coffey environments
SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

SUPPLEMENTARY ENVIRONMENTAL ASSESSMENT
MATERIAL SCIENCE BUILDING DEVELOPMENT
UNIVERSITY OF NEW SOUTH WALES
UNION ROAD, KENSINGTON, NSW

Prepared for:

University of New South Wales
C/-: Capital Insight Pty Ltd
Level 6, 77 Berry Street,
North Sydney NSW 2060

Report Date: 14 March 2013
Project Ref: ENAURHOD04414AB

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ENAURHOD04414AB R01

14 March 2013

University of New South Wales
C/-: Capital Insight Pty Ltd
Level 6, 77 Berry Street,
North Sydney NSW 2060

Attention: Frank Tong

Dear Frank

RE: Material Science Building Development, UNSW Kensington Campus - Supplementary Environmental Assessment

Please find enclosed our revised draft Supplementary Environmental Assessment for the proposed Material Science Building Development site located on Union Rd, within the University of NSW's Kensington Campus. This revised draft has been updated to consider a Site Audit Statement and associated documents received from the UNSW and Randwick City Council on the 12th March 2013.

We trust this meets your immediate requirements however if you do have any questions please do not hesitate to contact us.

For and on behalf of Coffey Environments Australia Pty Ltd

Matthew Locke
Senior Associate

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RECORD OF DISTRIBUTION

No. of copies	Report File Name	Report Status	Date	Prepared for:	Initials
1	ENAURHOD04414AB R01a.doc	Draft	5 March 2013	UNSW	
1	ENAURHOD04414AB R01a.doc	Draft	5 March 2013	Capital Insight Pty Ltd	
1	ENAURHOD04414AB R01a.doc	Draft	5 March 2013	Coffey Environments Australia Pty Ltd	
1	ENAURHOD04414AB R01b.doc	Draft	13 March 2013	UNSW	
1	ENAURHOD04414AB R01b.doc	Draft	13 March 2013	Capital Insight Pty Ltd	
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CONTENTS

LIST OF ATTACHMENTS

Figures

Appendices

ABBREVIATIONS

AEC	Area of Environmental Concern
ASS	Acid Sulfate Soils
Bgs	below ground surface
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
C6-C36	Hydrocarbon chainlength fraction
CLM Act	Contaminated Land Management Act (1997)
COPC	Contaminant of Potential Concern
CPT	Cone Penetrometer Tests
DA	Development Application
EIL	Ecological Investigation Level
HIL	Health Investigation Level
LGA	Local Government Area
LOR	Limit of Reporting
mg/kg	milligrams per kilogram
MSB	Materials Science Building
NATA	National Association of Testing Authorities
NEPM	National Environment Protection Measure
NSW EPA	Environment Protection Authority of New South Wales
OCP	Organochlorine Pesticide
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PID	Photoionisation Detector

ABBREVIATIONS

POEO Act	Protection of the Environment Operations (1997)
Ppm	parts per million
QA	Quality Assurance
QC	Quality Control
RCC	Randwick City Council
TCLP	Toxicity Characteristic Leaching Potential
TPH	Total Petroleum Hydrocarbon
UNSW	University of New South Wales
UST	Underground Storage Tank

EXECUTIVE SUMMARY

Coffey Environments Australia Pty Ltd (Coffey) was commissioned by Capital Insight Pty Ltd on behalf of the University of New South Wales (UNSW) to undertake supplementary environmental assessment works for the proposed Materials Sciences Building (MSB) on Union Road in the Kensington Campus (the site). This supplementary environmental assessment work has been undertaken in general accordance with Coffey's fee proposal dated 4 February 2013 (ref: ENAURHOD04414AB-P01a).

UNSW has lodged a development application (DA) to redevelop the Union Road car park for the proposed MSB development. The MSB development is proposed to include a multi-storey building (including a single storey basement) which will be used for educational purposes including classrooms and laboratories. The existing building E9 will be demolished as part of the redevelopment works. A selection of drawings which outline the proposed development is provided in Appendix K of this report.

In response to the DA, Coffey understands that Randwick City Council (RCC) has requested further information on the following matters:

- an opinion of the site's suitability for the proposed use with respect to land contamination; and
- acid sulfate soils.

The objectives of these works were to:

- review available reports relating to the site and provide an opinion on whether the site's suitability for the proposed use.
- assess the potential of whether acid sulphate soils may be present at the site.

Coffey undertook the following scope of works to address the project objective:

- project planning and management;
- supplementary desktop review;
- site walkover; and
- data assessment and reporting.

Based on a review of available desktop data, observations made during fieldwork, an assessment of laboratory analytical data and the proposed tertiary education land use, Coffey makes the following conclusions:

- concentrations of TPH, BTEX PAH, OCP, PCB, arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc detected in soils on site are not considered to present an unacceptable exposure risk to human health, with respect to direct contact or ingestion;
- site soils are considered unlikely to present an unacceptable aesthetic risk, subject to removal of the subsurface concrete slab in the vicinity of BH MSB-1, CBH3 and CBH4. It is noted that excavation of the basement presented in the proposed redevelopment plans, is likely to address this;
- concentrations of BTEX, TPH C_6-C_{10}, >C_{10}-C_{16} and naphthalene detected in soils are not considered to present an unacceptable exposure risk to human health, with respect to soil vapour intrusion;
- concentrations of arsenic, cadmium ,chromium, copper, lead, mercury, nickel and zinc detected in soils on site are not considered to present an unacceptable ecological exposure risk, with respect to phytotoxicity;
- acid sulfate soils are not likely to be present on the site; and

EXECUTIVE SUMMARY

- The historically assessed contamination status of the Gate 4 High Street land and Gate 2 Venue (off High Street) is not considered to have an adverse material impact on the contamination status of the site.

Based on these conclusions, the site is considered suitable (from a contamination perspective) for the proposed Material Science Building which comprises a multi-storey building (including a single storey basement) that will be used for educational purposes including classrooms and laboratories.

Groundwater has not been assessed for any beneficial use. Any future groundwater abstraction from the site would require investigation of the groundwater resource and approval from NSW office of Water.

This report must be read in conjunction with the attached Important Information About Your Coffey Environmental Report.

1 INTRODUCTION

1.1 Background

Coffey Environments Australia Pty Ltd (Coffey) was commissioned by Capital Insight Pty Ltd on behalf of the University of New South Wales (UNSW) to undertake supplementary environmental assessment works for the proposed Materials Sciences Building (MSB) on Union Road in the Kensington Campus (the site). This supplementary environmental assessment work has been undertaken in general accordance with Coffey's fee proposal dated 4 February 2013 (ref: ENAURHOD04414AB-P01a).

UNSW has lodged a development application (DA) to redevelop the Union Road car park for the proposed MSB development. The MSB development is proposed to include a multi-storey building (including a single storey basement) which will be used for educational purposes including classrooms, laboratories and associated service areas.

As part of this DA, UNSW are seeking to relocate an existing groundwater abstraction pump and water treatment facilities into the basement of the proposed MSB development. This plant will treat groundwater abstracted from existing bores located within UNSW's Kensington campus under an existing license issued by the NSW Office of Water. Bore water from this existing source will be the primary supply of non-potable cold water for sanitary flushing and mechanical plant. Treated bore water from this existing source will supply all laboratories within the new building. Coffey understand that UNSW are not seeking to establish groundwater bores within the application site, nor will groundwater from the site be used within the proposed MSB building.

The existing building E9 will be demolished as part of the redevelopment works. A selection of drawings which outline the proposed development is provided in Appendix K of this report.

In response to the DA, Coffey understands that Randwick City Council (RCC) has requested further information on the following matters:

- an opinion of the site's suitability for the proposed use with respect to land contamination; and
- acid sulfate soils.

1.2 Objectives

The objectives of these works were to:

- review available reports relating to the site and provide an opinion on whether the site is suitable for the proposed use.
- assess the potential of whether acid sulphate soils may be present at the site.

1.3 Scope of Works

Coffey undertook the following scope of works to address the project objective:

- project planning and management;
- supplementary desktop review;
- site walkover; and
- data assessment and reporting.

2 SITE LOCATION & SETTING

2.1 Site Location

The site is located on Union Road in the north western portion of the UNSW's Kensington campus, Sydney NSW as shown in Figure 1. The site falls within Lot 3, DP1104617. The layout of the site is presented in Figure 2.

2.2 Surrounding Land Uses

The site is bound by Union Road to the south and College Road to the north. Unnamed vehicle access roads also bound the site to the east and west.

The site is situated within the UNSW Kensington campus and as such land uses surrounding the site relate to activities undertaken various university faculties. The university buildings surrounding the site comprise the following:

- The Chemical Sciences Laboratory (Building F10) directly to the south of the site, beyond Union Road.
- The Material Sciences Building (Building E8) located to the west of the site, beyond which lies the Roundhouse (Building E6). The Law Building (Building F8) is established to the south/southeast of the site.
- The Australian School of Business (Building E12) is located to the east of the site.
- Buildings D9 and D10 lie to the north of the site and are currently used as studios.
- Figure 2 shows the Petroleum Engineering faculty (Buildings D12, D11c, D11b, D10c) is located to the northeast of the site according to available web-based aerial photography however during the site walkover, Coffey note that Building D12 has been recently demolished and transformed into the Alumni Lawn.

A selection of site photographs is provided in Appendix A.

2.3 Geology

The Sydney Geological Map (Sheet 9130; scale 1:100,000) indicates that the site is underlain by medium to fine grained sand overlying Hawkesbury Sandstone. Discontinuous bands of iron-indurated sand, known as "Waterloo Rock" occur within the Dune Sands throughout the Botany Basin area. These bands may vary from a few millimetres to up to 3m in thickness.

2.4 Soils

The Soil Landscapes of the Sydney 1:100 000 sheet indicates that the site is within the Tuggerah Soil landscapes group. This landscape group typically consists of gently undulating to rolling coastal dune fields. Slope gradients are generally less than 10% but can be up to 35%. This soil landscape group can be susceptible to extreme wind erosion hazard and other limitations of non-cohesive, highly permeable soil with a very low fertility, localised flooding and permanently high water tables.

2.5 Hydrogeology

A search of groundwater bore licences was undertaken using the NSW Natural Resources Atlas (NSW-NRA, http://nratlas.nsw.gov.au) on 20 February 2013.

Approximately 80 registered groundwater bores are located within a 500m radius of the site, with the majority of the registered bores being located to the west. A review of the groundwater bore data indicated that these bores are authorised for use for industrial, recreation, irrigation and domestic purposes, with groundwater generally present at depths between 5m and 10m below ground surface.

Groundwater flow on the site was reported in Coffey (2010) as likely to be in a westerly/southwesterly direction towards Alexandra Canal and/or Eastlakes.

2.6 Hydrology

There were no surface water courses identified within or immediately surrounding the site. The nearest water courses to the site are the Eastlakes (Eastlakes Golf Course) located approximately 1km southwest of the site and Kensington Ponds (Centennial Park) located approximately 1km to the north of the site. Alexandria Canal is located approximately 3.5km west of the site.

2.7 Topography

The topography of the site is generally flat with a slight slope to the west of the site. The elevation of the site from published web based sources (Google Earth) is 37m above sea level.

2.8 Acid Sulfate Soils

With reference to the Acid Sulfate Soil Risk Map available in the Australian Soil Resource Information System (Land and Water Conservation Acid Sulphate Soil Risk Map: 1:25000 2nd Ed. Botany Bay 1997), the site location has no known ASS occurrence

3 SITE WALKOVER

A site walkover was undertaken on 8 February 2013 by a suitably experienced Coffey environmental scientist (Keri Hartog). The observations made during the site walkover are presented in Sections 3.1 to 3.11.

3.1 Site Features

The site comprises a car park which is accessed via Union Road. The site is rectangular in shape and covers an area of approximately 3000m^2.

The site comprises an asphalt car park with soft landscaped verges. A number of mature trees were also noted within landscaped verges. No significant staining obvious sources of potential contamination were noted on any of the accessible areas of the asphalt during the walkover survey.

During the walkover, the eastern part of the site was occupied by construction works to install below ground services.

The north-western part of the site is occupied by Building E9. It is understood this building is used as a dance studio. Access to this building was not available during the walkover.

During the walkover, the eastern and southern boundaries of the site were separated from the remainder of the car park due to construction works to install below ground infrastructure.

3.2 Spills and Losses

At the time of site walkover there was no visual or olfactory evidence of spills or losses.

3.3 UST / AST

The area at the eastern end of building E9 is a former cylinder storage area. There were no cylinders in the area at the time of walkover, however the cylinder cage and signage remain. The base of the cylinder store appeared to comprise timber raised slightly above a concrete slab which also covers the area directly to the east and south of the cylinder store. The concrete slab is approximately 10 metres by 10 metres in size. The cylinder store is approximately 3 metres by 3 metres wide and approximately 3 metres tall.

3.4 Wastes

There was no evidence of waste being generated or stored at the. At the time of walkover the site was currently under construction and small stockpiles of sand, gravel and asphalt that had been removed from the site surface were evident.

3.5 Staining / Odours

There was no visual or olfactory evidence of staining or odours at the time of walkover.

3.6 Phytotoxicity

At the time of site walkover, trees and vegetation on site was observed to be in healthy condition and did not show signs of phytotoxic impact (stress or dieback).

3.7 Asbestos

There was no visual evidence of potential asbestos containing materials (ACM) observed on the site.

It is noted that this report does not constitute a hazardous materials audit of the site.

3.8 Fill Material

The use of fill material within the construction drainage works which were ongoing at the time of walkover was evident. There was no evidence of any stockpile material onsite at the time of walkover.

3.9 Site Drainage

The topography of the site is generally level. It is expected that the surface waters on sealed areas of the site would flow towards surface drainage pits, kerbside gutters and sub surface drainage systems.

3.10 Complaints

There was no documented register of complaints available for the site.

3.11 Anecdotal Evidence

No anecdotal evidence regarding historical land use on the site was provided.

4 SITE HISTORY

4.1 Aerial Photographs

A selection of aerial photographs were reviewed to assess the historical features of the site (refer Appendix I). The findings of the aerial photograph review are presented below in Table 4.1.

Table 4.1: Aerial Photograph Summary

Year	Comment
1930	The aerial photograph shows the site formed part of a horse race track, The surrounding area also forms part of the race track complex. Randwick Racecourse is present to the north. Anzac Parade is located to the west of the site, beyond which lies residential areas of Kingsford. Land use to the south and east of the site also appears to predominantly comprise residential.
1942	No significant changes are noted with regards to the site features or surrounding land uses.
1951	The aerial photograph shows the presence of ground disturbance in parts of the former race track However due to the low resolution of the aerial photograph it is difficult to determine the exact nature of the activity onsite. No other changes are noted in relation to surrounding land uses. It is noted that this aerial photograph does no show areas to the south and east of the site.
1961	This aerial photograph shows the site appears to remain undeveloped although the land immediately surrounding the site to the north, east and west has been developed. The form of several buildings is indicative of those currently present within the UNSW campus (e.g. Roundhouse Building to the west). Land uses surrounding the site appear unchanged although it is noted that this aerial photograph does no show areas to the south and east of the site.
1978	No significant changes are noted with regards to the site features or surrounding land uses.
1986	The aerial photograph clearly shows the site as a car parking area. Vegetation appears to be present within islands segregating parts of the car park. No significant changes are noted with regards to surrounding land uses.
1994	No significant changes are noted with regards to the site features or surrounding land uses.

Year	Comment
2000	No significant changes are noted with regards to the site or features or surrounding land uses.
Google Earth Imagery 2009	A rectangular building has been established along the southern part of the site and appears to be related to the construction of the new Law Buillding (Building F8). The remainder of the site appears to remain a car park. This building remains on site until circa 2009 following the completion of Building F8. No other significant changes are noted with regards to land uses immediately surrounding the site.

4.2 Title Search

Land title ownership records for the site were reviewed and are presented in Appendix D. A summary of the records is presented in Table 4.2.

Table 4.2: Summary of Title Ownership

Period	Identifier and Proprietor
Pre-1940	Crown Land
1940 – 1964	Minister for Education Commissioner for Railways and Tramways (Portion 1487 between 1940 & 1952 only)
1964 - present87 between 1940 & 1952wo separate lots ds to land uses immediately surrounding the site. elated to the construction op	University of New South Wales

It is noted that available land ownership records for the site are not available prior to 1940.

4.3 WorkCover Authority of NSW

Dangerous goods records supplied by WorkCover NSW are summarised in Table 4.3.

Table 4.3: Summary of Licensed Dangerous Goods

Licensed Dangerous Goods	Location
1 x 100L Acetylene (dissolved) cylinder 1 x 150L Hydrogen (compressed) cylinder 1 x 150L Methane (compressed) cylinder 1 x 250L Air (compressed) cylinder 1 x 400L Argon (compressed) cylinder 1 x 600L Nitrogen (compressed) cylinder 1 x 300L Oxygen (compressed) cylinder 1 x 50L Carbon monoxide (compressed) cylinder)	Cylinder store located on site immediately east of Building E9. It is noted that these dangerous good were not observed on site during the site walkover undertaken by Coffey in February 2013.
1 x 3,000L Above Ground Storage Tank (AST) used for Nitrogen Refrigerated Liquid	Chemical Sciences Laboratory (Building F10) located to the south of the site

A copy of the records provided by WorkCover NSW is provided in Appendix B.

4.4 Section 149 Planning Certificate

The Section 149 planning certificate obtained from Randwick City Council (RCC) is attached as Appendix C.

In summary, the Section 149 certificates indicate the above is zoned for Special Uses (Zone No. 5) (Randwick Local Environmental Plan 1998) which aims to accommodate development by public authorities on publicly owned land, and allows the development educational, religious public transport uses. It is noted that the site is Zoned SP2 Infrastructure in the draft Randwick Local Environmental Plan 2012 that will come into force imminently.

The land is located in a heritage conservation area under the Randwick LEP 1998.

The land is not proclaimed to be an area potentially affected by mine subsidence.

The land is affected by a Randwick Council Contaminated Lands policy. The policy restricts the development of land which has been affected by, used for certain purposes or whereby there is insufficient information regarding contamination status. However, the land:

- is not significantly contaminated within the meaning of the Contaminated Land Management Act (CLM) Act 1997 .
- is not the subject a management order or the subject of a voluntary management proposal under the CLM Act 1997.
- is subject to an on-going maintenance order and council has received a copy of a Site Audit Statement within the meaning of the CLM Act 1997.

Further enquires were lodged with RCC and the and UNSW's Facilities and Planning Department to obtain further information regarding the on-going maintenance order and site audit statement referred to

above. From these enquiries, Coffey were provided with two site audit statements and supporting documents relating to specific parts of Lot 3 DP1104617.

The land to which these site audit statements apply are located approximately 50m north of the site. Figure 3 illustrates the land to which these site audit statements apply relative to the study site. A summary of the Site Audit Statements and associated documentation is provided in 5.4 and 5.5.

4.5 NSW Environment Protection Authority

4.5.1 Protection of the Environment Operations (POEO) Act Public Register

Coffey conducted a search of the NSW Environmental Protection Authority (EPA) online Protection of the Environment Operations (POEO) Act public register on the 20 February 2013 and noted the following:

- No Clean-up Notices have been issued in relation to the site or land immediately surrounding the site under s.91 or s.92 of the POEO Act (1997).
- Two licenses under the POEO Act for properties in Kensington. These relate to:
  - (i) Leighton Contractors Pty Ltd for road construction between the Cahill Expressway and Kensington Link (surrendered in 2000).
  - (ii) Denwill Pty Ltd, 91 Anzac Parade Kensington approximately 600m northeast of site relating to hazardous waste from a medical diagnostic practice, issued in 2001 and varied for a change of name in 2004. This licence is current.

A record of this search is presented in Appendix F.

4.5.2 Contaminated Land Public Register

Coffey conducted a search of the NSW EPA Contaminated Lands Register on 20 February 2013, which returned 25 notices on 5 sites within the Randwick LGA. The following presents a summary of this search, in relation to the site:

- There are no management or maintenance notices within the CLM register relating to the site.
- The 7-Eleven service station on 128 Barker Street Randwick are still current, which is approximately 750m from site, has been Declared a Remediation Site by the EPA. A Voluntary Management Proposal is in place to manage this contamination.
- The nearest site where there is an active maintenance order within the CLM register is located approximately 5km south, at 133-149 Beauchamp Road, which relates to the former Golden Fleece Terminal No. 1 in Matraville.
- The remainder of the notices are no longer current or relate to sites which are greater than 5km from the site.

A record of this search is presented in Appendix E.

4.5.3 Section 60 Site Notification

Coffey conducted a search of the NSW EPA online list of sites notified to the NSW EPA under Section 60 of the NSW Contaminated Land Management Act 1997. The search found no records for the site. A record of this search is presented in Appendix E.

5 PREVIOUS CONTAMINATION ASSESSMENT REPORTS

5.1 Overview

Contamination assessments previously carried out on the site and surrounding land which have been reviewed as part of this assessment include:

- Coffey Geotechnics (2010), 'Geotechnical and Environmental Report, proposed MSB Building, University of New South Wales', dated 11 October 2011, ref: GEOTLCOV24080AC-AB
- Coffey Environments (2012), Assessment of Waste Classification, UNSW Material Sciences Building, Kensington Campus', dated 1 November 2012, ref: ENAURHOD04414AA-R01
- CH2M Hill (2008), 'Site Audit Report Proposed Student Accommodation UNSW, Gate 4 High Street', dated 28 April 2008, ref: 371073/0301-0803
- WSP (2011), 'Site Audit Report - Gate 2 Avenue (off High Street), University of New South Wales Kensington Campus, NSW', dated 12 December 2011, ref: KJL047

A summary of these reports is presented in Sections 5.2 to 5.5.

5.2 Coffey Geotechnics (2010); Geotechnical and Environmental Report, proposed MSB Building, University of New South Wales

The objective of this work (from a soil contamination perspective) was to undertake a preliminary contamination assessment of the site and provide preliminary advice on the likely waste classification of soils on the site.

Coffey Geotechincs (2010) reported that:

- intrusive investigations recorded materials comprising gravelly sand overlying sand deposits. Fill materials were reported to comprise variable thicknesses between 0.4 and >1.5m. With the exception of concrete slab of >1.5m thick encountered in BH MSB-1, no other anthropogenic inclusions or olfactory/visual indications of contaminated were noted;
- soil headspace screening reported concentrations between <0.1ppm and 12.6ppm which suggests that low concentrations of ionisable volatile organic compounds were present in the soil samples collected from the site;
- samples analytical results reported concentrations of TPH, BTEX, OCP and PCB less than the laboratory limit of reporting (LOR);
- samples tested reported concentrations of heavy metals and PAHs less than the adopted assessment criteria[1];

[1] The assessment criteria adopted were those for a high rise residential development scenario, which were considered a more sensitive land use relative to educational land uses currently proposed.

- the concentrations of contaminants of potential concern (COPC) within the subsurface were less than the human health-based and ecological assessment criteria adopted for the assessment;
- soil sample analytical results indicated a likely waste classification of “General Solid Waste”, however, the benzo(a)pyrene analytical result for one sample from BH MSB4/1.0-1.1 indicated the potential for a classification of “Restricted Solid Waste”.
- given the limited scope of the investigation, Coffey recommended additional assessment of the subsurface to further characterise the fill materials with respect to land suitability for the proposed development and waste classification.

A copy of this report is presented in Appendix J.

5.3 Coffey Environments (2012); Assessment of Waste Classification, UNSW Material Sciences Building, Kensington Campus

The objective of this work was to make an assessment of the waste classification of soils within the MSB development footprint.

Based on observations, available analytical data and the NSW DECC (2009) six step waste classification procedures, Coffey considered that:

- the assessed asphalt material would classify as general solid waste (non putrescible) for the purpose of offsite disposal
- the assessed concrete material would classify as general solid waste (non putrescible) for the purpose of offsite disposal
- the assessed fill material comprised of a mix of gravelly sand, gravelly sandy silt and sand, with some topsoil, would classify as General Solid Waste (non putrescible), for the purpose of off-site disposal.
- the assessed natural sand material underlying the fill material would classify as virgin excavated natural material (VENM), provided the natural sand is not mixed with fill materials, wastes or any other materials that display evidence of contamination (e.g. anthropogenic material, staining, discolouration or odours).

Coffey recommended that if material being excavated is observed to be different from that described in the assessment and/or showed evidence of potential contamination (e.g. staining, odours, discolouration, buried wastes), the material should be further assessed by a suitably qualified environmental consultant.

A copy of this report is presented in Appendix J.

5.4 CH2M Hill (2008); Site Audit Report Proposed Student Accommodation UNSW, Gate 4 High Street

The specific requirement of this Site Audit forms a condition of a Development Application (DA) determined by the NSW Department of Planning Major Project Application MP 07_0071 – UNSW Student Housing dated 25 January 2008.

The objective of the Site Audit was to independently review the investigation, remediation and validation works undertaken for land bound by High Street to the north, Gate 2 Ave to the west, Third Ave to the South and Gate 4 Ave to the west (refer Figure 3), and to determine whether this land was suitable for

the proposed student accommodation land use (considered to be residential with minimal access to soil).

Investigations carried out by the contaminated land consultants identified localised areas of soil contamination above the adopted health-based investigation levels, specifically relating to asbestos.

Slightly elevated concentrations of TPH C_6-C_9, mercury and zinc were also reported locally within the underlying groundwater. On review of the groundwater dataset available for the site, the Site Auditor indicated it is considered that the TPH C_6-C_9 contamination identified in one sample was not representative of groundwater quality at the site. The Site Auditor indicated that slightly elevated concentrations of mercury do not appear to be sourced from this land, and it is not considered to be significantly impacting this land. The Site Auditor indicated that the slightly elevated concentrations of zinc were within typical background concentrations for Sydney and it is not considered to be significantly impacting this land.

The site audit report also reviewed records relating to the removal of radioactive Cobalt (^{60}Co). Following his review of information provided by the contaminated land consultants, the Site Auditor indicated radiation contamination associated with ^{60}Co (i.e. above background levels) is no longer an issue of concern for this site.

The site audit statement indicated the following remedial works were carried out at the site:

- Further assessment of the Site to verify the nature and extent of asbestos contamination by an Occupational Hygienist, including inspections, sampling and laboratory analysis;
- Removal of identified asbestos contaminated materials (or materials not cleared of asbestos) by an appropriately licensed contractor to a landfill licensed by DECC to accept the asbestos contaminated waste;
- Following removal of the asbestos fragments/asbestos contaminated filling, conducting validation inspections and sampling and analysis by the Occupational Hygienist and the environmental consultant;
- Further ‘chase out’ and off-site disposal of asbestos contaminated materials, and
- Validation sampling as and when necessary.

Following review of the remediation validation records, the Site Auditor concluded that the site is considered suitable for the proposed student accommodation land use (considered to be residential with minimal access to soil). The Site Auditor also refers to an Asbestos Management Plan (AMP) to manage the potential for undiscovered fragments of fibre cement sheet containing asbestos. The Site Auditor concluded that an AMP was not considered necessary for the on-going management of this land.

A copy of the site audit statement relating to this land is provided in Appendix L.

It is noted that the above is a summary of the information contained within the Site Audit Report. Coffey was not provided copies of the reports prepared by the contaminated land consultants assessing this land.

5.5 WSP (2011); Site Audit Report - Gate 2 Avenue (off High Street), University of New South Wales Kensington Campus, NSW

This site audit was conducted to provide an independent review of the suitability and appropriateness of environmental investigation and remediation works completed within land bound by High Street to the north, International Road to the west, Gate 2 Ave to the east, Gate Ave to the South and Gate 4 Ave to the west (refer Figure 3).

Investigations carried out by the contaminated land consultants identified localised areas of soil contamination above the adopted health-based investigation levels, specifically relating to TPH C_{10}-C_{36}, aldrin & deildrin, polychlorinated biphenyls (PCB) and asbestos. Samples of groundwater reported slightly elevated concentrations of copper, zinc and TPH C_6-C_9. Both copper and zinc were deemed by the Site Auditor to be indicative of background concentrations. The Site Auditor noted that as there are no high reliability guideline criteria for TPH C_6-C_9 in groundwater in Australia, and no impact associated with BTEX compounds, the slightly elevated concentrations of TPH C_6-C_9 were not considered significant to warrant further consideration.

The following remediation works were carried out:

- Excavation of shallow fill material impacted by PCB and asbestos.
- Removal of a 5000L capacity underground storage tank (UST)
- Cap and contain fill materials impacted by TPH, OCP (i.e. aldrin and deildrin) and asbestos.

Following review of the validation report relating to the remediation works summarised above, the Site Auditor concluded that:

- ‘there is no potential for offsite migration of contamination’
- ‘There is a requirement for on-going management of residual minor areas of petroleum hydrocarbon contamination (TPH C_{10}-C_{36}), OCP, benzo(a)pyrene, and potential asbestos impacts.’
- The site is suitable for high density residential uses with minimal accessible soils.

The Auditor noted that the ‘Environmental Management Plan – Gate 2 Student Accomodation Project, UNSW Kensington Campus off High Street, Kensington, NSW’ (JBS; Nov 2011; Ref: JBS41773-18543; Rev. 2) is considered suitable to manage the residual contamination identified within this land.

Based on a subsequent conversation with Mr Danny Nelan, Environmental Health Officer with RCC, on the 12th March, Coffey understands that the maintenance order referenced within the Section 149 Planning Certificate is likely to relate to the JBS Environmental Management Plan. Mr Nelan confirmed that the NSW EPA had not issued a maintenance order (within the meaning of the Contaminated Land Management Act 1997) in relation to the UNSW’s campus in Kensington.

A copy of the site audit statement relating to this land is provided in Appendix L.

6 INTEGRITY ASSESSMENT OF HISTORICAL DATA

The following sources of historical data were referred to for this assessment:

- NSW EPA;
- NSW WorkCover Authority;
- NSW Natural Resources Atlas;
- Randwick City Council
- Land and Property Information Division, Department of Finance and Services; and
- Observations made in the field during the site walkover.
- Previous reports relating to the site and land surrounding the site as noted in Section 5.

The observations made during the site walkover were generally consistent with the documented records provided by third parties.

The Site Audit Statement prepared by CH2M Hill was provided to Coffey with the supporting reports prepared by the contaminated land consultants who were appointed to assess ground contamination conditions on land to the north of the site. Coffey does not believe this to be a significant data gap.

The Section 149 Planning Certificate for the site identified that land within the UNSW's Kensington campus is subject to an on-going maintenance order. Coffey has undertaken a review of the EPA's contaminated land record which indicates that there is no maintenance order relating to the site. Subsequent conversations with RCC's Environmental Health Officer also confirm that the EPA had not issued a maintenance order in relation to the UNSW's campus in Kensington.

Coffey notes that the Site Audit Statement relating to land located at the corner of Gate 2 Ave and High Street requires an Environmental Management Plan to manage residual soil contamination on this land. Notwithstanding this, the Site Auditor concluded that residual soil contamination within this land has 'no potential for off-site migration'. Subsequent conversations with RCC's Environmental Health Officer implied that reference to an on-going maintenance order most likely relates to the Environmental Management Plan in place for this site.

In summary, the data reviewed is considered to be generally accurate, representative and usable for the purposes of interpretation within the context and objective of this assessment.

7 AREAS OF ENVIRONMENTAL CONCERN AND CHEMICALS OF CONCERN

Review of available historical data and observations made during the site walkover indicate a number of areas of environmental concern (AEC) and contaminants of potential concern (COPC), specific to the context and objective of this assessment. These AEC and COPC are presented in Table 6.1.

Table 6.1: Potential Areas of Concern and Chemicals of Concern

AEC	Potential Areas of Concern	Chemical of Potential Concern (COPC)	Likelihood
AEC1	Uncontrolled fill material across the site	TPH, BTEX, PAH, OCP, Metals, Asbestos	Medium