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SPECIALISTS IN ENVIRONMENTAL, SOCIAL AND SAFETY PERFORMANCE

UNEXPECTED FINDS PROTOCOL FOR CONSTRUCTION
BLACKTOWN HOSPITAL REDEVELOPMENT
BLACKTOWN ROAD, BLACKTOWN NSW

Prepared for:

Health Infrastructure
NSW Health
Level 8, 77 Pacific Highway
NORTH SYDNEY NSW 2060

Report Date: 4 June 2012
Project Ref: ENAURHOD04072AB

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ENAURHOD04072AB-R01

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4 June 2012

Health Infrastructure
NSW Health
Level 8, 77 Pacific Highway
NORTH SYDNEY NSW 2060

Attention: Mr Andrew Paris

Dear Andrew

RE: Unexpected Finds Protocol for Construction, Blacktown Hospital, NSW

Coffey Environments Australia Pty Ltd is pleased to provide this Unexpected Finds Protocol (UFP) for the proposed construction works at Blacktown Hospital, Blacktown, NSW

Please do not hesitate to contact the undersigned should you have any questions.

For and on behalf of Coffey Environments Australia Pty Ltd

Craig Cowper
Senior Associate

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Important Information About Your Coffey Environmental Report

ABBREVIATIONS

AHD	Australian Height Datum
MSCP	Multi Storey Car Park
NSW EPA	Environment Protection Authority of New South Wales
TCLP	Toxicity Characteristic Leachate Procedure
UFP	Unexpected Finds Protocol
UST	Underground Storage Tank
VENM	Virgin Excavated Natural Material

1 INTRODUCTION

Coffey Environments Australia Pty Ltd (Coffey) was commissioned by Health Infrastructure, NSW Health (Health Infrastructure) to prepare an unexpected finds protocol (UFP) for construction associated with proposed redevelopment works at Blacktown Hospital, Blacktown Road, Blacktown (the site).

This report was commissioned by Mr Tony Kiernan of Appian Group on behalf of Health Infrastructure, in response to Coffey's proposal dated 17 May 2012 (ref: ENAURHOD04072AB-P01).

1.1 Objective

This document provides protocols to be implemented during the hospital redevelopment construction works, should an unexpected find of contamination (or potential contamination) be encountered.

The objective of the protocols is to manage potential unexpected finds of contamination and manage potential risks posed by the find to human health or the environment.

1.2 Site Identification

The site is the location of the proposed development at Blacktown Hospital, located to the south of the existing Blacktown District Hospital Main Building. The redevelopment comprises civil infrastructure works, multi storey car park (MSCP), new mental health unit and new inpatients clinical building.

1.3 Timeframe of the UFP

This UFP will come into effect prior to any construction works commencing on the site. It is understood that construction works are scheduled to commence in October 2012. This UFP, and any subsequent revision, will continue to apply until:

- the site proposed for construction works has been assessed by an experienced environmental consultant, to a degree that mitigates the need for an unexpected finds protocol; or
- all construction works have been completed.

2 BACKGROUND

Contamination assessment reports were previously undertaken for the site, including:

- Coffey Environments 2010, 'Stage 1 Preliminary Site Contamination Assessment, proposed Development Zone, Masterplan Option 03 Blacktown Hospital, Blacktown NSW' dated 2 December 2010, ref: ENAURHOD04072AA-R01.
- Coffey Environments 2012, 'Summary Advice on Recommendations for Further Contamination Assessment and Management Works, Blacktown Hospital and Mt Druitt Hospital' dated 14 May 2012, ref: GEOTLCOV24508AA-AD.
- Coffey Geotechnics 2011, 'Geotechnical Investigation and Preliminary Contamination Assessment Proposed Additions to Blacktown Hospital, Blacktown NSW', dated 10 May 2011, ref: GEOTLCOV24207AB-AB.

In summary the contamintion assessment reports identified the following:

- there was considered to be a low to medium likelihood of contamination being present on the portions of the site where the proposed development zones are located in Masterplan Option 3 (Woods Bagot, 2010), from past and present activities.
- the main issues that could potentially affect proposed development zones were assessed to include:
    - potential uncontrolled fill material (used for levelling);
    - the previous hospital footprint (potential presence of demolition wastes); and
    - the potential presence of a 20,000L UST.
- concentrations of chemical contaminants at the investigation locations were less than the adopted health based assessment criteria and no asbestos fibres were detected.
- there was no visual or olfactory indication at the borehole locations to suggest contamination conditions that may present significant limitations to the proposed hospital development.

It is generally considerered that the risks posed by potential contamination at the site that may remain unidentified (if any) (including the potential presnece of a UST) could be managed during construction with an unexpected finds protocol.

3 ROLES AND RESPONSIBILITIES

General roles and responsibilities associated with this UFP are:

Role	Responsibilities

Site Owner (Health Infrastructure, NSW Health)
Mr Andrew Paris
T: 02 9978 5432
E: andrew.paris@hinfra.health.nsw.gov.au
	• Ensure that the Project Manager is:
	  • fully aware of this UFP;
	  • able to implement the contingency procedures contained within this UFP, in the event that unexpected contamination is encountered during the proposed bypass works;
	• Appoint an appropriately qualified and experienced Project Manager to manage implementation of the UFP;
	• Ensuring that the UFP is implemented at the site by the Project Manager during construction works

Mr Project Manager (Appian Group)
Tony Kiernan
T: 8251 0050
E: tony.kiernan@appiangroup.com.au
	• Ensure that the Contractor is:
	  • fully aware of this UFP;
	  • able to implement the contingency procedures contained within this UFP, in the event that unexpected contamination is encountered during construction;
	• Appoint appropriately qualified and experienced Contractors and Consultants to implement the UFP and undertake reviews of the UFP;
	• Ensuring that the UFP is implemented at the site during construction works

Contractor (to be advised)	• Liaise with the Site Owner and Project Manager; • Ensure all relevant personnel undertaking works on the site are inducted into the requirements of this UFP; • Comply with and implement control measures as per the UFP; • Respond to and manage unexpected find incidents; • Report regularly to the Project Manager on performance against the UFP;
Environmental Consultant (to be advised)	• Induct relevant personnel into this UFP (as requested

	by the Site Owner or Project Manager); • Provide advice through the Site Owner or Project Manager to personnel working on the site or personnel with responsibility to implement the UFP (as requested); • Respond to unexpected finds of contamination and provide advice in relation to further assessment, remediation, validation and/or management of the find on a case by case basis (as requested); • Implement recommendations for further assessment, remediation, validation and/or management of any finds (as required); • Periodical review that the UFP is being appropriately implemented and review of the effectiveness of the UFP (first review scheduled for November 2012) • Revise the UFP based on the above review or after finds of contamination (if any) (if requested by the Site Owner or Project Manager;

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4 IDENTIFICATION OF UNEXPECTED FINDS

4.1 Expected Conditions

4.1.1 Regional Geology and Soils

The 1:250,000 Sydney Geological Series Sheet (Geological Survey of New South Wales, 3rd ed.1966) indicates that the site locality is underlain by Triassic age shale with some sandstone beds of the Wianamatta Group.

The Soil Conservation Service of NSW (1989) *Penrith Soil Landscape Series Sheet 9030* indicates that the site is located on the Blacktown Group soils.

The Blacktown soil groups are described as shallow to moderately deep (<100cm) *Red and Brown Podzolic Soils (Dr3.21, Dr3.11, Db2.11)* on crests, upper slopes and well drained areas; deep (150-300cm) *Yellow Podzolic Soils and Soloths (Dy2.11, Dy3.11)* on lower slopes and in areas of poor drainage. The limitations associated with this soil landscape are moderately reactive highly plastic subsoil, low soil fertility and poor soil drainage.

4.1.2 Regional Hydrogeology

Coffey Environments (2010) noted that:

- groundwater depth at the site may be between 3 and 11m below ground surface
- groundwater at the site may be brackish
- groundwater yield on the site may be between 0.15 and 0.3L per second.

4.1.3 Conditions Encountered During Previous Assessments

Based on the findings of Coffey Environments (2010) and Coffey Geotechnics (2011), the expected geology would include:

- fill consisting of topsoil/clay sand, gravel and clay
- clays, medium and high plasticity, firm to hard, pale grey to reddish brown, with ironstone gravels
- shale with interbedded sandstone, pale to dark grey and reddish brown, extremely to moderately to slightly weathered, very low to medium to high strength.

4.2 Unexpected Finds

Unexpected finds of potential contamination on site may be identified by visual (appearance or staining) and/or olfactory (odour) evidence during earthworks.

Based on the contamination assessments referred to in Section 2 potential ‘unexpected finds’ which could reasonably be possible within the site are described as follows. However, based on their very nature, it is not practical to cover all types of possible unexpected finds. It is possible that indications of contamination not specifically covered by the UFP may be encountered. In such cases it is assumed that “if in doubt” about a potential find, the precautionary principal will be employed and the unexpected

finds procedure documented in the following section will be duly activated. Potential unexpected finds may include:

- ground conditions encountered that differ from the expected conditions described in Section 4.1;
- fill materials or soils that exhibit indicators of potential contamination (such as odour, staining, and associated infrastructure, anthropogenic inclusions including building rubble or ash)
- groundwater that exhibits a hydrocarbon (or oily) sheen or odour.
- buried infrastructure such as underground storage tanks and associated pipe work.
- buried or surface asbestos containing materials (such as fibrous cement sheet fragments) and/or buried asbestos conduits/pipes:
    - it is often difficult to identify the presence of asbestos by sight. The only way to be certain is to have a sample of the material analysed by a laboratory. Cement bound asbestos may be present in building waste or conduits/pipes. Friable forms of asbestos including lagging and insulation may be evidenced by fibrous material which flakes and powders easily. Textured coatings and floor tiles may also contain asbestos;
- other, including (but not limited to):
    - solvent odour;
    - acetone odour;
    - alcohol odour;
    - sulphur (rotten egg) odour;
    - acidic (acetic/formic/citric) odour;
    - ammonia odour;
    - caustic odour; and
    - other

5 UNEXPECTED FINDS PROCEDURE

5.1 Training and Induction of Personnel

All excavation / construction personnel working on the site will be inducted on the identification of potential unexpected finds of contamination. The induction will be undertaken at the time of the general site induction, with additional information provided during the works via toolbox meetings.

Excavation / construction personnel working on the site will have general competencies to identify unexpected finds of contamination in the field and that these competencies will be used in good faith during earthworks.

It is not possible, nor practical, to provide awareness induction to cover all types of potential unexpected finds. It is possible that indications of contamination not specifically covered by the induction may be encountered. In such cases, the precautionary principle of “if in doubt” will apply and the unexpected finds protocol will be implemented.

It is noted that some forms of potential contamination may not be associated with any visual or olfactory indicators in the field. The unexpected finds protocol will not provide protection against such finds.

5.2 Procedure in the Event of an Unexpected Find

Should unexpected finds of contamination or potential contamination be found onsite, the following protocols will be adopted:

1. Stop work in the potentially hazardous area as soon as it is safe to do so and move to a designated meeting point.
2. Assess the potential risk to human health posed by the unexpected find and assess if evacuation or emergency services need to be contacted.
3. Delineate an exclusion/quarantine zone around the affected area using fencing and/or appropriate barriers and signage
4. Contact a suitably experienced Environmental Consultant for advice and request a site visit to undertake an assessment of the unexpected find
5. The Environmental Consultant will assess the unexpected find and provide advice on:
    - the preliminary assessment of the contamination and need for immediate management controls (if any);
    - what further assessment and/or remediation works may be required and how such works should be undertaken;
    - requirements for a remedial action plan (if necessary) and associated validation works.
6. Works are not to recommence in the area affected by the unexpected find until appropriate advice has been obtained from the Environmental Consultant and the find has been managed/remediated.
7. The Environmental Consultant will validate the management/remediation of the find and provide advice on recommencing works in the affected area.

Guidance documentation that may be referred to by the Environmental Consultant in assessing, remediating and validating unexpected finds would include:

- NEPC 1999, 'National Environment Protection (Assessment of Site Contamination) Measure, Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater'.
- NSW DEC 2006, “Contaminated Sites: Guidelines for the NSW Site Auditor Scheme (2nd edition)’.
- NSW DEC 2007, 'Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination'.
- NSW DECC 2009, 'Waste Classification Guidelines Part 1: Classifying Waste'.
- NSW DUAP 1998, 'Managing Land Contamination: Planning Guidelines SEPP55 - Remediation of Land'.
- NSW EPA 1994, 'Contaminated Sites: Guidelines for Assessing Service Station Sites'.
- NSW EPA 1995, 'Contaminated Sites: Sampling Design Guidelines'.
- WA DOH 2009, 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia'.

6 REVIEW AND REPORTING

6.1 Review

This UFP will be reviewed during its implementation, to confirm that the requirements of the UFP are understood and being implemented and to assess its on-going suitability. A suitably experienced Environmental Consultant will be engaged to undertake the review after one (1) month of implementing this UFP (that is November 2013).

The review shall include a site walkover, an assessment of UFP induction records prepared under this UFP, and an assessment of unexpected find reports (if available) prepared under this UFP. Should the review identify inconsistencies, these shall be documented in a review report and recommendations made for correcting these inconsistencies.

The review shall be documented in a brief review report.

6.2 Unexpected Finds Protocol Closure Report

Following the completion of construction works, a closure report will be prepared by an appropriately experienced Environmental Consultant. The report should provide documentary evidence that the UFP was appropriately implemented during the works and include:

- details of unexpected finds encountered during development work (if any);
- details of actions undertaken to address the unexpected finds;
- the results of any remediation undertaken and validation results (where applicable);
- recommendations for further assessment as a result of the unexpected find (if any).

The closure report should be prepared in accordance with relevant guidelines including those endorsed by the Contaminated Land Management Act 1997 and the national environment (Contaminated Land) Protection measure (NEPC 1999).

6.3 Records

The following records will be retained by the Site Owner and the Project Manager:

- unexpected find identification, assessment and validation reports;
- UFP review reports; and
- UFP closure report.

7 CLOSURE AND LIMITATIONS

As discussed previously, the excavation/construction personnel working are required to have the general competencies to identify unexpected finds of contamination in the field and that this competency will be used in good faith during earthworks.

It is not possible to provide awareness induction to cover all types of possible unexpected finds. It is possible that indications of contamination not specifically covered by the induction may be encountered. In such cases it is assumed that “if in doubt” about a potential find the precautionary principal will be employed and the unexpected finds procedure documented in the following section will be duly activated.

Additionally, it is noted that some forms of potential contamination may not be associated with any visual or olfactory indications in the field. The unexpected finds protocol will not provide protection against such finds.

The UFMP must be read in conjunction with the attached “Important Information about your Coffey Report.”

8 BIBLIOGRAPHY

Coffey Environments 2010, 'Stage 1 Preliminary Site Contamination Assessment, Proposed Development Zone, Masterplan Option 03 Blacktown Hospital, Blacktown NSW', dated 2 December 2010, ref: ENAURHOD04072AA-R01.

Coffey Environments 2012, 'Summary Advice on Recommendations for Further Contamination Assessment and Management Works, Blacktown Hospital and Mt Druitt Hospital', dated 14 May 2012, ref: GEOTLCOV24508AA-AD.

Coffey Geotechnics 2011, 'Geotechnical Investigation and Preliminary Contamination Assessment, Proposed Additions to Blacktown Hospital, Blacktown NSW', dated 10 May 2011, ref: GEOTLCOV24207AB-AB.

NEPC 1999, 'National Environment Protection (Assessment of Site Contamination) Measure, Schedule B (1) Guideline on the Investigation Levels for Soil and Groundwater', National Environment Protection Council.

NSW DEC 2007, 'Contaminated Sites: Guidelines for the Assessment and Management of Groundwater Contamination', ISBN 978 1 74122 366 8.

NSW DECC 2009, 'Waste Classification Guidelines Part 1: Classifying Waste', ISBN 978 1 74232 224 7, Department of Environment and Climate Change NSW.

NSW DUAP 1998, 'Managing Land Contamination: Planning Guidelines SEPP55 - Remediation of Land', ISBN 0 7310 9005 5, Department of Urban Affairs & Planning and Environment Protection Authority.

NSW EPA 1994, 'Contaminated Sites: Guidelines for Assessing Service Station Sites', ISBN 07310 3712 X, NSW Environment Protection Authority.

NSW EPA 1995, 'Contaminated Sites: Sampling Design Guidelines', ISBN 0 7310 3756 1, NSW Environment Protection Authority.

WA DOH 2009, 'Guidelines for the Assessment, Remediation and Management of Asbestos Contaminated Sites in Western Australia', dated May 2009.

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Important information about your **Coffey** Environmental Report

Uncertainties as to what lies below the ground on potentially contaminated sites can lead to remediation costs blow outs, reduction in the value of the land and to delays in the redevelopment of land. These uncertainties are an inherent part of dealing with land contamination. The following notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report has been written for a specific purpose

Your report has been developed on the basis of a specific purpose as understood by Coffey and applies only to the site or area investigated. For example, the purpose of your report may be:

- To assess the environmental effects of an on-going operation.
- To provide due diligence on behalf of a property vendor.
- To provide due diligence on behalf of a property purchaser.
- To provide information related to redevelopment of the site due to a proposed change in use, for example, industrial use to a residential use.
- To assess the existing baseline environmental, and sometimes geological and hydrological conditions or constraints of a site prior to an activity which may alter the sites environmental, geological or hydrological condition.

For each purpose, a specific approach to the assessment of potential soil and groundwater contamination is required. In most cases, a key objective is to identify, and if possible, quantify risks that both recognised and unrecognised contamination pose to the proposed activity. Such risks may be both financial (for example, clean up costs or limitations to the site use) and physical (for example, potential health risks to users of the site or the general public).

Scope of Investigations

The work was conducted, and the report has been prepared, in response to specific instructions from the client to whom this report is addressed, within practical time and budgetary constraints, and in reliance on certain data and information made available to Coffey.

The analyses, evaluations, opinions and conclusions presented in this report are based on those instructions, requirements, data or information, and they could change if such instructions etc. are in fact inaccurate or incomplete.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man and may change with time.

For example, groundwater levels can vary with time, fill may be placed on a site and pollutants may migrate with time.

Because a report is based on conditions which existed at the time of the subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time.

Consult Coffey to be advised how time may have impacted on the project and/or on the property.

Interpretation of factual data

Environmental site assessments identify actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from indirect field measurements and sometimes other reports on the site are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact with respect to the report purpose and recommended actions.

Actual conditions may differ from those inferred to exist, because no professional, no matter how well qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions.

For this reason, parties involved with land acquisition, management and/or redevelopment should retain the services of Coffey through the development and use of the site to identify variances, conduct additional tests if required, and recommend solutions to unexpected conditions or other problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area.

This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report's recommendations are valid and whether or not changes should be considered with redevelopment or on-going use of the site. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

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Important information about your **Coffey** Environmental Report

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. In particular, a due diligence report for a property vendor may not be suitable for satisfying the needs of a purchaser. Your report should not be applied for any purpose other than that originally specified at the time the report was issued.

Interpretation by other professionals

Costly problems can occur when other professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other professionals who are affected by the report. Have Coffey explain the report implications to professionals affected by them and then review plans and specifications produced to see how they have incorporated the report findings.

Data should not be separated from the report

The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way. Logs, figures, laboratory data, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel), field testing and laboratory evaluation of field samples. This information should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Contact Coffey for additional assistance

Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to land development and land use. It is common that not all approaches will be necessarily dealt with in your environmental site assessment report due to concepts proposed at that time. As a project progresses through planning and design toward construction and/or maintenance, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility

Environmental reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than other design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents.

Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.