o - C_d|}{C_o + C_d} \times 200$$

Where C_0 is the analyte concentration of the original sample
C_d is the analyte concentration of the duplicate sample

- **Sensitivity** – expresses the appropriateness of the chosen laboratory methods, including the limits of reporting, in producing reliable data in relation to the adopted site assessment criteria.

Table 6.2: Summary of Data Quality Indicators for Soil Validation Program

Data Quality Indicator	Frequency	Data Quality Criteria
Precision		
Blind duplicates (intra laboratory)	1/20	<50%RPD
Split duplicates (inter laboratory)	1/20	<50%RPD
Accuracy		
Trip blank	N/A*	N/A*
Trip Spike	N/A*	N/A*
Rinsate blank	N/A*	N/A*
Surrogate spikes	N/A*	N/A*
Matrix spikes	N/A*	N/A*
Representativeness		
Sampling appropriate for media and analytes	All media / analytes	-
Samples extracted and analysed within holding times.	All samples	6 months for inorganics
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		
Sample description and COCs completed and appropriate	All Samples	All samples
Appropriate documentation	All Samples	All samples
Data from critical samples is considered valid	All samples	Critical samples valid

*As the only contaminant of concern is asbestos the above DQO's are not applicable

6.1.7 Optimise the Design for Obtaining Data

The purpose of this step is to identify a resource-effective field investigation sampling design that generates data that are expected to satisfy the site manager's decision performance criteria, as specified in the preceding steps of the DQO Process. The output of this step is the sampling design that will guide development of the field sampling and analysis plan. This step provides a general description of the activities necessary to generate and select data collection designs that satisfy decision performance criteria.

Two validation samples were collected from the excavation floor and analysed for asbestos fibres by a laboratory with NATA accreditation for the analyses. As the excavation was extended out to the previously collected delineation sample locations (JBS 2013), no wall validation samples were collected.

6.2 Soil Validation Methodology

An inspection of the excavation was conducted by a WorkCover NSW licensed asbestos assessor (LAA 000157).

Samples were collected by appropriately trained and experienced personnel with a pair of disposable nitrile gloves. A new pair of gloves was used for the collection each sample.

During the collection of soil samples, features such as seepage, discolouration, staining, odours and other indications of contamination were noted on the field documentation, if present. Collected soil samples were immediately transferred to laboratory supplied ziplock plastic bags. 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.

6.3 Laboratory Analyses

The laboratory engaged for the project is NATA accredited for the required analyses.

In addition, the laboratory was required to meet internal JBS&G's QA/QC requirements consistent with NEPC 2013. Laboratory analysis of samples was conducted with reference to COPCs listed in **Table 6.3**.

The soil validation sampling analytical program for asbestos impacted soils is outlined in **Table 6.3**.

Validation sampling was completed in accordance with the RAP (JBS&G 2013).

Table 6.3 Quantification and Analytical Schedule

Area	Samples	Laboratory Analysis
Excavation floors	2 samples	Asbestos
Excavation Walls	0 samples	wall pre-validation samples already collected (JBS 2013)

6.4 Soil Validation Criteria

6.4.1 Remediation Criteria

The validation criteria adopted is for residential land use with accessible soil, as per NEPC (2013) (**Table 6.4**). The validation criteria have been adopted given the site zoning (**Table 2.1**) for potential residential, childcare or other sensitive land use scenarios.

In accordance with NEPC 2013 the criteria outlined in **Table 6.4** was adopted.

Table 6.4 Soil Validation Criteria (all units in mg/kg)

	Limit of Reporting	Laboratory Method	Health Screening Levels (residential A)[1]
ASBESTOS			
Bonded ACM	NA	NA	0.01 %
Friable asbestos (FA) including asbestos fibres, and Asbestos fines (AF) including small fragments of ACM	Presence 0.1g/kg	PLM / Dispersion Staining	0.001 %
All forms of asbestos	NA	Visual observation	No visible asbestos for surface soils

[1] National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (No. 1), National Environment Protection Council, 2013 (NEPC 2013).

6.4.2 Application of Soil Criteria

For soil to be considered as validated (i.e., not posing an unacceptable risk) all reported concentrations must be below the site remediation criteria.

In addition to the above criteria, consideration was given to the presence of odorous or discoloured soils (potentially caused by contamination).

6.4.3 Imported Soil Criteria

The importation of material to reinstate excavations was necessary during the proposed remediation works. In accordance with current EPA policy, only material that does not represent an environmental or health risk at the receiving site may be considered for resource recovery. In accordance with this requirement, only Virgin Excavated Natural Material (VENM) as defined in DECCW (2009); ENM, as defined in 'The excavated natural material exemption 2012' (EPA 2012); or any other suitable material granted an applicable EPA Waste Exemption under the Protection of the Environment Operations (Waste) Regulation 2005 was imported to reinstate the excavations.

6.4.4 Site Management Plan

All components of the site management plan were conducted in accordance with the RAP (JBS&G 2013). Details of the Site Management Plan can be found in **Section 8** of the RAP (JBS&G 2013).

6.4.5 Air Monitoring

The LOR of 0.01 fibres/mL was adopted as the site criteria for airborne asbestos fibres.

7 QA/QC Results

Validation sampling locations from the remedial area is shown in **Figure 2**. Analytical results are summarised in **Tables A**. Laboratory reports and associated documentation are provided in **Appendix G**, and field data sheets are included in **Appendix C**.

7.1 QA/QC Summary

The results of the QA/QC program are presented in **Table 7.1** and an assessment of the QA/QC results are provided in **Section 7.2**.

Table 7.1 Summary of Quality Assurance/ Quality Control Program

Data Quality Objective	Frequency	Results	DQO met?
Precision			
Blind duplicates (intra laboratory)	Nil	Both primary/duplicate sample pairs were in agreement.	Yes*
Split duplicates (inter laboratory)	Nil	Both primary/duplicate sample pairs were in agreement.	Yes*
Accuracy			
Surrogate spikes	NA	-	NA
Matrix spikes	NA	-	NA
Representativeness			
Sampling appropriate for media and analytes	All media / analytes	All sampling conducted in accordance with JBS&G procedures	Yes
Trip spike	NA	-	NA
Trip blank	NA	-	NA
Samples extracted and analysed within holding times.	All samples	It is noted that there is no holding time for the analysis of asbestos in soil.	Yes
Comparability			
Standard operating procedures for sample collection & handling	All Samples	The same standard operating procedures were used throughout the works.	Yes
Standard analytical methods used for all analyses	All Samples	Standard analytical methods used as noted in the Appendices.	Yes
Consistent field conditions, sampling staff and laboratory analysis	All Samples	A single field staff was used the same standard operating procedures throughout works. Works were conducted in predominantly dry, warm to cold conditions. The laboratory remained the same as the laboratory used in previous investigations.	Yes
Limits of reporting appropriate and consistent	All Samples	Limits of reporting were appropriate to achieve the validation objectives and were consistent throughout the works.	Yes
Completeness			
Soil description and COCs completed and appropriate	All Samples	All soil sample sheets and COCs were completed appropriately.	Yes
Appropriate documentation	All Samples	Appropriate field documentation is included in the Appendices	Yes
Satisfactory frequency and result for QC samples	All QA/QC samples	QC samples were collected at a slightly increased frequency.	Yes*
Data from critical samples is considered valid	All samples	Yes	Yes
Sensitivity			

Data Quality Objective	Frequency	Results	DQO met?
Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	All samples	Analytical methods and limits of recovery appropriate for media and adopted site assessment criteria	Yes

7.2 QA/QC Discussion

7.2.1 Precision

Asbestos Duplicate/ Triplicate Samples

Duplicate and triplicate samples were taken at the previous sampling event as detailed in the PSI (JBS 2013). Including the two samples taken on the 14th October 2013 this ratio becomes one per thirteen samples. This is above the required frequency of duplicate/triplicate samples proposed in the RAP (JBS&G 2013) (1 in 20 samples), thus the data is considered suitable for the current investigation.

7.2.2 Accuracy

Surrogate Spikes, Matrix Spikes and Lab Control Samples

As the only contaminant tested for during the current validation works was asbestos, surrogate spikes, matrix spikes and laboratory control samples were not considered necessary.

7.2.3 Representativeness

Sampling appropriate for media and analytes

All soil sampling works completed during the investigation were conducted in accordance with JBS&G standard operating procedures.

Rinsate, Trip Spike and Trip Blank

A rinsate sample was not collected during this sampling event as all samples were collected using disposable nitrile gloves.

As the only contaminant tested for in this remediation was asbestos, trip spikes and trip blanks were not applicable to this type of analysis and are therefore not required.

7.2.4 Comparability

Experienced JBS&G personnel undertook all sampling in accordance with standard JBS&G sampling methods.

All field works and sampling were undertaken by one experienced JBS&G field scientist.

The laboratory LORs were consistent and are considered appropriate.

7.2.5 Completeness

Samples were transported under full chain of custody (COC) documentation. The COC documentation was completed correctly and the selected analyses were correctly conducted.

All field documentation was completed appropriately and were correct.

The frequency of analysis and result for all QC samples are appropriate.

7.2.6 Assessment of QA/QC

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

The NATA certified laboratory results sheets indicate that the project laboratory was 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 are of an acceptable quality upon which to draw conclusions regarding the environmental condition of the site.

8 Validation Results

Validation sampling locations from the remedial area is shown in **Figure 2**. The validation sample results are shown in **Tables 1**. Laboratory reports and associated documentation are provided in **Appendix G**. Field data sheets are included in **Appendix C**. Waste Classification and disposal documentation is provided in **Appendix D** and Air monitoring results are provided in **Appendix E**.

8.1 Field Observations

A remedial area of 6 m x 6 m x 0.2m was excavated on the 14th October 2013. Fill material of grey and brown silty gravelly sand with inclusions of igneous gravels, concrete fragments, bricks and other building rubble was identified with in the walls and floor of the excavation. Field documentation is included in **Appendix C**.

No ACM was observed in the excavation.

No odours were encountered during intrusive works across the site. There was no evidence of stained soils.

8.2 Soil Analytical Results

The soil sampling locations are shown in **Figure 2** and summarised laboratory results are presented in **Table 1**. Detailed laboratory reports and chain of custody documentation are provided in **Appendix F**.

The summary laboratory results are discussed in the following sections against the respective assessment criteria relevant to residential land use scenarios.

8.2.1 Asbestos

No ACM was observed within the excavation after visual inspection by a WorkCover NSW Licensed Asbestos Assessor (LAA 000157).

No asbestos fibres were found in the trace analysis or above the limit of reporting (0.1 g/kg) in any of the pre-validation or floor samples analysed.

8.3 Waste Classification and Disposal Documentation

In accordance with the JBS&G Waste Classification letter report, material was disposed of at Horsley Park Waste Management Facility, a facility licensed to accept asbestos impacted waste.

8.4 Air monitoring

Air monitoring was completed as per **Section 5.4** at 3 locations around the site.

9 Site Characterisation

Based on the decisions requiring to be made to validate the surface and subsurface soils within the site, as discussed in **Section 6.1.2**, the outcomes of the remediation/validation works as they relate to site characterisation are discussed below.

Are there any unacceptable risks for future on-site or off-site receptors from any fill contamination following the removal of impacted soil?

Based on the remedial works described in **Section 5.2** and validation results discussed in **Section 9.1**, the asbestos area identified within the PSI (JBS 2013) has been adequately removed from the site. Validation of the remedial area, as per the RAP (JBS&G 2013), indicated that asbestos results were below relevant health based criteria for residential land use. Additionally, no visible ACM fragments were observed within the excavation.

Based on the results of the previous Preliminary Site Investigation (JBS 2013a), no other contaminants of potential concern exceeded the health based investigation criteria for residential land use. In addition, asbestos was not observed or detected in soil in other areas of the site and fibres detected at HA03 were delineated by sample C1, C2, C3 and C4.

Was the impacted soil suitably disposed of off-site off-site to a licensed waste facility to accept the classified waste?

Based on the results of the validation sampling conducted the ACM, friable asbestos area identified within the PSI (JBS 2013) was classified appropriately in accordance with the DECCW 2009 guidelines and have been removed from site to a suitably licensed facility.

As detailed in the JBS&G Waste Classification letter report, the asbestos containing material was classified as General Solid (Special) Waste in accordance with DECCW 2009 Guidelines. As the material was disposed of at Veolia Horsley Park waste facility, a facility licenced to accept special waste, it is considered that the material was disposed of appropriately.

10 Conclusion

Based on the findings of the current investigation, and subject to the limitations contained in **Section 12**, the following conclusions are made:

- There are no risks to future on-site or off-site receptors from any fill contamination on the site.
- The excavated material has been disposed of to a suitably licenced waste facility.

The site is therefore considered suitable for the proposed residential landuse without further assessment or management.

11 Limitations

This advice is provided 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 the client and other parties. The advice has been prepared specifically for the client for the purposes of the commission. No warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this advice by any third party.

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. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G.

Ground conditions between sampling locations and media 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 site, that 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 advice provided herein, through natural processes or through the intentional or accidental addition of contaminants. The advice is based on the information obtained or available at the time the advice is provided.

This advice is not a complete assessment of the status of the site, and it is limited to the scope of works commissioned. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the advice in the context of the additional information.

Figures

Source: Base Image - Google Maps www.maps.google.com 11-10-2012

0 50 100 200 m
Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
A	Original Issue - R01	SE	15-10-2013

Legend:
- Approximate Site Boundary

JBS&G **Figure 1: Site Location**

Client: Department of Planning and Infrastructure

Project: Willoughby Road, Willoughby NSW

Job No: 43079 File Name: 43079_01

Source: Base Image - Google Maps www.maps.google.com 16-10-2012

0 10 20 40 m

Scale: 1:1,000

Datum: GDA 1994 MGA Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
A	Original Issue - R01	SE	15-10-2013

Legend:

- Approximate Site Boundary
- Proposed Extent of Remediation
- Hand Auger Location
- Hand Excavation Location
- Validation Sample Location
- Air Monitoring Location

JBS&G

Figure 2: Site Layout, Sampling Locations and Extent of Remediation

Client: Department of Planning and Infrastructure

Project: Willoughby Road, Willoughby NSW

Job No: 43079 File Name: 43079_02

Tables

Project: Willoughby Rd, Willoughby
42926
Office of Strategic Lands within the Department of Planning and Infrastructure
Table A: Soil Validation Analytical Results

			Asbestos	
			- Asbestos Fibres	- Asbestos Fragments
EQL				
NEPC 2013 Soil HIL A			Nil	0.01
Sample Id	**Depth (m)**	**Date**		
C1	0.10	7/02/2013	No asbestos detected at reporting limit of 0.1g/kg. No respirable fibres detected	None observed
C2	0.10	7/02/2013	No asbestos detected at reporting limit of 0.1g/kg. No respirable fibres detected	None Observed
C3	0.10	7/02/2013	No asbestos detected at reporting limit of 0.1g/kg. No respirable fibres detected	None Observed
C4	0.10	7/02/2013	No asbestos detected at reporting limit of 0.1g/kg. No respirable fibres detected	None Observed
V03A	0.0-0.1	16/10/2013	No asbestos detected at reporting limit of 0.1g/kg. No respirable fibres detected	None Observed
V03B	0.0-0.1	16/10/2013	No asbestos detected at reporting limit of 0.1g/kg. No respirable fibres detected	None Observed

Notes:
NEPC 2013 HIL- A Residential with garden/accessible soil

Appendix A: Photographic Log

Photo 1: The area surrounding sample location V03 marked out for excavation. Photo looking north.

Photo 2: Beginning of excavation looking NE.

Photo 3: Excavation continued looking north. Truck being loaded for off-site disposal of the excavated material.

Photo 4: Dust suppression was carried out throughout the excavation process.

Source:

Rev	Description	Drn.	Date
A	Original Issue -	RH	14/10/2013

JBS&G **Appendix:**

Client: Department of Planning and Infrastructure

Project: Willoughby Rd, Artarmon

Job No: 43079 File Name: 14 October 2013

Photo 5: The average depth of the excavation is 0.2m.

Photo 6: The complete excavation.

Photo 7: Topsoil being delivered to fill in the remaining excavation.

Photo 8: The finished excavation filled with topsoil and then compacted.

Source:			
A	Original Issue -	RH	14/10/2013
Rev	Description	Drn.	Date

JBS&G **Appendix:**

Client: Department of Planning and Infrastructure

Project: Willoughby Rd, Artarmon

Job No: 43079 File Name: 14 October 2013

Appendix B: Category 2 Notification Letter

JBS&G (42374-55509)

10 September 2013

The General Manager
Willoughby City Council
PO Box 57
Chatswood NSW 2057

Notification of Category 2 Remedial Works at Willoughby Rd, near Walter St intersection, Willoughby, NSW

Dear Sir/Madam

JBS&G (NSW & WA) Pty Ltd (JBS&G) was engaged by the NSW Department of Planning & Infrastructure to submit notification on behalf of NSW Department of Planning & Infrastructure to the Willoughby City Council (Council), as the consent authority, of Category 2 Remedial Works to be undertaken at Willoughby Rd, near Walter St intersection, Willoughby, NSW. The site is formally identified as Lot 2 in Deposited Plan (DP) 586037.

Please consider this 30 days written notice of the proposed works in accordance with State Environmental Planning Policy (SEPP) 55 – Remediation of Land, and the DUAP/EPA (1998) Managing Land Contamination Planning Guidelines SEPP 55–Remediation of Land.

Details regarding the proposed works as specified in SEPP 55 – Remediation of Land (2005) (Clause 16, sub-clauses (1)-(3)) are included below:

- The notice is in writing;
- The duty of giving notice falls on Angela Yoong of the NSW Department of Planning and Infrastructure, Level 4, 10 Valentine Avenue, Parramatta NSW. The contact phone number for Angela Yoong is 02 9860 1518, and for JBS&G is 02 8245 0300;
- The remedial works include the removal and disposal of minor volumes of asbestos in soil from the site by appropriately licensed contractors, under the supervision of JBS&G, including air monitoring at all boundaries throughout the works;
- The basis for assessing the works as category 2 remediation work is provided below;
- The street address for the land is Willoughby Rd, near Walter St intersection, Willoughby, NSW, and the land is formally identified as Lot 2 in Deposited Plan (DP) 586037;
- The map of the location of the land is attached (Attachment 1); and
- The proposed works will commence no earlier than 30 days from the issue of this notification to Willoughby City Council and are estimated to be completed within a month, although a formal remediation schedule has yet to be developed.

The proposed works are not considered to be Category 1 remediation work as defined in SEPP 55 (Clause 9, sub-clauses (a)-(f)), based on the following:

- The proposed work is not a designated development;
- The site has not been identified as being a critical habitat, and the proposed works are not likely to have a significant effect on a critical habitat or a threatened species, population or ecological community;

- The proposed work is understood not to constitute development for which another SEPP or regional environmental plan requires development consent;
- The proposed works are not being carried out in an area or zone to which any classifications to the following apply under an environmental planning instrument:
    - Coastal protection;
    - Conservation or heritage conservation;
    - Habitat area, habitat protection area, habitat or wildlife corridor;
    - Environment protection;
    - Escarpment, escarpment protection or escarpment preservation;
    - Floodway;
    - Littoral rainforest;
    - Nature reserve;
    - Scenic area or scenic protection; and
    - Wetland; and
- The proposed works are not to be carried out in a manner that does not comply with a policy made under the contaminated land planning guidelines made by the council.

The proposed works are considered to be Category 2 remediation work as defined in SEPP 55 (Clause 14, sub-clauses (a)-(b)), based on the following:

- The proposed remediation work is not of a kind described in clause 9(a)-(f), as noted above;
- The remediation works are not being carried out by the terms of a remediation order;
- The remediation works do not trigger any other SEPP or a regional environmental plan;
- The remediation works are not being carried out on behalf of the Director-General of the Department of Agriculture on land contaminated by the use of a cattle dip; and
- The remediation works are not being carried out under the Public Land Remediation Program administered by the Broken Hill Environmental Lead Centre.

With regards to SEPP 55 Clause 15, it is noted the remediation works are not ancillary to other development on the land.

A Remedial Action Plan (RAP) (JBS&G 2013) has been prepared for the site. The RAP has been prepared in accordance with guidelines produced or endorsed by NSW Environment Protection Authority (EPA), under the Contaminated Land Management Act 1997. A PDF copy of the RAP is included within the attached disc. A hard copy of the RAP can be submitted on request

Should you have any queries or require further clarification, please feel free to contact Katie Linz on 02 8245 0300 or by email klinz@jbsg.com.au.

Yours sincerely:

Kasey Hills
Environmental Consultant
JBS&G

Reviewed/Approved by:

Matthew Bennett
Principal Contaminated Land
JBS&G

Level 1, 50 Margaret St, Sydney, NSW, 2000
Tel: 02 8245 0300 | Fax: 02 8245 0399 | www.jbsg.com.au | ABN 67 071 842 638

Attachments: (1) Map of property location (from JBS&G 2013)

(2) PDF Copy of JBS&G (2013) RAP on disc

Level 1, 50 Margaret St, Sydney, NSW, 2000
Tel: 02 8245 0300 | Fax: 02 8245 0399 | www.jbsg.com.au | ABN 67 071 842 638

Attachment 1 – Map of Property Location (from JBS&G 2013)

Level 1, 50 Margaret St, Sydney, NSW, 2000
Tel: 02 8245 0300 | Fax: 02 8245 0399 | www.jbsg.com.au | ABN 67 071 842 638

Source: Base Image - Google Maps www.maps.google.com 11-10-2012

0 50 100 200 m
Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
B	Original Issue - R01	RF	22-02-2013

Legend:
- Approximate Site Boundary

JBS ENVIRONMENTAL

Figure 1: Site Location

Client: Department of Planning and Infrastructure

Project: Willoughby Road, Willoughby NSW

Job No: 42374 File Name: 42374_01

Attachment 2 – JBS&G (2013) RAP on disc

Level 1, 50 Margaret St, Sydney, NSW, 2000
Tel: 02 8245 0300 | Fax: 02 8245 0399 | www.jbsg.com.au | ABN 67 071 842 638

Appendix C: Field Documentation

Field Reporting Cover Sheet

PROJECT NAME: Willoughby Rd, Artarmon	**PROJECT NO: 43079**
FIELD DATES: 14/10/2013	**JBS PM: KL**
FIELD STAFF: RH	
WEATHER: Overcast	
PROPOSED WORKS: Supervision of remediation & validation	
SUMMARY OF FIELDWORK: Excavate 6x6m area surrounding V03. Impacted soil removed to an offsite waste facility. Validation samples V03A & V03B taken. Excavation backfilled with imported soil	
IMPORTANT OUTCOMES TO NOTE:	
COC SENT?	**DATE SAMPLES SENT: 14/10/2013**
PRIMARY LAB: Envirolab	**SECONDARY LAB: NA**

POST-FIELDWORK CHECKLIST

- [x] COC checked with PM
- [ ] Site map updated and attached
- [x] Field data sheets attached (bore logs, well monitoring sheets)
- [x] Calibration and decontamination sheets attached
- [ ] Field notes attached
- [x] Photos downloaded to file
- [ ] Electronic bore logs completed and checked

OUTSTANDING ACTIONS:

Daily Field Report

Date:	14/10/2013	**Completed by**	RH
Arrival Time	7.20am	**Weather**	Overcast, Breezy
Depart Time	12.45pm	**Subcontractor(s)**	CPA Contracting
Site Address	Willoughby Rd, Artarmon		

Purpose of Visit Supervision of remediation & validation.

Notes

(include sketch or attach site map/plan)

- ★ Craig & Paul on site when RH arrived at 7.20am
- ★ Doug Smith (Locator) arrived at ~~8.25~~ 8.25am
- ★ Go through safety docs & sign JRAs at 8.30
- ★ Go through DBYD with Doug & cable location. No services present within 5m of the excavation area.
- ★ Craig & Paul set up dust supression & wait for the truck to arrive (due at 9.00am)
- ★ ~~Esc~~ Truck (bogey) arrived @ 9.00
- ★ safety docs
- ★ Excavation commenced at 9.20
- ★ Excavation finished at 10.15
- ★ ~~wait for topsoil to arrive~~ ★ M. Samuel inspected excavation
- ★ ~~Drop samples to the lab~~ for ACM. None observed.
- ★ Draw up & sample excavation
- ★ Wait for topsoil to arrive. Topsoil arrived at 11.45am
- ★ Spread out topsoil to cover excavated area. finish @ 12.30pm
- ★ Take samples to the lab

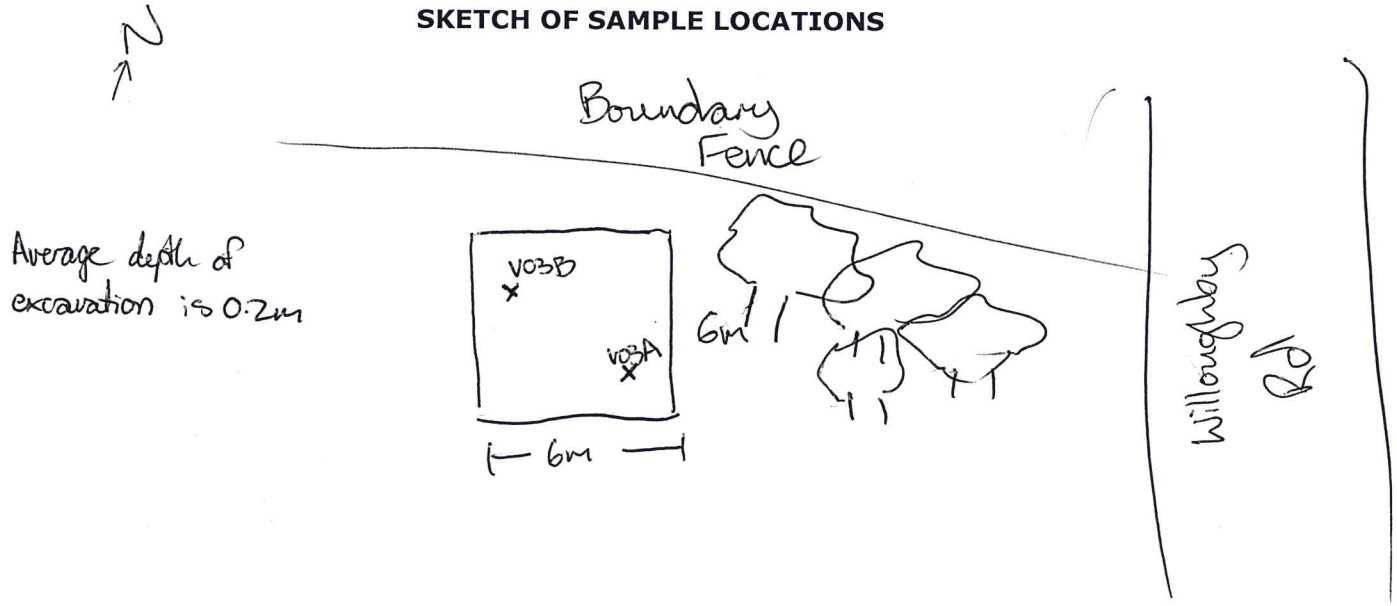
Associated Completed Forms

(eg, bore logs, PID/XRF calibration forms)

Field Screening of Soils

PROJECT NAME: Willoughby Rd, Artarmon	**PROJECT NO: 43079**
FIELDWORK DATES: 14/10/2013	**SAMPLERS: R.H**
TYPE OF INVESTIGATION (GME/ESA etc): Val	**PROJECT MANAGER: K.L**

SKETCH OF SAMPLE LOCATIONS



SAMPLE ID	DATE	DEPTH (m)	~~PID/XRF (ppm)~~	SOIL DESCRIPTION AND FATE
~~VOO2~~				
VO3A	14/10/13	0-0.1	No ACM, odours or staining observed	Gravelly silty sand, light grey brown, hot, damp, fine sand-cobbles, poorly graded. Includes coal, brick, concrete, terracotta, plastic, rats, sandstone, igneous gravel
VO3B	14/10/13	0-0.1	No ACM, odours or staining observed	As above

ADDITIONAL NOTES:

Description		Colour	Structure	Moisture	Cohesive Soils		Sand & Gravel			Secondary
FILL	clayey	red	homogenous	dry	very soft	non-plastic	very loose	boulders	poorly sorted	and (35-50%)
CLAY	silty	yellow	heterogeneous	damp	soft	low plasticity	loose	cobbles	(well graded)	some (20-35%)
SILT	sandy	black	stratified	moist	firm	mod plasticity	medium dense	coarse gravel	well sorted	little (10-20%)
SAND	gravelly	brown	laminated	wet	stiff	high plasticity	dense	fine gravel	(poorly	trace (0-10%)
	organic	grey	lens	saturated	very stiff		very dense	coarse sand	graded)	

CPA Contracting Pty Limited

Environmental Health & Safety Plan 8.6

ABN 88 114 435 308

START UP PLANT CHECK LIST. 044

Project Name: PARK WILLOUGHBY CARPARKING

Plant/Equipment: 4.5t EXC **Week Starting:** 14/10

Serial Number: _____ **Hours:** 328

ITEM (√ = OK X = fault)	MON	TUES	WED	THUR	FRI	SAT	REMARKS
WATER LEVEL, FAN BELTS, ENGINE HOSES.	✓						
OIL LEAKS FROM ENGINE PARTS.	✓						
OIL LEAKS & CONDITION OF HYDRAULIC HOSES.	✓						
ENGINE & HYDRAULIC OIL LEVEL	✓						
FUEL LEVEL	✓						
BATTERIES	✓						
EXHAUST	✓						
AIR COLLECTOR, AIR FILTER, A/C FILTER	✓						
TRACK & ROLLER WEAR	✓						
BUCKETS AND ATTACHMENTS.	✓						
SAFETY PIN.	✓						
BRAKES.	✓						
EMERGENCY SWITCH	✓						
LIFTING GEAR AND EQUIPMENT	N/A						
INSPECT FOR LOOSE OR BROKEN PARTS ON BODY & BOOM	✓						
WINDOWS & AIR CONDITIONER.	✓						
LIGHTS & ROOF BEACON.	✓						
REVERSE BEEPER	✓						
FIRE EXTINGUISHER & SPILL KIT.	✓						
GREASE PLANT	✓						
CABIN CLEAN & TIDY							
OPERATOR'S INITIALS	[illegible]						

Inspection needed? No ☐ YES ☐ DONE ☐

List any Maintenance/Repairs needed: Completed on:

Craig Homans Managing Director _____ (Date)_____

Field Equipment Calibration and Decontamination

PROJECT NAME: Willoughby Rd, Artarmon	**PROJECT NO: 43079**
FIELD DATES: 14/10/2013	**FIELD STAFF: RH**

CALIBRATION SUMMARY
EQUIPMENT:
CALIBRATION STANDARD:

DATE	TIME	READING (ppm_v)	COMMENTS

DECONTAMINATION SUMMARY
EQUIPMENT:

1. Was the equipment decontaminated appropriately prior to sampling at each location?	Y	N	NA
2. Was excess soil removed by scraping, brushing or wiping with disposable towels?	Y	N	NA
3. Was the equipment contaminated with grease, tar or similar material? If so, was the equipment steam cleaned or rinsed with pesticide-grade acetone:hexane?	Y Y	N N	NA
4. Was phosphate-free detergent used to wash the equipment?	Y	N	NA
5. Was the equipment rinsed with clean water?	Y	N	NA
6. Was the equipment then rinsed with deionised water?	Y	N	NA
7. Were all sample containers cleaned and acid or solvent washed prior to sample collection?	Y	N	NA

WERE ANY ADDITIONAL DECONTAMINATION MEASURES REQUIRED? PROVIDE DETAILS.

Clean fresh nitrile gloves used for each sample

Appendix D: Waste Classification Letter Report and Waste Documentation

JBS&G (42374-55717)

30 September 2013

Angela Yoong
NSW Department of Planning and infrastructure
Via email: angela.yoong@planning.nsw.gov.au

Waste Classification, Willoughby Road, near Walter Street Intersection, Willoughby NSW

Dear Angela,

JBS&G (NSW & WA) Pty Ltd (JBS&G) was engaged by NSW Department of Planning and Infrastructure to provide a waste classification for off-site disposal of material from the abovementioned site. Details of the source site, material characterisation and waste classification are provided below. The Limitations included in **Attachment 1** apply to the advice provided herein.

1. Source Site Details

Lot/DP	Lot 2 DP586037
Address	Willoughby Rd, near Walter St intersection, Willoughby NSW
Local Government Authority	Willoughby City Council
Description of Source Site/Area	Surface fill material around sample location HA03 in the north eastern portion of the site. Sample location map in **Attachment 3**

2. Material Characterisation

Material identification	Fill – Silty, sandy gravel
Area/Stockpile GPS Coordinates	6257267.90 N, 333322.90 E
Estimated volume (m^3)	Approximately 2 m^3
Characterisation Samples	HA03 0-0.1 (The waste classification is specifically limited to material in the vicinity of HA03, as such other results presented in the attached reports are not applicable)
QA/QC Samples	QC01 (Blind duplicate of sample HA03 0-0.1) and QA01 (Split triplicate of sample HA03 0-0.1)
TCLP Samples	None
Sampling Date	12 October 2012
Laboratories	Primary: Envirolab Services Pty Ltd. Secondary: ALS Group (Chemical) Secondary: Pickford and Rhyder Consulting Pty Ltd (Asbestos)
Contaminants of Concern	TRH OCPs BTEX PCBs PAH Heavy Metals Asbestos
Laboratory Reports Attached?	Yes – **Attachment 2**
Additional Data Sources?	No
Additional Data Attached?	NA
All laboratory methods NATA certified?	Yes
Material description	Fill – Grey and brown, silty sandy gravel
Visible Asbestos Containing Material (ACM)?	None observed, however Pickford and Rhyder Certificate of Analysis 72085-ID, reported the presence of a chrysotile asbestos fibre bundle in sample “QA01”
Visible Putrescible Material	None observed
Is the material covered by a General Immobilisation Approval?	No

3. Waste Classification

Waste Classification	**GENERAL SOLID WASTE (NON-PUTRESCIBLE), MIXED WITH SPECIAL (Asbestos) WASTE**
Does 'Special Waste' apply?	Yes – Asbestos
Is the material classified as 'Hazardous Waste'?	No
General/Specific Immobilisation Approval No.	NA
Classification Comments	The classification applies to all the material identified and described herein as a whole, and only the material identified and described herein.
Disposal Comments	Waste must be transported by an appropriately licensed transporter and disposed to a facility that is licensed to receive that class of waste

Should you have any queries or require further clarification, please feel free to contact Katie Linz on 02 8245 0300 or by email klinz@jbsg.com.au.

Yours sincerely:

Kasey Hills
Environmental Consultant
JBS&G

Reviewed/Approved by:

Joanne Rosner
Principal Contaminated Land
JBS&G

Attachments: (1) Limitations

(2) Laboratory Analysis Reports and COCs

(3) Figures

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[1] The estimated volume of waste is an indicative estimate only based on either client-supplied data or GPS coordinates, and estimated stockpile elevation. For material characterised in-situ, a bulking factor may be applied.

[2] Material observations including those relating to visible ACM and putrescible materials were made prior to material leaving the source site.

[3] Wastes that are not generally classified as putrescible include: soils, timber, garden trimmings, agricultural, forestry and crop materials, and natural fibrous organic and vegetative materials, as per NSW DECCW (2009) *Waste Classification Guidelines, Part 1: Classifying Waste*.

[4] Waste classification in accordance with NSW DECCW (2009) *Waste Classification Guidelines, Part 1: Classifying Waste*.

[5] Disposal Facility or Facilities must be appropriately licensed under Schedule 1, Section 39; "Waste Disposal (Application to Land)" , of The Protection of the Environment Operations (POEO) Act 1997. Disposal of 'Asbestos Waste', as defined under the Act and associated Waste Guidelines, is required to be managed in accordance with Section 42 of The Protection of the Environment Operations (Waste) Regulation 2005 in terms of loading, transport, unloading and disposal. The POEO Act 1997 states that if waste is transported to a facility not lawfully authorised as a waste facility for that waste, the owner, transporter and receiver of the waste are each guilty of an offence. The owner of waste includes, in relation to waste that has been transported, the person who was the owner of the waste immediately before it was transported.

Level 1, 50 Margaret St, Sydney, NSW, 2000
Tel: 02 8245 0300 | Fax: 02 8245 0399 | www.jbsg.com.au | ABN 67 071 842 638

Attachment 1 – 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 the client and other parties. The report has been prepared specifically for the client for the purposes of the commission, including use by the Site Auditor acting as an agent of the client in this respect. No warranties, express or implied, are offered to any third parties and no liability will be accepted for use or interpretation of this report by any third party.

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. This report should not be amended in any way without prior approval by JBS&G, or reproduced other than in-full including all attachments as originally provided to the client by JBS&G.

Limited sampling and laboratory analyses were undertaken as part of the investigations reviewed, as described herein. Ground conditions between sampling locations and media 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 site, which were not identified in the site history and which may not be expected at the site.

Changes to the stockpile or 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 or material investigated, 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&G reserves the right to review the report in the context of the additional information.

Level 1, 50 Margaret St, Sydney, NSW, 2000
Tel: 02 8245 0300 | Fax: 02 8245 0399 | www.jbsg.com.au | ABN 67 071 842 638

Attachment 2 – Laboratory Analysis Reports and COCs

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.:	42374
PROJECT NAME	ARTARMON
SEND REPORT TO:	K-LIN2
SEND INVOICE TO:	AJRAYNOR
DATE NEEDED BY:	STD

LABORATORY BATCH NO.	
SAMPLERS	G.BLACK
PHONE:	8338 1011
EMAIL:	klin@jbsgroup.com.au
QC LEVEL:	NEPM 1999 (✓)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

8 heavy metals As, Cd, Cr, Cu, Pb, Ni, Zn, Hg.

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH
1) HA01 0-0.1	SOIL	17/10/12	-	BAG + ICE + ICE	-
2) HA01 0.3					
3) HA02 0-0.1					
4) HA02 0.3					
5) HA03 0-0.1					
6) HA03 0.3					
7) HA04 0-0.1					
8) HA04 0.3					
9) HA04 0.5					
10) QC01					
QA01					
11) RINSATE	WATER			AMBER + METALS+VIALS HCL	
12) TRIP BLANK				VIAL + ICE	
13 TRIP SPIKE					
14. Composite1					

Heavy Metals	PAHs	TPH/BTEX	Asbestos	OCP/OPP*	BTEX	ASLP pH.HM	ASLP PAHs
X			X	X			
X	X	X	X	X			
X	X	X	X	X			
X	X						
X							
X	X	X	X				
Please forward to ALS & P.R.							
X	X	X			X		

NOTES

* Please analyse samples as a 3-part composite

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

Job No: 80365

Date Received: 17/10/12
Time Received: 15:05
Received by: PT
Temp: Cool/Ambient
Cooling: Icepack
Security: Intact/Broken/None

RELINQUISHED BY:	METHOD OF SHIPMENT: COURIER	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: G. Black DATE: 17/10/12	CONSIGNMENT NOTE NO.	NAME: Prat DATE: 17/10/12	COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
OF: JBS ENVIRONMENTAL	TRANSPORT CO.	OF: EL	COOLER TEMP ..... deg C
NAME: DATE:	CONSIGNMENT NOTE NO.	NAME: DATE:	COOLER SEAL - Yes..... No ..... Intact ..... Broken .....
OF:	TRANSPORT CO	OF:	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

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

CERTIFICATE OF ANALYSIS 80365

Client:
JBS Environmental Pty Ltd
P.O. Box 940
MASCOT
NSW 1460

Attention: Katie Linz, G Black

Sample log in details:

Your Reference:	**42374, Artarmon**
No. of samples:	11 soils, 3 waters
Date samples received / completed instructions received	17/10/12 / 17/10/12

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	24/10/12 / 24/10/12
Date of Preliminary Report:	Not issued

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Nancy Zhang
Chemist

Rhian Morgan
Reporting Supervisor

Hinoko Miyazaki
Chemist

Lulu Guo
Approved Signatory

Jeremy Faircloth
Chemist

ACCREDITED FOR TECHNICAL COMPETENCE

vTRH & BTEX in Soil				
Our Reference:	UNITS	80365-3	80365-5	80365-10
Your Reference	----------	HA02	HA03	QC01
Composite Reference	----------	-	-	-
Depth		0-0.1	0-0.1	-
Date Sampled		12/10/2012	12/10/2012	12/10/2012
Type of sample		soil	soil	soil
Date extracted	-	18/10/2012	18/10/2012	18/10/2012
Date analysed	-	19/10/2012	19/10/2012	19/10/2012
vTRH C_6 - C_9	mg/kg	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	77	104	102

sTRH in Soil (C10-C36)				
Our Reference:	UNITS	80365-3	80365-5	80365-10
Your Reference	----------	HA02	HA03	QC01
Composite Reference	----------	-	-	-
Depth		0-0.1	0-0.1	-
Date Sampled		12/10/2012	12/10/2012	12/10/2012
Type of sample		soil	soil	soil
Date extracted	-	18/10/2012	18/10/2012	18/10/2012
Date analysed	-	19/10/2012	19/10/2012	19/10/2012
TRHC$_{10}$ - C$_{14}$	mg/kg	<50	<50	<50
TRHC$_{15}$ - C$_{28}$	mg/kg	<100	<100	<100
TRHC$_{29}$ - C$_{36}$	mg/kg	150	<100	<100
Surrogate o-Terphenyl	%	89	89	92

PAHs in Soil					
Our Reference:	UNITS	80365-3	80365-5	80365-7	80365-10
Your Reference	----------	HA02	HA03	HA04	QC01
Composite Reference	----------	-	-	-	-
Depth		0-0.1	0-0.1	0-0.1	-
Date Sampled		12/10/2012	12/10/2012	12/10/2012	12/10/2012
Type of sample		soil	soil	soil	soil
Date extracted	-	18/10/2012	18/10/2012	18/10/2012	18/10/2012
Date analysed	-	21/10/2012	21/10/2012	21/10/2012	21/10/2012
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	0.1	0.2	0.1
Pyrene	mg/kg	<0.1	0.1	0.2	0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	0.1	<0.1
Benzo(b+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	0.05	0.09	0.06
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d_{14}	%	90	87	92	99

Organochlorine Pesticides in soil		
Our Reference:	UNITS	80365-14
Your Reference	----------	Composite 1
Composite Reference	----------	1+3+5
Depth		-
Date Sampled		12/10/2012
Type of sample		soil
Date extracted	-	18/10/2012
Date analysed	-	24/10/2012
HCB	mg/kg	<0.1
alpha-BHC	mg/kg	<0.1
gamma-BHC	mg/kg	<0.1
beta-BHC	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
delta-BHC	mg/kg	<0.1
Aldrin	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
gamma-Chlordane	mg/kg	<0.1
alpha-chlordane	mg/kg	<0.1
Endosulfan I	mg/kg	<0.1
pp-DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
pp-DDD	mg/kg	<0.1
Endosulfan II	mg/kg	<0.1
pp-DDT	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Surrogate TCMX	%	81

PCBs in Soil		
Our Reference:	UNITS	80365-14
Your Reference	----------	Composite 1
Composite Reference	----------	1+3+5
Depth		-
Date Sampled		12/10/2012
Type of sample		soil
Date extracted	-	18/10/2012
Date analysed	-	24/10/2012
Arochlor 1016	mg/kg	<0.1
Arochlor 1221	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Arochlor 1260	mg/kg	<0.1
Surrogate TCLMX	%	81

Acid Extractable metals in soil						
Our Reference:	UNITS	80365-1	80365-3	80365-5	80365-7	80365-8
Your Reference	----------	HA01	HA02	HA03	HA04	HA04
Composite Reference	----------	-	-	-	-	-
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.3
Date Sampled		12/10/2012	12/10/2012	12/10/2012	12/10/2012	12/10/2012
Type of sample		soil	soil	soil	soil	soil
Date digested	-	18/10/2012	18/10/2012	18/10/2012	18/10/2012	18/10/2012
Date analysed	-	18/10/2012	18/10/2012	18/10/2012	18/10/2012	18/10/2012
Arsenic	mg/kg	<4	<4	5	<4	<4
Cadmium	mg/kg	0.7	<0.5	<0.5	<0.5	1
Chromium	mg/kg	12	5	9	7	10
Copper	mg/kg	66	10	9	27	56
Lead	mg/kg	120	23	53	65	91
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	6	3	2	4	9
Zinc	mg/kg	170	58	49	110	190

Acid Extractable metals in soil		
Our Reference:	UNITS	80365-10
Your Reference	----------	QC01
Composite Reference	----------	-
Depth		-
Date Sampled		12/10/2012
Type of sample		soil
Date digested	-	18/10/2012
Date analysed	-	18/10/2012
Arsenic	mg/kg	5
Cadmium	mg/kg	<0.5
Chromium	mg/kg	8
Copper	mg/kg	9
Lead	mg/kg	55
Mercury	mg/kg	<0.1
Nickel	mg/kg	2
Zinc	mg/kg	48

Moisture						
Our Reference:	UNITS	80365-1	80365-3	80365-5	80365-7	80365-8
Your Reference	----------	HA01	HA02	HA03	HA04	HA04
Composite Reference	----------	-	-	-	-	-
Depth		0-0.1	0-0.1	0-0.1	0-0.1	0.3
Date Sampled		12/10/2012	12/10/2012	12/10/2012	12/10/2012	12/10/2012
Type of sample		soil	soil	soil	soil	soil
Date prepared	-	18/10/2012	18/10/2012	18/10/2012	18/10/2012	18/10/2012
Date analysed	-	19/10/2012	19/10/2012	19/10/2012	19/10/2012	19/10/2012
Moisture	%	7.2	13	8.4	9.9	11

Moisture			
Our Reference:	UNITS	80365-10	80365-14
Your Reference	----------	QC01	Composite 1
Composite Reference	----------	-	1+3+5
Depth		-	-
Date Sampled		12/10/2012	12/10/2012
Type of sample		soil	soil
Date prepared	-	18/10/2012	18/10/2012
Date analysed	-	19/10/2012	19/10/2012
Moisture	%	9.9	8.5

Asbestos ID - soils					
Our Reference:	UNITS	80365-1	80365-3	80365-5	80365-10
Your Reference	----------	HA01	HA02	HA03	QC01
Composite Reference	----------	-	-	-	-
Depth		0-0.1	0-0.1	0-0.1	-
Date Sampled		12/10/2012	12/10/2012	12/10/2012	12/10/2012
Type of sample		soil	soil	soil	soil
Date analysed	-	22/10/2012	22/10/2012	22/10/2012	22/10/2012
Sample mass tested	g	Approx 50g	Approx 50g	Approx 50g	Approx 50g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected	No respirable fibres detected

vTRH & BTEX in Water				
Our Reference:	UNITS	80365-11	80365-12	80365-13
Your Reference	----------	RINSATE	TRIP BLANK	TRIP SPIKE
Composite Reference	----------	-	-	-
Depth		-	-	-
Date Sampled		12/10/2012	12/10/2012	12/10/2012
Type of sample		soil	soil	soil
Date extracted	-	17/10/2012	17/10/2012	17/10/2012
Date analysed	-	18/10/2012	18/10/2012	18/10/2012
TRHC$_6$ - C$_9$	µg/L	<10	[NA]	[NA]
Benzene	µg/L	<1	<1	95%
Toluene	µg/L	<1	<1	95%
Ethylbenzene	µg/L	<1	<1	96%
m+p-xylene	µg/L	<2	<2	97%
o-xylene	µg/L	<1	<1	97%
Surrogate Dibromofluoromethane	%	98	100	99
Surrogate toluene-d8	%	100	100	101
Surrogate 4-BFB	%	99	99	100

sTRH in Water (C10-C36)		
Our Reference:	UNITS	80365-11
Your Reference	----------	RINSATE
Composite Reference	----------	-
Depth		-
Date Sampled		12/10/2012
Type of sample		soil
Date extracted	-	19/10/2012
Date analysed	-	19/10/2012
TRHC$_{10}$ - C$_{14}$	µg/L	<50
TRHC$_{15}$ - C$_{28}$	µg/L	<100
TRHC$_{29}$ - C$_{36}$	µg/L	<100
Surrogate o-Terphenyl	%	91

PAHs in Water		
Our Reference:	UNITS	80365-11
Your Reference	----------	RINSATE
Composite Reference	----------	-
Depth		-
Date Sampled		12/10/2012
Type of sample		soil
Date extracted	-	19/10/2012
Date analysed	-	19/10/2012
Naphthalene	µg/L	<1
Acenaphthylene	µg/L	<1
Acenaphthene	µg/L	<1
Fluorene	µg/L	<1
Phenanthrene	µg/L	<1
Anthracene	µg/L	<1
Fluoranthene	µg/L	<1
Pyrene	µg/L	<1
Benzo(a)anthracene	µg/L	<1
Chrysene	µg/L	<1
Benzo(b+k)fluoranthene	µg/L	<2
Benzo(a)pyrene	µg/L	<1
Indeno(1,2,3-c,d)pyrene	µg/L	<1
Dibenzo(a,h)anthracene	µg/L	<1
Benzo(g,h,i)perylene	µg/L	<1
Surrogate p-Terphenyl-d_{14}	%	99

Metals in Water - Dissolved		
Our Reference:	UNITS	80365-11
Your Reference	----------	RINSATE
Composite Reference	----------	-
Depth		-
Date Sampled		12/10/2012
Type of sample		soil
Date digested	-	18/10/2012
Date analysed	-	18/10/2012
Arsenic - Dissolved	mg/L	<0.05
Cadmium - Dissolved	mg/L	<0.01
Chromium - Dissolved	mg/L	<0.01
Copper - Dissolved	mg/L	<0.01
Lead - Dissolved	mg/L	<0.03
Mercury - Dissolved	mg/L	<0.0005
Nickel - Dissolved	mg/L	<0.02
Zinc - Dissolved	mg/L	<0.02

Method ID	Methodology Summary
Org-016	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS.
Org-003	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID.
Org-012 subset	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS.
Org-005	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC with dual ECD's.
Org-006	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Metals-020 ICP-AES	Determination of various metals by ICP-AES.
Metals-021 CV-AAS	Determination of Mercury by Cold Vapour AAS.
Inorg-008	Moisture content determined by heating at 105 deg C for a minimum of 4 hours.
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.

QUALITY CONTROL vTRH & BTEX in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/10/2012	[NT]	[NT]	LCS-7	18/10/2012
Date analysed	-			19/10/2012	[NT]	[NT]	LCS-7	19/10/2012
vTRH C_6 - C_9	mg/kg	25	Org-016	<25	[NT]	[NT]	LCS-7	99%
Benzene	mg/kg	0.2	Org-016	<0.2	[NT]	[NT]	LCS-7	89%
Toluene	mg/kg	0.5	Org-016	<0.5	[NT]	[NT]	LCS-7	98%
Ethylbenzene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-7	97%
m+p-xylene	mg/kg	2	Org-016	<2	[NT]	[NT]	LCS-7	106%
o-Xylene	mg/kg	1	Org-016	<1	[NT]	[NT]	LCS-7	100%
Surrogate aaa-Trifluorotoluene	%		Org-016	110	[NT]	[NT]	LCS-7	106%
QUALITY CONTROL sTRH in Soil (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/10/2012	[NT]	[NT]	LCS-7	18/10/2012
Date analysed	-			19/10/2012	[NT]	[NT]	LCS-7	19/10/2012
TRH C_{10} - C_{14}	mg/kg	50	Org-003	<50	[NT]	[NT]	LCS-7	116%
TRH C_{15} - C_{28}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	111%
TRH C_{29} - C_{36}	mg/kg	100	Org-003	<100	[NT]	[NT]	LCS-7	91%
Surrogate o-Terphenyl	%		Org-003	98	[NT]	[NT]	LCS-7	117%
QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/10/2012	[NT]	[NT]	LCS-7	18/10/2012
Date analysed	-			21/10/2012	[NT]	[NT]	LCS-7	21/10/2012
Naphthalene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	125%
Acenaphthylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluorene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	113%
Phenanthrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	113%
Anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	116%
Pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	137%
Benzo(a)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Chrysene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	LCS-7	115%

QUALITY CONTROL PAHs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Benzo(b+k)fluoranthene	mg/kg	0.2	Org-012 subset	<0.2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	mg/kg	0.05	Org-012 subset	<0.05	[NT]	[NT]	LCS-7	88%
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-012 subset	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	91	[NT]	[NT]	LCS-7	87%
QUALITY CONTROL Organochlorine Pesticides in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/10/2012	[NT]	[NT]	LCS-5	18/10/2012
Date analysed	-			24/10/2012	[NT]	[NT]	LCS-5	24/10/2012
HCB	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	77%
gamma-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
beta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	83%
Heptachlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	71%
delta-BHC	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Aldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	89%
Heptachlor Epoxide	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	80%
gamma-Chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
alpha-chlordane	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan I	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDE	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	87%
Dieldrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	83%
Endrin	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	80%
pp-DDD	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	91%
Endosulfan II	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
pp-DDT	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Endosulfan Sulphate	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	LCS-5	81%
Methoxychlor	mg/kg	0.1	Org-005	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCMX	%		Org-005	87	[NT]	[NT]	LCS-5	80%

Client Reference: 42374, Artarmon

QUALITY CONTROL PCBs in Soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			18/10/2012	[NT]	[NT]	LCS-5	18/10/2012
Date analysed	-			24/10/2012	[NT]	[NT]	LCS-5	24/10/2012
Arochlor 1016	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	LCS-5	100%
Arochlor 1260	mg/kg	0.1	Org-006	<0.1	[NT]	[NT]	[NR]	[NR]
Surrogate TCLMX	%		Org-006	87	[NT]	[NT]	LCS-5	84%

QUALITY CONTROL Acid Extractable metals in soil	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date digested	-			18/10/2012	[NT]	[NT]	LCS-2	18/10/2012
Date analysed	-			18/10/2012	[NT]	[NT]	LCS-2	18/10/2012
Arsenic	mg/kg	4	Metals-020 ICP-AES	<4	[NT]	[NT]	LCS-2	90%
Cadmium	mg/kg	0.5	Metals-020 ICP-AES	<0.5	[NT]	[NT]	LCS-2	94%
Chromium	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	93%
Copper	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	91%
Lead	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	89%
Mercury	mg/kg	0.1	Metals-021 CV-AAS	<0.1	[NT]	[NT]	LCS-2	103%
Nickel	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	91%
Zinc	mg/kg	1	Metals-020 ICP-AES	<1	[NT]	[NT]	LCS-2	92%

QUALITY CONTROL Moisture	UNITS	PQL	METHOD	Blank
Date prepared	-			[NT]
Date analysed	-			[NT]
Moisture	%	0.1	Inorg-008	[NT]

QUALITY CONTROL Asbestos ID - soils	UNITS	PQL	METHOD	Blank
Date analysed	-			[NT]

QUALITY CONTROL vTRH & BTEX in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			17/10/2012	[NT]	[NT]	LCS-W1	17/10/2012
Date analysed	-			18/10/2012	[NT]	[NT]	LCS-W1	18/10/2012
TRHC$_6$ - C$_9$	µg/L	10	Org-016	<10	[NT]	[NT]	LCS-W1	90%
Benzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	88%
Toluene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	88%
Ethylbenzene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	91%
m+p-xylene	µg/L	2	Org-016	<2	[NT]	[NT]	LCS-W1	91%
o-xylene	µg/L	1	Org-016	<1	[NT]	[NT]	LCS-W1	89%
Surrogate Dibromofluoromethane	%		Org-016	109	[NT]	[NT]	LCS-W1	93%
Surrogate toluene-d8	%		Org-016	100	[NT]	[NT]	LCS-W1	98%
Surrogate 4-BFB	%		Org-016	106	[NT]	[NT]	LCS-W1	98%

QUALITY CONTROL sTRH in Water (C10-C36)	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			19/10/2012	[NT]	[NT]	LCS-W1	19/10/2012
Date analysed	-			19/10/2012	[NT]	[NT]	LCS-W1	19/10/2012
TRHC$_{10}$ - C$_{14}$	µg/L	50	Org-003	<50	[NT]	[NT]	LCS-W1	103%
TRHC$_{15}$ - C$_{28}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	118%
TRHC$_{29}$ - C$_{36}$	µg/L	100	Org-003	<100	[NT]	[NT]	LCS-W1	110%
Surrogate o-Terphenyl	%		Org-003	101	[NT]	[NT]	LCS-W1	76%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base ll Duplicate ll %RPD	Spike Sm#	Spike % Recovery
Date extracted	-			19/10/2012	[NT]	[NT]	LCS-W1	19/10/2012
Date analysed	-			19/10/2012	[NT]	[NT]	LCS-W1	19/10/2012
Naphthalene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	83%
Acenaphthylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Acenaphthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluorene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	93%

QUALITY CONTROL PAHs in Water	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Phenanthrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	87%
Anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Fluoranthene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	87%
Pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	89%
Benzo(a)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	97%
Benzo(b+k)fluoranthene	µg/L	2	Org-012 subset	<2	[NT]	[NT]	[NR]	[NR]
Benzo(a)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	LCS-W1	97%
Indeno(1,2,3-c,d)pyrene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Dibenzo(a,h)anthracene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Benzo(g,h,i)perylene	µg/L	1	Org-012 subset	<1	[NT]	[NT]	[NR]	[NR]
Surrogate p-Terphenyl-d_{14}	%		Org-012 subset	90	[NT]	[NT]	LCS-W1	93%

QUALITY CONTROL Metals in Water - Dissolved	UNITS	PQL	METHOD	Blank	Duplicate Sm#	Duplicate results Base II Duplicate II %RPD	Spike Sm#	Spike % Recovery
Date digested	-			18/10/2012	[NT]	[NT]	LCS-W1	18/10/2012
Date analysed	-			18/10/2012	[NT]	[NT]	LCS-W1	18/10/2012
Arsenic - Dissolved	mg/L	0.05	Metals-020 ICP-AES	<0.05	[NT]	[NT]	LCS-W1	101%
Cadmium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	101%
Chromium - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	103%
Copper - Dissolved	mg/L	0.01	Metals-020 ICP-AES	<0.01	[NT]	[NT]	LCS-W1	101%
Lead - Dissolved	mg/L	0.03	Metals-020 ICP-AES	<0.03	[NT]	[NT]	LCS-W1	101%
Mercury - Dissolved	mg/L	0.0005	Metals-021 CV-AAS	<0.0005	[NT]	[NT]	LCS-W1	96%
Nickel - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	103%
Zinc - Dissolved	mg/L	0.02	Metals-020 ICP-AES	<0.02	[NT]	[NT]	LCS-W1	106%

Report Comments:

Asbestos ID was analysed by Approved Identifier: Alex Tam
Asbestos ID was authorised by Approved Signatory: Lulu Guo

INS: Insufficient sample for this test
NA: Test not required
<: Less than

PQL: Practical Quantitation Limit
RPD: Relative Percent Difference
>: Greater than

NT: Not tested
NA: Test not required
LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

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

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes and LCS: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

CHAIN OF CUSTODY

JBS ENVIRONMENTAL

PROJECT NO.:	42374	LABORATORY BATCH NO.	
PROJECT NAME	Artarmon	SAMPLERS	G. Black
SEND REPORT TO:	K. Lin2	SEND INVOICE TO: A.Trannor	PHONE: 8338 1011 EMAIL: Klin@jbsgroup.com.au
DATE NEEDED BY:	STD	QC LEVEL:	NEPM 1999 (✓)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

8 HEAVY METALS = As, Cd, Cr, Cu, ~~Pb~~ Pb, Ni, Hg, Zn

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	8 HEAVY METALS	PAHs	TPH/BTEX	NOTES
SA01	SOIL	17/10/12	-	JAR + ICE	-	x	x	x	ES Job no:- 80365

PLEASE SEND TO ACS

Environmental Division
Sydney
Work Order
ES1224844

Telephone : +61-2-8784 8555

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: George Black DATE: 17/10/12	CONSIGNMENT NOTE NO.	NAME: Pratistha DATE: 17/10/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS Environmental	TRANSPORT CO.	OF: ES	COOLER TEMP ..... deg C
NAME: DATE: 18/10/12	CONSIGNMENT NOTE NO.	NAME: Frank DATE: 18-10-12 1400	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: ES	TRANSPORT CO	OF: ACS	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700
IMSO Forms013 – Chain of Custody

Suite 2, 595 Gardeners Road MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

Environmental Division

CERTIFICATE OF ANALYSIS

Work Order	: **ES1224844**	Page	: 1 of 5
Client	: **JBS ENVIRONMENTAL**	Laboratory	: Environmental Division Sydney
Contact	: KATIE LINZ	Contact	: Client Services
Address	: 128 ORIORDAN STREET MASCOT NSW, AUSTRALIA 2020	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
E-mail	: klinz@jbsgroup.com.au	E-mail	: sydney@alsglobal.com
Telephone	: +61 02 8338 1011	Telephone	: +61-2-8784 8555
Facsimile	: +61 02 8338 1700	Facsimile	: +61-2-8784 8500
Project	: 42374 ARTARMON	QC Level	: NEPM 1999 Schedule B(3) and ALS QCS3 requirement
Order number	: ----		
C-O-C number	: ----	Date Samples Received	: 18-OCT-2012
Sampler	: GB	Issue Date	: 25-OCT-2012
Site	: ----		
		No. of samples received	: 1
Quote number	: SY/291/12	No. of samples analysed	: 1

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. All pages of this report have been checked and approved for release.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

NATA Accredited Laboratory 825

Accredited for compliance with ISO/IEC 17025.

Signatories

This document has been electronically signed by the authorized signatories indicated below. Electronic signing has been carried out in compliance with procedures specified in 21 CFR Part 11.

Signatories	*Position*	*Accreditation Category*
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics
Evie.Sidarta	Inorganic Chemist	Sydney Inorganics
Pabi Subba	Senior Organic Chemist	Sydney Organics

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: QA01	----	----	----	----
				Client sampling date / time: 17-OCT-2012 16:00	----	----	----	----
				ES1224844-001	----	----	----	----
EA055: Moisture Content								
Moisture Content (dried @ 103°C)	----	1.0	%	**6.4**	----	----	----	----
EG005T: Total Metals by ICP-AES								
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----
Chromium	7440-47-3	2	mg/kg	**8**	----	----	----	----
Copper	7440-50-8	5	mg/kg	**9**	----	----	----	----
Lead	7439-92-1	5	mg/kg	**66**	----	----	----	----
Nickel	7440-02-0	2	mg/kg	<2	----	----	----	----
Zinc	7440-66-6	5	mg/kg	**48**	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons								
Naphthalene	91-20-3	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthylene	208-96-8	0.5	mg/kg	<0.5	----	----	----	----
Acenaphthene	83-32-9	0.5	mg/kg	<0.5	----	----	----	----
Fluorene	86-73-7	0.5	mg/kg	<0.5	----	----	----	----
Phenanthrene	85-01-8	0.5	mg/kg	<0.5	----	----	----	----
Anthracene	120-12-7	0.5	mg/kg	<0.5	----	----	----	----
Fluoranthene	206-44-0	0.5	mg/kg	<0.5	----	----	----	----
Pyrene	129-00-0	0.5	mg/kg	<0.5	----	----	----	----
Benz(a)anthracene	56-55-3	0.5	mg/kg	<0.5	----	----	----	----
Chrysene	218-01-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(b)fluoranthene	205-99-2	0.5	mg/kg	<0.5	----	----	----	----
Benzo(k)fluoranthene	207-08-9	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	mg/kg	<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	0.5	mg/kg	<0.5	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	0.5	mg/kg	<0.5	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	0.5	mg/kg	<0.5	----	----	----	----
^ **Sum of polycyclic aromatic hydrocarbons**	----	0.5	mg/kg	<0.5	----	----	----	----
Benzo(a)pyrene TEQ (WHO)	----	0.5	mg/kg	<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons								
C6 - C9 Fraction	----	10	mg/kg	<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg	<50	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg	<100	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **C10 - C36 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----

Analytical Results

Sub-Matrix: **SOIL**

Compound	CAS Number	LOR	Unit	Client sample ID: QA01	----	----	----	----
				Client sampling date / time: 17-OCT-2012 16:00	----	----	----	----
				ES1224844-001	**----**	**----**	**----**	**----**
EP080/071: Total Recoverable Hydrocarbons - NEPM 2010 Draft								
C6 - C10 Fraction	----	10	mg/kg	<10	----	----	----	----
^ **C6 - C10 Fraction minus BTEX (F1)**	----	10	mg/kg	<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg	<50	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg	<100	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
^ **>C10 - C40 Fraction (sum)**	----	50	mg/kg	<50	----	----	----	----
EP080: BTEX								
Benzene	71-43-2	0.2	mg/kg	<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg	<0.5	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg	<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	----	----	----	----
EP080: BTEXN								
^ **Sum of BTEX**	----	0.2	mg/kg	<0.2	----	----	----	----
^ **Total Xylenes**	1330-20-7	0.5	mg/kg	<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg	<1	----	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates								
Phenol-d6	13127-88-3	0.1	%	**104**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	0.1	%	**103**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	0.1	%	**108**	----	----	----	----
EP075(SIM)T: PAH Surrogates								
2-Fluorobiphenyl	321-60-8	0.1	%	**108**	----	----	----	----
Anthracene-d10	1719-06-8	0.1	%	**106**	----	----	----	----
4-Terphenyl-d14	1718-51-0	0.1	%	**122**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates								
1.2-Dichloroethane-D4	17060-07-0	0.1	%	**109**	----	----	----	----
Toluene-D8	2037-26-5	0.1	%	**109**	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.1	%	**97.2**	----	----	----	----

Surrogate Control Limits

Sub-Matrix: **SOIL**

Compound	CAS Number	Recovery Limits (%) Low	High
EP075(SIM)S: Phenolic Compound Surrogates			
Phenol-d6	13127-88-3	56.3	133.3
2-Chlorophenol-D4	93951-73-6	53.8	133.8
2.4.6-Tribromophenol	118-79-6	23.1	134.9
EP075(SIM)T: PAH Surrogates			
2-Fluorobiphenyl	321-60-8	58.9	132.7
Anthracene-d10	1719-06-8	55.0	137.6
4-Terphenyl-d14	1718-51-0	54.0	147.8
EP080S: TPH(V)/BTEX Surrogates			
1.2-Dichloroethane-D4	17060-07-0	72.8	133.2
Toluene-D8	2037-26-5	73.9	132.1
4-Bromofluorobenzene	460-00-4	71.6	130.0

7285

JBS ENVIRONMENTAL

CHAIN OF CUSTODY

PROJECT NO.:	42374	LABORATORY BATCH NO.	
PROJECT NAME	ARTARMON	SAMPLERS	G. BLACK
SEND REPORT TO:	K. LINZ	SEND INVOICE TO: A. TRAYNOR	PHONE: 8338 1011 EMAIL: Klinz@jbsgroup.com.au
DATE NEEDED BY:	STD	QC LEVEL:	NEPM 1999 (✓)

COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

SAMPLE ID	MATRIX	D A T E	TIME	TYPE & PRESERVATIVE	pH	ASBESTOS	NOTES
QA01	SOIL	17/10/12	-	BAG	-	X	ELS Job No: 82365

PLEASE SEND TO PICKFORD AND RAYDER

RELINQUISHED BY:	METHOD OF SHIPMENT:	RECEIVED BY:	FOR RECEIVING LAB USE ONLY:
NAME: George Black DATE: 17/10/12	CONSIGNMENT NOTE NO. \	NAME: Post DATE: 17/10/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: JBS ENVIRONMENTAL	TRANSPORT CO.	OF: ELS	COOLER TEMP ..... deg C
NAME: K. Temia DATE: 18/10/12	CONSIGNMENT NOTE NO.	NAME: KIM OPENSHAW DATE: 18/10/12	COOLER SEAL – Yes..... No ..... Intact ..... Broken .....
OF: ELS	TRANSPORT CO	OF: PICKFORD 0850	COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

JBS Environmental Pty Ltd ABN 67 071 842 638
Phone: (02) 8338-1011
Fax: (02) 8338-1700

Suite 2, 595 Gardeners Road MASCOT NSW 2020
PO Box 940 MASCOT NSW 1460
www.jbsgroup.com.au

PICKFORD & RHYDER CONSULTING PTY LTD
ABN 17 105 546 076
Occupational Hygiene Measurements and Solutions.

PO Box 1422 Lane Cove 1595
Rear - 244 Burns Bay Road
Lane Cove NSW Australia
Phone: (02) 9418 9151
Fax: (02) 9418 9150

23 October 2012

Ms Katie Linz
JBS Environmental
PO Box 940
MASCOT NSW 1460

Email: klinz@jbsgroup.com.au, cbroberts@jbsgroup.com.au

CERTIFICATE OF ANALYSIS – ASBESTOS IDENTIFICATION

YOUR REFERENCE/JOB No: 42374
TYPE OF SAMPLES: Bulk sample - as received from Envirolab
SITE LOCATION: Artarmon
DATE SAMPLED: 17 October 2012 **DATE RECEIVED:** 18 October 2012
OUR REFERENCE: 72085-ID

TEST METHOD: Soil samples examined by Stereomicroscopy and Polarized Light Microscopy (with Dispersion Staining) in accordance with AS 4964-2004: - 'Method for the qualitative identification of asbestos in bulk samples' as outlined in Laboratory Method ID/1. The Reporting Limit for the results in this Certificate is numerically equal to the lowest detection limit of 0.1 g/kg. Trace asbestos analysis has been conducted on each sample, which is generally designed to detect 'respirable' asbestos fibres (ie less than 3 micrometres in width) distributed throughout the sample.

Sample No	*Lab No*	*Sample Information*	*Analysis Result*	*Description*
QA01	72085	Soil sample as received	chrysotile asbestos detected	The sample was a brown, sandy soil with plant matter, of approximate weight 77 g, in which organic fibres were identified and asbestos fibres were detected in the sample. Chrysotile asbestos fibres were identified in a fibre bundle. No asbestos fibres were found in the race analysis or above the Reporting Limit of 0.1 g/kg.

All sampling and site work has been undertaken by the client - the analytical procedures and results reported on this Certificate have been conducted by Pickford & Rhyder Consulting.

Sampling is not covered by the scope of accreditation.

Analysed and reported by:

Gary Conaty,
Approved Identifier and Signatory.

NATA
ACCREDITED FOR TECHNICAL COMPETENCE

Accreditation number 2515

Attachment 3 – Figures

Source: Base Image - Google Maps www.maps.google.com 11-10-2012

0 50 100 200 m

Scale: Approximate

Datum: MGA94 Zone 56 - AHD

Rev	Description	Drn.	Date
A4			
A	Original Issue - R02	SE	06-09-2013

Legend:

- Approximate Site Boundary

JBS&G **Figure 1: Site Location**

Client: Department of Planning and Infrastructure

Project: Willoughby Road, Willoughby NSW

Job No: 42374 File Name: 42374_01

Source: Base Image - Google Maps www.maps.google.com 16-10-2012

0 10 20 40 m

Scale: 1:1,000

Datum: GDA 1994 MGA Zone 56 - AHD

Rev	Description	Drn.	Date:
A4			
A	Original Issue - R02	SE	30-09-2013

Legend:

- Approximate Site Boundary
- Proposed Extent of Remediation
- Hand Auger Location
- Hand Excavation Location

JBS&G

Figure 2: Site Layout, PSI Sampling Locations and Proposed Extent of Remediation

Client: Department of Planning and Infrastructure

Project: Willoughby Road, Willoughby NSW

Job No: 42374 File Name: 42374_02

CPA CONTRACTING PTY LIMITED

SOIL/DEMOLITION WASTE DISPOSAL RECORD

Site Address: PARK (460) WILLOUGHBY RD - WILLOUGHBY.

CPA Supervisor: CRAIG HOMANS

Transport Company: CPA.

Landfill/Tip Address: VEOLIA 716 WALLGROVE RD HORSLEY PARK

Loads Removed from Site.

Date:	Type of Material Being Removed:	Location Where Materials was Removed (LOT):	Rego:	Time Left:	Capacity: TONNES	Disposal Docket Number:	CPA Supervisor Witness Initials.
14/10/13	ASB SOIL	EXCAVATION PIT.	A19802	10-00am	8.22	1231348588	[initials]

This is to certify that, I the undersigned, have witnessed the removal of the above materials on the behalf of CPA and confirm that with regard to contaminants, observed no change or variation in odour or discolouration of the materials.

In the event of a change in odour or discolouration with regard to contaminants, the material is to segregate and stockpile on-site until appropriate testing has been carried out to assess its removal requirements.

Name: C HOMANS **Signature:** [signature]

Docket

Horsley Park Waste Management
716-752,Wallgrove Road
Horsley park NSW 2164
ABN: 20051316584

Docket : 1231348588

Date : 14/10/2013
Time : 11:26 - 11:37
Reg # : AY98QT
PO # :
Hauler : 0020053937
EPA # :
Waste : ASBS

Desc : Asbestos Contaminated Soil (Special)
BP : CPA Contracting - Willoughby
Gross : 19.340 t
Tare : 11.120 t
NET : 8.220 t

Signature : .....

Appendix E: Air Monitoring Reports

AMR001 - DAILY AIRBORNE ASBESTOS FIBRE MONITORING REPORT

DATE OF ISSUE:	15/10/2013	**JOB NAME:**	Atarmon Asbestos Remediation	**JOB NUMBER:**	43079
SITE ADDRESS:	Willoughby Road, Atarmon	**CLIENT:**	Department of Planning	**CLIENT CONTACT:**	Angela Yoong
DOCUMENT NUMBER:	JBS&G 43079-55842	**SAMPLER/S:**	Michael Samuel	**ROTAMETER ID:**	R002
SAMPLING DATE:	14/10/2013	**ANALYSIS DATE:**	14/10/2013		

TEST METHOD: Estimation of Airborne Asbestos Fibres and Synthetic Mineral Fibres by the Membrane Filter Method. Dust particles collected and filters examined in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres [NOHSC:3003 (April 2005)], and Envirolab in-house method ASB-2. Envirolab NATA Accreditation No: 2901

Pump ID	Lab ID	Filter ID	Location Description	Start Time	Flow Rate Start (L/min)	End Time	Flow Rate End (L/min)	Average Flow Rate (L/min)	Result (Fibres/Field)	Result (fibres/mL)
G008	98937-1	ELS 279	South of asbestos removal works - temporary fencing	07:51	3.50	10:12	3.50	3.50	1/100	<0.01
G015	98937-2	ELS 677	SE of asbestos removal works - street pole	07:53	3.50	10:08	3.50	3.50	0/100	<0.01
SKC009	98937-3	ELS 533	North of asbestos removal works - temporary bollard	07:56	3.50	10:05	3.50	3.50	0/100	<0.01
G018	98937-4	ELS 609	West of asbestos removal works - attached to tree	08:00	3.50	10:20	3.50	3.50	0/100	<0.01
N/A	98937-5	ELS 253	Field Blank	-	-	-	-	-	0/100	-

NOTE: The results contained in this report relate only to the sample(s) submitted for analysis

COMMENT: The calculated concentrations for the samples analysed are less than the minimum control action level of 0.01 fibres/mL for control monitoring as outlined in the Code of Practice - How to Safely Remove Asbestos (Safe Work Australia 2011).

Approved by:

Michael Samuel
WorkCover NSW Licensed Asbestos Assessor (LAA 000157)
Operations Manager – Hazardous Materials & Air Monitoring
JBS&G (NSW & WA) Pty Ltd

Attachment 1 – Laboratory Reports and Chain of Custody Documentation

Level 1, 50 Margaret St, Sydney, NSW, 2000
Tel: 02 8245 0300 | Fax: 02 8245 0399 | www.jbsg.com.au | ABN 67 071 842 638

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

CERTIFICATE OF ANALYSIS 98937

Client:
JBS & G (NSW & WA) Pty Ltd
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: Michael Samuel

Sample log in details:

Your Reference:	**43079, Artarmon Remediation**
No. of samples:	5 Filters
Date samples received:	14/10/2013
Date completed instructions received:	14/10/2013

Analysis Details:
Please refer to the following pages for results and methodology summary.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Sampling performed by client, concentration values are reported seperately.

Report Details:

Date results requested by:	15/10/13
Date of Preliminary Report:	Not Issued
Issue Date:	14/10/13

NATA accreditation number 2901. This document shall not be reproduced except in full.
Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Analysed by Approved Counter:	Matt Mansfield
Asbestos was authorised by Approved Signatory:	Matt Mansfield

M. Mansfield
Matt Mansfield
Approved Signatory

Envirolab Ref:	Description –	Cassette No. –	Date analysed -	Fibres -	Fields -
98937/1	ELS 279	ELS 279	14/10/2013	1.0	100
98937/2	ELS 677	ELS 677	14/10/2013	0.0	100
98937/3	ELS 533	ELS 533	14/10/2013	0.0	100
98937/4	ELS 609	ELS 609	14/10/2013	0.0	100
98937/5	Blank	ELS 253	14/10/2013	0.0	100

Method ID	Methodology Summary
ASB-002	Estimation of Airborne Asbestos Fibres by the Membrane Filter Method. Dust particles collected and filters examined in accordance with NOHSC:3003 (April 2005) Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres and Envirolab in-house method ASB-002. The microscope constant for Zeiss Std 20 (Sydney Laboratory) calculated using 25mm filter is 48952. The microscope constant for Olympus BX41 (Perth Laboratory) calculated using 25mm filter is 46981. These constants are to be used to calculate fibres/mL concentration for asbestos fibre air monitoring filters.

Appendix F: VENM Documentation

CPA CONTRACTING PTY LIMITED

IMPORTATION OF FILL/QUARRY MATERIALS TO SITE

Date:	Type of Material Being Received:	Source Of Material:	Transport Company:	Location Where Materials Was Placed (LOT):	Rego:	Time Arrived:	Capacity: TONNES	Docket Number:	CPA Supervisor Witness Initials:
14/10/13	TOPSOIL	BENEDICT SANDS MENACLE	CAMSONS	EXCAVATION PIT.	SBR	11.45AM	14.3	M062928	

This is to certify that, I the undersigned have witnessed the importation of the above materials on the behalf of CPA Contracting and confirm that with regard to contaminants in the material, I have observed no change or variation in type of material being received, any smelt any odours from the fill/quarry materials.

In the event of a change in type of material, odour or discolouration detected, the material is to be stop importing to site. The material will be segregate and stockpile onsite until appropriate testing has been carried out or removed from site.

Name: CRAIG HOMANS **Signature:**

CAMSONS

Delivering reliable service in quarry products and bulk transport ...

Docket No. 918234

• Sands • Soil • Roadbase • Landscape Materials
• Recycled Products • Decorative Gravels • Bulk Transport
• EPA Licenced • EnviroAgg • Bottom Ash • Aggregates

Date	Camsons Fleet No.	Rego	Job No.	Order Number
14/10/13	646	SBR	82	

Customer	CPA
Material	TOP SOIL
From	MENANGLE
To	WILLOUGHBY

	QUARRY DKT	SECOND DKT	NET WEIGHT	INITIALS
1	M-062928		14.30	
2				
3				
4				
5				
6				

Hourly Hire/ Waiting time	Start	Finish	Travel Time	Total

Waiting time Reason	
Print Name	
X SIGNATURE	Date

CAMSONS PTY LTD A.C.N. 002 113 279 A.B.N. 27 828 824 886
PO Box 430 St Marys NSW 1790
SALES: **PHONE (02) 9675 6444 FAX (02) 9675 6522**
DIRECT ORDERS: **PHONE (02) 9675 6222 FAX (02) 9677 2587**

YELLOW - OFFICE COPY BLUE - CUSTOMER'S COPY PINK - OFFICE COPY GREEN - SPARE COPY WHITE - BOOK COPY

REFER TO CAMSONS TRADING TERMS & CONDITIONS
www.camsons.com.au

BENEDICT SANDS

ABN: 46 001 926 503
P.O. Box 431
Frenchs Forest 1640
PH: 9986 3500

MENANGLE

M-062928

14 Oct 2013
10:23 AM
TRUCK ID: SBR

CUSTOMER: CAMSONS TRANSPORT
P.O. BOX 430
ST MARYS
ORDER NO:
JOB NO:
PRODUCTS

M01
M01 SCREENED TOP SOIL

GROSS: 22.30 t
TARE: 8.00 t
NET: 14.30 t

Total today : 14.30 t
Total this month: 14.30 t

Payment Type: Account

SIGNATURE:

Appendix G: Laboratory Certificates and Chain of Custody Documentation

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

SAMPLE RECEIPT ADVICE

Client:

JBS & G (NSW & WA) Pty Ltd
Level 1, 50 Margaret St
Sydney NSW 2000

ph: 02 8245 0300
Fax: 02 8245 0399

Attention: K Linz R Heywood

Sample log in details:

Your reference:	**43079, Willoughby Rd Artarmon**
Envirolab Reference:	**98920**
Date received:	14/10/2013
Date results expected to be reported:	**21/10/13**

Samples received in appropriate condition for analysis:	YES
No. of samples provided	2 Soils
Turnaround time requested:	Standard
Temperature on receipt (°C)	NA
Cooling Method:	Not applicable
Sampling Date Provided:	

Comments:

Samples will be held for 1 month for water samples and 2 months for soil samples from date of receipt of samples.

Contact details:

Please direct any queries to Aileen Hie or Jacinta Hurst
ph: 02 9910 6200 fax: 02 9910 6201
email: ahie@envirolabservices.com.au or jhurst@envirolabservices.com.au

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

CERTIFICATE OF ANALYSIS 98920

Client:
JBS & G (NSW & WA) Pty Ltd
Level 1, 50 Margaret St
Sydney
NSW 2000

Attention: Katie Linz / Ruth Heywood

Sample log in details:

Your Reference:	**43079, Artarmon**		
No. of samples:	2 Soils		
Date samples received / completed instructions received	14/10/13	/	14/10/13

Analysis Details:
Please refer to the following pages for results, methodology summary and quality control data.
Samples were analysed as received from the client. Results relate specifically to the samples as received.
Results are reported on a dry weight basis for solids and on an as received basis for other matrices.
Please refer to the last page of this report for any comments relating to the results.

Report Details:

Date results requested by: / Issue Date:	21/10/13	/	17/10/13
Date of Preliminary Report:	Not Issued		

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Accredited for compliance with ISO/IEC 17025. **Tests not covered by NATA are denoted with *.**

Results Approved By:

Jacinta Hurst
Laboratory Manager

Asbestos ID - soils WA Our Reference: Your Reference Type of sample	UNITS ---------- ----------	98920-1 V03A Soil	98920-2 V03B Soil
Date analysed	-	17/10/2013	17/10/2013
Sample mass tested	g	681.99g	654.21g
Sample Description	-	Brown fine-grained soil & rocks	Brown fine-grained soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg	No asbestos detected at reporting limit of 0.1g/kg
Trace Analysis	-	No respirable fibres detected	No respirable fibres detected

Method ID	Methodology Summary
ASB-003	Asbestos ID - Minimum 500mL soil sample was analysed as recommended by "The Guidelines from the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009" with a reporting limit of 0.1g/kg as per AS4964-2004.

Report Comments:

This report is consistent with the analytical procedures and reporting recommendations in the Western Australian Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia - May 2009.

Asbestos ID was analysed by Approved Identifier:	Alex Tam
Asbestos ID was authorised by Approved Signatory:	Matt Mansfield

INS: Insufficient sample for this test	PQL: Practical Quantitation Limit	NT: Not tested
NA: Test not required	RPD: Relative Percent Difference	NA: Test not required
<: Less than	>: Greater than	LCS: Laboratory Control Sample

Quality Control Definitions

Blank: This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.

Duplicate: This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.

Matrix Spike : A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.

LCS (Laboratory Control Sample) : This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.

Surrogate Spike: Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.
Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.
Spikes for Physical and Aggregate Tests are not applicable.
For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: <5xPQL - any RPD is acceptable; >5xPQL - 0-50% RPD is acceptable.
Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals; 60-140% for organics and 10-140% for SVOC and speciated phenols is acceptable.

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

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

CHAIN OF CUSTODY

JBS&G

PROJECT NO.: 43079
PROJECT NAME: Willoughby Rd, Artarmon
SEND REPORT TO: K.Linz and R.Heywood SEND INVOICE TO: G.Ng
DATE NEEDED BY: ~~24hr~~ TAT Standard
COMMENTS / SPECIAL HANDLING / STORAGE OR DISPOSAL:

LABORATORY BATCH NO.
SAMPLERS RH
PHONE: 02 82450300 EMAIL: klinz@jbsg.com.au and AdminNSW@jbsg.com.au
QC LEVEL: NEPM (2013) rheywood@jbsg.com.au

SAMPLE ID	MATRIX	DATE	TIME	TYPE & PRESERVATIVE	pH	500ml Asbestos	NOTES
V03A	Soil	14/10/13		Bag		X	
V03B	Soil	14/10/13		Bag		X	

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

Job No: 98920
Date Received: 14/10/13
Time Received: 10:45
Received by: AW
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

RELINQUISHED BY:
NAME: R.Heywood DATE: 14/10/13
OF: JBS&G
NAME: DATE:
OF:

METHOD OF SHIPMENT:
CONSIGNMENT NOTE NO.
TRANSPORT CO.
CONSIGNMENT NOTE NO.
TRANSPORT CO

RECEIVED BY:
NAME: A.Weir DATE: 14/10/13
OF: ELS
NAME: DATE:
OF:

FOR RECEIVING LAB USE ONLY:
COOLER SEAL – Yes..... No..... Intact ..... Broken .....
COOLER TEMP ..... deg C
COOLER SEAL – Yes..... No..... Intact ..... Broken .....
COOLER TEMP ..... deg C

Container & Preservative Codes: P = Plastic; J = Soil Jar; B = Glass Bottle; N = Nitric Acid Prsvd.; C = Sodium Hydroxide Prsvd; VC = Hydrochloric Acid Prsvd Vial; VS = Sulfuric Acid Prsvd Vial; S = Sulfuric Acid Prsvd; Z = Zinc Prsvd; E = EDTA Prsvd; ST = Sterile Bottle; O = Other

Appendix H: WorkCover Documentation

Notice of intent to remove friable asbestos

Notification number: 943R-00050308-03 **Date of notice:** 4/10/2013 **Notification status:** Accepted

LICENCE DETAILS

Asbestos removal licence number: 211128 Expiry date: 30/08/2017

Licence holder name: CPA Contracting Pty Ltd

Class(es): Class A / ASA/ Class B / ASB

Registered business name: CPA Contracting Pty Ltd

A.B.N:

Daytime contact number:

WORK/ SITE DETAILS

Proposed work start date: 14/10/2013 Proposed work finish date: 14/10/2013

Site name: Park

Site address: 604 Willoughby Rd Willoughby NSW 2068

Site owner: Jbs&G Pty Ltd Telephone:

Approximate quantity of asbestos: 4 TONNE

Detail location of asbestos on site: On Parkland Ground Refer To Attached Report For Location

Details of removal including method used to enclose the removal area: Asbestos Soil To Be Wet Down And Loading Onto Truck By Excavator Bucket.

Waste disposal site name: VEOLIA ENVIRONMENTAL SERVICES

CLEARANCE CERTIFICATE PROVIDER

Competent person: Telephone:

Licensed asbestos assessor: Micheal Samuel From Jbs&G Pty Lir Number: LAA000157 Telephone: 82450300

SUPERVISOR/ WORKER DETAILS

Number of workers for this removal work: 2

Number of workers who have successfully completed relevant competency unit: 2

Supervisor	DOB	Competency	Telephone
MR Craig Homans	01/07/1969	ASA ASB	0419 411 896

All work is to be carried out in accordance with the *Workplace Health and Safety Regulation 2011* and the associated codes of practice.
This notification to remove asbestos is required by clause 466 of the *Work Health and Safety Regulation 2011.*
See Section 268 of the *Work Health and Safety Act 2011* for offences relating to the giving of false or misleading information under the Act or the Regulation.

Document Distribution

Rev No.	Copies	Recipient	Date:
0	1x electronic	Angela Yoong	29/10/2013

Document Status

Rev No.	Author	Reviewer	Approved for Issue		
		Name	Name	Signature	Date
0	Ruth Heywood	Katie Linz	Matthew Bennett	-	29/10/2013