



Ref FOI18-48

[REDACTED]
[REDACTED]

Dear [REDACTED]

Freedom of information request – FOI18-48

I refer to your application received by ACT Health on 20 June 2018 in which you sought access to information under the *Freedom of Information Act 2016* (the FOI Act).

In your application you have requested:

“Documents generated or received by the ACT Government in relation to contamination from toxic chemicals at the former Charnwood fire station site. These would include but not be limited to the following:

- results of testing for all per-and poly-fluoroalkyl substances (PFASs, including PFOS and PFOA) at this site;*
- advice or recommendations from Health Protection Services in response to these results;*
- any protection or mitigation measures recommended by the Health Directorate (either alone or jointly with any other government department, such as the Environment Protection Agency) in relation to PFASs at this site;*
- protection or mitigation measures that have been completed;*
- and, if different, all remediation conditions put into place on the site’s recent development application that were required by the Health Protection Service (or another division of the Health Directorate, either alone or jointly with any other government department, such as the Environment Protection Agency).”*

I am an Information Officer appointed by the Director-General under section 18 of the Act to deal with access applications made under Part 5 of the Act.

ACT Health is required to provide a decision on your access application by 8 August 2018.

Decision on access

I can inform you that in response to your request, 66 documents have been identified by ACT Health within the scope of your request. I have decided that 44 documents are to be partially released in accordance with Sch 2.2 (a)(ii) of the Act, as the information is personal information about an individual or the document contains information that is not within the scope of the request.

The partial release of these documents is outlined in the Schedule of documents attached.

The remaining 22 documents are released in full.

Charges

Processing charges are not applicable for this request.

Online publishing – disclosure log

Under section 28 of the Act, ACT Health maintains an online record of access applications called a disclosure log. Your original access application, my decision and documents released to you in response to your access application will be published in the ACT Health disclosure log not less than three days but not more than 10 days after the date of this decision. Your personal contact details will not be published.

Ombudsman review

My decision on your access request is a reviewable decision as identified in Schedule 3 of the Act. You have the right to seek Ombudsman review of this outcome under section 73 of the Act within 20 working days from the day that my decision is published in ACT Health disclosure log, or a longer period allowed by the Ombudsman.

If you wish to request a review of my decision you may write to the Ombudsman at:

The ACT Ombudsman
GPO Box 442
CANBERRA ACT 2601

Via email: ACTFOI@ombudsman.gov.au.

ACT Civil and Administrative Tribunal (ACAT) review

Under section 84 of the Act, if a decision is made under section 82(1) on an Ombudsman review, you may apply to the ACAT for review of the Ombudsman decision.

Further information may be obtained from the ACAT at:

ACT Civil and Administrative Tribunal
Level 4, 1 Moore St
GPO Box 370
Canberra City ACT 2601
Telephone: (02) 6207 1740
<http://www.acat.act.gov.au/>

Should you have any queries in relation to your request, please do not hesitate to contact the FOI Coordinator on 6205 1340 or email HealthFOI@act.gov.au.

Yours sincerely

A handwritten signature in black ink, appearing to read 'CBarr', written in a cursive style.

Conrad Barr

Director

Health Protection Service

7 August 2018

FREEDOM OF INFORMATION REQUEST SCHEDULE

Please be aware that under the *Freedom of Information Act 2016*, some of the information provided to you will be released to the public through the ACT Government's Open Access Scheme. The Open Access release status column of the table below indicates what documents are intended for release online through open access.

Personal information or business affairs information will not be made available under this policy. If you think the content of your request would contain such information, please inform the contact officer immediately.

Information about what is published on open access is available online at: <http://www.health.act.gov.au/public-information/consumers/freedom-information>

NAME	WHAT ARE THE PARAMETERS OF THE REQUEST	File No
<div style="background-color: black; width: 100px; height: 15px; margin-bottom: 5px;"></div>	<p>Documents generated or received by the ACT Government in relation to contamination from toxic chemicals at the former Charnwood fire station site. These would include but not be limited to the following:</p> <ul style="list-style-type: none"> • results of testing for all per-and poly-fluoroalkyl substances (PFASs, including PFOS and PFOA) at this site; • advice or recommendations from Health Protection Services in response to these results; • any protection or mitigation measures recommended by the Health Directorate (either alone or jointly with any other government department, such as the Environment Protection Agency) in relation to PFASs at this site; • protection or mitigation measures that have been completed; • and, if different, all remediation conditions put into place on the site's recent development application that were required by the Health Protection Service (or another division of the Health Directorate, either alone or jointly with any other government department, such as the Environment Protection Agency). 	FOI18-48

Ref No	No of Folios	Description	Date	Status	Reason for non-release or deferral	Open Access release status
1	1 - 2	E-mail	15/05/2018	Partial release	Document contains personal information about an individual	Yes
2	3	Letter to AECOM from Environment Protection Authority	10/08/2015	Partial release	Document contains personal information about an individual	Yes
3	4-9	Letter to Environment Protection Authority from AECOM, refers to attachment at document 4	17/07/2015	Partial release	Document contains personal information about an individual	Yes
4	10-35	Remedial Action Plan	03/03/2014	Full release		Yes
5	36-37	ACT Health Minute refers to attachment at document 6	02/06/2017	Full release		Yes
6	38	Letter to Environment and Planning Directorate (EPD) from Health Protection Services	02/06/2017	Full release		Yes
7	39-42	E-mail with brief	17/07/2017	Partial release	Document contains personal information about an individual	Yes

8	43-45	E-mail	20/07/2017	Partial release	Document contains personal information about an individual	Yes
9	46-63	Stage 1 Site Investigation Report for Block 22 Section 97 Charnwood	September 2017	Full release		Yes
10	64-614	Letter report titled Block 6, Section 97 Charnwood, ACT – Summary of previous Investigations and Site Suitability Status	17/07/2018	Partial release	Document contains personal information about an individual	Yes
11	615-617	E-mail with attachment – Letter from Health Protection Services, ACT Health to EPD	9/06/2017	Full release		Yes
12	618-627	Email with attachment – Further Information Response	3/07/2017	Partial release	Document contains personal information about an individual	Yes
13	628-697	ACT Health Minute – Development Application	21/07/2017	Partial release	Document contains personal information about an individual	Yes
14	698-700	E-mail with attachment – Referral Health Development Application	24/07/2017	Full release		Yes
15	701-702	E-mail	26/07/2017	Full release		Yes

16	703	E-mail	Undated	Partial release	Document contains personal information about an individual	Yes
17	704-711	Document from Canberra Town Planning to Environment, Planning and Sustainable Development Directorate	18/06/2017	Partial release	Document contains personal information about an individual	Yes
18	712	E-mail	26/07/2017	Partial release	Document contains personal information about an individual	Yes
19	713-716	E-mail with attachment – Referral-Health-Development Application	26/07/2017	Full release		Yes
20	717	E-mail	26/07/2017	Full release		Yes
21	718-719	E-mail	26/07/2017	Full release		Yes
22	720-724	E-mail with attachment – Referral-Health-Development Application	27/07/2017	Partial release	Document contains personal information about an individual	Yes
23	725-727	E-mail	28/07/2017	Full release		Yes
24	728-734	Email	28/07/2017	Partial release	Document contains personal information about an individual	Yes
25	735-758	E-mail with attachment – Notice of Decision	7/08/2017	Partial release	Document contains personal information about an individual	Yes

26	759	E-mail	16/08/2017	Partial release	Document contains personal information about an individual	Yes
27	760-765	Email	21/08/2017	Partial release	Document contains personal information about an individual	Yes
28	766-871	E-mail with attachment – Soil PFAS Investigation - 172678	23/10/2017	Partial release	Document contains personal information about an individual	Yes
29	872-874	E-mail	24/10/2017	Partial release	Document contains personal information about an individual	Yes
30	875-917	ACT Health Minute – Development Application	7/11/2017	Partial release	Document contains personal information about an individual	Yes
31	918-919	E-mail with attachment – Health-Development Application – Applicant Response	10/11/2017	Partial release	Document contains personal information about an individual	Yes
32	920-921	E-mail with attachment – Health-Development Application – Applicant Response	10/11/2017	Partial release	Document contains personal information about an individual	Yes
33	922-924	E-mail with attachment – Ground Surface Plan	10/11/2017	Partial release	Document contains personal information about an individual	Yes

34	925-926	E-mail with attachment – Health-Development Application – Landscape	17/11/2017	Partial release	Document contains personal information about an individual	Yes
35	927-930	E-mail	7/12/2017	Partial release	Document contains personal information about an individual	Yes
36	931-934	E-mail	7/12/2017	Partial release	Document contains personal information about an individual	Yes
37	935-937	E-mail	21/12/2017	Full release		Yes
38	938-939	E-mail	6/06/2018	Partial release	Document contains personal information about an individual	Yes
39	940-941	E-mail	6/06/2018	Partial release	Document contains personal information about an individual	Yes
40	942-943	E-mail	7/06/2018	Partial release	Document contains personal information about an individual	Yes
41	944	E-mail	14/06/2018	Partial release	Document contains personal information about an individual	Yes
42	945-950	E-mail with attachment – Ministerial Brief	14/06/2018	Full release		Yes
43	951-955	E-mail with attachment – Ministerial Brief	15/06/2018	Partial release	Document contains personal information about an individual	Yes

44	956-963	E-mail with attachment – Talking Points – PFAS Contamination	15/06/2018	Partial release	Document contains personal information about an individual	Yes
45	964-975	E-mail	18/06/2018	Full release		Yes
46	976-977	E-mail	18/06/2018	Partial release	Document contains information outside the scope of the request	Yes
47	978-979	E-mail with attachment – Health-Development Application – Applicant Response	18/06/2018	Partial release	Document contains personal information about an individual	Yes
48	980-981	E-mail	18/06/2018	Partial release	Document contains personal information about an individual	Yes
49	982	E-mail	18/06/2018	Full release		Yes
50	983-987	E-mail with attachment – Referral-Health-Development Application	18/06/2018	Full release		Yes
51	988-990	E-mail with attachment – Referral-Health-Development Application	24/07/2018	Full release		Yes
52	991-992	E-mail with attachment – Referral-Health-Development Application	18/06/2018	Full release		Yes

53	993-998	E-mail with attachment – ministerial Brief	18/06/2018	Partial release	Document contains personal information about an individual	Yes
54	999-1006	E-mail attachment - Talking Points	18/06/2018	Partial release	Document contains personal information about an individual	Yes
55	1007-1034	E-mail with attachment – Referral-Health-Development Application – Notice of Decision, Notice of Decision & Referral-Health-Development Application	18/06/2018	Partial release	Document contains personal information about an individual	Yes
56	1035-1047	E-mail	18/06/2018	Full release		Yes
57	1048-1053	E-mail with attachment – Ministerial Brief	19/06/2018	Partial release	Document contains personal information about an individual	Yes
58	1054-1055	E-mail	19/06/2018	Partial release	Document contains personal information about an individual	Yes
59	1056-1060	E-mail – Referral-Health-Development Application & Health-Development Application Response	19/06/2018	Partial release	Document contains personal information about an individual	Yes
60	1061-1064	E-mail	19/06/2018	Full release		Yes
61	1065-1067	E-mail with attachment - Budget Estimates Brief	20/06/2018	Full release		Yes

62	1068-1076	E-mail with attachment – Ministerial Brief	22/06/2018	Partial release	Document contains personal information about an individual	Yes
63	1077-1082	E-mail with attachment – Ministerial Brief	22/06/2018	Partial release	Document contains personal information about an individual	Yes
64	1083-1087	E-mail with attachment – Ministerial brief	22/06/2018	Partial release	Document contains personal information about an individual	Yes
65	1089-1096	E-mail with attachment – Ministerial brief	22/06/2018	Partial release	Document contains personal information about an individual	Yes
66	1097-1102	E-mail with attachment – Ministerial brief	22/06/2018	Full release		Yes
Total No of Docs						
66						

Stedman, Andrew (Health)

From: Stedman, Andrew (Health) on behalf of Environmental Health
Sent: Monday, 15 May 2017 11:00 AM
To: Rogers, Keith (Health)
Subject: FW: REFERRAL-ACT HEALTH-201731430-22/97 CHARNWOOD-01 [SEC=UNCLASSIFIED]
Attachments: DEMO-201731430-01#2.pdf; ELEV-201731430-01#2.pdf; ELEV-201731430-02#2.pdf; ELEV-201731430-03#2.pdf; FLOOR-201731430-01#2.pdf; FLOORREG-201731430-01#2.pdf; INDEX-201731430-01#2.pdf; LSCAPE-201731430-01#2.pdf; PERSP-201731430-01#2.pdf

Hi Keith,

A DA for completion.

Please back to us before you leave. Before May 26

Thanks



Andrew Stedman | Environment Team Leader
 Health Protection Service | health.act.gov.au
 Phone (02) 6205 4404 | Mobile [REDACTED]

From: Moroney, Rebecca (Health)
Sent: Friday, 12 May 2017 2:52 PM
To: Krsteski, Radomir (Health)
Cc: Environmental Health
Subject: FW: REFERRAL-ACT HEALTH-201731430-22/97 CHARNWOOD-01 [SEC=UNCLASSIFIED]

To Rad
 Cc: EH

Due to me by NLT COB Wednesday 31st May please

Thank you – Bec ☺

(2 more emails to follow.....)

From: HPS
Sent: Friday, 12 May 2017 2:39 PM
To: Moroney, Rebecca (Health)
Subject: FW: REFERRAL-ACT HEALTH-201731430-22/97 CHARNWOOD-01 [SEC=UNCLASSIFIED]



Kim Warren
 Office Manager | Business Support Services
 Health Protection Service | Population Health Protection and Prevention | ACT Health
 25 Mulley Street Holder ACT | Locked Bag 5005 Weston Creek ACT 2611
 T 02 6205 1700 | E kim.warren@act.gov.au | Website |

From: EPD, Customer Services
Sent: Friday, 12 May 2017 2:25 PM
To: HPS <HPS@act.gov.au>
Subject: REFERRAL-ACT HEALTH-201731430-22/97 CHARNWOOD-01 [SEC=UNCLASSIFIED]

Email 1 of 3

DEVELOPMENT APPLICATION NO: 201731430
BLOCK: 22 SECTION: 97 DIVISION: CHARNWOOD

Description - PROPOSAL FOR NEW COMMERCIAL DEVELOPMENT - demolition of the existing buildings and construction of a childcare centre and pre-school, landscaping, surface car park, services infrastructure, signage and associated site works.

Pursuant to Section 148(1) of the Planning and Development Act 2007 the ACT Planning and Land Authority requests that you consider the above mentioned development application and provide any written advice no later than 15 working days after the date of this notice **(02/06/17)**.

In accordance with Section 150 of the Planning and Development Act 2007 If advice is not received within the prescribed time it will be taken that you have supported the application.

Please forward any written advice via email to Customer Services

EPDcustomerservices@act.gov.au

Please use the following format in the subject line of the email when providing advice:

COMM-Agency Name-20080XXXX-Block XX Section XX SuburbXXXXX-01

Example: COMM-Heritage-200801234-Block 10 Section 10 Dickson-01

Kind Regards

Courtney | Customer Services

Phone 02 6207 1923

Access Canberra | ACT Government

Dame Pattie Menzies House, Challis Street, Dickson | GPO Box 158 Canberra ACT 2601

Access Canberra is an ACT Government service that brings together customer and regulatory services, including the former Environment and Planning Directorates Customer Services Team. Access Canberra has been set up to make it easier for business, community organisations and individuals to work with ACT Government and deliver a more seamless experience.

www.planning.act.gov.au | EPDcustomerservices@act.gov.au





ACT
Government

Chief Minister, Treasury and
Economic Development

File Ref: 02/2664

██████████
██████████
Level 2, 60 Marcus Clarke Street
Canberra City ACT 2601

Dear Mr ██████████

**ENDORSEMENT OF SUMMARY REPORT -
BLOCK 6 SECTION 97 CHARNWOOD BELCONNEN**

The Environment Protection Authority (EPA) has reviewed the report titled "Block 6, Section 97 Charnwood, ACT - Summary of Previous Investigations and Site Suitability Status" dated 17 July 2015 by AECOM Australia Pty Ltd.

The EPA has assessed the report and on the basis of the findings supports the consultant's conclusions that the site is "capable of supporting a CFZ land use with potential for a child care" from a contamination perspective subject to the following condition:

- a site specific unexpected finds protocol must be developed by a suitably qualified environmental consultant and implemented during development works at the site.

The works have been generally undertaken to the satisfaction of the EPA in accordance with the Contaminated Sites Environment Protection Policy 2009 and associated guidelines.

This letter of endorsement must be read in conjunction with the above report.

This should not be taken as a warranty by the Environment Protection Authority or the Territory that the land is fit for any particular purpose.

Yours sincerely

Christopher Collier
Environment Protection Authority

10 August 2015



AECOM Australia Pty Ltd +61 2 6201 3000 tel
 Level 2 +61 2 6201 3099 fax
 60 Marcus Clarke Street ABN 20 093 846 925
 Canberra ACT 2600
 Australia
 www.aecom.com

17 July 2015

Mark Heckenberg
 Environment Protection Authority
 Level 2, North Dame Pattie Menzies House
 16 Challis Street
 Dickson ACT 2602

Dear Mark

Block 6, Section 97 Charnwood, ACT - Summary of Previous Investigations and Site Suitability Status

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by the Land Development Agency (LDA) to prepare a letter report for Block 6, Section 97, Charnwood ACT (the Site) to satisfy comments provided by the Environment Protection Authority (EPA) (ref: Mark Heckenberg via email on 9 June 2015), specifically:

- The findings of these reports [AECOM 2015a and 2015b] and all other contamination studies undertaken at the site must be consolidated into a single site suitability/validation report. This report must be prepared in general accordance with the guidelines endorsed by the EPA, as detailed in the Contaminated Sites Environment Protection Policy 2009, and include a clear conclusion as to the suitability of the site for its proposed and permitted uses under the ACT Territory Plan; and
- Clear comment must be made in regard to the need or otherwise for a groundwater assessment based on the findings of the above reports and whether interim on-going environmental management of the site is required prior to, during or post development.

The Site is the former West Belconnen Fire Station, operated by ACT Emergency Services Agency i.e. ACT Fire and Rescue, and was zoned as a TSZ2 Services zone (Transport and Services Zone Development Code). LDA are proposing to redevelop the Site as a Community Facility Zone (CFZ) with potential for a childcare centre, subject to required Territory Plan Variation and other relevant statutory processes.

2.0 Objectives

The objectives of the works were to:

- Prepare a letter report, in accordance with the guidelines endorsed by the EPA, which consolidates finding of previous investigations undertaken at the Site and provides a clear statement regarding the suitability of the Site for its proposed land use.
- Assess the potential for site-derived groundwater impacts and whether interim on-going environmental management is required.
- Request review of the enclosed reports by the ACT EPA in conjunction with the suitability statement presented in **Section 6.0** of this letter. Previous environmental investigations are enclosed as an attachment to this letter.

3.0 Scope of Works

In order to achieve the objectives, the following scope of work was undertaken:

- Review comments provided by the EPA on the Stage 2 Environmental Site Assessment (AECOM, 2015a) and Excavated Soils Validation Letter (AECOM, 2015b).
- Prepare a summary of previous investigations undertaken at the Site.
- Conduct a qualitative assessment of groundwater conditions at the Site.
- Prepare a clear statement regarding the suitability of the Site for its proposed land use.

4.0 Summary of Previous Investigations

Table 1 Summary of Previous Investigations

Hazardous Materials Register and Management Plan, Charnwood Fire Station, 35 Lhotsky Street, Charnwood, ACT (Coffey, 2013)
<p>Coffey Environments Australia Pty Ltd (Coffey) undertook a Hazardous Materials survey at the Site on 3 October 2012. The survey was undertaken to identify and locate hazardous materials within accessible areas of the Site to enable the management of asbestos containing material (ACM) and other hazardous materials. The survey identified friable ACM within the boiler room (i.e. rope seal to boiler flue and millboard) and bonded ACM (i.e. asbestos cement sheeting) on the exterior of the building (e.g. eaves, soffits and spandrel panel). Based on the results of the survey and subsequent laboratory analytical results, a register of hazardous materials and an Asbestos Management Plan (AMP) were prepared in accordance with the <i>Work Health and Safety Regulation 2011</i>.</p>
Remedial Action Plan, Former West Belconnen Fire Station (AECOM, 2014a)
<p>AECOM was engaged to prepare a Remedial Action Plan (RAP) for the removal of underground storage tanks (USTs), associated infrastructure and surrounding impacted soil (if any) present at the Site. A review of the Site plan identified the following fuel infrastructure on-site:</p> <ul style="list-style-type: none"> - Three USTs up to 4500 L (containing diesel and petroleum products). - Two fuel dispensers. - Three vent pipes. - Associated pipework. <p>A remediation feasibility study was undertaken and it was considered that excavation with off-site disposal to landfill was the most practical remedial strategy. The RAP was compiled to provide the remedial strategy detailing the excavation, soil stockpiling, transport, validation and occupational health and safety and environmental management strategies associated with the remediation works. It was noted that the works would not provide an overall assessment of the suitability of the Site and only related to the on-site fuel storage and dispensing area.</p>
JACSD Charnwood, Stage 1 Environmental Assessment (AECOM, 2014b)
<p>AECOM was engaged to undertake a Phase 1 Environmental Site Assessment (ESA) at the Site to identify any potential contamination issues that may require further investigation and/or management. The scope of work comprised a review of background information, a site inspection, consultation with personnel familiar with the Site and data evaluation and reporting.</p> <p>The areas of environmental concern (AECs) identified within the Phase 1 ESA included:</p> <ul style="list-style-type: none"> - Underground petroleum storage system (UPSS) i.e. three USTs, two fuel dispensers, three vent pipes and associated pipework. - Vehicle maintenance. - Use and storage of aqueous film forming foam (AFFF). - Septic tanks and/or septic lines. - Possible presence of imported fill material of unknown origin and quality. <p>A preliminary Conceptual Site Model (CSM) was developed based on the findings of the Phase 1 ESA.</p> <p>The Phase 1 ESA recommended that a Phase 2 ESA be undertaken to further evaluate the potential contamination risks, to include intrusive investigation, sampling and analysis. Specifically, targeted soil sampling around the building footprint and a grid sampling approach for the remainder of the Site within areas of environmental concern was recommended.</p>
UPSS Validation Report, Former West Belconnen Fire Station, Belconnen ACT (AECOM, 2014c)
<p>AECOM was engaged to prepare a validation report for the removal of the UPSS at the Site in accordance with the RAP (AECOM, 2014a). The scope of work comprised:</p>

- Lodging a development application (DA) and obtaining development approval for the Site.
- Preparing and adhering to a Site Specific Work Health and Safety Plan and Environmental Management Plan.
- Underground service locating by an accredited locator with reference to Dial Before You Dig (DBYD) plans.
- Removal of UPSS which included three USTs up to 4,500 L, two fuel dispenser pumps, three vent pipes and associated pipework.
- Collection of 18 soil validation samples from the walls and bases of each excavation formed by UPSS removal plus two quality control / quality assurance (QAQC) samples.
- Stockpiling of soils excavated during UPSS removal works into four separate stockpiles. Collection of 11 soil samples for characterisation of stockpiled material plus 2 QAQC samples.
- Inspection and collection of soil samples from proposed imported excavated natural material (ENM) at the source location (Boral Quarry at Kaveney's Road, Hall, NSW).
- Backfilling of excavations with imported ENM soils.
- Laboratory analysis of selected soils samples for the following CoPC: asbestos, total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene and xylenes and naphthalene (BTEXN); polycyclic aromatic hydrocarbons (PAHs); phenols; heavy metals; organochlorine and organophosphorus pesticides (OCP and OPP), polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs). All analysis was completed by NATA accredited laboratories.
- Preparation of a waste classification letter for all soils within the four stockpiles for off-site disposal.

The results of the field activities was summarised as follows:

- All UPSS tanks and associated infrastructure were removed and disposed off-site at a licensed waste disposal facility.
- Laboratory analysis of samples collected from the base and walls of three excavations reported concentrations of all CoPCs less than the laboratory limit of reporting (LOR) and/or adopted remediation acceptance criteria (RAC) (selected based on a low-density residential land use including a childcare centre), indicating that the UPSS excavations were appropriately validated.
- A total of 96 m³ of excavated materials were classified and disposed off-site as solid waste (refer to AECOM, 2014b). It should be noted that concentrations of CoPCs in samples collected from the stockpiles were below the laboratory LOR and/or adopted RAC, with the exception of TRH C₆-C₁₀ less BTEX (F1) and TRH C₁₀-C₁₆ less naphthalene (F2).
- A total of 32 tonnes of suitable ENM was imported to the Site following an inspection of the material and analysis of samples collected, which reported concentrations of all CoPCs below the laboratory LOR and/or adopted RAC.

AECOM considered that validation of the UPSS excavation was completed to a standard acceptable for the proposed future land use i.e. Community Facility Zone (CFZ) with potential for a childcare centre.

Former Charnwood Fire Station, Stage 2 Environmental Site Assessment Report (AECOM, 2015a)

AECOM was engaged to undertake a targeted Phase 2 ESA at the Site to investigate the five AECs identified as part of the Phase 1 ESA (AECOM, 2014b) and assess the potential presence/evaluate any risks posed by the AECs to the proposed future childcare centre. The scope of work comprised:

- Development of a health and safety plan and safe work method statement.
- Underground service locating by an accredited locator with reference to DBYD plans.
- Site supervision by AECOM Environmental Scientist of sub-contractor's environmental scope of work.
- Collection of 20 soil samples from three drilled soil bores (between 0.0 and 8.0 m below ground level (BGL)), nine excavated test pits (between 0.0 and 4.1 m BGL) and one hand auger location (between 0.0 and 0.1 m BGL), inclusive of QAQC samples.

- Laboratory analysis of soils samples for the abovementioned CoPCs, excluding VOCs as all were previously reported below the laboratory LOR. All analysis was completed by NATA accredited laboratories.

The CSM was further refined based on the findings of the Phase 2 ESA.

The Phase 2 ESA identified fill material within the former UST area (AEC01) at depths ranging from 0.5 to 2.0 m BGL. Natural soil conditions across the Site to comprise sandy clay soils. No visual or olfactory observations of contamination impact were noted across the boreholes, test pits and hand auger locations. Photo-ionisation detector (PID) readings ranged from 0.0 to 4.7 parts per million (ppm).

One test pit sample (TP05_0.0-0.1) collected from the former vehicle maintenance shed (located on the southeast unsealed corner of the Site) reported a concentration of TRH C₁₀-C₁₆ less naphthalene (F2) marginally above the Site Assessment Criteria (SAC) (selected based on a low-density residential land use including a childcare centre). The hydrocarbon impacted area was delineated and appeared to be limited to the surface soil (i.e. top 100 mm). Potentially complete exposure pathways were identified to exist between impacted soil and future human health receptors, therefore it was recommended that remediation works be undertaken to remove and validate the surface soil at TP05.

Excavated Soils, Block 6 Section 97, Former West Belconnen Fire Station, Charnwood, ACT, Validation Letter (AECOM, 2015b)

AECOM was engaged to prepare a validation report for the removal of surface soil at TP05, to include an assessment of the remaining soil based on the proposed future land use. The scope of work comprised:

- Excavation of TP05 (dimensions of 7 m L x 5 m W x 0.3 m D) and stockpiling of excavation material.
- Collection of three soil validation samples from the base of the excavation plus two QA/QC samples.
- Laboratory analysis of soil samples for the abovementioned CoPC plus AFFF compounds i.e. perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid (PFOA). All analysis was completed by NATA accredited laboratories.

All CoPC concentrations were reported below the SAC for low-density residential land use including a childcare centre. AECOM considered that validation of the TP05 excavation was completed to a standard acceptable for the proposed future land use *i.e.* Community Facility Zone (CFZ) with potential for a childcare centre.

5.0 Qualitative Assessment of Groundwater Conditions

Groundwater has not directly been assessed as part of previous investigations. However, consistent with Tier 1 of the National Environmental Protection Measure (NEPM) Schedule B9 (Guidelines for Risk Assessment of Groundwater), groundwater risk is not considered to be of concern as:

- Groundwater was not encountered during UPSS validation works (AECOM, 2014c) or during the Stage 2 ESA (AECOM, 2015a), indicating that the regional groundwater table exists greater than 8 m BGL.
- Natural soils are low permeability tight clays and, under the low density residential land use with childcare centres, the appropriate criteria for volatile contaminants (ASC NEPM, HSL-A) at a site with groundwater greater than 8 m and soil samples greater than 4 m in clay are all not limiting with the exception of benzene and TRH C₆-C₁₀ F1 (less BTEX).
- Soil samples analysed during AECOM (2014c) and (2015a) did not report any concentrations of volatile hydrocarbons above the limit of laboratory reporting at the base of the former tanks (approximately 4 m BGL) and in the soils beneath (between 4 m and 8 m BGL). Field screening at the time of sampling did not note any elevated PID readings (less than 10 ppm) and "out-of-ground" tank inspections did not observe any visible leaks/penetrations.

On this basis interim or ongoing environmental management of groundwater is not warranted.

6.0 Site Suitability Status

Based on the information available from the assessments completed to date:

- Soil and groundwater investigations have not identified any unacceptable risk to current or future occupants of the Site.
- Remedial works carried out (associated with the UPSS) have reported successful removal of UPSS and associated impacted soils.
- Hazardous material investigations did not identify materials that could not be managed through conventional WHS, Asbestos Register, or Construction Environmental Management Plan procedures.

Furthermore, in relation to development on the site:

- Any future development proposal would be subject to development assessment under the *Planning and Development ACT 2007*, at which time consideration would be given, by the relevant entities, to the merits of the proposal and the appropriateness of the site to the support development of that type.

For these reasons, AECOM considers that the site could be capable of supporting a CFZ land use with potential for a child care.

7.0 References

- 1) AECOM Australia Pty Ltd (2014a) *Remedial Action Plan, Former West Belconnen Fire Station*, issued 03 March 2014 (attached).
- 2) AECOM Australia Pty Ltd (2014b) *JACSD Charmwood, Stage 1 Environmental Assessment*, issued 18 November 2014 (attached).
- 3) AECOM Australia Pty Ltd (2014c) *UPSS Validation Report, Former West Belconnen Fire Station, Belconnen ACT*, issued 03 October 2014 (attached).
- 4) AECOM Australia Pty Ltd (2015a) *Former Charmwood Fire Station, Stage 2 Environmental Site Assessment Report*, issued 13 March 2015 (attached).
- 5) AECOM Australia Pty Ltd (2015b) *Excavated Soils, Block 6 Section 97, Former West Belconnen Fire Station, Charmwood, ACT, Validation Letter*, issued 30 April 2015 (attached).
- 6) Coffey Environments Pty Ltd (2013) *Hazardous Materials Register and Management Plan, Charmwood Fire Station, 35 Lhotsky Street, Charmwood*, issued
- 7) National Environmental Protection Council (1999) *National Environment (Assessment of Site Contamination) Protection Measure*, as amended May 2013. Health Screening Levels A – low density land use including childcare centres and risk-based assessment of groundwaters.

Yours sincerely,

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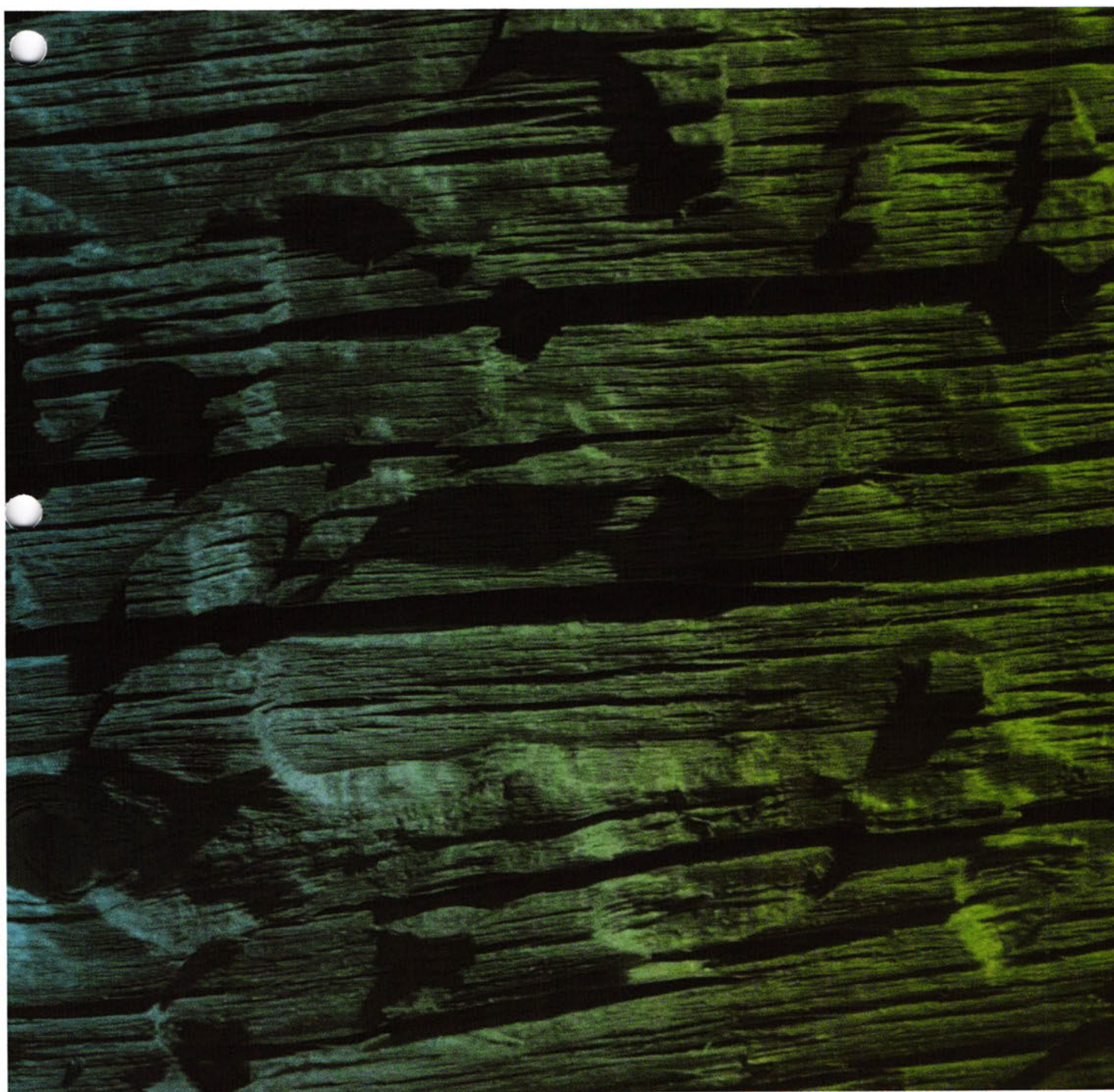
AECOM Australia Pty Ltd (2014a) *Remedial Action Plan, Former West Belconnen Fire Station*, issued 03 March 2014.



West Belconnen RAP
Justice and Community Services
Directorate
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Remedial Action Plan

Former West Belconnen Fire Station



AECOM

West Belconnen RAP
Remedial Action Plan

Remedial Action Plan

Former West Belconnen Fire Station

Client: Justice and Community Services Directorate

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AECOM

West Belconnen RAP
Remedial Action Plan

Quality Information

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Reviewed by [REDACTED]

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Glossary of Terms

General Terms				
ACT EPA	Australian Capital Territory Environment Protection Authority			
ACM	Asbestos containing material(s)			
AEC	Areas of Environmental Concern			
ANZECC	Australian and New Zealand Environment and Conservation Council			
AHD	Australian Height Datum			
AST	Above Ground Storage Tank			
BMRGG	Bureau of Mineral Resources, Geology and Geophysics			
BoM	Bureau of Meteorology			
BTEX	Benzene, toluene, ethylbenzene and xylenes			
COPC	Contaminants of potential concern			
EMP	Environmental Management Plan			
EPA	Environment Protection Authority			
ESA	Environmental Site Assessment			
Heavy metals	Generally arsenic, cadmium, chromium, copper, mercury, nickel, lead and zinc			
JACSD	The Justice & Community Safety Directorate			
NEPC	National Environment Protect Council			
NEPM	National Environmental Protection Measure			
NSW EPA	New South Wales Environment Protection Authority			
OCP	Organochlorine pesticides			
OPP	Organophosphorus pesticides			
PAH	Polycyclic Aromatic Hydrocarbons			
PCB	Polychlorinated biphenyls			
RAC	Remediation Acceptance Criteria			
SMP	Soil or Site Management Plan			
SWL	Standing water level			
TPH	Total petroleum hydrocarbons			
UST	Underground Storage Tank			
VENM	Virgin Excavated Natural Material			
Units				
ha	hectare		mg/L	milligrams/litre
km	kilometre		µg/kg	micrograms/kilogram
L	litre		µg/L	micrograms/litre
L/s	litres/second		ppb	parts per billion
m	metre		ppm	parts per million
mg/kg	milligrams/kilogram		t	Tonne

1.0 Introduction

1.1 Preamble

AECOM Australia Pty Ltd (AECOM) was engaged by Justice and Community Safety Directorate (JACSD) to prepare this Remedial Action Plan (RAP) for the removal of Underground Storage Tanks (USTs) located at the former West Belconnen Fire Station.

The former Fire Station site is identified as Block 6, Section 97, Charnwood, ACT (the Property). The Property location is shown on **Figure 1** and the current Property and Site layout is shown on **Figure 2** in **Appendix A**.

Remediation activities are to be undertaken at the Site to ensure that removal of onsite Fuel Storage and Dispensing Infrastructure is undertaken in accordance with ACT Environment Protection Authority (EPA) requirements and its suitability for proposed future land consistent with commercial/industrial land use, as defined under the National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 2013) (herein referred to as the ASC NEPM [NEPC, 1999 as amended]).

It should be noted that these works do not provide an overall assessment of the Suitability of the site and only relate to the onsite fuel storage and dispensing area.

1.2 Objective

The objectives of this RAP are to:

- Present a plan of the anticipated remediation works for the removal of existing onsite USTs and related fuel dispensing infrastructure.

The scope of remediation works and methodology presented herein is based on AECOM's current understanding of the nature and extent of existing fuel storage and dispensing infrastructure and potential contamination identified within the Site.

AECOM notes that the RAP is required to be approved by the ACT EPA.

This RAP has been developed with reference to the following guideline documents:

- ANZECC/ARMCANZ, 2000. *Australian and New Zealand Environment Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand)
- ACT EPA, 2011. Environmental Guidelines for Service Station Site and Hydrocarbon Storage
- ACT EPA, 2009. Contaminated Sites Environmental Protection Policy
- ACT EPA, 2008. Practice Note 3 – Contaminated Soils
- ACT EPA, 2008. Practice Note 4 – Contaminated Sites
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 2013) NSW Environment Protection Authority (EPA), 1997. *Guidelines for Consultants Reporting on Contaminated Sites*
- NSW Department of Environment and Conservation (DEC), 2006. *Guidelines for the NSW Site Auditor Scheme* (2nd edition)
- Western Australian (WA) Department of Health (DOH), 2009. *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. May 2009.

1.3 Background

The site is identified as the former West Belconnen Fire Station located on the corner of Lhotsky Street and Florey Drive, Charnwood, ACT (the Site).

The Site is currently non-operational and is planned to be redeveloped for future commercial/industrial purposes.

Information provided to AECOM indicates the presence of USTs, Fuel Dispensing Infrastructure and associated connective pipe works to be located within the eastern portion of the Site associated with the historical use of the Site.

A review of site plans provided to AECOM indicates that the storage and dispensing infrastructure is comprised of the following:

- 3 Underground storage tanks up to 4500 L in size. The tanks were identified to contain a range of diesel and petroleum products
- 2 fuel dispensers located on concrete hardstand
- 3 vent pipes
- Buried connective pipework.

Figure 1 (below) illustrates the layout of the Site.

Figure 1 Former West Belconnen Fire Station Site Layout



Following removal of the identified contamination sources within the Site (USTs, Fuel Dispensers etc.), validation and classification samples are to be collected and analysed to assess the suitability for the proposed ongoing commercial/industrial land use.

2.0 Summary of Background Information

2.1 Property Identification

The Property identification details are provided in **Table 1** below.

Table 1 Property Details

Item	Description
Property Identification	Former West Belconnen Fire Station
Property Address ⁽¹⁾	Corner of Lhotsky Street and Florey Drive, Charnwood ACT
Title Identification Details ⁽²⁾	Block 6, Section 97 Charnwood
Property Area ⁽²⁾	The total site area is approximately 3638 m ²
Current Zoning ⁽¹⁾	TSZ2 - Services
Site Owner	Owned by ACT Government, managed by Justice and Community Safety Directorate
Property Location	Figure 1
Property & Site Layout	Figure 2

Notes: ⁽¹⁾ Data sourced from Douglas Partners 2012a

⁽²⁾ Data sourced from AECOM 2012

2.2 Topography and Drainage

The site and surrounding area is generally flat with a slight slope to the south. During an inspection of the Site no visible surface water was present within the Site boundary; however it is expected that surface water when present during periods of rainfall would generally flow to the site boundaries and captured by onsite and adjacent stormwater infrastructure.

2.3 Regional Meteorology

Climatic data was obtained from the Bureau of Meteorology (BoM) website (<http://www.bom.gov.au>). The closest BoM weather station (070014), located at Canberra Airport indicates the following:

- Average annual rainfall of 616 mm, with October and November typically the wetter months (>60 mm per month)
- Average maximum temperature of 19.7°C, ranging from 11.3°C in July to 28.0°C in January
- Average minimum temperature of 6.5°C, ranging from 0.1°C in July to 13.2°C in January.

2.4 Geology

Review of available mapping indicates that the site is underlain by material of middle-late Silurian age (Bureau of Mineral Resources, Geology and Geophysics 1984). This material consists of rhyodacitic ignimbrite and minor volcaniclastic and argillaceous sediments.

2.5 Hydrogeology

Review of available mapping indicates that the site is underlain by two water bearing zones of middle-late Silurian age (Bureau of Mineral Resources, Geology and Geophysics 1984).

Both of the hydrogeological units are noted to be fractured with higher yielding zones associated the upper and lower portions of the individual ash-flow tufts and interbedded sediments. The water quality is variable to poor with yields expected to be 0.5 – 1.0 L/s with total dissolved solids of 500 – 1000 mg/L.

3.0 Remediation Feasibility Study

3.1 Remedial Objective

The remedial objective is to remove existing USTs, fuel dispensing infrastructure, associated tank fill materials and contaminated soils at the Site to the specified Remediation Acceptance Criteria (RAC) (Refer to **Section 5.0**).

3.2 Soil

3.2.1 Summary of Remediation Required at the Site

AECOM notes that:

- The remedial areas relate to the area immediately surrounding USTs and dispensing infrastructure only, not the remainder of the Property
- The ACT EPA preference for decommissioning of USTs is by removal, with in-situ decommissioning to be considered only where all other options have been exhausted.

Based on information provided to AECOM by JACs the following table summarises the remediation areas to be addressed. The remediation areas are shown on **Figure 2 (Appendix A)**:

Table 2 Remediation Areas

Area(s)	Location	Remediation Extent
1	3 x Underground Storage Tanks located within the eastern portion of the Site adjacent to the site access driveway.	Vertically to approximately 0.5 m beneath the current base of the USTs and laterally as far as necessary and practicable to remove hydrocarbon impacted soils.
2	Vent pipes, Connective pipework and dispensing infrastructure.	Removal of fuel lines, dispensing infrastructure and vent lines and excavation of soil beneath the line to approximately 0.5 m beneath lines.
3	Contaminated soils.	Contaminated soils surrounding the UST tank pits are to be excavated to the extent practicable to ensure risk to human health and the environment is acceptable from potential contamination arising from onsite Underground Petroleum Storage Systems (UPSS) infrastructure.

3.2.2 Evaluation of Soil Remediation Options

Following removal of USTs and associated dispensing infrastructure the potential exists for contaminated fill and soil material to be present within the Site.

An evaluation of the remediation options for the impacted soils at the Site is summarised in **Table 4** below.

Table 3 Soil Remediation Options

Soil Remediation Options	Comments	Feasibility Assessment
1. Do Nothing/Ongoing Management	This option is suitable where contamination presents a low or minimal risk to human health and the environment.	Poor – Strategy does not match with Site objective of remediating to meet EPA requirements for UST removal.
2. Excavation and Offsite Treatment/ Landfarming	This option involves onsite landfarming of soils containing CoPCs above the RAC. This strategy is a well proven and relatively time- and cost-effective option for remediation of petroleum hydrocarbon impacted soils where there is substantial space available for stockpiling of soils. This strategy is in line with the preferred options detailed in the ACT EPA (2009).	Possible – Space for land farming is available within the sealed bitumen area at the rear of the Site, however due to the small volume of material to be excavated, it is the opinion of AECOM that land farming and turning of soils on site is not cost effective.
3. Excavate and Offsite Disposal to Licensed Landfill Facility	This option involves the excavation and offsite disposal of soils containing CoPC concentrations above the RAC. This strategy is less environmentally-sustainable than onsite landfarming and reuse.	Feasible – This can be an uncomplicated and time-effective strategy, however, additional costs would be incurred for transport and disposal of soils. AECOM notes that due to the small volume of soil material this is likely to be the most cost effective option.
4. Consolidation and Isolation of Contaminated Soils	This option involves the excavation and placement of soil exceeding the RAC in a properly engineered barrier or containment cell. Typically requires a long-term management plan and long-term design integrity monitoring program.	Poor - This strategy would require approval from the consenting authority and does not match well with Site objective of remediating to the RAC. Could affect future site use and development.

3.2.3 Preferred Soil Remediation Strategy

Based on the available options, the proposed future land use and the feasibility study presented above, AECOM considers that Soil Remediation Option # 3 (comprising excavation with offsite disposal to landfill where/as required) is the most practical approach to address impacted soils present at the Site.

It should be noted that wherever possible, the volume of soils to be disposed to landfill shall be minimised.

3.3 Groundwater

At the time of preparing this RAP, it is the understanding of AECOM that no investigation into the quality of groundwater underlying the Site has been undertaken.

Upon completion of UST excavation and soil disposal works, where the potential is identified for contamination to have impacted underlying groundwater aquifers consideration to be given to the installation and monitoring of groundwater monitoring wells.

The potential for impact on groundwater and where necessary additional investigation recommendations should also be addressed within the Site Validation Report.

4.0 Remediation Acceptance Criteria

The proposed Remediation Acceptance Criteria (RAC) for the Site is based on the following guidance documents:

- ACT EPA (2009). Contaminated Sites, Environment Protection Policy
- ACT EPA (2000). Environmental Standards: Assessment and Classification of Liquid and Non-Liquid Wastes
- ACT EPA (2001). Practice Note No. 3: Requirements for the Disposal of Contaminated Soil
- Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand. (ANZECC and ARMCANZ), 2000. Australian and New Zealand Guidelines for Fresh and Marine Water Quality – Aquatic Ecosystems 95% Protection of Species Trigger Values for Fresh Water
- National Environment Protection Council (NEPC), 1999. National Environment Protection (Assessment of Site Contamination) Measure
- NSW DEC, 2006. Guidelines for the NSW Site Auditor Scheme (2nd Edition)
- NSW EPA, 1994. Guidelines for Assessing Service Station Sites
- Western Australian Department of Health (2009): Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia.

It is noted that all soil movement in ACT requires approval from ACT EPA.

While it is the opinion of AECOM that less than 200m³ of material will require excavation, if more than 1000 m³ of material is to be landfarmed, an Environmental Authorisation (EA) will be required from the ACT EPA in accordance with the Environment Protection Act 1997.

4.1 Remediation Acceptance Criteria

Given the proposed required soil analytical program for the Site and the proposed future land use (commercial/industrial), a range of investigation criteria sourced from the guidance documents listed above are required to be applied.

Application of these guidelines to the soil samples to be collected and analysed from the Site is described below.

The current assessment criteria endorsed by ACT EPA to evaluate soil analytical results are based on the following guidelines:

- ACT EPA 2011: Environmental guidelines for service station sites and hydrocarbon storage
- NSW EPA, 1994. *Guidelines for Assessing Service Station Sites*
- NSW DEC, 2006. *Guidelines for the NSW Site Auditor Scheme (2nd Edition)*
- National Environment Protection (Assessment of Site Contamination) Amendment Measure 2013 (NEPC, 2013).

The guidelines to which soil analytical results are compared within ACT present a range of Health-Based Soil Investigation Levels (SILs), provisional Phytotoxicity-Based Investigation Levels (PBILs), Ecological Investigation Levels (EILs), sensitive land use thresholds and expected background concentration ranges for urban redevelopment Sites in ACT. Application of these guidelines is briefly described below.

SILs

The SILs described in the NSW DEC (2006) and 2013 ASC NEPC (1999) are based on the National Environmental Health Forum (NEHF) levels devised by Imray and Langley (1996).

A series of statistically based guideline levels are provided for various substances for the protection of human health based on four specific land use and exposure scenarios, as summarised below.

Table 4 SILs and Relevant Land-Use

SIL	Land-Use
SIL ₁	Residential with gardens and accessible soil (home-grown produce contributing less than 10% fruit and vegetable intake; no poultry), including children's day care centres, preschools and primary schools, or town houses or villas. SIL ₁ is the same as NEPC HIL A .
SIL ₂	Residential with minimal access to soil access, includes dwellings with fully and permanently paved yard space such as high-rise apartments and flats. SIL ₂ is the same as NEPC HIL B .
SIL ₃	Parks, recreational open space, playing fields including secondary schools. SIL ₃ is the same as NEPC HIL C .
SIL ₄	Commercial or industrial. SIL ₄ is the same as NEPC HIL D .

For the assessment of petroleum hydrocarbon contamination, NSW DEC (2006) refer to the use of the *Guidelines for Assessing Service Station Sites*, which contain threshold concentrations for petroleum contaminants in soil and provide for the protection of human and environmental health assuming a sensitive (i.e. residential) land use.

Identified hydrocarbon concentrations will also be assessed against the CRC Care (2011) screening criteria. The criteria are based on potential risk via dermal contact and vapour risk in a range of soil types and depths.

The NSW DEC (2006) assessment process also stipulates that the impact of contaminants on ground and surface water, potential degradation of building structures and effects of chemical mixtures need to be considered and that SILs may not be appropriate for the protection of groundwater, surface water or all potential environmental concerns, such as the protection of wildlife.

4.1.1 Asbestos

Potential asbestos contamination will be assessed against the ACT EPA adopted Western Australian Department of Health (2009): *Guidelines for the Assessment Remediation and Management of Asbestos-Contaminated Sites in Western Australia*.

4.1.2 Aesthetic Conditions

Due to the potential offsite disposal and beneficial re-use of excavated materials originating from the Site, the aesthetic condition of soil material must be considered.

In the decision-making process for assessing urban sites, presented in NSW DEC (2006) and endorsed by the ACT EPA, the assessment of sites that are to be used for purposes other than commercial/industrial requires the consideration of aesthetic issues in the assessment of contamination.

Aesthetic issues include the presence of potential asbestos contaminated materials, the presence of anthropogenic waste materials, the generation of odours and any discolouration of and/or presence of inclusions in the soil as a result of contamination.

In accordance with the ACT EPA endorsed NSW DEC (2006) guidelines, consideration will be given to aesthetic issues such as potential asbestos, odour and discolouration during the investigation of soil across the Site.

Table 5 Soil Remediation Acceptance Criteria

Contaminant of Potential Concern (COPC)	Commercial / Industrial HIL D (mg/kg)	CRC Care Direct Contact HSL D (mg/kg)	CRC Care Vapour Intrusion (sand) 2-<4 m (mg/kg)	Adopted SAC (mg/kg)	Reference
MAHs					
Benzene	350	430	3	3	CRC Care Vapour Intrusion HSL-D
Toluene		99,000		99,000	CRC Care Direct Contact HSL-D
Ethylbenzene		27,000		27,000	CRC Care Direct Contact HSL-D
Xylene (Total)		81,000		81,000	CRC Care Direct Contact HSL-D
TRH					
C6-C10		26,000		26,000	CRC Care Direct Contact HSL-D
>C10-C16		20,000		20,000	CRC Care Direct Contact HSL-D
>C16-C34		27,000		27,000	CRC Care Direct Contact HSL-D
>C34-C40		38,000		38,000	CRC Care Direct Contact HSL-D
PAH/Phenols					
Naphthalene		11,000		11,000	CRC Care Direct Contact HSL-D
Total PAHs	4,000			4,000	NEPC 2013 HIL D
Phenols	240,000			240,000	NEPC 2013 HIL D
Pentachlorophenol	660				NEPC 2013 HIL D
Heavy metals					
Arsenic	3,000			3,000	NEPC 2013 HIL D
Cadmium	900			900	NEPC 2013 HIL D
Chromium					NEPC 2013 HIL D
Copper	240,000			240,000	NEPC 2013 HIL D

Contaminant of Potential Concern (COPC)	Commercial / Industrial HIL D (mg/kg)	CRC Care Direct Contact HSL D (mg/kg)	CRC Care Vapour Intrusion (sand) 2-<4 m (mg/kg)	Adopted SAC (mg/kg)	Reference
Lead	1,500	1,500		1500	NEPC 2013 HIL D
Mercury	730			730	NEPC 2013 HIL D
Nickel	6,000			6,000	NEPC 2013 HIL D
Zinc	400,000			400,000	NEPC 2013 HIL D
Asbestos					
Asbestos	Non Detect				NEPC 2013 HIL D

4.1.3 Waste Criteria

The current criteria used in the ACT to characterise waste materials for off-site disposal are provided in ACT EPA (2000), *Waste Classification Guidelines*.

The guidelines set different maximum total concentrations and leachable concentrations, for specific contaminants in order for waste to be classified as '**Inert, Solid or Industrial**'. This classification then affects the way in which the waste is handled and where the waste is able to be disposed.

For the purpose of characterising soil conditions at the Site for potential off-site disposal, soil analytical results, will be compared to in ACT EPA (2000) *Waste Classification Guidelines*.

It should be noted that approval from the ACT EPA will be obtained prior to any off-site disposal of waste.

5.0 Proposed Remediation Methodology

The proposed remedial and further investigation works at the Site will comprise the following tasks, which will be conducted in a staged approach.

5.1 Stage 1: Engagement of an Environmental Officer

A suitably qualified and experienced Environmental Officer (EO) is to be engaged to advise on and undertake all requirements specified within this RAP. The EO is to undertake at least the following:

- All remediation requirements specified within this RAP
- Make observations of the materials encountered and undertake sampling and analysis of soil/groundwater and soil vapour as deemed necessary
- Make an evaluation of potential risks to human health and the environment posed by the materials and ensure the risk to health and the environment are acceptable
- Provide guidance to assist with the appropriate re-use and/or disposal of material.

5.2 Stage 2: Environmental Controls

Prior to the commencement of works, the principal contractor is to develop an environmental management plan to manage all environmental issues associated with the proposed works.

The environmental controls to be implemented prior to commencement of remedial works should include, but are not limited to, the following:

- Sediment/erosion management
- Excavation water (groundwater and storm water runoff) management
- Stockpile management
- Material tracking and disposal
- Site access
- Noise, odour, dust, and vibration controls.

5.3 Stage 3: Service Location across the Site

A Telstra-accredited services locator will be required to locate underground services across the Site.

It is the recommendation of AECOM that relevant service providers attend the Site to determine the specific location of service lines and make recommendations regarding the suitability of the proposed excavation works.

5.4 Stage 4: Excavation and Removal of Underground Storage Tanks

Following service location, an excavator will be required to excavate around and then remove the 3 known USTs on the Site.

If the principal contractor deems the location of USTs too close to buildings for safe removal and building stability prior to or during excavations, the tanks may need to be decommissioned in-situ in accordance with Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation (2008).

The excavator will also be required to remove UST associated underground infrastructure including fuel lines and any aboveground infrastructure including fuel bowsers and fuel vents.

USTs are required to be removed and disposed of in accordance with the ACT EPA (2011) Guidelines for the assessment of service station facilities and the POEO (UPSS) Regulations (2008).

Any waste water/liquid products removed from Site should be disposed of to a licenced ACT waste facility and disposal dockets provided with a Validation Report for the Site.

The excavator will be required to excavate soils beneath the USTs to approximately 0.5 - 1 m vertically below the base of the tank pit and laterally to approximately 0.5 m, or to below/adjacent to the observable potential

contamination, which would be noted by the EO for visual indicators, olfactory indicators or photoionization detector (PID) measurements.

The excavator will be required to excavate soils beneath the fuel lines to approximately 0.5 m vertically and laterally below the base of the fuel lines or to below the observable potential contamination.

5.5 Stage 5: Excavation of Impacted Soils and Validation of Tank Pits

Following excavation works to remove the USTs and associated infrastructure, validation of the excavation boundary of each UST pit should be undertaken.

Validation samples should be collected from the base and walls of each excavation to ensure all residual impact has been appropriately removed.

Excavation sampling should be conducted in accordance with ACT EPA endorsed NSW EPA (1994) guidelines. In general samples should be collected at a rate of 1/10 m of linear tank pit wall and 1/5 m² of tank pit floor. Duplicate and triplicate samples should be collected as per regulatory guideline criteria requirements.

5.6 Stage 6: Sampling of Stockpiles

Samples should be collected from fill material or natural excavated soils proposed to be reused or disposed off-site, to validate suitability for use and/or disposal. Samples should be collected and analysed at rate of one per 25 m³ and analysed for TPH, BTEX, PAH, phenols, metals, VOC and asbestos. Where additional potential contamination is identified during excavation works consideration should be given to additional analysis.

If offsite disposal of excavated materials is required, this will be undertaken in accordance with the *Environmental Standards: Assessment & Classification of Liquid and Non-liquid Wastes* Guidelines (ACT EPA, 2000).

The materials will be assessed based on total concentrations of contaminants and toxicity characteristic leaching procedure (TCLP) results (as required).

The EO should prepare a Waste Classification Letter for any soils requiring offsite disposal. Prior to disposal to landfill, a letter addressed to the selected licensed landfill facility would be required, indicating the waste classification and volumes of the relevant excavated materials.

Disposal dockets from the landfill facility should be obtained and provided in a Validation Report as evidence of appropriate disposal.

5.7 Stage 7: Imported Fill Sampling

If imported fill is required at the Site for reinstatement of excavations, only certified Virgin Excavated Natural Material (VENM) should be imported onto the Site. The EO should also observe materials as they are imported and placed onsite.

If a VENM certificate is unavailable, samples of the imported fill should be collected at an approximate rate of one per 100 m³ and submitted for laboratory analysis for the following potential contaminants at a minimum:

- Heavy metals (Cu, Cr, As, Pb, Ni, Zn, Hg and Cd)
- TPH
- BTEX
- PAH
- Pesticides (OCPs/OPPs)
- Polychlorinated Bi-Phenyls
- Asbestos.

Further analysis may be required as determined by a qualified EO and approved by the EPA based on the current and historical uses of the VENM source site.

6.0 Environmental Management

The objective of environmental management is to ensure that all personnel involved in the project are aware of the potential environmental issues and activities associated with the works and that they have the necessary information to manage and minimise any resulting impacts.

The consultant should conduct its operations in an environmentally efficient and responsible manner, ensuring that all staff including sub-contractors are aware of their environmental responsibilities, minimise harm and handle all waste products in an environmentally responsible manner.

It should be noted that a detailed Environmental Management Plan is to be prepared for use during all site works.

The following sections outline required environmental controls during site remediation works only and does not constitute a site Environmental Management Plan.

6.1 Potential Environmental Impacts

Environmental controls should be implemented at the Site to address the following potential impacts (hazards) associated with the project:

- Noise and vibration
- Flora and fauna
- Water quality
- Contamination
- Waste
- Air quality, including odour and dust
- Surface water and off-site waters protection
- Public road maintenance
- Security
- Traffic impacts and management, both on and off-site around the Site entry and exit points.

The EO should ensure that environmental controls are in place to alleviate potential environmental impacts. The environmental controls and management should be documented in an Environment Management Plan (EMP).

AECOM recommends that daily inspections of environmental control measures occur by the EO at the commencement of each day and at the end of the work day to ensure that systems and structures are in place.

6.2 Management of Unexpected Finds

In the event that other in-ground features are identified and are considered to represent potential contamination sources (e.g. USTs, drums, asbestos, unusual wastes etc.), the following protocol should be adopted:

- All excavation works will cease, the nominated Site manager/principal contractor and/or the EO should be contacted and the area of concern should be appropriately barricaded
- If required, appropriate sampling and analysis should be undertaken by the EO
- The requirement for additional remediation works should be assessed by the EO and undertaken as required
- The above works should be documented in a validation report.

Occupational Health & Safety (OH&S) and environmental protection requirements may need to be reviewed, depending on the type of unexpected finds encountered.

6.3 Landfill Disposal

The requirements of the *ACT's Assessment & Classification of Liquid & Non-liquid Wastes* (ACT EPA, 2000) would apply. After appropriate characterisation sampling and analysis, the process steps would involve:

- The EO gaining approval from the ACT EPA. This would require a written application to the Landfill facility, including an assessment of the ACT EPA (2000) waste classification and an estimate of the anticipated volume of material proposed for disposal
- Once Landfill approval is gained, excavated materials can be transported to the nominated facility. In the event that the material is classified as Hazardous Waste or Restricted Solid Waste (RSW), a licensed transporter would be required, and a NSW landfill would be used to dispose the waste, as the ACT currently has no landfills licensed to accept Hazardous or RSW.

Tracking and record keeping of materials disposed to landfill must be 'cradle-to-grave'. The contractor must dispose of the material to the nominated landfill and must retain all weighbridge dockets to validate that materials were disposed appropriately.

6.4 Excavation Backfilling

6.4.1 Excavation Backfilling with Site Derived Stockpiled Materials

Where analysis results indicate that stockpiled materials are suitable for re-use on site, the materials can be used for excavation backfilling purposes.

All material should be placed and compacted in accordance with relevant standards.

6.4.2 Excavation Backfilling with Imported Fill Material

Where there is insufficient site material, fill materials may be required to replace the volume of the removed USTs and fuel lines. The following strategy should be adopted:

- The excavations should only be backfilled with certified VENM material (refer to **Section 5.7**)
- An inspection of the VENM source would be required. Sampling and analysis of the VENM at the source and the destination (Site) would be required
- The VENM should be sampled at an approximate rate of one sample per 100 m³ and analytes assessed as per **Section 5.7**. Additional analysis may be required depending on the historical/current use of the VENM source site
- All material imported to the site must be approved by the ACT EPA.

6.5 Remediation Contingency Plan

As variable sub-surface conditions impose a degree of uncertainty for the project, a set of anticipated conditions has been assumed in developing this RAP.

However, because field conditions may vary, flexibility has been built into the programme to adapt to differing conditions or in the event of unforeseen circumstances

6.5.1 Environmental Control Contingencies

Examples of environmental control contingencies are provided in **Table 6** below.

Table 6 Environmental Control Contingency Examples

Potential Problem	Corrective Action By Contractor
Chemical spill / exposure	Stop work, refer to Environment Management Plan (EMP) and Occupational Health & Safety (OH&S) Plan and immediately contact the Site Manager.
Excessive rain	Cover working areas/stockpiles not located under cover with plastic during off-shifts. Inspect and maintain sediment controls and filter fences.
Excessive noise	Identify source and review noise attenuation equipment and as necessary provide silencers on noisy equipment.
Excessive drainage	Minimise active/contaminated work area; or improve diversion of clean run-on; or maintain sufficient onsite wastewater storage capacity; or mobilise additional storage and/or treatment systems as needed.
Excessive dust	Use water sprays or biodegradable dust sprays, or cease dust-generating activity until better dust control can be achieved, or apply interim capping systems. If necessary, install dust deposition gauges prior to and during works to monitor the effectiveness of dust controls implemented on site.
Excessively wet materials	Stockpile and dewater onsite or add absorbents.
Equipment failures	Maintain spare equipment or parts; or maintain alternate rental options; or shut down affected operations until repairs are made.
Release of fuel/oil from machinery	Remove source, use absorbent booms to remove fuel/oil and make any repairs as required. Any spillages to be tested by the environmental consultant, who will recommend any remediation requirements.
Silt fence fails	Stop work and repair fence to specifications.

In the event that unexpected finds of contamination (including the depth is greater than envisaged) or items such as drums, additional USTs, asbestos pipes or waste, stained or odorous soils, etc. are encountered, the following protocol would be adopted:

- 1 All excavation works would cease and the AECOM Project Manager should be contacted
- 2 The area of concern should be appropriately barricaded
- 3 The nature of the contamination should be visually characterised and, if required, appropriate sampling and analysis completed by the environmental scientist
- 4 The requirement for any additional remediation works should be assessed
- 5 The above works should be documented in a Validation Report.

OH&S and environmental protection requirements may need to be reviewed, depending on the type of the unexpected finds encountered. Potential supplementary measures may include, but are not limited to:

- Upgrade of PPE, for workers within the active work zone, in accordance with the OH&S Plan
- Segregation and bunding of discovered material
- Use of odour suppressants (where appropriate)
- Cover the discovered material with plastic sheeting
- Appropriate sampling and analysis to assess potential contaminants

- Appropriate treatment and/or disposal of the materials following receipt of analytical results and any associated regulatory approvals required.

6.5.2 Remediation Contingencies

Should an increase in observed hydrocarbon concentrations or offsite migration of contamination within observed groundwater conditions indicate that an unacceptable risk exists to offsite receptors then the following must be undertaken:

- Notify the ACT EPA and EPA accredited contaminated land site auditor of the anticipated risk
- Provide written review of groundwater monitoring results and assessment of implications of elevated groundwater concentrations to the EPA
- Provide a proposal, to the EPA, outlining the actions to be undertaken as part of the contingency plan, which is prepared by an environmental consultant, in consultation with the site owner and the EPA accredited contaminated land site auditor
- Undertake contingency plan actions, as agreed with the EPA.

The groundwater contingency actions may include the following:

- Additional quantitative assessment of the risks posed by any potential trigger-level exceedances; or
- Review of practicable groundwater control / remediation measures.

7.0 Validation Plan

This section provides a description of the validation methodology to be adopted by the EO during remediation works. The information presented herein is of a summary nature only.

7.1 Project Team

The Project team must be from a suitably qualified environmental consultant with experience working on contaminated sites and trained in the requirements of this RAP.

Decisions related to validation shall be made in accordance with relevant guidelines endorsed by the ACT EPA.

7.2 Quality Assurance / Quality Control

The EO will adopt the Data Quality Objectives (DQO) process, which has been developed, based on the iterative DQO process developed by the USEPA (2000) Guidance for the Data Quality Objectives Process – EPA QA/G-4 and stated in the Australian Guidelines AS 4482.1 (2005).

The guidelines incorporate field quality control and laboratory analysis, methods and information on laboratory quality control data and shall be used to validate the field and analytical data for the validation works. Assessment of the achievement of the DQOs shall be undertaken through reference to the Data Quality Indicators (DQIs) of completeness, comparability, representativeness, precision and accuracy.

Components of the DQO process are briefly presented in the following sections.

7.2.1 Sampling Methodology

Field procedures shall be undertaken with reference to:

- 2013 ASC NEPC (1999) - National Environment Protection Measure (NEPM) for the Assessment of Site Contamination, Guideline 2, "*Data Collection, Sample Design and Reporting*", December 1999
- ANZECC (2000) - Australian and New Zealand Environment and Conservation Council and National Health and Medical Research Council (ANZECC/NHMRC), "*Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*", October 2000.

The general soil sampling strategy would be as follows:

- All soil samples shall be collected into laboratory prepared and supplied glass jars with Teflon lined lids. The sampling locations shall be accurately recorded. Sample depths shall be recorded by tape measure

- Screening of the vapour headspace of soil samples for volatile organic compounds (VOCs) shall be undertaken in the field using a photoionisation detector (PID). Observations of odours, staining and other unusual conditions shall be made. Sample collection shall be biased towards detecting contamination
- All samples shall be collected using decontaminated equipment and a new pair of nitrile gloves
- Samples for analysis for organic compounds shall be placed on ice
- All samples shall be forwarded to an analytical laboratory for analysis under chain-of-custody protocols.

7.2.2 Field and Laboratory QA/QC

Collection of field quality control samples shall include:

- Blind duplicate soil samples (intra-laboratory) shall be analysed at a rate of 1 per 10 primary samples;
- Split duplicate samples (inter-laboratory) shall be analysed at a rate of 1 per 20 primary samples; and
- Where required, rinsate or equipment blank samples shall be collected and analysed at a rate of 1 sample per day of sampling activities.
- The PID shall be calibrated prior to the start of field activities and daily during field activities. Calibration records will be provided in the Validation Report.

Laboratory QA/QC procedures shall comprise the following at a minimum:

- Laboratory Duplicate Samples: at least one per batch (where the batch exceeds five samples);
- Matrix Spiked Samples: at a rate of approximately 5% of all analyses. At least one per batch shall be reported;
- Laboratory Blanks: at least one per batch and one per analyte;
- Laboratory Control Samples: analysed at a rate of at least one per process batch, and typically at a rate of 5% of analyses; and
- Surrogates: at least one per sample.

7.2.3 Laboratory Analyses

All laboratory analyses shall be conducted by laboratories using methods accredited by the National Association of Testing Authorities, that adhere to the international standard methods referred in the ANZECC (1996) guidelines and NEPM (1999) Schedule B(3).

7.2.4 Decision Rules

To evaluate the sample analysis data, the following decision rules shall be applied:

- Sampling locations are to be recorded by survey or measurement to known, fixed reference points;
- Comparison of the soil sample analysis results to the RAC;
- Qualitative assessment of potential risk associated with 'elevated' result(s);
- If required, assessment of data through checking that each individual sample concentration does not exceed the RAC by more than 250%;
- Calculation of the Upper Confidence Limit (UCL) on the average concentrations (of the relevant contaminant(s)) at a confidence level of 95 % (95 % UCL_{average}). This would include excavation and stockpile samples. If required, calculation of the standard deviation of the data. The standard deviation should be less than 50% of the RAC;
- Assessment of the sampling results for soil/waste to be disposed off-site in accordance with the *ACT's Assessment & Classification of Liquid & Non-liquid Wastes* (ACT EPA, 2000); and
- Assessment of the reliability of both the field and laboratory programs by reference to DQIs.

Where data indicates that unacceptable concentrations of chemical contaminants remain, the excavation and stockpiling process shall be required at the relevant location(s).

7.3 Sampling & Analysis Rates

Validation samples should be collected at the rates specified within Section 5.0

7.4 Validation Reporting

A Validation Report shall be prepared by the EO on completion of remediation works. The report shall contain an overview of the remediation activities conducted and details of the following:

- Volumes of excavated material and location of excavations/stockpiles;
- Tracking of materials disposed off-site or relocated to other parts of the Site;
- Volumes of soil reinstated into excavations;
- Validation field methods;
- Plan of sampling locations;
- Site photographs;
- Analytical results of validation and characterisation soil samples and QA/QC;
- Analytical results of collected groundwater samples; and QA/QC; and
- A conclusion regarding the completeness of remediation and the suitability of the Site for the proposed land use.

Supporting factual evidence shall be included in the report. This shall include NATA 'stamped' laboratory analysis certificates, landfill disposal certificates, VENM certificates (if required), interpretative summary tables and an overview of the works carried out during the remediation process. The report shall include an assessment of all results and evaluation of the suitability of the Site for the proposed land use.

The Validation Report shall be prepared in accordance with the relevant ACT EPA endorsed guideline documents, and submitted to the ACT EPA and Site Auditor as soon as practicable after completion of the works.

8.0 Conclusions

This RAP was compiled to provide the remedial strategy detailing the excavation, soil stockpiling, transport, validation and occupational health and safety and environmental management strategies associated with the remediation works for the partial validation area of the West Belconnen Fire Station.

AECOM considers that if the remediation and management works proposed within this RAP are successfully undertaken in accordance with this RAP, the onsite fuel storage and dispensing infrastructure and potentially contaminated soils will be removed and validated in accordance with ACT EPA requirements.

It should be noted that these works do not provide an overall assessment of the Suitability of the site and only relate to the onsite fuel storage and dispensing area.

9.0 References

ACT EPA, 2000. *Waste Classification Guidelines*.

ACT EPA, 2011. *Environmental Guidelines for Service Station Site and Hydrocarbon Storage*.

ACT EPA, 2009. *Contaminated Sites Environmental Protection Policy*.

ACT EPA, 2008. *Practice Note 3 – Contaminated Soils*.

ACT EPA, 2008. *Practice Note 4 – Contaminated Sites*.

ANZECC and ARMCANZ, 2000. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australian and New Zealand Environment and Conservation Council and Agriculture and Resourced Management Council of Australia and New Zealand.

ANZECC and ARMCANZ, 2000. Australian and New Zealand Environment and Conservation Council and Agriculture and Resource Management Council of Australia and New Zealand. *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*.— Aquatic Ecosystems 95% Protection of Species Trigger Values for Fresh Water.

ANZECC/NHMRC, 1992. *Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites*. Australian and New Zealand Environment and Conservation Council and National Health and Medical Research Council.

Australian Standard AS 4482.1-1997. *Guide to sampling and investigation of potentially contaminated soil: Part 2: Non-volatile and semi-volatile substances*. Standards Australia.

Australian Standard AS 4482.1-1999. *Guide to sampling and investigation of potentially contaminated soil: Part 2: Volatile substances*. Standards Australia.

NEPC 1999c. *Guideline on Laboratory Analysis of Potentially Contaminated Soils. Schedule B(3). National Environmental Protection Measure*. National Environmental Protection Council.

NEPC, 1999a. *Guideline on the Investigation Levels for Soil and Groundwater. Schedule B(1). National Environmental Protection Measure*. National Environmental Protection Council.

NEPC, 1999b. *Guideline on Data Collection, Sample Design and Reporting. Schedule B(2). National Environmental Protection Measure*. National Environmental Protection Council.

NEPC, 1999d. *Guideline on Health Risk Assessment Methodology. Schedule B(4). National Environmental Protection Measure*. National Environmental Protection Council.

NEPC, 1999. *National Environment Protection (Assessment of Site Contamination) Measure (NEPM)*. National Environment Protection Council.

NSW DEC, 2006. *Guidelines for the NSW Site Auditor Scheme (2nd edition)*. NSW Department of Environment and Conservation.

NSW DEC, 2007. *Guidelines for the Assessment and Management of Groundwater Contamination*. NSW Department of Environment and Conservation.

NSW EPA, 1994. *Contaminated Sites: Guidelines for Assessing Service Station Sites*. NSW Environment Protection Authority.

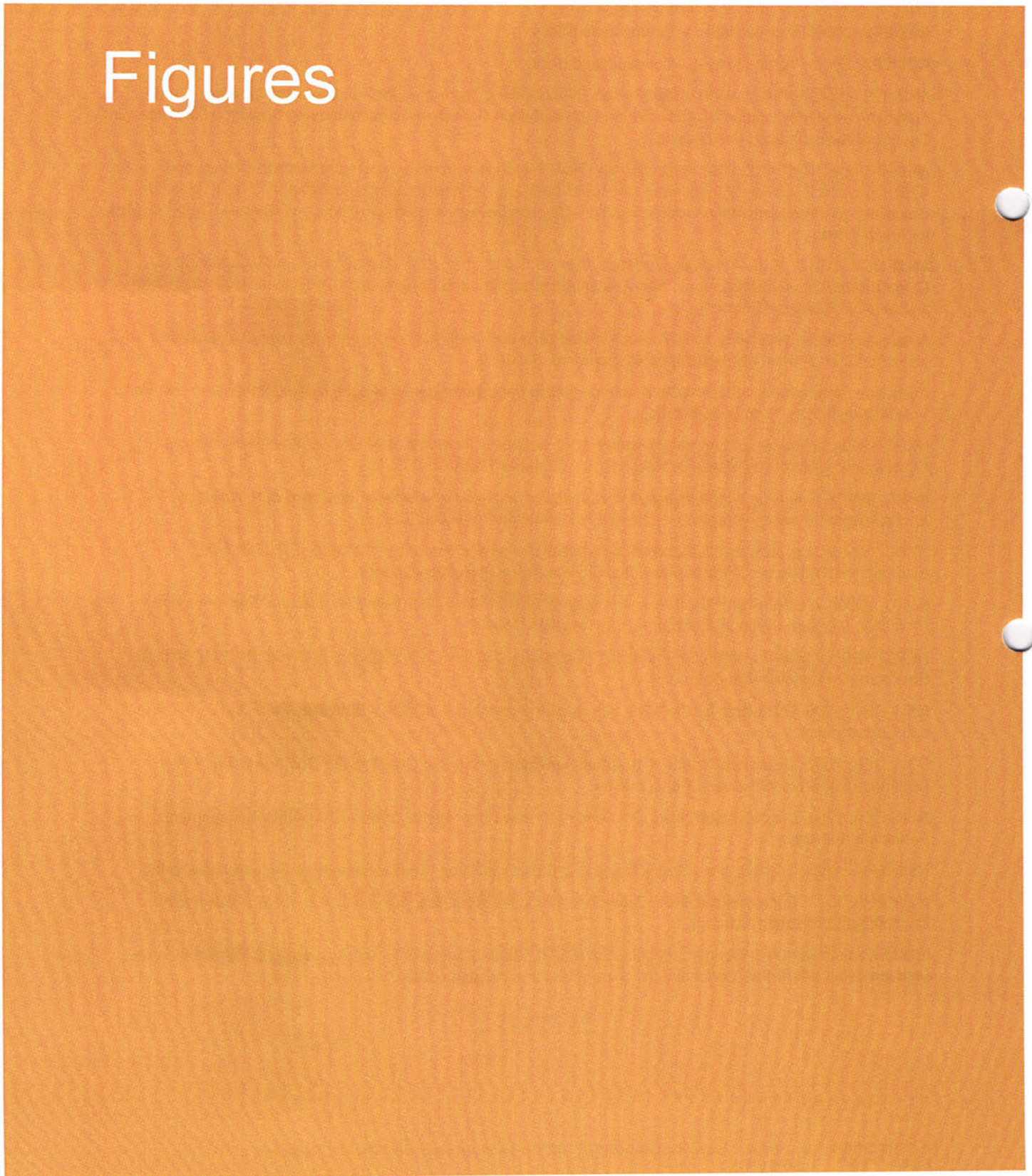
NSW EPA, 1995. *Contaminated Sites: Sampling Design Guidelines*. NSW Environment Protection Authority.

NSW EPA, 1997. *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites*. NSW Environment Protection Authority.

Western Australian (WA) Department of Health (DOH), 2009. *Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia*. May 2009.

Appendix A

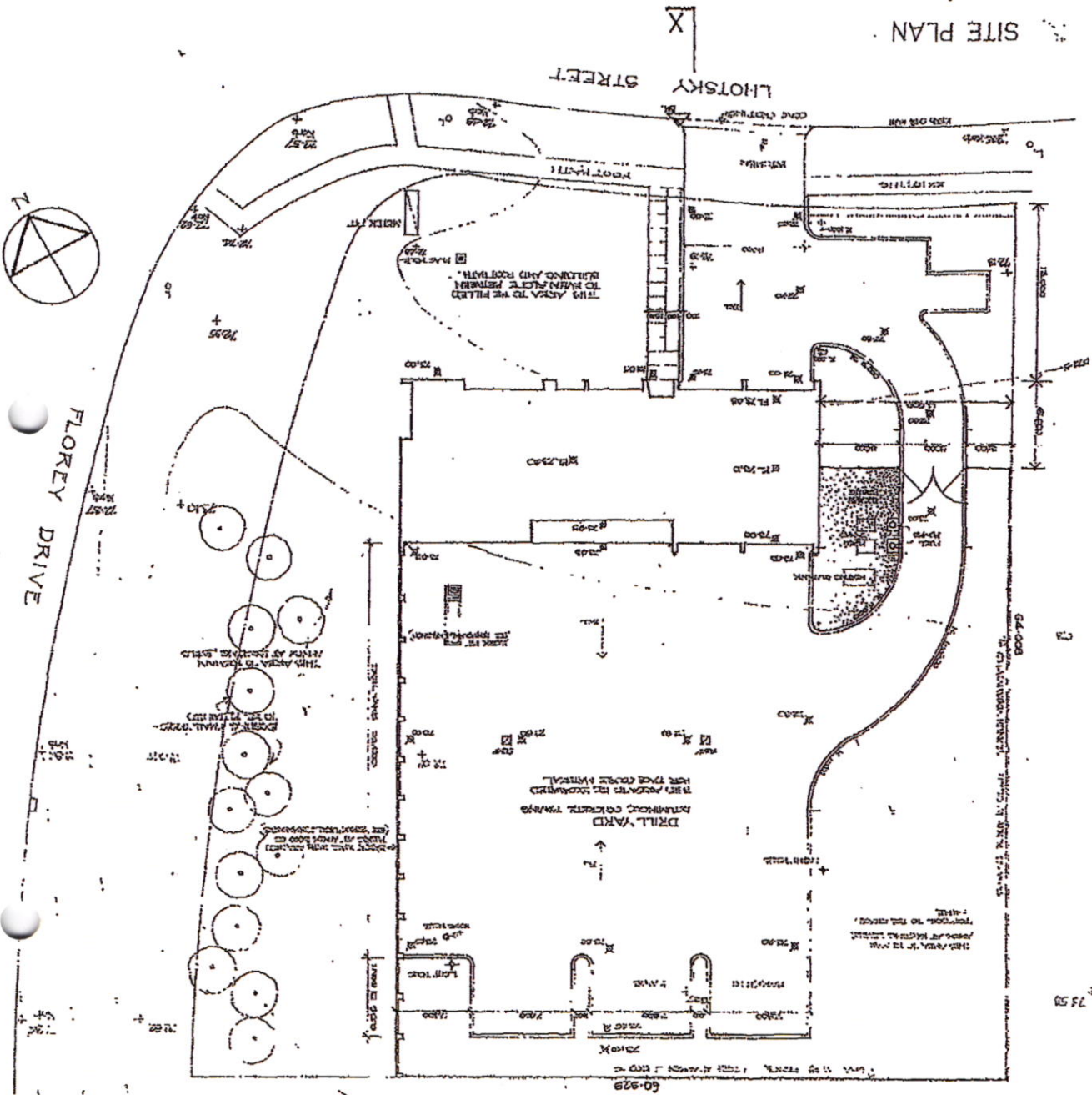
Figures



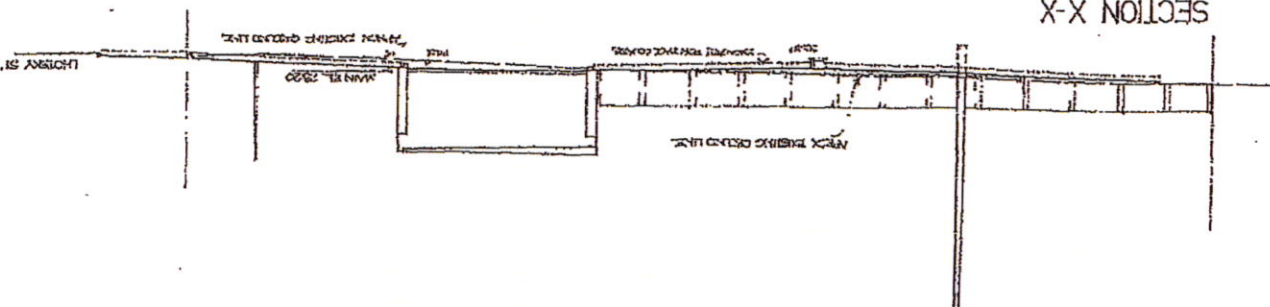
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SITE PLAN



SECTION X-X





AECOM Australia Pty Ltd (2014b) *JACSD Charnwood, Stage 1 Environmental Assessment*, issued 18 November 2014.



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MINUTE

SUBJECT: Development Application 201731430-22-97-CHARNWOOD-03

To: Conrad Barr, Executive Director Health Protection Service
From: Radomir Krsteski, A/g Manager Environmental Health
Date: June 2017

Purpose

To provide you with a response to Environment and Planning Directorate (EPD) following their request for comment regarding a development application for a proposed childcare centre in Charnwood.

Background

1. EPD has requested that comments are received by 2 June 2017.
2. The development application proposes:
 - a. demolition of an existing building
 - b. construction of a single storey, 1217 square meter childcare centre
 - c. construction of 1157 square meter playground, site works and fencing
3. The site is located within the CZF – Community Facility Zone - Block 22 Section 97, Charnwood, with an approximate land area of 3601 square meters.

Issues

4. The development proposes construction of a kitchen to serve the childcare centre. The applicant is required to submit a food business registration and fit-out assessment application (with suitably detailed plans) to the Health Protection Service (HPS) for the food business prior to construction. The applicant is advised to contact the HPS for further information.
5. A report titled "Block 6, Section 97 Charnwood, ACT – Summary of Previous Investigations and Site Suitability Status" (Summary Report) dated 17 July 2015 by AECOM Australia Pty Ltd was supplied and an endorsement provided by the Environment Protection Authority (EPA). Information regarding the results of the perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid (PFAS) analysis is not clearly stated in the Summary Report. The HPS will seek further information regarding the results of the PFAS and PFOA analysis of soil.
6. The HPS supports the Environment Protection Authority's (EPA) endorsement of the report conducted by AECOM Australia Pty Ltd, but would seek further information regarding the results of the PFAS and PFOA analysis of soil.

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7. HPS also supports the EPA's recommendation that a site specific unexpected finds protocol be developed by a suitably qualified environmental consultant and implemented during development works at the site.
8. There are no other public health concerns in relation to the proposed development.

Recommendation

9. It is recommended that you sign the letter at Attachment A to EPD.

AGREED/NOT AGREED/NOTED/PLEASE DISCUSS



Conrad Barr
Executive Director, Health Protection Service
June 2017

Radomir Krsteski
A/g Manager, Environmental Health
June 2017

Action Officer: Keith Rogers
Extension: 51716



EPDcustomerservices@act.gov.au

Referral-Health-Development Application – 201731430-22-97-CHARNWOOD-03

Dear Sir/Madam,

Thank you for the documentation received on 12 May 2017 regarding a proposed childcare centre in Charnwood.

The Health Protection Service (HPS) notes that the proposed development will include:

- a. demolition of an existing building
- b. construction of a single storey, 1217 square meter childcare centre
- c. construction of 1157 square meter playground, site works and fencing.

The development proposes construction of a kitchen. The applicant is required to submit a food business registration and fit-out assessment application (with suitably detailed plans) to the HPS for the food business prior to construction. The applicant is advised to contact the HPS for further information.

The HPS supports the Environment Protection Authority's (EPA) endorsement of the report conducted by AECOM Australia Pty Ltd, but seeks further information regarding the results of the perfluorooctane sulphonate and perfluorooctanoic acid analysis of soil.

HPS also supports the EPA's recommendation that a site specific unexpected finds protocol be developed by a suitably qualified environmental consultant and implemented during development works at the site.

There are no other public health concerns in relation to the proposed development.

Please contact Faith Bvirakare on (02) 62059616 if you require any further information.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Conrad Barr'.

Conrad Barr
Executive Director
Health Protection Service

2 June 2017

Moroney, Rebecca (Health)

From: Krsteski, Radomir (Health)
Sent: Monday, 17 July 2017 5:54 PM
To: Walters, Daniel; Mcinnes, Alison
Cc: Jones, Greg; Barr, Conrad (Health); Chester, Heath; Clapham, David; Brown, Mark
Subject: RE: Agenda item 4 - Brief - Daniel.doc [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Thanks Daniel,

I have had a quick look and have just one comment, do want to be less specific in relation to PFAS at Belconnen Fire Fighting training facilities and more general i.e. at ACT Fire Fighting facilities, PFAS has come up in an DA for old Charnwood fire station.

Other than that, I am happy supporting this paper.

Cheers
 Rad



Radomir Krsteski

A/g Manager | Environmental Health
 Health Protection Service | Population Health | ACT Health
 25 Mulley Street Holder ACT | Locked Bag 5005 Weston Creek ACT 2611
 T 02 62050956 | M Mobile [REDACTED] | E radomir.krsteski@act.gov.au | Website |

From: Walters, Daniel
Sent: Monday, 17 July 2017 2:43 PM
To: Mcinnes, Alison
Cc: Jones, Greg; Barr, Conrad (Health); Krsteski, Radomir (Health); Chester, Heath; Clapham, David; Brown, Mark
Subject: Agenda item 4 - Brief - Daniel.doc [SEC=UNCLASSIFIED, DLM=For-Official-Use-Only]

Hi Alison

Please see PFAS Brief for AGMIN attached for clearance.

I've included details of matters to be included in upcoming MEM on 28 July and work COAG is undertaking in this space as well.

I haven't had a chance to check with other directorates but have cc'd relevant officers in, in case I've missed something.

Regards

Daniel

Agenda Item 4: Per- and Poly-fluoroalkyl Substances (PFAS)

Proposed ACT Position: That the ACT supports the recommendations of this agenda item.

Background:

- Per- and poly-fluoroalkyl substances (PFAS) contamination originating from fire-fighting foams continues to be a source of public concern. There are currently 123 potentially contaminated sites on Commonwealth land (primarily Defence and airport sites). Other contaminated sites include fire fighting agency premises in Victoria, NSW and Qld, and a spill from a QANTAS facility at Brisbane Airport.
- On 4 May 2017, AGSOC agreed to support effective collaboration between jurisdictions and the Commonwealth, to ensure a consistent response across Australia, including sharing information, data and key messages on PFAS contamination. The Commonwealth considers this essential to effectively address community concerns and avoid potential market access issues for Australian produce.
- The agenda paper describes Australian Government activities to address PFAS contamination issues.
- A cross-agency taskforce has been established to oversee the Commonwealth response, provide strategic communications, develop a nationally consistent approach to managing PFAS contamination through COAG, and consider options for improving coordination and collaboration of efforts at local, regional and state/territory levels.
- A Food Standards Australia New Zealand (FSANZ) report released on 3 April 2017 confirmed there is no consistent evidence that exposure to PFAS is harmful to human health and FSANZ has recommended new tolerable daily intake (TDI) values for use in site investigations. The TDIs are a precautionary measure pending further research.
- FSANZ has not recommended a regulatory approach or Maximum Levels of PFAS for food consumption due to lack of available data or evidence of health effects. FSANZ recommends trigger points be employed by state and territory agencies analysing PFAS in foods to identify when further investigation is required. People living in affected communities are advised to follow state and territory authority recommendations.
- Currently there are no impacts on agricultural export trade and no trading partner has expressed concern about PFAS contamination in Australian products. The Australian Government Department of Agriculture and Water Resources is monitoring potential implications for export markets.
- AGMIN members are asked to note these issues.

Issues for the ACT:

- The Senior Manager, Environment Protection Policy, EPSDD supports the recommendations of this agenda item.
- PFAS-containing fire retardant foams are no longer used in the ACT by ACT fire-fighting agencies.

- Contamination from historic fire fighting foam use has been identified in soil and groundwater at the Canberra Airport and Belconnen Fire Training Facilities.
- No off-site impacts have been reported by the Airport or are evident from the Belconnen site, and groundwater in both areas is not utilised for drinking or agricultural purposes.
- The ACT Emergency Services Agency in consultation with Access Canberra is undertaking an assessment of other potentially contaminated sites in the ACT. ~~To complement this assessment Access Canberra has undertake preliminary sampling of ACT waterways with no detectable impacts identified.~~
- On- and off-site ground and surface water impacts from the Defence facilities at Jervis Bay (ACT Territory) have been identified and are being managed by the Commonwealth in consultation with ACT Health and Access Canberra. A detailed sampling and analysis plan has been developed and is in the process of being implemented to determine the nature and extent of on and off site impacts. The Wreck Bay aboriginal community is being consulted on the assessment.
- Environment Protection Policy supports a coordinated response on this issue across health, environment, food and agriculture ministerial portfolios and forums in all jurisdictions.
- The Senior Manager, Environment Protection Policy, is the ACT member of the National Chemicals Working Group under the Heads of Environment Protection Authorities (HEPA) Forum, which has been tasked with developing a PFAS national management plan (NMP).
- A working draft of the PFAS NMP prepared by Victoria and the Commonwealth in consultation with the working group, was agreed by HEPA at their sixth meeting on 26 April 2017.
- The PFAS NMP will not replace Australian-derived guideline levels for the protection of human health, or duplicate the guidance provided in this area by public health agencies in Australia.
- A draft Stakeholder Engagement Plan for the PFAS NMP Consultation Draft has been prepared. This draft outlines the approach that will be taken for consistent whole-of-government stakeholder engagement, and how formal feedback will be sought from key stakeholders and the wider community.
- A PFAS NMP Consultation Draft and draft Stakeholder Engagement Plan have been prepared and will be presented to Meeting of Environment Ministers (MEM) for noting at their meeting on 28 July 2017.
- The identified stakeholders to be engaged in the agriculture sector include SAFEMEAT and the National Farmers Federation.
- In June 2017, COAG Senior Officials agreed to develop a National Framework for responding to PFAS contamination. This agreement was accepted at the COAG meeting. The proposed framework is intended to bring together a number of pieces of work currently underway across the Commonwealth and states, including the National Management Plan under HEPA and associated work by MEM. Although this decision was not referenced in the published COAG Communique, it is expected to appear in the final record of the meeting.
- COAG Senior official will meet in Brisbane on 26-27 July 2017 to workshop the National Framework.

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The Senior Manager, Environment Protection Policy, is a member of the recently formed National Chemicals Working Group under the Heads of Environment Protection Authorities (HEPA) Forum, which has been tasked with developing a PFAS management plan. A National Summit was held in Melbourne on 4-6 April to develop the plan. The outcomes and next steps from the Summit are currently being considered by HEPA and will be transmitted to Senior Official Group and Meeting of Environment Ministers on 31 May and 30 June respectively for their consideration.

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Financial Implications:

- There are no immediate financial implications for the ACT in supporting this agenda item. However it should be noted that HEPA members and the Commonwealth agreed at the recent HEPA meeting to provide funding of \$250,000 for further development of the PFAS management plan. It was also agreed that cost be shared on the NEPC funding model, where ACT's contribution is 0.8% (\$2,000).

Contact Daniel Walters**Telephone** 6207 6334

Johnston, Vanessa (Health)

From: Johnston, Vanessa (Health)
Sent: Thursday, 20 July 2017 10:14 AM
To: Rogers, Keith (Health); Farrant, Adrian (Health)
Subject: FW: Block 22 Section 97 Charnwood [SEC=UNCLASSIFIED]

Hi Keith and Adrian,

I found the relevant environmental health risk assessment report towards the end of the very large document linked to below.

Regards,
 Vanessa

From: Rogers, Keith (Health)
Sent: Tuesday, 18 July 2017 5:02 PM
To: Johnston, Vanessa (Health)
Subject: FW: Block 22 Section 97 Charnwood [SEC=UNCLASSIFIED]

Hi Vanessa,

Due to the size of the document I cannot send it to you, however it is saved in our folder if you have access:

<file:///G:\HPS\P&EHS\Operations\3%20-%20Environment\3%20-%20Development%20Applications\2017\201731430-22-97-CHARWOOD-01\Original%20DA\Stage%201%20SIR%20Report%20Template%20Block%2022%20Section%2097%20Charnwood%20OVERC.pdf>

Otherwise the dropbox link and email below is where it comes from.

Cheers,



ACT
 Government
 Health



Care Excellence Collaboration Integrity

Keith Rogers

Senior Public Health Officer | Environmental Health

Health Protection Service | Population Health Protection and Prevention | ACT Health

25 Mulley Street Holder ACT | Locked Bag 5005 Weston Creek ACT 2611

T 02 6205 1716 |  | E keith.rogers@act.gov.au | www.health.act.gov.au | 

From: Zamora-Pullin, Joshua
Sent: Monday, 10 July 2017 2:51 PM
To: Rogers, Keith (Health)
Cc: Pooley, John
Subject: RE: Block 22 Section 97 Charnwood [SEC=UNCLASSIFIED]

Afternoon Keith,

Please see a link to the Dropbox, the results you are looking for are located in attachment E and F, there is also an EPA endorsement summary located in attachment K.

<https://www.dropbox.com/sh/twcbezoom3yjo4e/AACjiDeIH977xJA-3HdINfgFa?dl=0>

any questions, or if the link doesn't work let me know and I'll arrange to have a USB delivered to you.

Kind Regards

Josh Zamora-Pullin

Project Officer

T: 02 6207 1749

Suburban Land Agency | ACT Government

TransACT House, 470 Northbourne Avenue, Dickson ACT 2602 | GPO Box 158 Canberra ACT 2601

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From: Pooley, John

Sent: Monday, 10 July 2017 2:05 PM

To: Zamora-Pullin, Joshua; Rogers, Keith (Health)

Subject: RE: Block 22 Section 97 Charnwood [SEC=UNCLASSIFIED]

Mate

Can you please send all the reports to Keith below for his information.

JP

John Pooley

Development Director - Urban Projects

T: 02 6205 7073 | M: [REDACTED]

Suburban Land Agency | ACT Government

TransACT House, 470 Northbourne Avenue, Dickson ACT 2602 | GPO Box 158 Canberra ACT 2601

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From: Rogers, Keith (Health)

Sent: Monday, 10 July 2017 11:00 AM

To: suburbanland

Subject: RE: Block 22 Section 97 Charnwood [SEC=UNCLASSIFIED]

Hi there,

I called in search for any soil test documentation that Suburban Land / LDA may have in relation to this block.

Soil tests were carried out between 2014 and 2015 and a Development Application lodged this year (DA201731430) advised that LDA had the sample results.

Our response to the applicant will be determined by such results so your assistance would be greatly appreciated.

Regards,




Keith Rogers

A/ Team Leader | Environmental Health

Health Protection Service | Population Health Protection and Prevention | ACT Health

25 Mulley Street Holder ACT | Locked Bag 5005 Weston Creek ACT 2611

T 02 6205 1716 | M [REDACTED] | E keith.rogers@act.gov.au | www.health.act.gov.au | 



STAGE 1 SITE INVESTIGATION REPORT

FOR

BLOCK 22 SECTION 97 CHARNWOOD

SEPTEMBER 2016

PROJECT TITLE: <i>Block 22 Section 97 Charnwood</i>			
PROJECT NUMBER: <i>C14064</i>			
Prepared by:	██████████	<i>September 2016</i>	
Reviewed by:	██████████	<i>September 2016</i>	
Approved by:	██████████	<i>September 2016</i>	

REVISION CONTROL			
Document	Issue Date	Recipient	Details
<i>Block 6 Section 97 Charnwood Belconnen SIR</i>	<i>July 2016</i>	<i>LDA</i>	
<i>Block 6 Section 97 Charnwood Belconnen SIR</i>	<i>August 2016</i>	<i>LDA</i>	
<i>Block 6 Section 97 Charnwood Belconnen SIR – Ver B</i>	<i>September 2016</i>	<i>LDA</i>	<i>Proposed path removed as per TCCS comments.</i>
<i>Block 22 Section 97 Charnwood Belconnen SIR – Ver C</i>	<i>September 2016</i>	<i>LDA</i>	<i>Block number updated from 6 to 22</i>

LDA TEMPLATE Version B – Stage 1 Site Investigation Report

DISCLAIMER

This report has been prepared by Calibre Consulting for information purposes only.

Buyers are required to undertake their own assessments of the site prior to forwarding a Development Application with the Environment & Planning Directorate.

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**ATTACHMENTS**

Attachment A	<i>Drawings</i>
Attachment B	<i>Site Photos</i>
Attachment C	<i>Agency / Authority Correspondence</i>
Attachment D	<i>Tree Assessment Report (Redbox Design Group, June 2014)</i>
Attachment E	<i>Preliminary Geotechnical Investigation (Douglas Partners, June 2014)</i>
Attachment F	<i>Preliminary Environmental Assessment</i>
Attachment G	<i>Cost Estimate Breakdown</i>
Attachment H	<i>Building Dilapidation Report (Tony Gray Building Services, February 2016)</i>
Attachment I	<i>Earth Mat Performance Study Eagle Electromagnetic Design Services (July 2016)</i>
Attachment J	<i>Traffic Report (AECOM, March 2016)</i>
Attachment K	<i>EPA Endorsement of Summary Report (EPA, August 2015)</i>
Attachment L	<i>Block 6 Section 97 Survey (ACT Survey, June 2014)</i>

EXECUTIVE SUMMARY

Please note; Block 22 Section 97 was previously identified Block 6 Section 97, any reference made to Block 6 Section 97 in the SIR or appendices is referring to Block 22 Section 97.

Calibre Consulting has been engaged by the Land Development Agency (LDA) to prepare a Site Investigation Report (SIR). The SIR provides a summary of the key planning framework and investigations undertaken for the Block 22 Section 97 Charnwood development (the site). The site is a former Fire Brigade Depot and is zoned under the ACT Government Territory Plan as CF: Community Facilities. The SIR provides a summary of the investigations below:

- Tree Assessment Report (Redbox Design Group, June 2014)
- Preliminary Geotechnical Investigation (Douglas Partners, June 2014)
- Building Dilapidation Report (Tony Gray Building Services, February 2016)
- Preliminary Environmental Assessments:
 - Hazardous Materials Register and Management Plan, Charnwood Fire Station, 35 Lhtosky Charnwood, ACT (Coffey, 2013).
 - Remedial Action Plan, Former West Belconnen Fire Station (AECOM, 2014a).
 - JACSD Charnwood, Stage 1 Environmental Assessment (AECOM, 2014b).
 - UPSS Validation Report, Former West Belconnen Fire Station, Belconnen ACT (AECOM, 2014c)
 - Former Charnwood Fire Station, Stage 2 Environmental Site Assessment Report (AECOM, 2015a)
 - Excavated Soils, Block 6 Section 97, Former West Belconnen Fire Station, Charnwood, ACT, Validation Letter (AECOM, 2015b).
- Earth Mat Performance Study (Eagle Electromagnetic Design Services (July, 2016)
- Traffic Report (AECOM, March 2016)
- EPA Endorsement of Summary Report (EPA, August 2015)
- Block 6 Section 97 Survey (ACT Survey, June 2014)

SUMMARY OF RECOMMENDATIONS

The following key recommendations are presented in this report:

- At the time that the nature of the development is known a Traffic Report should be undertaken to ensure that the Lhotsky Street / Florey Drive intersection is not adversely affected.
- Further investigation into the extent of uncontrolled filling should be undertaken to determine the likely geotechnical conditions to be encountered on site.
- The developer should liaise with ActewAGL and submit an application for preliminary advice for network connection, as well as review additional substation earthing analysis for the site.

1. INTRODUCTION

This Site Investigation Report (SIR) provides a summary of the planning framework for the site. The aim of this SIR is to provide an overview of the site and to enable the identification of opportunities and constraints for future development of the site.

2. LAND USE & PLANNING FRAMEWORK

The site is a former Fire Brigade Depot and is zoned under the ACT Government Territory Plan as CF: Community Facilities and can be utilised for a number of different developments according to the ACT Territory Plan, including but not limited to:

- Business Agency
- Child Care Centre
- Health Facility
- Office
- Place of Worship
- Public Agency
- Retirement Village



Figure 1: Block 6 Section 97 overlaid with Territory Plan

3. INVESTIGATION SCOPE

This report provides a preliminary investigation of the following existing conditions:

- Services;
- Easements;
- Traffic requirements;

- Flooding and Overland Flows Characteristics;
- Vegetation;
- Ground Conditions;
- Geotechnical and Contamination;
- Heritage and;
- Environmental / Ecological.

4. SITE DESCRIPTION AND LOCATION

The site is situated approximately 15km northwest of the Canberra City Centre. The study area is bounded by Florey Drive to the west, Lhotsky Street to the north, with abuttal to the Ginninderra Christian Church (Block 5 Section 97) to the south and St Thomas Aquinas Primary School (Block 14 Section 97) to the east (refer to Figure 2). Currently access to the site is provided via Lhotsky Street.

Photographs of the site taken during a site inspection are referenced within Attachment B.

A detailed site survey was undertaken by ACT Survey in June 2014 for the site investigation. A copy of the detailed Site Survey Plan is attached in Attachment L.

Figure 2 references the location of the subject site.



Figure 2: Location of Block 6 Section 97 Charnwood

The site has an area of approximately 3,600 square meters. The site is located on the high point of Section 97. The site survey shows that there are two localised low points located within the bitumen carpark in the southern portion of the site.

There are sixty-five (65) trees located within and adjacent to the site. Red Box Design Group was engaged by Calibre Consulting to undertake a Tree Assessment for these trees (June, 2014). A copy of the Assessment Report is in Attachment D.

Details of blocks around the subject site are summarized in Table 1.

Table 1: Summary of Developments and Land Use

Block No.	Section No.	Location	Area (ha)	Land Use
5	97	South	0.4	CF: Community Facilities Ginninderra Christian Church
14	97	East	3.5	CF: Community Facilities St Thomas Aquinas Primary School
14	112	West	17.8	PRZ1: Urban Open Space
3	94	North	5.4	CZ6: Leisure and Accommodation Brindabella Christian College

5. EXISTING SITE SERVICING

5.1 GENERAL

Calibre Consulting carried out a Site Services Investigation for the site, including liaison and consultation with local service authorities, a "Dial Before You Dig" enquiry, site survey and a visual site inspection.

Existing services information has been obtained from:

- ICON Water for sewer & water supply services;
- ActewAGL for electricity services;
- ZNX for gas services;
- Survey provided by ACT Survey;
- Transport Canberra and City Services (TCCS), formerly known as TaMS; and
- Telstra, Optus, ICON and TransACT for telecommunications services.

The information supplied in this section is qualified on the basis that it has been supplied by external parties. This information was updated and confirmed where possible through detailed survey and site visits. No major discrepancy was found on site that appeared to be in conflict with the information supplied by the service authorities.

The following existing site services have been compiled and are detailed on Drawing C14064-001 in Attachment A.

5.2 STORMWATER DRAINAGE

Stormwater infrastructure in close proximity to the site comprises the following:

- The site is serviced by two grated pits located within the bitumen carpark in the southern portion of site. These pits capture and drain the surface runoff from the site to a stormwater manhole located adjacent to Tree No. 27, within the western part of the site. The pits and manhole are connected by a pipe network, with pipe diameters ranging from 150mm to 300mm.
- A stormwater network is located in the eastern verge of Florey Drive, west of the site. The network consists of two R sumps, the abovementioned manhole and 300mm diameter pipes. This network drains to the south.
- A 1050mm diameter pipe is located within Block 3 Section 94 Charnwood, north of the site.

5.3 OVERLAND FLOW

There are no major overland flow paths nearby which affect the site. Flows in the northern portion of site fall towards Lhotsky Street and are picked up by the road drainage. Flows in the southern portion of site are picked up by the grated sumps located in the carpark.

5.4 SEWER

Sewer infrastructure in close proximity to the site comprises the following:

- There is an existing 525mm sewer trunk main which runs along the northern verge of Lhotsky Street.
- The site is serviced by a 150mm diameter sewer tie located in the north eastern corner of site. This tie connects into a sewer manhole located in the southern verge of Lhotsky Street. A 150mm diameter sewer line crosses Lhotsky Street and connects into the 525mm sewer trunk main.
- A 150mm diameter sewer main runs along the eastern verge of Florey Drive and connects into the abovementioned sewer network.

5.5 WATER SUPPLY

Water supply infrastructure in close proximity to the site comprises the following:

- Running along both the western verge of Florey Drive and the southern verge of Lhotsky Street there are 300mm diameter water mains. These mains connect at the intersection of Lhotsky Street and Florey Drive on the western verge of Florey Drive.
- A 100mm diameter water main connected to the 300mm water main crosses Lhotsky Street near the north west corner of site and dead ends in the northern verge of Lhotsky Street.
- There is a 100mm water tie which enters in the north west corner of site. A valve pit is located within the north west corner of site where the water tie reduces to a 50mm diameter connection.

5.6 ELECTRICITY SUPPLY

Electrical infrastructure in close proximity to the site comprises the following:

- At the north-eastern corner of site along the southern verge of Lhotsky Street there is an existing electrical substation (No. 3253).
- The existing electrical connection to site comes from the abovementioned substation and enters the site 9m along the northern boundary (offset 9.0m from the eastern boundary).
- At the intersection of Lhotsky Street and Florey Drive there are two streetlights located in the road verge, these are serviced from electrical lines which run in the common trench along the road verges of Lhotsky Street and Florey Drive.

5.7 TELECOMMUNICATIONS SERVICES

Telecommunications plant comprises the following:

5.7.1 Telstra

Telstra cables are located as follows:

- A P100 conduit runs along the eastern verge of Florey Drive.
- A P100 conduit runs along the southern verge of Lhotsky Street.
- The site is currently serviced by a P100 conduit which connects to a P6 pit near the north west corner of site.

5.7.2 Optus

There are no Optus cables in the immediate vicinity of the site

5.7.3 ICON

ICON cables are located as follows:

- An ICON cable runs along the eastern verge of Florey Drive, the site is serviced by a cable that enters site from the western boundary.

5.7.4 TransACT

Other telecommunication network cables are located as follows:

- A P100 conduit runs along the southern verge of Lhotsky Street. The site is serviced by a P100 conduit that enters site from the northern boundary.

5.8 NATURAL GAS SUPPLY

Natural gas infrastructure in close proximity to the site comprises the following:

- A 110mm (210kPa) main runs along the northern verge of Lhotsky Street.
- A service tie crosses Lhotsky Street from the abovementioned main and enters via the northern boundary of site.

5.9 VERGEWORKS

5.9.1 Lhotsky Street

The nature of the adjacent Lhotsky Street road reserve and associated verge is outlined below.

- Road Reserve widths¹:
 - Northern verge: 5.75m
 - Northern footpath: 1.2m
 - Carriageway: 10.0m
 - Southern verge: 5.5m
 - Southern footpath: 1.2m
- There are streetlights at the intersection of Florey Drive and Lhotsky Street.
- No street trees are present along southern verge of Lhotsky Street.

¹Cross section widths are taken as approximate values.

5.9.2 Florey Drive

The nature of the adjacent Florey Drive road reserve and associated verge is outlined below.

- Road Reserve widths¹:
 - Western verge: 13.7m
 - Western footpath: 1.2m
 - Carriageway²: 13.3m
 - Eastern verge: 5.5m
 - Eastern footpath: 1.2m
- There are streetlights at the intersection of Florey Drive and Lhotsky Street.
- Street trees are present along the eastern verge of Florey Drive.
- Approaching the intersection of Lhotsky Street a median of varying width is present

¹Cross section widths are taken as approximate values.

²Carriageway width varies at the intersection of Florey Drive and Lhotsky Street.

5.10 EASEMENTS

There are no easements on site.

5.11 TRAFFIC, PARKING & ACCESS

5.11.1 Vehicle and Pedestrian Access

Vehicle access to site is currently provided by a driveway on the northern boundary of site. The driveway connects to Lhotsky Street.

There are concrete pedestrian paths around the western and northern boundaries of site. At the intersection of Lhotsky Street and Florey Drive there are pram ramps which provide access to both sides of the road. The paths connect to the Charnwood pedestrian network.

5.11.2 Parking

Currently there are significant numbers of car parking spaces on site. The majority of these car parking spaces are located in the southern portion of site (at the back of the fire station). These car parking spaces are accessed by the driveway on the northern boundary.

5.11.3 Traffic

AECOM undertook a Traffic Report for the site in March 2016. The purpose of this Traffic Report was to assess the current level of service provided to site.

AECOM findings indicated that there had been a total of 17 crashes at the intersection of Lhotsky Street / Florey Drive in a five-year period (2010 to 2014). There is an expectation that the severity and number of these crashes will reduce as the speed limit surrounding the intersection has been reduced to 40km/h.

The Traffic Analysis conducted by AECOM of the intersection suggested that the current operating Level of Service (LoS) for the intersection of Lhotsky Street and Florey Drive was LoS A.

6. SPECIALIST INVESTIGATIONS

6.1 TREE SURVEY & ASSESSMENT

The Tree Assessment (identification and classification), which was carried out by Redbox Design Group Landscape Architects (June, 2014) as part of the Site Investigation Report, is based on the Tree Protection Act 2005.

The Tree Assessment tabulates information relating to species, size, condition and status of the trees on site.

Details of the results of the Tree Assessment and recommendations are detailed in Attachment D.

This Tree Assessment evaluates individual trees located on the site Charnwood and offsite trees within proximity to the site. The Tree Assessment includes a total of sixty-five (65) trees. Twenty-two (22) trees (34%) have been defined as a Regulated Tree under the Tree Protection Act (2005).

There are twenty-two (22) regulated trees and twenty-four (24) unregulated trees within the site.

Under the Tree Protection Act 2005, a tree is a regulated tree and is protected if it is growing on urban leased land and it has:

- A height of 12 metres or more
- A trunk circumference of 1500mm at 1000mm above existing ground level
- Two or more trunks of total circumference greater than 1500mm at 1000mm above existing ground level
- A crown width of 12m or more

Based on the findings of the Tree Assessment data it is recommended that as many trees as possible that are defined as Regulated Trees be protected and preserved. Should the intended development occur on the site, all vegetative hazards should be removed including deadwood or weak branches, employing tree surgery as recommended by a certified arborist.

There is an existing high quality tree (No. 22) located within the eastern verge of Florey Drive. The tree canopy encroaches the north-western boundary of the site. If this tree needs to be removed as part of the development, TCCS should be consulted with.

A summary of the number of trees with their associated classification identified as part of the Tree Assessment within the site are shown in Table 2 below.

Table 2: Tree Assessment Summary

Current Classification (pre-treatment)	Number of Trees within Block
High	1
Medium	13
Poor	8
Total	22

See Attachment D for full Tree Assessment.

6.2 PRELIMINARY HERITAGE ASSESSMENT

No elements on or near the site were registered as having heritage significance as per the ACT Heritage Register.

6.3 PRELIMINARY ENVIRONMENTAL ASSESSEMENT

The Preliminary Environmental Assessment comprises the following reports (see Attachment F)

- Hazardous Materials Register and Management Plan, Charnwood Fire Station, 35 Lhtosky Charnwood, ACT (Coffey, 2013).
- Remedial Action Plan, Former West Belconnen Fire Station (AECOM, 2014a).
- JACSD Charnwood, Stage 1 Environmental Assessment (AECOM, 2014b).
- UPSS Validation Report, Former West Belconnen Fire Station, Belconnen ACT (AECOM, 2014c)
- Former Charnwood Fire Station, Stage 2 Environmental Site Assessment Report (AECOM, 2015a)
- Excavated Soils, Block 6 Section 97, Former West Belconnen Fire Station, Charnwood, ACT, Validation Letter (AECOM, 2015b).

Initially a Hazardous Materials Survey was undertaken by Coffey Environments Australia Pty Ltd (Coffey) to identify and locate any hazardous materials within the site. The survey identified friable asbestos containing material (ACM) within the boiler room and bonded ACM on the exterior of the building.

AECOM was then engaged to prepare a Remedial Action Plan (RAP) for the removal of the underground fuel infrastructure on site (three storage tanks, two fuel dispensers, three vent pipes and all pipework associated with the structures). It was determined that removal and disposal of the structures was the most appropriate solution.

As part of the RAP it was determined that the Underground Petrol Storage System (UPSS) would need to be removed. AECOM were tasked with obtaining the DA for this work and ensuring that all remediation works were completed as required. These works included;

- Removal and disposal of all UPSS and associated works infrastructure at an off-site licensed waste disposal facility.
- Collection and analysis of 18 soil samples from around the base of the excavation.
- Reinstatement of imported fill to excavated area.

AECOM completed further reports including a Phase 1 Environmental Site Assessment (ESA). From the ESA five Areas of Environmental Concern (AEC) were noted, it was recommended that a Phase 2 Report be completed.

The Phase 2 Report expanded upon the five AEC's noted and a total of 20 soil samples were collected from site to determine if there was any contamination present at these sites. Of the 20 sample locations one sample site returned greater than acceptable levels of TRH contamination. This location was then excavated to remove any contaminated soils. Approximately 10.5 cubic metres of soil was removed from site. Testing was completed on the remaining existing soils at this location, all tests returned acceptable contamination values for the remaining soil. AECOM determined that the location had been remediated and was deemed acceptable for the proposed development.

At the completion of all of these works AECOM determined that the site is capable of supporting a CF land use.

The EPA endorsed the finding and summations of AECOM, the signed letter by the EPA acknowledging this is found in Attachment K.

6.4 PRELIMINARY GEOTECHNICAL ASSESSEMENT

Calibre Consulting engaged Douglas Partners to undertake a Preliminary Geotechnical Investigation for the site.

Douglas Partners dug a total of four boreholes across the site. The borehole locations shown in Attachment E were located on the northern, western and south-eastern boundaries of site. Uncontrolled filling was encountered in two of the boreholes to a depth of 0.4m, it was also noted that some boreholes had silty and sandy soils to depths of at least 0.9m.

Douglas Partners stated that due to the presence of uncontrolled filling the site was classified as 'Class P' (Problematic). They also stated the main requirement for Class P sites is for design of footings to be undertaken by a Structural Engineer.

Suggested allowable base bearing pressures are as follows:

- | | |
|--------------------------------------|--------|
| • Stiff / medium dense natural soils | 100kPa |
| • Controlled filling: | 150kPa |
| • Very stiff to hard natural soils | 150kPa |
| • Very low strength bedrock | 500kPa |

See Attachment E for full report.

6.5 BUILDING DILAPIDATION REPORT

In February 2016, Tony Gray Building Services conducted a Building Condition Report for the existing building on site. The general findings of the investigation indicate the following:

- The overall review indicated that the building was rated as being in poor condition and that it would need considerable maintenance in order to ensure that it is up to a usable standard.
- It was noted that over the years many minor modifications had been made to the original building (additional power points, the installation of air conditioning and general maintenance including painting and carpeting).
- The structure has multiple classifications under Building Code of Australia (BCA);
 - Vehicle engine bay area: class 7(a)
 - Office area; class 5
 - Resting areas: class 3
 - External metal shed class 10 (a)
- Part of the structure has been damaged due to what was assumed as vandalism.
- It was recommended that remedial work would have to be done on the roof to ensure that there was no leaking. This was noted due to the number of roof penetrations present.

See Attachment H for further details

6.6 EARTH MAT PERFORMANCE STUDY

Eagle Electromagnetic Design Services Pty Ltd were commissioned by the LDA to prepare an Earth Mat Performance Study. The aim of this study was to summarise the calculated performance of the ActewAGL substation 3253 (located near the north-east corner of site) and confirm if it could supply a proposed Child Care Centre. It was noted that the report was for information purposes only and that further investigation would be required by the developer.

The report provided the following conclusions:

- In the event of an 11kV line to earth fault at substation 3253, step and touch potentials at the development (with the standard building earthing requirements) were acceptable according to AS 2067. However, it was noted a modified earthing design would be required to ensure the hazardous touch potentials around the substation itself were acceptable.
- Due to the proposed site being located within 100m of a substation, additional earthing analysis is required to be completed as per ActewAGL's instruction. A report has been commissioned and hazardous "Step & Touch" potentials around the substation itself have been identified. The report suggests these potentials are caused by the non CMEN connection which need to be addressed by ActewAGL. The report recommends a simple earth grid be installed during the construction, which will be added to the Developer Funded Works cost." The developer will be required to liaise with ActewAGL at the DA stage to confirm requirements.

See Attachment I for further details.

7. PROPOSED SITE SERVICING

It was determined that for CF developments a Child Care facility would produce the greatest servicing requirements, this information was given to authorities.

7.1 STORMWATER DRAINAGE

The proposed development can connect to the existing stormwater tie located within the eastern verge of Florey Drive, west of the site.

7.2 WATER SUPPLY

ICON Water advised that there is sufficient capacity within the existing ICON Water network to supply the site and Type F4 fire flows for the proposed development. The proposed development can be serviced by the existing 100mm diameter water service tie.

See Attachment C for further details.

7.3 SEWER

ICON Water advised that there is sufficient capacity within the downstream sewer network to accept discharge from the proposed development. The proposed development can be serviced by the existing 150mm diameter sewer tie.

See Attachment C for further details.

7.4 ELECTRICITY SUPPLY

ActewAGL advised that

- The existing substation No. 3253 located adjacent the north-eastern corner of the site has spare capacity to service the site. The existing Point of Entry (POE) can be retained for the proposed development.
- The existing substation earthing needs to be upgraded to be less than one ohm.
- The developer is required to design the substation earth mat with an earthing resistance less than one ohm in compliance with Clause 8 of AS2067. Earth mat design needs to be submitted to ActewAGL for approval prior to construction.

See Attachment C for further details.

7.5 TELECOMMUNICATIONS

Telstra advised that there is sufficient capacity to service the proposed development. The existing lead-in at Lhotsky Street can be used to provide service connection.

The proposed Child Care Centre can connect to the existing Telstra and/or TransACT tie within the site. The service tie needs to be confirmed once the development layout is finalised.

No advice was received regarding the ICON cable.

See Attachment C for further details.

7.6 NATURAL GAS SUPPLY

ZNX advised that the proposed development can connect to the existing service tie. Any other new connection point would require a main extension and additional costs to the developer.

See Attachment C for further details.

7.7 BOUNDARIES & EASEMENTS

There are no existing or proposed easements on site.

7.8 TRAFFIC

AECOM conducted a traffic analysis for the site. In order to determine the most traffic intensive scenario, it was assumed that the site would be utilised as a Child Care facility catering for 120 places. Results indicated that a facility of this nature and size would not change the level of service at the intersection from the existing conditions (LoS A). A scenario was run where a 10% increase in background traffic and an increase in the number of heavy vehicles was assumed. From these results only the right turn movement from Florey Drive to Lhotsky Street decreased to a LoS B. It can be concluded from this analysis that there is sufficient traffic capacity for a CF zoned development.

7.9 VERGE WORKS

No verge works are proposed.

8. COST ESTIMATE

The following works are required to adequately service the site for the proposed development. The associated estimates of cost for each item include design, documentation, construction costs and supervision, contingencies (20%) and GST (10%).

Table 3: DEVELOPER FUNDED – OFFISITE WORKS

ITEM	PROBABLE COST
Sewer	\$0
Stormwater	\$0
Water	\$0
Driveway	\$0
Footpaths / Verges / Trees	\$0

Table 4: DEVELOPER FUNDED – INTERNAL SITE SPECIFIC WORKS

ITEM	ESTIMATED COSTS (Incl. GST)
General <ul style="list-style-type: none"> • Site establishment • Protection of works • Work As Executed • Landscape Management & Protection Plan • Removal of trees • Coordination with Authorities • Traffic Control 	Subject to detail design & negotiations with provider.
Gas	Subject to detail design & negotiations with provider.
Electricity	Subject to detail design & negotiations with provider.
Telecommunications <ul style="list-style-type: none"> • Telstra • Icon • TransACT 	Subject to detail design & negotiations with provider.
Substation <ul style="list-style-type: none"> • Earth mat / grid 	Subject to detail design & negotiations with provider.

9. SUMMARY OF OPPORTUNITY & CONSTRAINTS

Based on the investigations carried out the following opportunities and constraints have been identified:

Opportunities:
<ul style="list-style-type: none"> • Existing services for sewer, water, stormwater, gas, electricity and telecommunications are all readily available to site. • Traffic modelling indicated that development on the site would not significantly affect the neighbouring streets.
Constraints:
<ul style="list-style-type: none"> • There is an existing high quality tree (No. 22) located within the eastern verge of Florey Drive. The tree canopy encroaches the north-western boundary of the site. If this tree needs to be removed as part of the development, TAMS shall be consulted. • There is a building on site which will require upgrades if it is to be utilised or the building will need to be demolished as part of a new development. • Part of the works to confirm that the site can be used appropriately will include ensuring substation 3253 (located at the north east corner of site) doesn't present a touch potential risk. • Geotechnical investigations revealed the presence uncontrolled fill on site, due to this the site was classified as Class P. The use of a structural engineer to design the footings of a new development was recommended.

10. RECOMMENDATIONS

Based on the investigations carried out to date it is recommended that the lessee / developer carry out the following additional investigations:

- At the time that the nature of the development is known a Traffic Report should be undertaken to ensure that the Lhotsky Street / Florey Drive intersection is not adversely affected.
- Further investigation into the extent of uncontrolled filling should be undertaken to determine the likely geotechnical conditions to be encountered on site.
- The developer should liaise with ActewAGL and submit application for preliminary advice for network connection, as well as review additional substation earthing analysis for the site.

11. DRAWINGS

Drawings provided in Attachment A of this report include:

- Drawing C14064-D000+ COVER SHEET
- Drawing C14064-D001+ EXISTING SERVICES PLAN
- Drawing C14064-D002+ PROPOSED SERVICES PLAN

These drawings are to be read in conjunction with this report. The plans are based upon work as executed information and other information supplied by authorities. All services are to be confirmed on site. The existing services in the vicinity of the site are represented in an indicative format. The plans were prepared solely for the purposes of this report and for the use of the LDA.

ATTACHMENT F PRELIMINARY ENVIRONMENTAL ASSESSMENT



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17 July 2015

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Dear Mark

Block 6, Section 97 Charnwood, ACT - Summary of Previous Investigations and Site Suitability Status

1.0 Introduction

AECOM Australia Pty Ltd (AECOM) was engaged by the Land Development Agency (LDA) to prepare a letter report for Block 6, Section 97, Charnwood ACT (the Site) to satisfy comments provided by the Environment Protection Authority (EPA) (ref: Mark Heckenberg via email on 9 June 2015), specifically:

- The findings of these reports [AECOM 2015a and 2015b] and all other contamination studies undertaken at the site must be consolidated into a single site suitability/validation report. This report must be prepared in general accordance with the guidelines endorsed by the EPA, as detailed in the Contaminated Sites Environment Protection Policy 2009, and include a clear conclusion as to the suitability of the site for its proposed and permitted uses under the ACT Territory Plan; and
- Clear comment must be made in regard to the need or otherwise for a groundwater assessment based on the findings of the above reports and whether interim on-going environmental management of the site is required prior to, during or post development.

The Site is the former West Belconnen Fire Station, operated by ACT Emergency Services Agency i.e. ACT Fire and Rescue, and was zoned as a TSZ2 Services zone (Transport and Services Zone Development Code). LDA are proposing to redevelop the Site as a Community Facility Zone (CFZ) with potential for a childcare centre, subject to required Territory Plan Variation and other relevant statutory processes.

2.0 Objectives

The objectives of the works were to:

- Prepare a letter report, in accordance with the guidelines endorsed by the EPA, which consolidates finding of previous investigations undertaken at the Site and provides a clear statement regarding the suitability of the Site for its proposed land use.
- Assess the potential for site-derived groundwater impacts and whether interim on-going environmental management is required.
- Request review of the enclosed reports by the ACT EPA in conjunction with the suitability statement presented in **Section 6.0** of this letter. Previous environmental investigations are enclosed as an attachment to this letter.

3.0 Scope of Works

In order to achieve the objectives, the following scope of work was undertaken:

- Review comments provided by the EPA on the Stage 2 Environmental Site Assessment (AECOM, 2015a) and Excavated Soils Validation Letter (AECOM, 2015b).
- Prepare a summary of previous investigations undertaken at the Site.
- Conduct a qualitative assessment of groundwater conditions at the Site.
- Prepare a clear statement regarding the suitability of the Site for its proposed land use.

4.0 Summary of Previous Investigations

Table 1 Summary of Previous Investigations

Hazardous Materials Register and Management Plan, Charnwood Fire Station, 35 Lhotsky Street, Charnwood, ACT (Coffey, 2013)
<p>Coffey Environments Australia Pty Ltd (Coffey) undertook a Hazardous Materials survey at the Site on 3 October 2012. The survey was undertaken to identify and locate hazardous materials within accessible areas of the Site to enable the management of asbestos containing material (ACM) and other hazardous materials. The survey identified friable ACM within the boiler room (i.e. rope seal to boiler flue and millboard) and bonded ACM (i.e. asbestos cement sheeting) on the exterior of the building (e.g. eaves, soffits and spandrel panel). Based on the results of the survey and subsequent laboratory analytical results, a register of hazardous materials and an Asbestos Management Plan (AMP) were prepared in accordance with the <i>Work Health and Safety Regulation 2011</i>.</p>
Remedial Action Plan, Former West Belconnen Fire Station (AECOM, 2014a)
<p>AECOM was engaged to prepare a Remedial Action Plan (RAP) for the removal of underground storage tanks (USTs), associated infrastructure and surrounding impacted soil (if any) present at the Site. A review of the Site plan identified the following fuel infrastructure on-site:</p> <ul style="list-style-type: none"> - Three USTs up to 4500 L (containing diesel and petroleum products). - Two fuel dispensers. - Three vent pipes. - Associated pipework. <p>A remediation feasibility study was undertaken and it was considered that excavation with off-site disposal to landfill was the most practical remedial strategy. The RAP was compiled to provide the remedial strategy detailing the excavation, soil stockpiling, transport, validation and occupational health and safety and environmental management strategies associated with the remediation works. It was noted that the works would not provide an overall assessment of the suitability of the Site and only related to the on-site fuel storage and dispensing area.</p>
JACSD Charnwood, Stage 1 Environmental Assessment (AECOM, 2014b)
<p>AECOM was engaged to undertake a Phase 1 Environmental Site Assessment (ESA) at the Site to identify any potential contamination issues that may require further investigation and/or management. The scope of work comprised a review of background information, a site inspection, consultation with personnel familiar with the Site and data evaluation and reporting.</p> <p>The areas of environmental concern (AECs) identified within the Phase 1 ESA included:</p> <ul style="list-style-type: none"> - Underground petroleum storage system (UPSS) i.e. three USTs, two fuel dispensers, three vent pipes and associated pipework. - Vehicle maintenance. - Use and storage of aqueous film forming foam (AFFF). - Septic tanks and/or septic lines. - Possible presence of imported fill material of unknown origin and quality. <p>A preliminary Conceptual Site Model (CSM) was developed based on the findings of the Phase 1 ESA.</p> <p>The Phase 1 ESA recommended that a Phase 2 ESA be undertaken to further evaluate the potential contamination risks, to include intrusive investigation, sampling and analysis. Specifically, targeted soil sampling around the building footprint and a grid sampling approach for the remainder of the Site within areas of environmental concern was recommended.</p>
UPSS Validation Report, Former West Belconnen Fire Station, Belconnen ACT (AECOM, 2014c)
<p>AECOM was engaged to prepare a validation report for the removal of the UPSS at the Site in accordance with the RAP (AECOM, 2014a). The scope of work comprised:</p>

- Lodging a development application (DA) and obtaining development approval for the Site.
- Preparing and adhering to a Site Specific Work Health and Safety Plan and Environmental Management Plan.
- Underground service locating by an accredited locator with reference to Dial Before You Dig (DBYD) plans.
- Removal of UPSS which included three USTs up to 4,500 L, two fuel dispenser pumps, three vent pipes and associated pipework.
- Collection of 18 soil validation samples from the walls and bases of each excavation formed by UPSS removal plus two quality control / quality assurance (QAQC) samples.
- Stockpiling of soils excavated during UPSS removal works into four separate stockpiles. Collection of 11 soil samples for characterisation of stockpiled material plus 2 QAQC samples.
- Inspection and collection of soil samples from proposed imported excavated natural material (ENM) at the source location (Boral Quarry at Kaveney's Road, Hall, NSW).
- Backfilling of excavations with imported ENM soils.
- Laboratory analysis of selected soils samples for the following CoPC: asbestos, total recoverable hydrocarbons (TRH); benzene, toluene, ethylbenzene and xylenes and naphthalene (BTEXN); polycyclic aromatic hydrocarbons (PAHs); phenols; heavy metals; organochlorine and organophosphorus pesticides (OCP and OPP), polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs). All analysis was completed by NATA accredited laboratories.
- Preparation of a waste classification letter for all soils within the four stockpiles for off-site disposal.

The results of the field activities was summarised as follows:

- All UPSS tanks and associated infrastructure were removed and disposed off-site at a licensed waste disposal facility.
- Laboratory analysis of samples collected from the base and walls of three excavations reported concentrations of all CoPCs less than the laboratory limit of reporting (LOR) and/or adopted remediation acceptance criteria (RAC) (selected based on a low-density residential land use including a childcare centre), indicating that the UPSS excavations were appropriately validated.
- A total of 96 m³ of excavated materials were classified and disposed off-site as solid waste (refer to AECOM, 2014b). It should be noted that concentrations of CoPCs in samples collected from the stockpiles were below the laboratory LOR and/or adopted RAC, with the exception of TRH C₆-C₁₀ less BTEX (F1) and TRH C₁₀-C₁₆ less naphthalene (F2).
- A total of 32 tonnes of suitable ENM was imported to the Site following an inspection of the material and analysis of samples collected, which reported concentrations of all CoPCs below the laboratory LOR and/or adopted RAC.

AECOM considered that validation of the UPSS excavation was completed to a standard acceptable for the proposed future land use i.e. Community Facility Zone (CFZ) with potential for a childcare centre.

Former Charnwood Fire Station, Stage 2 Environmental Site Assessment Report (AECOM, 2015a)

AECOM was engaged to undertake a targeted Phase 2 ESA at the Site to investigate the five AECs identified as part of the Phase 1 ESA (AECOM, 2014b) and assess the potential presence/evaluate any risks posed by the AECs to the proposed future childcare centre. The scope of work comprised:

- Development of a health and safety plan and safe work method statement.
- Underground service locating by an accredited locator with reference to DBYD plans.
- Site supervision by AECOM Environmental Scientist of sub-contractor's environmental scope of work.
- Collection of 20 soil samples from three drilled soil bores (between 0.0 and 8.0 m below ground level (BGL)), nine excavated test pits (between 0.0 and 4.1 m BGL) and one hand auger location (between 0.0 and 0.1 m BGL), inclusive of QAQC samples.

- Laboratory analysis of soils samples for the abovementioned CoPCs, excluding VOCs as all were previously reported below the laboratory LOR. All analysis was completed by NATA accredited laboratories.

The CSM was further refined based on the findings of the Phase 2 ESA.

The Phase 2 ESA identified fill material within the former UST area (AEC01) at depths ranging from 0.5 to 2.0 m BGL. Natural soil conditions across the Site to comprise sandy clay soils. No visual or olfactory observations of contamination impact were noted across the boreholes, test pits and hand auger locations. Photo-ionisation detector (PID) readings ranged from 0.0 to 4.7 parts per million (ppm).

One test pit sample (TP05_0.0-0.1) collected from the former vehicle maintenance shed (located on the southeast unsealed corner of the Site) reported a concentration of TRH C₁₀-C₁₆ less naphthalene (F2) marginally above the Site Assessment Criteria (SAC) (selected based on a low-density residential land use including a childcare centre). The hydrocarbon impacted area was delineated and appeared to be limited to the surface soil (i.e. top 100 mm). Potentially complete exposure pathways were identified to exist between impacted soil and future human health receptors, therefore it was recommended that remediation works be undertaken to remove and validate the surface soil at TP05.

Excavated Soils, Block 6 Section 97, Former West Belconnen Fire Station, Charnwood, ACT, Validation Letter (AECOM, 2015b)

AECOM was engaged to prepare a validation report for the removal of surface soil at TP05, to include an assessment of the remaining soil based on the proposed future land use. The scope of work comprised:

- Excavation of TP05 (dimensions of 7 m L x 5 m W x 0.3 m D) and stockpiling of excavation material.
- Collection of three soil validation samples from the base of the excavation plus two QA/QC samples.
- Laboratory analysis of soil samples for the abovementioned CoPC plus AFFF compounds i.e. perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid (PFOA). All analysis was completed by NATA accredited laboratories.

All CoPC concentrations were reported below the SAC for low-density residential land use including a childcare centre. AECOM considered that validation of the TP05 excavation was completed to a standard acceptable for the proposed future land use *i.e.* Community Facility Zone (CFZ) with potential for a childcare centre.

5.0 Qualitative Assessment of Groundwater Conditions

Groundwater has not directly been assessed as part of previous investigations. However, consistent with Tier 1 of the National Environmental Protection Measure (NEPM) Schedule B9 (Guidelines for Risk Assessment of Groundwater), groundwater risk is not considered to be of concern as:

- Groundwater was not encountered during UPSS validation works (AECOM, 2014c) or during the Stage 2 ESA (AECOM, 2015a), indicating that the regional groundwater table exists greater than 8 m BGL.
- Natural soils are low permeability tight clays and, under the low density residential land use with childcare centres, the appropriate criteria for volatile contaminants (ASC NEPM, HSL-A) at a site with groundwater greater than 8 m and soil samples greater than 4 m in clay are all not limiting with the exception of benzene and TRH C₆-C₁₀ F1 (less BTEX).
- Soil samples analysed during AECOM (2014c) and (2015a) did not report any concentrations of volatile hydrocarbons above the limit of laboratory reporting at the base of the former tanks (approximately 4 m BGL) and in the soils beneath (between 4 m and 8 m BGL). Field screening at the time of sampling did not note any elevated PID readings (less than 10 ppm) and "out-of-ground" tank inspections did not observe any visible leaks/penetrations.

On this basis interim or ongoing environmental management of groundwater is not warranted.