SGS

ANALYTICAL REPORT

ME304337 R1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	ME304337.021 Soil 22 Sep 2017 BH9-0.4-0.6	ME304337.022 Soil 22 Sep 2017 BH10-0.1-0.2	ME304337.023 Soil 22 Sep 2017 BH10-1.0-1.1	ME304337.024 Soil 22 Sep 2017 QA1
Moisture Content Method: AN002 Tested: 10/10/2017							
% Moisture*	%w/w	1	-	**5.0**	-	**14.6**
Perfluoronated Surfactants in Soil - TOPS Method: MA_1523_TOPS Tested: 10/10/2017							
10:2 Fluorotelomersulphonate*	mg/kg	0.02	-	<0.02	-	<0.02
4-2 Fluorotelomersulphonate*	mg/kg	0.02	-	<0.02	-	<0.02
6-2 Fluorotelomer Sulfonate*	mg/kg	0.02	-	<0.02	-	<0.02
8:2 Fluorotelomersulphonate*	mg/kg	0.02	-	<0.02	-	<0.02
N-Ethyl-heptadecafluorooctane sulphonamide*	mg/kg	0.02	-	<0.02	-	<0.02
N-Ethyl-heptadecafluorooctane sulphonamidoethanol*	mg/kg	0.02	-	<0.02	-	<0.02
N-Methyl-heptadecafluorooctane sulphonamide*	mg/kg	0.02	-	<0.02	-	<0.02
N-Methyl-heptadecafluorooctane sulphonamidoethanol*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorononanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorooctane sulfonate*	mg/kg	0.02	-	**0.82**	-	**0.34**
Perfluorooctanesulfonamidoacetic Acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorooctanoic Acid*	mg/kg	0.02	-	**0.02**	-	<0.02
Perfluorobutanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorobutane sulfonate*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorodecanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorodecane sulfonate*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluoro-1-dodecanesulfonate*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorodecylphosphonic acid*	mg/kg	0.04	-	<0.04	-	<0.04
Perfluorododecanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluoro-1-heptanesulfonate*	mg/kg	0.02	-	**0.02**	-	<0.02
Perfluoro-1-nonanesulfonate*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluoroheptanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorohexanoic acid*	mg/kg	0.02	-	**0.04**	-	<0.02
Perfluoro-n-hexadecanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorohexane sulfonate*	mg/kg	0.02	-	**0.08**	-	<0.02
Perfluorohexylphosphonic acid*	mg/kg	0.02	-	**0.08**	-	<0.02
Perfluorooctadecanoic Acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorooctylphosphonic acid*	mg/kg	0.02	-	**0.02**	-	<0.02
Perfluorooctane sulfonamide*	mg/kg	0.02	-	**0.02**	-	**0.02**
Perfluoropentanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorotetradecanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorotridecanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluoroundecanoic acid*	mg/kg	0.02	-	<0.02	-	<0.02

SGS

ANALYTICAL REPORT

ME304337 R1

Parameter	Units	LOR	Sample Number Sample Matrix Sample Date Sample Name	ME304337.021 Soil 22 Sep 2017 BH9-0.4-0.6	ME304337.022 Soil 22 Sep 2017 BH10-0.1-0.2	ME304337.023 Soil 22 Sep 2017 BH10-1.0-1.1	ME304337.024 Soil 22 Sep 2017 QA1
Perfluoronated Surfactants in Soils MA_1523.SL.01 Method: MA_1523 Tested: 10/10/2017							
10:2 Fluorotelomersulphonate*	mg/kg	0.01	-	<0.01	-	<0.01
4:2 Fluorotelomersulphonate*	mg/kg	0.01	-	<0.01	-	<0.01
6-2 Fluorotelomer Sulfonate*	mg/kg	0.01	-	<0.01	-	<0.01
8:2 Fluorotelomersulphonate*	mg/kg	0.01	-	<0.01	-	<0.01
N-Ethyl-heptadecafluorooctane sulphonamide*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorooctanesulfonamidoacetic acid (FOSAA)*	mg/kg	0.01	-	<0.01	-	<0.01
N-Ethyl-heptadecafluorooctane sulphonamidoethanol*	mg/kg	0.01	-	<0.01	-	<0.01
N-Methyl-heptadecafluorooctane sulphonamide*	mg/kg	0.01	-	<0.01	-	<0.01
N-Methyl-heptadecafluorooctane sulphonamidoethanol*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorononanoic acid	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorooctane sulfonate	mg/kg	0.01	-	**0.52**	-	**0.30**
Perfluorooctanoic Acid	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorobutanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorobutane sulfonate*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorodecanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorodecane sulfonate*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluoro-1-dodecanesulfonate (PFDoS)*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorodecylphosphonic acid (PFDPA)*	mg/kg	0.02	-	<0.02	-	<0.02
Perfluorododecanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluoro-1-heptanesulfonate (PFHpS)*	mg/kg	0.01	-	**0.01**	-	<0.01
Perfluoroheptanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorohexanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorohexylphosphonic acid (PFHxPA)*	mg/kg	0.01	-	**0.05**	-	<0.01
Perfluoro-n-hexadecanoic acid (PFHxDA)*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluoro-1-nonanesulfonate (PFNS)*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorohexane sulfonate*	mg/kg	0.01	-	**0.06**	-	<0.01
Perfluorooctadecanoic Acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorooctylphosphonic acid (PFOPA)*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluoroctane sulfonamide*	mg/kg	0.01	-	**0.02**	-	**0.02**
Perfluoropentanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorotetradecanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluorotridecanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01
Perfluoroundecanoic acid*	mg/kg	0.01	-	<0.01	-	<0.01

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QC SUMMARY

ME304337 R1

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Moisture Content Method: ME-(AU)-[ENV]AN002

Parameter	QC Reference	Units	LOR	DUP %RPD
% Moisture*	LB016143	%w/w	1	1 - 5%

Perfluoronated Surfactants in Soil - TOPS Method: MA_1523_TOPS

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery	MSD %RPD
10:2 Fluorotelomersulphonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
4-2 Fluorotelomersulphonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
6-2 Fluorotelomer Sulfonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
8:2 Fluorotelomersulphonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
N-Ethyl-heptadecafluorooctane sulphonamide*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
N-Ethyl-heptadecafluorooctane sulphonamidoethanol*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
N-Methyl-heptadecafluorooctane sulphonamide*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
N-Methyl-heptadecafluorooctane sulphonamidoethanol*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorononanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorooctane sulfonate*	LB016061	mg/kg	0.02	<0.02	0 - 67%	NA	NA	NA
Perfluorooctanesulfonamidoacetic Acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorooctanoic Acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorobutanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorobutane sulfonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorodecanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorodecane sulfonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluoro-1-dodecanesulfonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorodecylphosphonic acid*	LB016061	mg/kg	0.04	<0.04	0%	NA	NA	NA
Perfluorododecanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluoro-1-heptanesulfonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluoro-1-nonanesulfonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluoroheptanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorohexanoic acid*	LB016061	mg/kg	0.02	<0.02	67%	NA	NA	NA
Perfluoro-n-hexadecanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorohexane sulfonate*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorohexylphosphonic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorooctadecanoic Acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorooctylphosphonic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluoroctane sulfonamide*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluoropentanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorotetradecanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorotridecanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluoroundecanoic acid*	LB016061	mg/kg	0.02	<0.02	0%	NA	NA	NA

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QC SUMMARY

ME304337 R1

MB blank results are compared to the Limit of Reporting
LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.
DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula : *the absolute difference of the two results divided by the average of the two results as a percentage.* Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Perfluoronated Surfactants in Soils MA_1523.SL.01 Method: MA_1523

Parameter	QC Reference	Units	LOR	MB	DUP %RPD	LCS %Recovery	MS %Recovery	MSD %RPD
10:2 Fluorotelomersulphonate*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
4:2 Fluorotelomersulphonate*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
6-2 Fluorotelomer Sulfonate*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
8:2 Fluorotelomersulphonate*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
N-Ethyl-heptadecafluorooctane sulphonamide*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorooctanesulfonamidoacetic acid (FOSAA)*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
N-Ethyl-heptadecafluorooctane sulphonamidoethanol*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
N-Methyl-heptadecafluorooctane sulphonamide*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
N-Methyl-heptadecafluorooctane sulphonamidoethanol*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorononanoic acid	LB016168	mg/kg	0.01	<0.01	0%	64%	72%	14%
Perfluorooctane sulfonate	LB016168	mg/kg	0.01	<0.01	0 - 7%	78%	86%	12%
Perfluorooctanoic Acid	LB016168	mg/kg	0.01	<0.01	0%	64%	67%	19%
Perfluorobutanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorobutane sulfonate*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorodecanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	61%	69%	8%
Perfluorodecane sulfonate*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluoro-1-dodecanesulfonate (PFDoS)*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorodecylphosphonic acid (PFDPA)*	LB016168	mg/kg	0.02	<0.02	0%	NA	NA	NA
Perfluorododecanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	42%	47%	6%
Perfluoro-1-heptanesulfonate (PFHpS)*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluoroheptanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	61%	64%	16%
Perfluorohexanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorohexylphosphonic acid (PFHxPA)*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluoro-n-hexadecanoic acid (PFHxDA)*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluoro-1-nonanesulfonate (PFNS)*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorohexane sulfonate*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorooctadecanoic Acid*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorooctylphosphonic acid (PFOPA)*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluoroctane sulfonamide*	LB016168	mg/kg	0.01	0.01	0%	NA	NA	NA
Perfluoropentanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	NA	NA	NA
Perfluorotetradecanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	33%	33%	8%
Perfluorotridecanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	36%	42%	6%
Perfluoroundecanoic acid*	LB016168	mg/kg	0.01	<0.01	0%	47%	56%	5%

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METHOD SUMMARY

ME304337 R1

METHOD	METHODOLOGY SUMMARY
AN002	The test is carried out by drying (at either 40°C or 105°C) a known mass of sample in a weighed evaporating basin. After fully dry the sample is re-weighed. Samples such as sludge and sediment having high percentages of moisture will take some time in a drying oven for complete removal of water.
MA1523	This method is intended for the analysis of polyfluorinated compounds (PFCs) by High Performance Liquid Chromatography-Tandem Mass Spectrometry (HPLC-MS/MS). A weighed soil sample is solvent extracted with acetonitrile/methanol then filtered into a 1mL polypropylene for analysis by LC-MS/MS.
MA1523-TOPS	This method is intended for the analysis of polyfluorinated compounds (PFCs) by High Performance Liquid Chromatography-Tandem Mass Spectrometry (HPLC-MS/MS). Soil and sediment samples undergo oxidative pre-treatment (TOPs) prior to concentration using Solid Phase Extraction (SPE) and the SPE cartridge is eluted with 4ml of 0.1% acetic acid/ACN and then 4 ml of ACN. The eluent is then concentrated and transferred to a 1 mL polypropylene GC vial for analysis by LC-MS/MS.

FOOTNOTES

IS	Insufficient sample for analysis.
LNR	Sample listed, but not received.
*	NATA accreditation does not cover the performance of this service.
**	Indicative data, theoretical holding time exceeded.
LOR	Limit of Reporting
↑↓	Raised or Lowered Limit of Reporting
QFH	QC result is above the upper tolerance
QFL	QC result is below the lower tolerance
-	The sample was not analysed for this analyte
NVL	Not Validated

Samples analysed as received.
Solid samples expressed on a dry weight basis.

Where "Total" analyte groups are reported (for example, Total PAHs, Total OC Pesticides) the total will be calculated as the sum of the individual analytes, with those analytes that are reported as <LOR being assumed to be zero. The summed (Total) limit of reporting is calcuated by summing the individual analyte LORs and dividing by two. For example, where 16 individual analytes are being summed and each has an LOR of 0.1 mg/kg, the "Totals" LOR will be 1.6 / 2 (0.8 mg/kg). Where only 2 analytes are being summed, the " Total" LOR will be the sum of those two LORs.

Some totals may not appear to add up because the total is rounded after adding up the raw values.

If reported, measurement uncertainty follow the ± sign after the analytical result and is expressed as the expanded uncertainty calculated using a coverage factor of 2, providing a level of confidence of approximately 95%, unless stated otherwise in the comments section of this report.

Results reported for samples tested under test methods with codes starting with ARS-SOP, radionuclide or gross radioactivity concentrations are expressed in becquerel (Bq) per unit of mass or volume or per wipe as stated on the report. Becquerel is the SI unit for activity and equals one nuclear transformation per second.
Note that in terms of units of radioactivity:

a. 1 Bq is equivalent to 27 pCi
b. 37 MBq is equivalent to 1 mCi

For results reported for samples tested under test methods with codes starting with ARS-SOP, less than (<) values indicate the detection limit for each radionuclide or parameter for the measurement system used. The respective detection limits have been calculated in accordance with ISO 11929.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here : http://www.sgs.com.au/~/media/Local/Australia/Documents/Technical%20Documents/MP-AU-ENV-QU-022%20QA%20QC%20Plan.pdf

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CHAIN OF CUSTODY & ANALYSIS REQUEST

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SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: Arcadis
Address: Canberra
Contact Name: [redacted]

Project Name/No: 17267
Purchase Order No:
Results Required By: [redacted]
Telephone: [redacted]
Facsimile:
Email Results: [redacted]@arcadis.com

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	Standard PFAS	TOP Assay PFAS
BH1-0.05-0.15	22/9/17			X			X	X
BH1-0.4-0.6	22/9/17			X				
BH1-0.9-1.1	22/9/17			X				
BH2-0.0-0.2	22/9/17			X			X	
BH2-0.4-0.6	22/9/17			X				
BH2-0.9-1.1	22/9/17			X				
BH3-0.0-0.1	22/9/17			X			X	X
BH3-0.4-0.6	22/9/17			X				
BH3-0.9-1.1	22/9/17			X				

SGS Melbourne EHS

ME304337 COC
Received: 02 – Oct – 2017

Relinquished By:	Date/Time: **Revised 4/10/17**	Received By: [signature]	Date/Time: 2/10/17 18:45am
Relinquished By:	Date/Time:	Received By:	Date/Time:
Samples Intact: Yes/ No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:
	Comments: Please email invoice to accounts@environmentalstrategies.com.au		

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CHAIN OF CUSTODY & ANALYSIS REQUEST

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SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name: Arcadis
Address: Canberra
Contact Name: [redacted]

Project Name/No: 17267
Purchase Order No:
Results Required By: [redacted]
Telephone: [redacted]
Facsimile:
Email Results: [redacted]@arcadis.com

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	Standard PFAS	TOP Assay PFAS
BH4-0.0-0.2	22/9/17			X			X	
BH4-0.4-0.6	22/9/17			X				
BH5-0.0-0.2	22/9/17			X			X	
BH5-0.4-0.6	22/9/17			X				
BH6-0.0-0.2	22/9/17			X			X	X
BH6-0.4-0.6	22/9/17			X				
BH7-0.0-0.2	22/9/17			X			X	X
BH7-0.4-0.6	22/9/17			X				
BH8-0.02-0.2	22/9/17			X			X	

Relinquished By:	Date/Time:	Received By:	Date/Time
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: Yes/ No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:
	Comments:		

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CHAIN OF CUSTODY & ANALYSIS REQUEST

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SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name:	Arcadis	Project Name/No:	WBFS – COOMBS - 17267
Address:	Canberra	Purchase Order No:	
		Results Required By:	[redacted]
		Telephone:	[redacted]
Contact Name:	[redacted]	Facsimile:	
		Email Results:	[redacted]@arcadis.com

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	Standard PFAS	TOP Assay PFAS
BH8-0.4-0.6	22/9/17			X				
BH9-0.02-0.2	22/9/17			X			X	
BH9-0.4-0.6	22/9/17			X				
BH10-0.1-0.2	22/9/17			X			X	X
BH10-1.0-1.1	22/9/17			X				
QA1	22/9/17			X			X	X

Relinquished By:	Date/Time:	Received By:	Date/Time
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: Yes/ No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:
	Comments:		

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES1724553**	Page	: 1 of 5
Client	: **ARCADIS AUSTRALIA PACIFIC PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: LEVEL 5, 141 MILLER STREET NORTH SYDNEY NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 03[redacted]	Telephone	: +61-2[redacted]
Project	: WBFS - COOMBS - 17267	Date Samples Received	: 29-Sep-2017 16:15
Order number	: ----	Date Analysis Commenced	: 03-Oct-2017
C-O-C number	: ----	Issue Date	: 09-Oct-2017 15:18
Sampler	: ----		
Site	: ----		
Quote number	: EN/091/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

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Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW

General Comments

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

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

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

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

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

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key : CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
^ = This result is computed from individual analyte detections at or above the level of reporting
ø = ALS is not NATA accredited for these tests.
~ = Indicates an estimated value.

- EP231: Particular samples required dilution due to the presence of high level contaminants. LOR values have been adjusted accordingly.

Page	: 3 of 5
Work Order	: ES1724553
Client	: ARCADIS AUSTRALIA PACIFIC PTY LTD
Project	: WBFS - COOMBS - 17267

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QA2	----	----	----	----
				Client sampling date / time	22-Sep-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1724553-001	--------	--------	--------	--------
					Result	---	---	---	---
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		**17.8**	----	----	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		**0.0037**	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		**0.0008**	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		**0.322**	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		**0.0054**	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		**0.0402**	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		**0.0016**	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		**0.0045**	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0006	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		**0.0008**	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0006	----	----	----	----

Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	QA2	----	----	----	----
				Client sampling date / time	22-Sep-2017 00:00	----	----	----	----
Compound	CAS Number	LOR	Unit		ES1724553-001	--------	--------	--------	--------
					Result	---	---	---	---
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0006	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg		<0.0006	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0006	----	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	----	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	----	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	----	----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	----	----	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		**0.379**	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		**0.326**	----	----	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		**0.378**	----	----	----	----
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		**0.245**	----	----	----	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		**130**	----	----	----	----

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Work Order	: ES1724553
Client	: ARCADIS AUSTRALIA PACIFIC PTY LTD
Project	: WBFS - COOMBS - 17267

Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	60	130

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **ES1724553**	Page	: 1 of 5
Client	: **ARCADIS AUSTRALIA PACIFIC PTY LTD**	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Contact	: [redacted]
Address	: LEVEL 5, 141 MILLER STREET NORTH SYDNEY NSW, AUSTRALIA 2065	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: +61 03 8623 4000	Telephone	: +61 [redacted]
Project	: WBFS - COOMBS - 17267	Date Samples Received	: 29-Sep-2017
Order number	: ----	Date Analysis Commenced	: 03-Oct-2017
C-O-C number	: ----	Issue Date	: 09-Oct-2017
Sampler	: ----		
Site	: ----		
Quote number	: EN/091/16		
No. of samples received	: 1		
No. of samples analysed	: 1		

ilac-MRA NATA

Accreditation No. 825
Accredited for compliance with
ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

Signatories

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

Signatories	*Position*	*Accreditation Category*
Alex Rossi	Organic Chemist	Sydney Organics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Inorganics, Smithfield, NSW

Page	: 2 of 5
Work Order	: ES1724553
Client	: ARCADIS AUSTRALIA PACIFIC PTY LTD
Project	: WBFS - COOMBS - 17267

General Comments

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

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

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

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot
CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.
LOR = Limit of reporting
RPD = Relative Percentage Difference
# = Indicates failed QC

Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: **SOIL**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1149533)									
ES1724542-086	Anonymous	EA055: Moisture Content	----	1	%	18.9	19.6	3.48	0% - 50%
ES1724550-005	Anonymous	EA055: Moisture Content	----	1	%	<1.0	<1.0	0.00	No Limit
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1148463)									
EB1720154-001	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0047	0.0055	14.8	0% - 20%
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0214	0.0255	17.6	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	0.0012	0.0009	27.2	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1148463)									
EB1720154-001	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0032	0.0032	0.00	0% - 50%
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0012	0.0012	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0016	0.0016	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0008	0.0008	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0026	0.0026	0.00	0% - 50%
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0006	0.0008	26.4	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0008	0.0011	21.0	No Limit
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0006	<0.0006	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	0.014	0.013	0.00	0% - 50%
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1148463)									
EB1720154-001	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	0.0009	0.0008	15.4	No Limit

Sub-Matrix: **SOIL**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1148463) - continued									
EB1720154-001	Anonymous	EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0006	<0.0006	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0006	<0.0006	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0006	<0.0006	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0006	<0.0006	0.00	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1148463)									
EB1720154-001	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	0.0342	0.0334	2.24	0% - 20%
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	0.0373	0.0344	7.90	0% - 20%
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	0.0082	0.0055	39.1	0% - 50%
EP231_TOP_P: PFAS Sums (QC Lot: 1148463)									
EB1720154-001	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.133	0.130	1.82	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0261	0.0310	17.1	0% - 20%
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	0.0509	0.0553	8.29	0% - 20%

Method Blank (MB) and Laboratory Control Spike (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Spike (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: **SOIL**

				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 1148463)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.006 mg/kg	81.7	50	150
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.003 mg/kg	66.2	50	150
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.066 mg/kg	102	50	150
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 1148463)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.0082 mg/kg	84.5	50	150
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.0168 mg/kg	83.2	50	150
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.0177 mg/kg	93.3	50	150
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.0033 mg/kg	106	50	150
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0036 mg/kg	90.6	50	150
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 1148463)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	2448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1148463)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----

Page	: 5 of 5
Work Order	: ES1724553
Client	: ARCADIS AUSTRALIA PACIFIC PTY LTD
Project	: WBFS - COOMBS - 17267

Sub-Matrix: **SOIL**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1148463) - continued								
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 1148463)								
EP231X: Sum of PFAS	----	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	<0.0002	----	----	----	----

Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

- **No Matrix Spike (MS) or Matrix Spike Duplicate (MSD) Results are required to be reported.**

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: ES1724553	Page	: 1 of 4
Client	: ARCADIS AUSTRALIA PACIFIC PTY LTD	Laboratory	: Environmental Division Sydney
Contact	: [redacted]	Telephone	: +61-2[redacted]
Project	: WBFS - COOMBS - 17267	Date Samples Received	: 29-Sep-2017
Site	: ----	Issue Date	: 09-Oct-2017
Sampler	: ----	No. of samples received	: 1
Order number	: ----	No. of samples analysed	: 1

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

Brief method summaries and references are also provided to assist in traceability.

Summary of Outliers

Outliers : Quality Control Samples

This report highlights outliers flagged in the Quality Control (QC) Report.

- **NO Method Blank value outliers occur.**
- **NO Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **NO Matrix Spike outliers occur.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO Quality Control Sample Frequency Outliers exist.**

Page	: 2 of 4
Work Order	: ES1724553
Client	: ARCADIS AUSTRALIA PACIFIC PTY LTD
Project	: WBFS - COOMBS - 17267

Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for ***VOC in soils*** vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: **SOIL**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
HDPE Soil Jar (EA055)							
QA2	22-Sep-2017	----	----	----	03-Oct-2017	06-Oct-2017	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X (TOP))							
QA2	22-Sep-2017	04-Oct-2017	21-Mar-2018	✓	04-Oct-2017	13-Nov-2017	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X (TOP))							
QA2	22-Sep-2017	04-Oct-2017	21-Mar-2018	✓	04-Oct-2017	13-Nov-2017	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE Soil Jar (EP231X (TOP))							
QA2	22-Sep-2017	04-Oct-2017	21-Mar-2018	✓	04-Oct-2017	13-Nov-2017	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE Soil Jar (EP231X (TOP))							
QA2	22-Sep-2017	04-Oct-2017	21-Mar-2018	✓	04-Oct-2017	13-Nov-2017	✓
EP231_TOP_P: PFAS Sums							
HDPE Soil Jar (EP231X (TOP))							
QA2	22-Sep-2017	04-Oct-2017	21-Mar-2018	✓	04-Oct-2017	13-Nov-2017	✓

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Project	: WBFS - COOMBS - 17267

Quality Control Parameter Frequency Compliance

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: **SOIL**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Moisture Content	EA055	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	8	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	8	**12.50**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Brief Method Summaries

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Moisture Content	EA055	SOIL	In house: A gravimetric procedure based on weight loss over a 12 hour drying period at 105-110 degrees C. This method is compliant with NEPM (2013) Schedule B(3) Section 7.1 and Table 1 (14 day holding time).
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	SOIL	In house, following oxidation per Houtz,Erika F.; Sedlak,David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349.: A portion of the oxidised sample is mixed with methanol (1:1) prior to analysis by LC-Electrospray-MS-MS,Negative Mode using MRM. Where commercially available, isotopically labelled analogues of the target analytes are used as internal standards for quantification. Where a labelled analogue is not commercially available, the internal standard with similar chemistry and the closest retention time to the target is used for quantification. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers.

Preparation Methods	Method	Matrix	Method Descriptions
TOP Digest for PFAS on soil Extract.	* ORG70-S	SOIL	In-House Extraction followed by digestion with oxidation per Houtz, Erika F.; Sedlak, David L. (2012): Oxidative Conversion as a Means of Detecting Precursors to Perfluoroalkyl Acids in Urban Runoff. In Environmental Science & Technology 46 (17), pp. 9342¿9349: A soil extract is taken to near dryness and made up to 5 mL with reagents. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.

SGS

CHAIN OF CUSTODY & ANALYSIS REQUEST

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SGS Environmental Services
Unit 16, 33 Maddox Street
Alexandria NSW 2015
Telephone No: (02) 85940400
Facsimile No: (02) 85940499
Email: au.samplereceipt.sydney@sgs.com

Company Name:	Arcadis	Project Name/No:	WBFS – COOMBS - 17267
Address:	Canberra	Purchase Order No:	
		Results Required By:	[redacted]
		Telephone:	[redacted]
Contact Name:	[redacted]	Facsimile:	
		Email Results:	[redacted]@arcadis.com

Client Sample ID	Date Sampled	Lab Sample ID	WATER	SOIL	PRESERVATIVE	NO OF CONTAINERS	TOP Assay PFAS
BH8-0.4-0.6	22/9/17			X			
BH9-0.02-0.2	22/9/17			X			X
BH9-0.4-0.6	22/9/17			X			
BH10-0.1-0.2	22/9/17			X			X
BH10-1.0-1.1	22/9/17			X			
QA1	22/9/17			X			X
QA2 (1)	22/9/17			X			X

Please forward to ALS

Environmental Division Sydney
Work Order Reference
ES1724553

Telephone : + 61-2-8784 8555

Relinquished By:	Date/Time:	Received By:	Date/Time 29/9/17 9:54 165
Relinquished By:	Date/Time:	Received By:	Date/Time
Samples Intact: Yes/ No	Temperature: Ambient / Chilled	Sample Cooler Sealed: Yes/ No	Laboratory Quotation No:
	Comments:		

APPENDIX D

Tables Analytical Results

			Perfluorinated Surfactants in Soil - TOPS																																					
			10:2 Fluorotelomersulphonate	4:2 Fluorotelomersulphonate	6:2 Fluorotelomer Sulfonate	8:2 Fluorotelomersulphonate	N-Ethyl-heptadecafluorooctane sulphonamide	N-Ethyl-heptadecafluorooctane sulphonamidoethanol	N-Methyl-heptadecafluorooctane sulphonamide	N-Methyl-heptadecafluorooctane sulphonamidoethanol	Perfluorononanoic acid	Perfluorooctane sulfonate	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorooctanoic Acid	Perfluorobutanoic acid	Perfluorobutane sulfonate	Perfluorodecanoic acid	Perfluorodecane sulfonate	Perfluoro-1-dodecanesulfonate	Perfluorodecylphosphonic acid	Perfluorododecanoic acid	Perfluoro-1-heptanesulfonate	Perfluoro-1-nonanesulfonate	Perfluoroheptanoic acid	Perfluorohexanoic acid	Perfluoro-n-hexadecanoic acid	Perfluorohexane sulfonate	Perfluorohexylphosphonic acid	Perfluorooctadecanoic Acid	Perfluorooctylphosphonic acid	Perfluorooctane sulfonamide	Perfluoropentanoic acid	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
NSW OEH and NSW Health - HIL A														0.1																											
HIL - A Calculated - plant uptake pathway removed																																									
Field_ID	Sample_Depth_Range	Sampled_Date-Time																																							
BH1	0.05-0.15	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BH2	0.0-0.2	22-09-2017	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH3	0.0-0.1	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BH4	0.0-0.2	22-09-2017	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH5	0.0-0.2	22-09-2017	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH6	0.0-0.2	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
BH7	0.0-0.2	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.74	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.02	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
QA1			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
QA2			N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<0.0002	0.322	<0.0006	0.0045	<0.001	N.A.	<0.0007	N.A.	N.A.	N.A.	<0.0002	N.A.	N.A.	0.0016	0.0402	N.A.	0.004	N.A.	N.A.	N.A.	N.A.	0.0054	<0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
BH8	0.02-0.2	22-09-2017	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH9	0.02-0.2	22-09-2017	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
BH10	0.1-0.2	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.82	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	0.02	<0.02	<0.02	0.04	<0.02	0.08	0.08	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

Statistical Summary																																								
Number of Results	6	6	6	6	6	6	6	6	7	7	7	7	7	6	7	6	6	6	7	6	6	6	7	7	6	7	6	6	6	7	7	7	7	7	7	7	7	7	7	7	7
Number of Detects	0	0	0	0	0	0	0	1	0	7	0	2	0	0	0	0	0	0	0	1	0	1	3	0	2	2	0	3	6	1	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.0002	0.02	<0.0006	0.005	<0.001	<0.02	<0.0002	<0.02	<0.02	<0.04	<0.0002	<0.02	<0.02	0.002	<0.02	<0.02	0.004	<0.02	<0.02	<0.02	0.02	0.0054	<0.0006	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Minimum Detect	ND	ND	ND	ND	ND	ND	ND	0.02	ND	0.02	ND	0.005	ND	ND	ND	ND	ND	ND	ND	0.02	ND	0.002	0.04	ND	0.004	0.02	ND	0.02	0.02	0.0054	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.82	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	0.02	<0.02	<0.02	0.06	<0.02	0.08	0.08	<0.02	0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Maximum Detect	ND	ND	ND	ND	ND	ND	ND	0.02	ND	0.82	ND	0.02	ND	ND	ND	ND	ND	ND	ND	0.02	ND	0.002	0.06	ND	0.08	0.08	ND	0.02	0.02	0.0054	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.012	0.0086	0.33	0.0086	0.011	0.009	0.01	0.0086	0.01	0.01	0.02	0.0086	0.012	0.01	0.009	0.026	0.01	0.019	0.023	0.01	0.015	0.02	0.0093	0.0086	0.0086	0.0086	0.0086	0.0086	0.0086	0.0086	0.0086	0.0086	0.0086	0.0086
Median Concentration	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.322	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Standard Deviation	0	0	0	0	0	0	0	0.004	0.0037	0.33	0.0037	0.005	0.004	0	0.0037	0	0	0	0.0037	0.004	0	0.003	0.021	0	0.027	0.028	0	0.006	0	0.0017	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037	0.0037
Number of Guideline Exceedances	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Number of Guideline Exceedances(Detects Only)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

			Perfluorinated Surfactants																																		
			10:2 Fluorotelomersulphonate	8:2 Fluorotelomersulphonate	6:2 Fluorotelomer Sulfonate	8:2 Fluorotelomersulphonate	N-Ethyl-heptadecafluorooctane sulphonamide	Perfluorooctane sulfonamide (FOSA)	N-Ethyl-heptadecafluorooctane sulphonamidoethanol	N-Methyl-heptadecafluorooctane sulphonamide	N-Methyl-heptadecafluorooctane sulphonamidoethanol	Perfluorononanoic acid	Perfluorooctane sulfonate	Perfluorooctanoic Acid	Perfluorobutanoic acid	Perfluorobutane sulfonate	Perfluorodecanoic acid	Perfluorodecane sulfonate	Perfluoro-1-dodecanesulfonate (PFDoS)	Perfluorodecylphosphonic acid (PFDPA)	Perfluorododecanoic acid	Perfluoro-1-heptanesulfonate (PFHpS)	Perfluoroheptanoic acid	Perfluorohexanoic acid	Perfluorohexylphosphonic acid (PFHxPA)	Perfluoro-n-hexadecanoic acid (PFHxDA)	Perfluoro-1-nonanesulfonate (PFNS)	Perfluorohexane sulfonate	Perfluorooctadecanoic Acid	Perfluorooctylphosphonic acid (PFOPA)	Perfluorooctane sulfonamide	Perfluoropentanoic acid	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid	Sum of PFOS and PFHxS
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
NSW OEH and NSW Health - HIL A														0.1																								
HIL - A Calculated - plant uptake pathway removed																																						1
Field_ID	**Sample_Depth_Range**	**Sampled_Date-Time**																																				
BH1	0.05-0.15	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02
BH2	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	N.A.			
BH3	0.0-0.1	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01			0.06
BH4	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	N.A.			
BH5	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	N.A.			
BH6	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.04			
BH7	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.74			
QA1			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.34			
QA2			<0.0005	<0.0005	<0.0005	<0.0005	N.A.	8E-04	N.A.	N.A.	N.A.	<0.0002	N.A.	0.0045	<0.001	N.A.	<0.0002	N.A.	N.A.	N.A.	<0.0002	N.A.	0.002	0.04	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0.005	<0.0006	<0.0002	N.A.	0.326			
BH8	0.02-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.22	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	0.02	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	N.A.		
BH9	0.02-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	0.02	0.05	<0.01	<0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	N.A.			
BH10	0.1-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.52	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	0.01	<0.01	<0.01	0.05	<0.01	<0.01	0.06	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.9			
Statistical Summary																																						
Number of Results			12	12	12	12	11	12	11	11	11	12	11	12	12	11	12	11	11	11	12	11	12	12	11	11	11	11	11	12	12	12	11	7				
Number of Detects			0	0	0	0	0	1	0	0	0	0	10	1	0	0	0	0	0	2	0	1	1	2	3	0	1	3	0	1	9	1	0	0	0	7		
Minimum Concentration			<0.0005	<0.0005	<0.0005	<0.0005	<0.01	8E-04	<0.01	<0.01	<0.01	<0.0002	<0.01	0.005	<0.001	<0.01	<0.0002	<0.01	<0.01	<0.02	<0.0002	<0.01	0.002	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.005	<0.0006	<0.0002	<0.01	0.02			
Minimum Detect			ND	ND	ND	ND	ND	8E-04	ND	ND	ND	ND	0.02	0.005	ND	ND	ND	ND	ND	0.02	ND	0.01	0.002	0.02	0.03	ND	0.02	0.02	ND	0.01	0.02	0.005	ND	ND	ND	0.02			
Maximum Concentration			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.52	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.01	<0.01	0.04	0.05	<0.01	0.02	0.06	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.9		
Maximum Detect			ND	ND	ND	ND	ND	8E-04	ND	ND	ND	ND	0.52	0.005	ND	ND	ND	ND	ND	0.02	ND	0.01	0.002	0.04	0.05	ND	0.02	0.06	ND	0.01	0.02	0.005	ND	ND	ND	0.9		
Average Concentration			0.0046	0.0046	0.0046	0.0046	0.005	0.005	0.005	0.005	0.005	0.0046	0.17	0.005	0.005	0.005	0.0046	0.005	0.005	0.012	0.0046	0.006	0.005	0.009	0.015	0.005	0.006	0.016	0.005	0.006	0.017	0.005	0.0046	0.0046	0.005	0.35		
Median Concentration			0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.08	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.02	0.005	0.005	0.005	0.005	0.326		
Standard Deviation			0.0014	0.0014	0.0014	0.0014	0	0.001	0	0	0	0.0014	0.19	1E-04	0.001	0	0.0014	0	0	0.004	0.0014	0.002	1E-03	0.011	0.019	0	0.005	0.022	0	0.002	0.006	1E-04	0.0014	0.0014	0	0.35		
Number of Guideline Exceedances			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7		
Number of Guideline Exceedances(Detects Only)			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7		

			Perfluoronated Surfactants in Soil - TOPS																																		
			10:2 Fluorotelomersulphonate	4:2 Fluorotelomersulphonate	6:2 Fluorotelomer Sulfonate	8:2 Fluorotelomersulphonate	N-Ethyl-heptadecafluorooctane sulphonamide	N-Ethyl-heptadecafluorooctane sulphonamidoethanol	N-Methyl-heptadecafluorooctane sulphonamide	N-Methyl-heptadecafluorooctane sulphonamidoethanol	Perfluorononanoic acid	Perfluorooctane sulfonate	N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	Perfluorooctanoic Acid	Perfluorobutanoic acid	Perfluorobutane sulfonate	Perfluorodecanoic acid	Perfluorodecane sulfonate	Perfluoro-1-dodecanesulfonate	Perfluorodecylphosphonic acid	Perfluorododecanoic acid	Perfluoro-1-heptanesulfonate	Perfluoro-1-nonanesulfonate	Perfluoroheptanoic acid	Perfluorohexanoic acid	Perfluoro-n-hexadecanoic acid	Perfluorohexane sulfonate	Perfluorohexylphosphonic acid	Perfluorooctadecanoic Acid	Perfluorooctylphosphonic acid	Perfluorooctane sulfonamide	Perfluoropentanoic acid	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.04	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
BH7	0.0-0.2	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.74	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
QA1	0.0-0.2	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.34	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
RPD %			N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	44%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0%	N.A.	N.A.	N.A.	N.A.
BH7	0.0-0.2	22-09-2017	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.74	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.04	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	<0.02	<0.02
QA2	0.0-0.2	22-09-2017	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	<0.0002	0.322	<0.0006	0.0045	<0.001	N.A.	<0.0002	N.A.	N.A.	N.A.	<0.0002	N.A.	N.A.	0.0016	0.0402	N.A.	0.004	N.A.	N.A.	N.A.	N.A.	0.0054	<0.0006	<0.0002	<0.0002	<0.0002
RPD %			N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	46%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	25%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

			Perfluoronated Surfactants																																				
			10:2 Fluorotelomersulphonate	6:2 Fluorotelomersulphonate	8:2 Fluorotelomer Sulfonate	8:2 Fluorotelomersulphonate	N-Ethyl-heptadecafluorooctane sulphonamide	Perfluorooctane sulfonamide (FOSA)	N-Ethyl-heptadecafluorooctane sulphonamidoethanol	N-Methyl-heptadecafluorooctane sulphonamide	N-Methyl-heptadecafluorooctane sulphonamidoethanol	Perfluorononanoic acid	Perfluorooctane sulfonate	Perfluorooctanoic Acid	Perfluorobutanoic acid	Perfluorobutane sulfonate	Perfluorodecanoic acid	Perfluorodecane sulfonate	Perfluoro-1-dodecanesulfonate (PFDoS)	Perfluorodecylphosphonic acid (FPDPA)	Perfluorododecanoic acid	Perfluoro-1-heptanesulfonate (PFHpS)	Perfluoroheptanoic acid	Perfluorohexanoic acid	Perfluorohexylphosphonic acid (FPHxPA)	Perfluoro-n-hexadecanoic acid (PFHxDA)	Perfluoro-1-nonanesulfonate (PFNS)	Perfluorohexane sulfonate	Perfluorooctadecanoic Acid	Perfluorooctylphosphonic acid (FPOPA)	Perfluoroctane sulfonamide	Perfluoropentanoic acid	Perfluorotetradecanoic acid	Perfluorotridecanoic acid	Perfluoroundecanoic acid	Sum of PFOS and PFHxS
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
BH7	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.74
QA1	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.30	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.34
	RPD %		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	31%	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0%	N.A.	N.A.	N.A.	N.A.	N.A.	44%
BH7	0.0-0.2	22-09-2017	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.50	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.74
QA2	0.0-0.2	22-09-2017	<0.0005	<0.0005	<0.0005	<0.0005	N.A.	8E-04	N.A.	N.A.	N.A.	<0.0002	N.A.	0.0045	<0.001	N.A.	<0.0002	N.A.	N.A.	N.A.	<0.0002	N.A.	0.002	0.04	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	0.005	<0.0005	<0.0002	N.A.	N.A.	N.A.	N.A.	0.326
	RPD %		N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	46%

APPENDIX E

NEPM Toolbox Calculator for HILs

Derivation of Investigation Levels
HIL A - Low Density Residential

Summary of Exposure Parameters		Abbreviation	units	Parameter	References/Notes
Soil and Dust Ingestion Rate	- Young children (0-5 years)	IR_{SC}	mg/day	100	Schedule B7, Table 5
	- Adults	IR_{SA}	mg/day	50	Schedule B7, Table 5
Surface Area of Skin	- Young children (0-5 years)	SA_C	cm^2/day	2700	Schedule B7, Table 5
	- Adults	SA_A	cm^2/day	6300	Schedule B7, Table 5
Soil-to-Skin Adherence Factor		AF	mg/cm^2/day	0.5	Schedule B7, Table 5
Time Spent Outdoors		ETo	hours	4	Schedule B7, Table 5
Time Spent Indoors		ETi	hours	20	Schedule B7, Table 5
Lung Retention Factor		RF	-	0.375	Schedule B7, Table 5
Particulate Emission Factor		PEFo	(m^3/kg)	2.9E+10	Calculated for scenario, refer to Equations 19 and 20 and assumptions in Schedule B7
Indoor Air Dust Factor		PEFi	(m^3/kg)	2.6E+07	As per Equation 21 based assumptions presented in Schedule B7
Fraction of indoor dust comprised of outdoor soil		TF	-	0.5	Assume 50% soil concentration present in dust as noted in Schedule B7
Indoor Air-to-Soil Gas Attenuation Factor		α	-	0.1	Value adopted as discussed in Section 5.5 of Schedule B7
Body weight	- Young children (0-5 years)	BW_C	kg	15	Schedule B7, Table 5
	- Adults	BW_A	kg	70	Schedule B7, Table 5
Exposure Frequency		EF	days/year	365	Schedule B7, Table 5
Exposure Duration	- Young children (0-5 years)	ED_C	years	6	Schedule B7, Table 5
	- Adults	ED_A	years	29	Schedule B7, Table 5
Averaging Time (non-carcinogenic)		AT_T	days	ED*365	Calculated based on ED for each relevant age group, multiplied by 24 hours for the assessment of inhalation exposures
Averaging Time (carcinogenic)		AT_{NT}	days	25550	Based on lifetime of 70 years, multiplied by 24 hours for the assessment of inhalation exposures

Threshold Calculations - Young Child aged 2-3 years

Compound	Toxicity Reference Value Oral (TRV_O) (mg/kg/day)	GI Absorption (GAF) (unitless)	Toxicity Reference Value Dermal (TRV_D) (mg/kg/day)	Oral Bioavailability BA_O (%)	Dermal Absorption Factor (DAF) (unitless)	Background Intake Oral/Dermal (BI_O) (% of TDI)	Toxicity Reference Value Inhalation (TRV_I) (mg/m^3)	Background Intake Inhalation (BII) (% of TC)		Plant Uptake Factor (incl % intake) Adults (kg/day) (eqn 16)	Plant Uptake Factor (incl % intake) Children (kg/day) (eqn 16)	Pathway Specific HILs (mg/kg)				Derived Soil HIL (to 1 or 2 s.f.) (mg/kg)	HIL	Pathways Included		Notes
												Soil Ingestion (eqn 3)	Home-grown produce (eqn 15)	Dermal (eqn 6)	Dust (eqn 9)			Plant Uptake	Dermal Absorption	
PFOS/PFHxS	0.00002	1	0.00002	100%	0.005	80%	0.00014	0%				6.0E-01	0.0E+00	8.9E+00	2.3E+04	**1.0**	**5.6E-01**	n	y	

ARCADIS Design & Consultancy for natural and built assets

Stedman, Andrew (Health)

From: Hudson, Lyndell (Health)
Sent: Tuesday, 24 October 2017 2:17 PM
To: Farrant, Adrian (Health)
Cc: Stedman, Andrew (Health)
Subject: FW: Referral-Health-Development Application - 201731430-22-97-Charnwood-01 [SEC=UNCLASSIFIED]

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Adrian

Can you please see Andrew about this one ☺

Thanks

ACT Government Health
Lyndell Hudson | Manager Environmental Health
Health Protection Service | health.act.gov.au
Phone (02) 6205 0956 | Mobile [redacted]

From: Stedman, Andrew (Health)
Sent: Tuesday, 24 October 2017 10:35 AM
To: Hudson, Lyndell (Health) <Lyndell.Hudson@act.gov.au>
Subject: FW: Referral-Health-Development Application - 201731430-22-97-Charnwood-01 [SEC=UNCLASSIFIED]

Hi Lyndell,

We may need Adrian's help on assessing the suitability of this.

Thanks

Andrew Stedman | Public Health Officer | Environment Team Leader
Phone: 02 6205 4404 | Mobile: [redacted] | Email: andrew.stedman@act.gov.au
Health Protection Service | Population Health Protection and Prevention | ACT Health | ACT Government
25 Mulley Street, Holder ACT 2611 | health.act.gov.au/hps

From: Rogers, Keith (Health)
Sent: Monday, 23 October 2017 4:12 PM
To: Stedman, Andrew (Health) <Andrew.Stedman@act.gov.au>
Cc: Bvirakare, Faith (Health) <Faith.Bvirakare@act.gov.au>; Durant, Sam (Health) <Sam.Durant@act.gov.au>
Subject: FW: Referral-Health-Development Application - 201731430-22-97-Charnwood-01 [SEC=UNCLASSIFIED]

Hi Andrew,

This email will require a response from the ED regarding the PFAS/Charnwood Child care centre DA.

The report submitted is in response to the condition placed on the NOD which means the proponent cannot move forward without our support.

Adrian Farrant was involved and verified the calculations, and I believe the response went through Rad, Vojkan, Vanessa and Brett before Conrad.

Let me know if you need any information or assistance with the response.

Regards,

Keith Rogers | Senior Public Health Officer
Phone: 02 6205 1716 | Mobile: [redacted] | Email: keith.rogers@act.gov.au
Health Protection Service | Population Health Protection and Prevention | ACT Health | ACT Government
25 Mulley Street, Holder ACT 2611 | health.act.gov.au/hps

From: Ryan Stewart [mailto:[redacted]@arcadis.com]
Sent: Monday, 23 October 2017 3:59 PM
To: Rogers, Keith (Health) <Keith.Rogers@act.gov.au>
Subject: FW: Referral-Health-Development Application - 201731430-22-97-Charnwood-01

Amended with title.

Afternoon Keith,

Arcadis is seeking endorsement of the report titled '**SOIL PFAS INVESTIGATION – 172678,** Block 22 Section 97, Charnwood ACT ' from the Health Protection Service (HPS).

This report can be downloaded from the link provided:

https://spaces.hightail.com/space/0Ec4ser0mp

This report is related to the development application 201731430.

Please contact myself if you have any questions.

Regards,

[redacted] | [redacted] | BSc Environment & Sustainability |
[redacted]@arcadis.com
Arcadis | Unit 5/9 Beaconsfield Street, Fyshwick Canberra | ACT 2609 | Australia
T. + 61 2 6280 9898 | M. + 61[redacted]
www.arcadis.com/au

Environmental Strategies

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ACT Government
Health

E-MAILED
10/11/17

MINUTE

SUBJECT: Development Application 201731430-22-97-CHARNWOOD-03 – Applicant response

To: Conrad Barr, Executive Director Health Protection Service

From: Lyndell Hudson, Manager Environmental Health

Date: November 2017

Purpose

To provide you with a response to the applicant of DA 201731430 following a request by the applicant to endorse an Arcadis Design and Consulting report titled 'Soil PFAS Investigation - 172678, Block 22 Section 97, Charnwood ACT'.

Background

1. The HPS has been requested to endorse a report titled 'Soil PFAS Investigation -172678, Block 22 Section 97, Charnwood ACT' in relation to development application (DA) 201731430.
2. DA 201731430 proposes:
    a. demolition of an existing building on the site of a former Fire Brigade Depot
    b. construction of a single storey, 1217 square meter childcare centre (with a proposed capacity of 120 childcare places)
    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.
4. The HPS provided comments to the Environment and Planning Directorate (EPD) regarding DA 201731430 on 24 July 2017. The HPS identified potential exposure of sensitive receptors (children) to Per and Polyfluorinated alkyl Substances (PFAS) chemicals – (PFAS includes: perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid (PFOA)) within soil at the site.
5. Young children are particularly at risk for increased exposure to soil contaminants, such PFAS from pica (eating soil), greater hand-to-mouth activity (including crawling) and reduced hygiene (i.e. washing of hands).
6. The HPS requested the applicant undertake further investigative sampling and propose measures to mitigate potential exposure to PFAS. The minute to ED HPS detailing health concerns and the formal comments provided to EPD are at Attachment 1.

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7. EPD approved DA 201731430 subject to the condition that HPS comments were addressed by the applicant. EPD's Notice of Decision is at Attachment 2. EPD advised the applicant that plans would not be released until HPS confirms support of the proposed development.
8. The applicant undertook the report titled 'Soil PFAS Investigation -172678, Block 22 Section 97, Charnwood ACT' in response to the EPD condition that they address HPS comments.

Issues

9. HPS has reviewed the report and is satisfied the sampling program undertaken was completed as requested. The sample program found soil PFAS concentrations lower than that contained within the Land Development Agency testing undertaken in 2015. The report has proposed a number of mitigation measures including: permanent barriers installed over soil; confirmatory site inspection and review of mitigation measures, with a report provided to ACT Health; soil to be contained on site unless EPA approval is obtained; and an Environment Management Plan (EMP) focusing on maintenance of the proposed mitigation measures and/or intrusive works at the site.
10. The applicant is advised that the HPS supports all mitigation measures proposed within the 'Soil PFAS Investigation -172678, Block 22 Section 97, Charnwood ACT' report undertaken by Arcadis Design and Consulting.
11. The applicant is advised that prior to HPS providing support for the proposed development, the applicant ~~must~~ provide to the HPS details of where each proposed mitigation barrier will be implemented across the site.
12. The HPS will also require an onsite inspection undertaken by HPS officers following the installation of the mitigation measures. This will be a condition of HPS support for the development.

Recommendation

13. It is recommended that you sign the letter at Attachment 3 to the applicant.

AGREED/NOT AGREED/NOTED/PLEASE DISCUSS

Conrad Barr
Executive Director, Health Protection Service
10 November 2017

Lyndell Hudson
Manager Environmental Health
7 November 2017

Action Officer: Andrew Stedman
Extension: 54404

ACT Government
Health

EPDcustomerservices@act.gov.au

Referral-Health-Development Application – 201731430-22-97-CHARNWOOD-01

Dear Sir/Madam,

Thank you for the documentation received on 3 July 2017 regarding a proposed childcare centre in Charnwood.

The Health Protection Service (HPS) notes that the proposed development will include demolition of an existing building on the site of a former Fire Brigade Depot, construction of a single storey, 1217 square meter childcare centre, and construction of 1157 square meter playground, site works and fencing.

Results obtained through the Land Development Agency indicate perfluorooctane sulphonate (PFOS) contamination in three soil samples tested 2015 at levels of between 1.06mg/kg and 1.92mg/kg.

Young children are particularly at risk for increased exposure to soil contaminants, such as PFOS and PFOA from pica (eating soil), greater hand-to-mouth activity (including crawling) and reduced hygiene (i.e. washing of hands). Assessment of the health risk to children of soil contamination at this site was undertaken using the 'Health Based Guidance Values for PFAS – For Use in Site Investigations in Australia,' recently released by the Australian Government Department of Health. These outline a PFOS tolerance value of 20ng/kg/day.

Preliminary calculations suggest a 10kg child (assuming a two year old) would exceed the PFOS tolerable daily intake by consuming just 100mg of soil from the site. A 2006 study conducted in the United States of America found that children aged between two and six years of age consume an average of 138mg/day of soil, or 193mg/day of soil and dust.

The applicant is advised that additional sampling must be undertaken to provide a more complete and up-to-date assessment of the site, focusing on areas likely to be exposed (including playgrounds and landscaped areas). The results and a map indicating sample sites must be provided to the HPS.

HPS requires that the applicant demonstrate suitable mitigation measures to eliminate the exposure of PFOS to vulnerable populations.

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

Please contact Keith Rogers on (02) 6205 1716 if you require any further information.

Yours sincerely

Conrad Barr
Executive Director
Health Protection Service

26 July 2017

ACT Government
Health

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: July 2017

Purpose

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

Background

1. EPSDD has requested that comments are received by 24 July 2017.
2. The development application proposes:
    a. demolition of an existing building on the site of a former Fire Brigade Depot
    b. construction of a single storey, 1217 square meter childcare centre (with a proposed capacity of 120 childcare places)
    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.
4. The Health Protection Service (HPS) responded to an initial development application on 2 June 2017. A copy of the response is at Attachment A. The HPS sought further information regarding the results of the perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid (PFOA) analysis of soil.
5. A representative of the applicant contacted the HPS on Thursday 15 June 2017 by phone seeking clarification of the HPS request at Attachment A. An email response was provided to the representative on 15 June 2017. A copy is at Attachment B.
6. Information provided in this development application in response to HPS concerns advised that HPS should contact the Environmental Protection Agency or the Land Development Agency to obtain results of the testing. A copy of the results was obtained through the Land Development Agency (LDA), on 10 July 2017. A copy is at Attachment C.
7. The information provided by the LDA included a 2015 report undertaken by AECOM, an engineering consultant in Canberra that provided soil sample results for PFOS and PFOA at three sites in one 5m x 7m area at the periphery of the site (Attachment D). These

ACT Government
Health

results demonstrate the presence of PFOS in all three soil samples tested at levels of 1.06mg/kg, 1.30mg/kg and 1.92mg/kg.

8. AECOM concluded that these levels were below *the USA EPA Region 4 (2009) – Soil Screening Levels for PFOS and PFOA Memorandum* of 6mg/kg and therefore determined that the site is acceptable for future child care land use.

9. The USA EPA Memorandum noted the inherent uncertainties in the degree of protectiveness afforded by the listed screening levels and the document has since been archived by the US EPA.

10. Further, in April 2017, the Australian Government Department of Health published *Health Based Guidance Values for PFAS – For Use in Site Investigations in Australia* which outlines a PFOS tolerable daily intake value of 20ng/kg/day (Attachment E).

11. Young children are particularly at risk for increased exposure to soil contaminants, such as PFOS and PFOA from pica (eating soil), greater hand-to-mouth activity (including crawling) and reduced hygiene (i.e. washing of hands).

12. Preliminary calculations suggest a 10kg child (assuming a two year old) would exceed the PFOS daily tolerance level by consuming just 100mg of soil from the site. A 2006 study conducted in the United States of America found that children aged between 2 and 6 years of age may have an average soil ingestion of 138mg/day of soil, or 193mg/day of soil and dust (Attachment F).

Issues

13. The applicant is advised that additional sampling for PFOS and PFOA must be undertaken to provide a more complete and up-to-date assessment of the site, focusing on areas where children are likely to be exposed to surface soils (including playgrounds and landscaped areas). The results and a map indicating sample sites must be provided to the HPS.

14. The HPS requires that the applicant demonstrate suitable mitigation measures to minimise or eliminate the potential ingestion of PFOS and PFOA by children, who are the most sensitive land use receptors considered in this application.

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

ACT Government
Health

MINUTE

Recommendation

16. It is recommended that you sign the letter at Attachment G to EPD.

AGREED/NOT AGREED/NOTED/PLEASE DISCUSS

Conrad Barr
Executive Director, Health Protection Service
July 2017

Radomir Krsteski
A/g Manager, Environmental Health
July 2017

Action Officer: Keith Rogers
Extension: 51716

Stedman, Andrew (Health)

From: Rogers, Keith (Health)
Sent: Monday, 23 October 2017 4:12 PM
To: Stedman, Andrew (Health)
Cc: Bvirakare, Faith (Health); Durant, Sam (Health)
Subject: FW: Referral-Health-Development Application - 201731430-22-97-Charnwood-01 [SEC=UNCLASSIFIED]

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Andrew,

This email will require a response from the ED regarding the PFAS/Charnwood Child care centre DA.

The report submitted is in response to the condition placed on the NOD which means the proponent cannot move forward without our support.

Adrian Farrant was involved and verified the calculations, and I believe the response went through Rad, Vojkan, Vanessa and Brett before Conrad.

Let me know if you need any information or assistance with the response.

Regards,

Keith Rogers | Senior Public Health Officer
Phone: 02 6205 1716 | Mobile: [redacted] | Email: keith.rogers@act.gov.au
Health Protection Service | Population Health Protection and Prevention | ACT Health | ACT Government
25 Mulley Street, Holder ACT 2611 | health.act.gov.au/hps

From: Ryan Stewart [mailto:[redacted]@arcadis.com]
Sent: Monday, 23 October 2017 3:59 PM
To: Rogers, Keith (Health) <Keith.Rogers@act.gov.au>
Subject: FW: Referral-Health-Development Application - 201731430-22-97-Charnwood-01

Amended with title.

Afternoon Keith,

Arcadis is seeking endorsement of the report titled '**SOIL PFAS INVESTIGATION – 172678,** Block 22 Section 97, Charnwood ACT ' from the Health Protection Service (HPS).

This report can be downloaded from the link provided:

https://spaces.hightail.com/space/0Ec4ser0mp

This report is related to the development application 201731430.

Please contact myself if you have any questions.

Regards,

[redacted] | BSc Environment & Sustainability |
ryan.stewart@arcadis.com

Arcadis | Unit 5/9 Beaconsfield Street, Fyshwick Canberra | ACT 2609 | Australia
T. + 61 2 6280 9898 | M. [redacted]
www.arcadis.com/au

Environmental Strategies

ARCADIS Design & Consultancy for natural and built assets

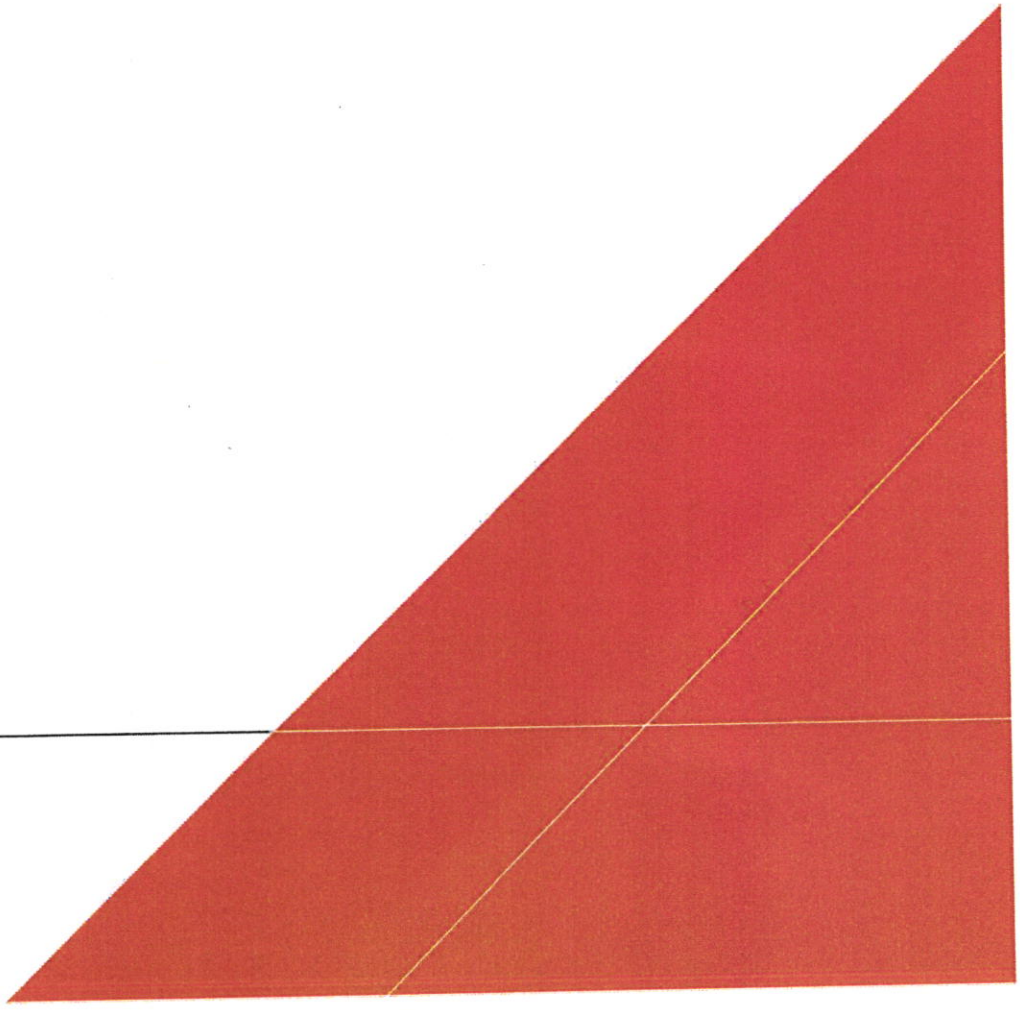
Be green, leave it on the screen.

ARCADIS Design & Consultancy for natural and built assets

SOIL PFAS INVESTIGATION - 172678

Block 22 Section 97, Charnwood ACT

23 OCTOBER 2017



Incorporating

Environmental Strategies

CONTACT

[redacted]

T [redacted]
M [redacted]
E [redacted]@arcadis.com.au

Arcadis
Unit 5, 9 Beaconsfield St
Fyshwick, ACT

PEACH AND CO
17267

Soil PFAS Investigation

Block 22 Section 97, Charnwood ACT

Author [redacted]

Checker [redacted]

Checker [redacted]

Approver [redacted]

Report No 17267

Date 23/10/2017

Revision Text V03

REVISIONS

Revision	Date	Description	Prepared by	Approved by
V01	19/10/2017	Draft	RPS & VL	CG
V02	20/10/2017	Draft for client review	RPS	CG
V03	23/10/2017	Final	RPS	CG

CONTENTS

APPENDICES

EXECUTIVE SUMMARY

Arcadis Australia Pacific Pty Ltd (Arcadis) was commissioned by the Peach and Co Pty Ltd (Peach and Co) to complete a Soil per- and poly-fluoroalkyl substances (PFAS) Investigation at Block 22 Section 97 Charnwood ACT (herein referred to as the Site). It is understood that the site is intended to be redeveloped into a childcare facility.

A historical environmental investigation identified concentrations of PFAS within natural soils in the southern portion of the site. Due to the historical identification of PFAS at the site the ACT Health Directorate required further assessment and recommendations for any mitigation measures, focusing on areas in which children are likely to come in contact with soils (inclusive of playgrounds and landscaped areas).

The objective of this investigation was to assess the soil at the site for PFAS and assess the potential risk of PFAS to the proposed childcare centre.

Ten (10) boreholes were advanced across the site in order to assess soils for potential PFAS impacts.

Concentrations of PFOS and PFHxS (sum) exceeded the OEH residential HSL screening guidelines (0.009 mg/kg) for the following samples:

- BH1 0.05-0.15 at 0.02 mg/kg.
- BH3 0.0-0.1 at 0.06 mg/kg.
- BH6 0.0-0.2 at 0.04 mg/kg.
- BH7 0.0-0.2 at 0.74 mg/kg.
- QA1 (intra-lab duplicate for BH7 0.0-0.2) at 0.34 mg/kg.
- QA2 (inter-lab triplicate for BH7 0.0-0.2) at 0.326 mg/kg.
- BH10 0.1-0.2 at 0.9 mg/kg.

All locations were below the derived screening level of 1 mg/kg, assuming that home grown produce pathways are removed.

A preliminary risk assessment was performed and identified that with the proposed redevelopment plan, the soil ingestion exposure pathway for children is potentially complete.

Arcadis believes that the implementation of a barrier between the existing soil and occupants of the childcare centre will make the exposure pathway incomplete. The following permanent barriers will be acceptable for use to prevent exposure to soil on the site:

- Concrete pavement.
- Compacted decomposed Gravel (minimum 100mm) over geofabric.
- Synthetic turf.
- Rubber soft fall.
- Soft fall mulch (minimum 150mm) over geofabric.
- Tiles and pavers.
- Wooden decking.
- Play sand/digging pit (minimum of 400mm in depth) – Arcadis notes that a geofabric liner will be required below these areas to prevent direct contact to the underlying soils.

Any produce (e.g. fruit or vegetables) grown for consumption must be contained within elevated (400 mm) planter boxes with imported growing medium and must be placed on top of a base layer of geofabric material.

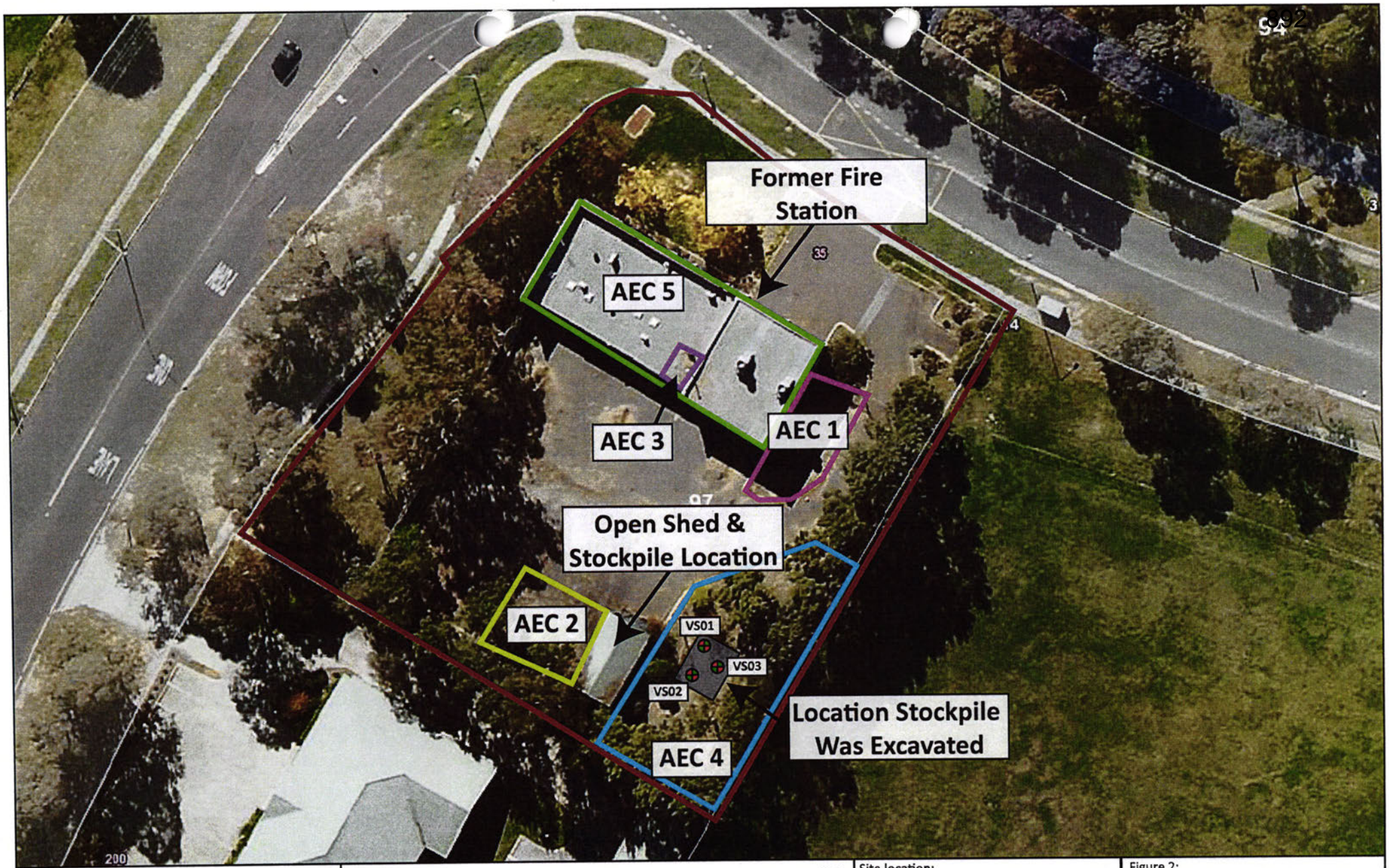
Several mature trees and general landscaping will be located within the playgrounds of the proposed redevelopment. To comply with tree protection guidelines as well as provide a

satisfactory barrier, either compacted decomposed gravel, soft fall mulch, and/or wooden decking as detailed above will be used around the base of these trees.

Based on the results of this investigation, Arcadis makes the following recommendations:

- Implement mitigation measures as described above.
- Where surface soil needs to be moved for construction purposes it should be placed under sealed hardstand areas such as the proposed carpark and or building, where possible.
- A confirmatory site inspection and review of the mitigation measure once installed should be completed. This will include a brief letter report to be provided to the ACT Health Directorate.
- No soil is to be removed from site without prior approval from the ACT EPA.
- An Environmental Management Plan (EMP) focusing on maintenance of the proposed mitigation measures and or intrusive works at the site should be prepared for the site.

Based on the implementation of the above mitigation measures, the potentially complete exposure pathway is revised to incomplete and therefore, the site would be suitable for the proposed childcare facility.



Key:

Sample Location (AECOM 2015B)

Block 22 Section 99 Charnwood (Site)

Source: Google Earth 2017

AECOM (2015A) AECs

AEC 1 - Former USTs
AEC 2 - Car Wrecks/Training
AEC 3 - AFFF Storage
AEC 4 - Potential Uncontrolled Fill
AEC 5 - Septic Tanks and drainage

North

Scale (m)

0 10

Site location:

Block 22 Section 97 Charnwood

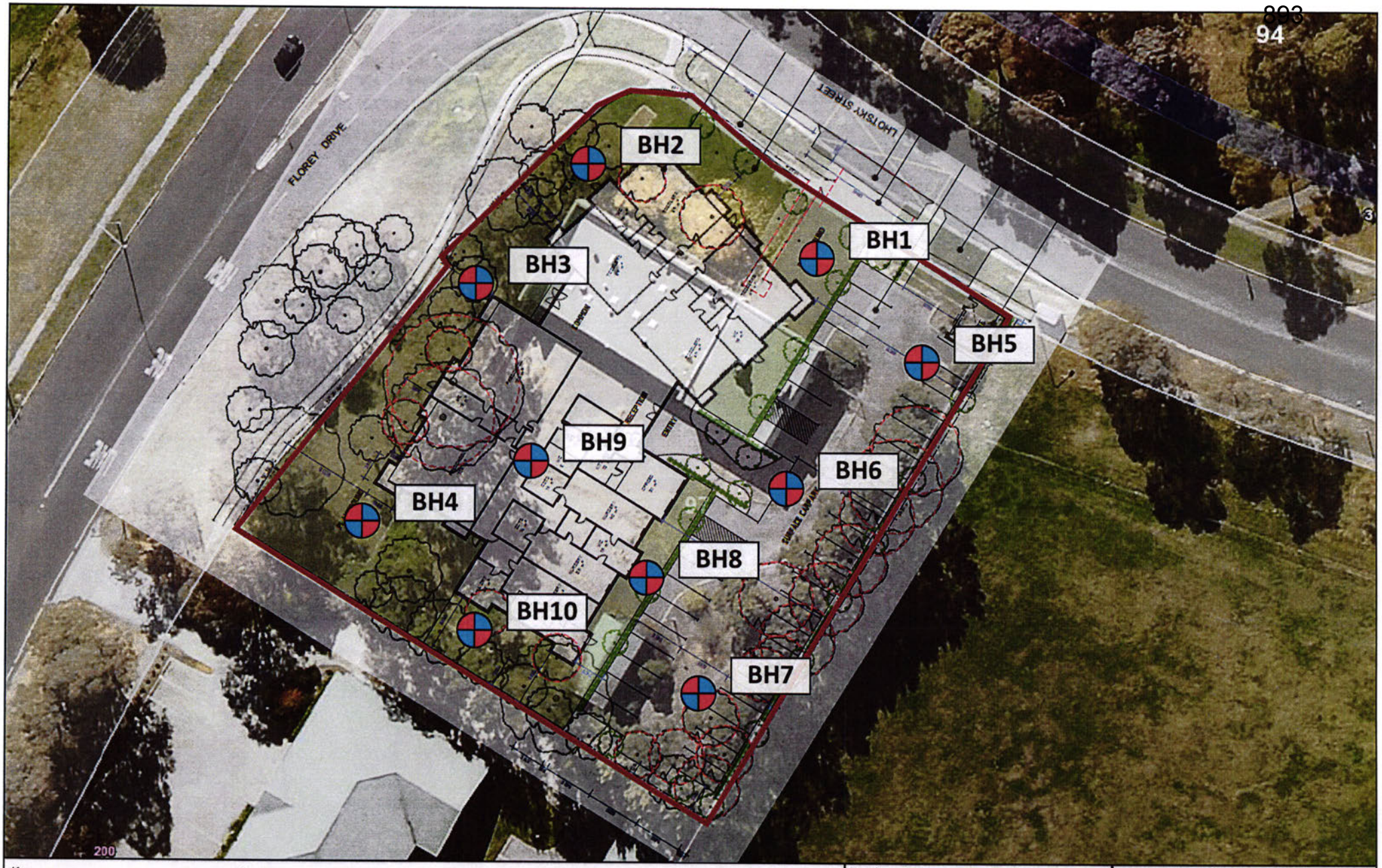
Figure 2:

Site Layout

Job:

17267 - PFAS Soil Assessment

ARCADIS



Key:

Sample Location (Arcadis 2017)

Block 22 Section 99 Charnwood (Site)

Source: Google Earth 2017

North

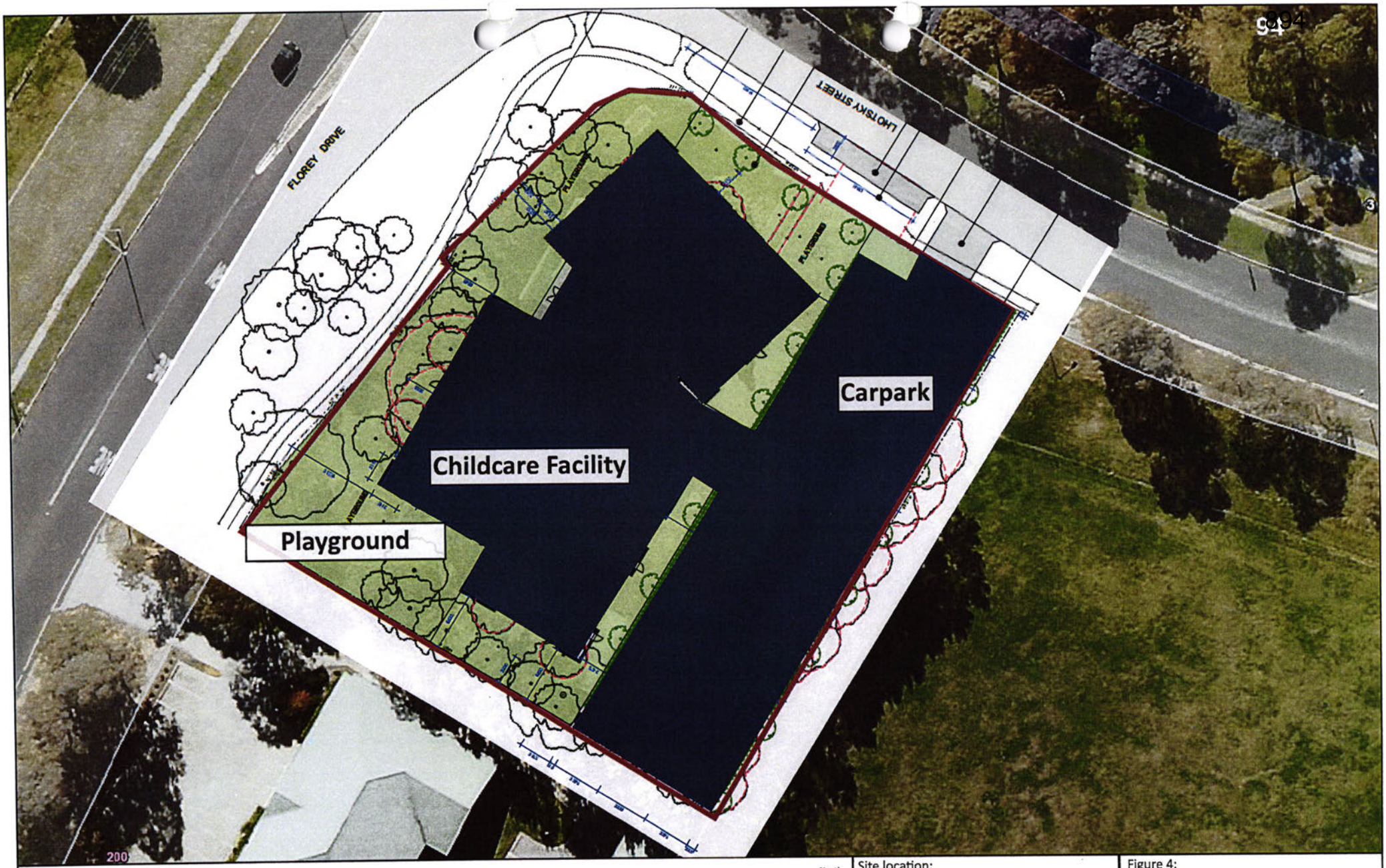
Scale (m) 0 10

Site location: Block 22 Section 97 Charnwood

Figure 3: Arcadis Soil Sample Locations

Job: 17 PFAS Soil Assessment

ARCADIS



Key:

Area of Site Requiriung Mitigation - Playground and Landscaped Areas

Childcare Facility and Carpark - Area Not Requiring Mitigation

Source: Google Earth 2017

North

Scale (m)

0 10

Site location:

Block 22 Section 97 Charnwood

Figure 4:

Proposed Childcare Facility and Mitigation Barrier Locations

Job:

17267 - PFAS Soil Assessment

ARCADIS

ACT Government
Environment, Planning and Sustainable Development

Notice of decision

Under Part 7 of the *Planning and Development Act 2007*

Merit track

2

DA NO: 201731430 201731430/A – S141 201731430/A – S141		DATE LODGED: 1 May 2017 18 June 2017 22 June 2017
DATE OF DECISION: 3 August 2017		
BLOCK: 22	SECTION: 97	SUBURB: CHARNWOOD
STREET NO AND NAME: 35 Lhotsky Street Charnwood		
APPLICANT: Kasparek Architects		
LESSEE: Childcare Investments Aus Pty Limited		

THE DECISION

This application was lodged in the merit track. Pursuant to section 113(2) of the *Planning and Development Act 2007* (Act), the application must be assessed according to the provisions relevant to merit track applications.

I, Jyoti Pradhan, delegate of the planning and land authority, pursuant to section 162 of the Act, hereby **approve subject to conditions** the proposal for:

- **removal of existing nineteen (19) regulated trees** (as indicated on the Tree Management Plan (Project No 1607, Drawing No. DA17 issue B, dated 1/06/2017) prepared by Kasparek Architects)
- **relocation of existing driveway verge crossing and construction of a new driveway verge crossing;**
- **three on-street car parking spaces along Lhotsky Street;**
- **demolition of existing building and associated structures;**
- **construction of a new single storey child care centre for 120 child care spaces and comprising of:**
  - **nursery rooms with attached cot rooms, toddler rooms and pre-school rooms;**
  - **office/admin area;**
  - **kitchen; and**
  - **outdoor play areas;**
- **new surface carpark for minimum 44 car parking spaces;**
- **two illuminated Wall Signs and**
- **associated infrastructure, paving, landscaping and other site works,**

in accordance with the plans, drawings and other documents and items submitted with the application for approval and endorsed as forming part of this approval.

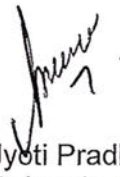
This decision is subject to the conditions of approval at **PART 1** being satisfied.

PART 2 sets out the Reasons for the Decision

PART 3 is Public Notification and Entity Advice.

PART 4 contains administrative information relating to the determination.

DELEGATE



Jyoti Pradhan
Delegate of the planning and land authority
Environment Planning and Sustainable Development Directorate
3 August 2017

CONTACT OFFICER

Jyoti Pradhan
Phone: (02) 6207 1649
Email: Jyoti.Pradhan@act.gov.au

PART 1
CONDITIONS OF APPROVAL

This application is approved subject to the following conditions being satisfied. Some conditions of approval will require attention before the approved drawings will be released, others before work commences or before the completion of building work.

A. ADMINISTRATIVE / PROCESS CONDITIONS

A1. APPROVAL NOT TO TAKE EFFECT

This approval shall not take effect and works shall not commence on site until an endorsement from Health Protection Service (ACT Health Directorate) confirming the suitability of the proposed child care centre, is provided to the authority.

B. CONDITIONS FROM ENTITIES

B1. ACT HEALTH DIRECTORATE - HEALTH PROTECTION SERVICES (HPS)

The applicant/lessee **must** address the concerns raised by HPS in their letter dated 24 July 2017 (Refer to ***Attachment A***).

Note: *Stamped plans will not be released till HPS confirms their support for the proposed development.*

B2. CONSERVATOR OF FLORA and FAUNA – TREE PROTECTION AUTHORITY

The development proposal shall comply with the following conditions to the satisfaction of the Conservator as noted in the advice dated 21 July 2017.

(a) All proposed tree removal and tree protection works must be in accordance with the following plans as submitted:

- Demolition Plan, (Project No 1607, Drawing No. DA16 issue B, dated 1/06/2017, prepared by Kasparek Architects);
- Site Plan & External Lighting (Project No 1607, Drawing No. DA04 issue C, dated 22/06/2017, prepared by Kasparek Architects.)
- Tree Management Plan (Project No 1607, Drawing No. DA17 issue C, dated 1/06/2017, prepared by Kasparek Architects.); and
- Stormwater Management Plan (Job No. 17PEACH1, Drawing No. DA04 issue C, dated 6/06/2017, prepared by Pierre Dragh Consulting Engineers Pty Ltd).

B3. ENVIRONMENT PROTECTION AUTHORITY (EPA)

Applicant must comply with the conditions of approval imposed by the Environment Protection Authority, **prior to works commencing** on site.

Please refer to the conditions of approval at **C1** below.

B4. CUSTODIAN OF THE LAND – TRANSPORT CANBERRA AND CITY SERVICES (TCCS)

Verge Crossing

(a) The verge crossing must be constructed in accordance with TCCS Design Standards;

(b) The levels on the verge must not be altered as a result of the new constructed verge crossing;

(c) Any infrastructure assets such as street lighting, mini-pillars, signage etc must be a minimum of 1.5m away from the closest edge of the driveway. In case of stormwater sumps this minimum distance must be 1.2m;

Pedestrian Network

(d) The pedestrian footpath must take precedence over the verge crossings so pedestrians have right of way over vehicles;

Verge

(e) The verge must be protected at all times during construction;

(f) There must be no encroachments on Unleased Territory Land;

(g) All excavation within the tree protection zones of the verge trees must be carried out through hand digging, hydro excavation or any other recommended methods to ensure minimal damage to the tree roots;

(h) Any new services located within tree protection zones (canopy plus 2m) must be installed by using trenchless methodology beneath tree root systems (i.e. under-boring beneath 650mm);

(i) A Landscape Management and Protection Plan (LMPP) must be submitted to Development Review & Coordination and approved prior to commencement of works;

(j) A dilapidation report for all government assets adjacent to the site must be submitted to Development Review & Coordination prior to commencement and on completion of works;

Waste

(k) Waste Truck Dimensions must not exceed 3.4m long and 2.4m in height;

On-Street Parking

(l) On-street parking spaces must comply with TCCS requirements for on-street parking;

(m) Any proposed parking signs and line-marking must be as per the Australian Standards, AS 1742.11; and

(n) Compliance with the above must be demonstrated at the Design Acceptance Stage.

Note: *See further advice from TCCS under* ***Part 3: ENTITY ADVICE*** *below.*

B5. ACT EDUCATION DIRECTORATE – CHILDREN'S EDUCATION AND CARE ASSURANCE (CECA)

The applicant/lessee/service provider must contact CECA for further details and information regarding the proposed child care centre design and operations **prior to final design and works commencing on site.**

C. PRIOR TO CONSTRUCTION AND/OR DEMOLITION

C1. ENVIRONMENT PROTECTION AUTHORITY (EPA)

1. Contaminated Sites:

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

(b) All soil subject to disposal from site must be assessed in accordance with Environment *Protection Authority Information Sheet 4 - Requirements for the reuse and disposal of contaminated soil in the ACT; and*

(c) No soil is to be disposed from site without EPA approval.

2. Hazardous Materials:

(a) A hazardous materials survey prepared by a suitably qualified consultant in accordance with section 8.1 of the *Authority's Hazardous Materials Environment Protection Policy November 2010* must be submitted to and be endorsed by the Environmental Quality Unit prior to works commencing.

The survey must identify all potential hazardous materials associated with the alteration of the structure and any residues or wastes remaining within the structure. The survey must identify all hazardous material including fuel tanks, asbestos, lead, PCB containing materials, Synthetic Mineral Fibre (SMF), Ozone Depleting Substances etc..

(b) Appropriately ACT licensed contractors must be engaged for the removal, transport and disposal of all hazardous materials found on the site.

3. Environment Protection:

(a) Construction and development works should be in accordance with *"Environment Protection Guidelines for Construction and Land Development, 2011".*

Construction/development on a site of 0.3 hectares or greater is an activity listed in Schedule 1 of the *Environment Protection Act 1997* as a Class B activity. Therefore, the contractor/builder proposing to develop the site must hold an Environmental Authorisation or enter into an Environment Protection Agreement with the EPA in respect of that activity **prior to final design and works commencing on site**.

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

C2. SEDIMENT AND EROSION CONTROL

That prior to any work on the site commencing, the applicant/lessee must submit two copies of the Sediment and Erosion Control Plan to Environment Protection Authority for approval

C3. DESIGN REVIEW

A Letter of Design Review is required for all off-site works from the Senior Manager, Development Review and Coordination, TCCS, prior to the construction.

C4. TEMPORARY TRAFFIC MANAGEMENT (TTM)

A TTM plan approval is required from the Manager, Traffic Management & Safety, Roads ACT, TCCS. All times during construction the site and surrounds shall be managed in accordance with a Temporary Traffic Management Plan, prepared by a suitably qualified person and approved by the Manager, Traffic Management & Safety. This plan is to address, as a minimum, measures to be employed during construction to manage all traffic, including construction traffic, in and around the site, provision of safe pedestrian movement around the site, the provision of parking for construction workers, and associated traffic control devices.

C5. LANDSCAPE MANAGEMENT & PROTECTION PLAN (LMPP)

LMPP approval is required from the Senior Manager, Development Review and Coordination, TCCS. During construction, all existing vegetation (trees, shrubs and grass) located on the verge and unleased Territory land immediately adjacent to the development shall be managed, protected and maintained in accordance with the LMPP approved by the Senior Manager, Development Review and Coordination, TCCS. This plan is to be implemented before the commencement of works, including demolition on the site and is to be in accordance with *TCCS Guidelines for the Protection of Public Landscape Assets Adjacent to Development Works-REF-04.*

C6. NOTICE OF COMMENCEMENT OF CONSTRUCTION

Notice of Commencement of Construction shall be submitted to the Senior Manager, Development Review and Coordination, TCCS one week prior to the commencement of works. The Notice shall also include the confirmation of any protective measures installed in accordance with the approved LMPP and programmed implementation of the TTM.

C7. USE OF VERGES OR OTHER UNLEASED TERRITORY LAND

In accordance with the *Public Unleased Land Act 2013*, road verges and other unleased Territory land must not be used for carrying out of works, including storage of materials or waste, without prior approval of the Territory. Such approval can be obtained from Licensing and Compliance, City Services, Parks and Territory Services, TCCS.

C8. REPAIR OF DAMAGE TO PUBLIC ASSETS

The applicant/lessee is held responsible for all damages to ACT Government assets (including footpaths) caused by the development and they must properly repair any damages to those assets. Before work commences, the applicant/lessee must notify TCCS of any existing damage to public facilities.

C9. TREE PROTECTION

Tree protection fencing, if required, shall be erected prior to the commencement of any work on the site.

D. DURING CONSTRUCTION AND/OR DEMOLITION

D1. LANDSCAPE MANAGEMENT AND PROTECTION

During any work undertaken on the site, all existing vegetation (trees, shrubs and grass) located on the verge and unleased Territory land immediately adjacent to the development shall be managed, protected and maintained in accordance with the approved Landscape Management and Protection Plan (LMPP) approved by the Senior Manager, Development Review and Coordination, TCCS.

D2. TREE PROTECTION

The applicant/lessee shall protect and maintain all existing trees and shrubs located on the subject site, on adjoining blocks overhanging the subject site, on the verge and unleased Territory land immediately adjacent, except for those specifically identified for removal in the approved drawings and a Tree Management Plan.

D3. TRAFFIC MANAGEMENT

At all times, the site and surrounds shall be managed in accordance with the approved Temporary Traffic Management (TTM) Plan.

D4. SEDIMENT AND EROSION CONTROL

All unsurfaced entry and exit points must be consolidated with crushed aggregate or similar extending from the road kerb to the building line.

Temporary sediment controls – comprising, as a minimum, geotextile silt fencing along the lowest points of the site and hay bale filters as required – are to be installed and maintained at least daily to prevent sediment from reaching the stormwater mains system.

D5. WASTE MANAGEMENT

All building waste is to be stored on the site in suitable receptacles and collected regularly. The lessee is to take all reasonable steps to ensure that waste, particularly wind borne litter, does not affect adjoining or adjacent properties.

E. ADVISORY NOTES

This application is approved with the following advisory notes. It is recommended that careful consideration be given to advisory notes prior to commencing work.

E1. ENVIRONMENT PROTECTION

(a) All rain water that enters the site and pools in excavations during a rain storm event would be considered as a sediment control pond, and must meet the following conditions.

1. No discharge from dam. All stormwater must be pumped out and disposed in at an approved location.
2. No discharge from pond unless sediment level is less than 60mg/litre. If sediment level is greater, then prior to discharge, the dam must be dosed with either Alum or Gypsum and allowed to settle until the sediment is less than 60 mg/litre.

E2. EXTERNAL LIGHTING

All external lights must comply with Australian Standards *AS4282 Control of the obtrusive effects of outdoor lighting.*

E3. ACT HEALTH DIRECTORATE- HEALTH PROTECTION SERVICES (HPS)

Prior to work commencing on site the applicant/lessee must submit a 'Food Business Registration and Fit-Out Assessment' application (with suitably detailed plans) for approval by HPS.

E4. ACT EMERGENCY SERVICES AGENCY (ESA)

Prior to commencing work on site the applicant/lessee must consider and address the advice from ESA in their letter dated 18 May 2017 (Refer to ***Attachment B***).

E5. ICON Water

The proposal must comply with the Statement of Conditional Acceptance dated 10 May 2017, by ICON Water (Refer to ***Attachment C***).

E6. ACTEW*AGL*:

(a) The proposal must comply with the Statement of Conditional Compliance dated 23 May 2017, by Actew – Electricity Networks Division (Refer to ***Attachment D***).

(b) The proposal must comply with the Statement of Conditional Compliance dated 16 May 2017, by Actew AGL - Gas Networks Division (Refer to ***Attachment E***).

E7. ENTITY ADVICE

The applicant is advised to carefully consider all the relevant advice (in addition to the conditions imposed) from each of the entities stated in ***PART 3 PUBLIC NOTIFICATION AND ENTITY ADVICE*** of this Notice of Decision throughout the process of development (prior to, during & post construction) as applicable.

Refer to **Appendix 1** for information about approvals that may be required for construction.

PART 2
REASONS FOR THE DECISION

The application satisfactorily meets the requirements for approval. The application was approved because, based on the documentation and in the form modified by the imposed conditions, it was considered to meet:

- the relevant codes, being
  - the Charnwood Precinct Map and Code;
  - the Community Facility Zone Development Code;
  - the Community and Recreation Facilities Location Guidelines General Code; and
  - the Signs General Code.
- the advice of the Conservator of Flora and Fauna in relation to the proposal.

The key issues identified in the assessment are in relation to,

1. Suitability of Site for a Child Care Centre – HPS requirements:

   HPS advised that the EPA endorsement of the site investigation report conducted by AECOME Australia Pty Ltd is supported. However, HPS requested further information from the applicant in relation to the results of the perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid analysis of the soil.

   EPA also confirmed that the above additional information, be requested from the applicant.

   In response, the applicant advised that the information requested was not made available to them at the time of purchase of the site from the Land Development Agency (LDA). The applicant also confirmed that all works on site would be carried out in accordance with the EPA requirements and relevant Australian Standards.

   Further to receiving this response from the applicant, HPS has advised that the results obtained through LDA has provided evidence that PFOS contamination levels on site is considered unacceptable due to its potential health impact on children. HPS has raised concerns in relation to the suitability of the site for the proposed child care centre.

   HPS has advised the applicant to provide a complete and up-to-date assessment of the site, focusing on areas likely to be exposed (including playgrounds and landscaped areas). HPS requires that the applicant demonstrates suitable mitigation measures to eliminate the exposure of (PFOS) to vulnerable populations (refer to ***Attachment A***).

   Condition of approval has been included to provide HPS endorsement confirming the suitability of the proposed child care centre. Refer ***PART 1 CONDITIONS OF APPROVAL*** for more details.

2. Removal of Existing Regulated Trees and Tree Damaging activity:

   The subject development includes removal of nineteen (19) regulated trees. The development also includes tree damaging activity under the canopy of existing regulated trees on site.

   The Conservator of Flora and Fauna - Tree Protection Authority did not support the proposed removal of regulated trees. The advice stated that the trees proposed for removal were of low to medium quality. However, the trees did not meet the Tree Protection Criteria for removal pursuant to the Section 82 of the *Tree Protection Act 2005* and therefore need to be considered for removal on development grounds.

To consider the removal of trees on development grounds pursuant to section 119 (2) of the Act, the applicant was advised to provide additional information on any realistic alternatives to the development proposed or aspects of it.

Applicant provided drawings and further information, which was also referred back to the Tree Protection Authority for further review.

On 21 July 2017, the Conservator liaison advised that the proposed removal of the regulated trees identified for removal on the Tree Management Plan (Project No 1607, Drawing No. DA17 issue B, dated 1/06/2017, prepared by Kasparek Architects) was supported pursuant to conditions of approval. Refer ***PART 1 CONDITIONS OF APPROVAL*** for details.

3. Entity requirements:
   - Environment Protection Authority;
   - Transport Canberra and City Services (TCCS);
   - ACT Education Directorate;
   - ICON Water;
   - Actew AGL – Electricity Networks Division; and
   - Actew AGL – Gas Networks Division.

Conditions have been imposed to address the key issues and ensure that the proposal is consistent with the Territory Plan and the *Planning and Development Act 2007*.

EVIDENCE

Application No. 201731430

File No. 1-2017/07672

The Territory Plan Zone – CFZ Community Facility Zone

The Development Codes – Community Facility Zone Development Code
Community and Recreation Facilities Location Guidelines General Code
Signs General Code

The Precinct Codes – Charnwood Precinct Map and Code

Current Crown Lease – Volume 2270 Folio 56

Representations – No representations received

Entity advice – ACT Health Directorate – Health Protection Services
Conservator of Flora and Fauna
Tree Protection Authority
Environment Protection Authority
Custodian of the Land - Transport Canberra and City Services
ACT Education Directorate
Emergency Services Agency
ICON Water
ActewAGL
– Electricity Networks Division
– Gas Networks Division

PART 3
PUBLIC NOTIFICATION AND ENTITY ADVICE

PUBLIC NOTIFICATION

Pursuant to Division 7.3.4 of the Act, the application was publicly notified from 8 May 2017 to 26 May 2017. No written representations were received during public notification.

ENTITY ADVICE

Pursuant to Division 7.3.3 of the Act, the application was referred to entities and advice was received. The referral entities' comments are as follows. A response to the advice is provided as appropriate.

ACT HEALTH DIRECTORATE - HEALTH PROTECTION SERVICES (HPS)

1. On 5 June 2017 advice was received from HPS in relation to the proposal. The advice stated that,

   (a) The applicant is required to submit a 'Food Business Registration and Fit-Out Assessment' application (with suitably detailed plans) for approval, prior to commencement of construction; and

   (b) Further information is required in relation to the results of the perfluorooctane sulphonate (PFOS) and perfluorooctanoic acid analysis of the soil.

   - In response to item (b), the applicant advised that the above results were not available to them but confirmed that all works will be in accordance with EPA requirements.

2. On 26 July 2017 further advice was received from HPS in relation to the proposal.

   The advice states that the applicant must provide a more complete and up-to-date site assessment and to demonstrate suitable mitigation measures to eliminate the exposure of PFOS to vulnerable populations.

Response:

Matters noted have been incorporated as **conditions of approval** and **advice.**

A copy of the HPS advice is included at ***Attachment A***.

CONSERVATOR OF FLORA and FAUNA

On 18 May 2017 advice was received from the Conservator liaison in relation to the proposal. The advice states that,

> *Dasyurus Macalatus* (Spotted tail quolls) are a largely solitary animal that have a large home range and are highly mobile. At some point in the past a quoll was seen in the vicinity and the works proposed would not impact on that species.

Response:

Matters noted have been incorporated as **advice to the applicant.**

CONSERVATOR OF FLORA and FAUNA – TREE PROTECTION AUTHORITY

1. On 22 May 2017 advice was received from the Conservator liaison in relation to the proposed removal of regulated trees on the site.

   The advice stated that the trees proposed for removal were of low to medium quality.

However, the trees did not meet the Tree Protection Criteria for removal pursuant to the Section 82 of the *Tree Protection Act 2005* and therefore need to be considered for removal on Development Grounds

- The applicant provided drawings and further information, which was also referred back to the Tree Protection Authority for further review.

2. On 21 July 2017 further advice was received from the Conservator liaison in relation to the proposal. The advice states that the proposal is supported provided all works are in accordance with the following plans as submitted for assessment:

   - Demolition Plan, (Project No 1607, Drawing No. DA16 issue B, dated 1/06/2017, prepared by Kasparek Architects);
   - Site Plan & External Lighting (Project No 1607, Drawing No. DA04 issue C, dated 22/06/2017, prepared by Kasparek Architects.)
   - Tree Management Plan (Project No 1607, Drawing No. DA17 issue C, dated 1/06/2017, prepared by Kasparek Architects.); and
   - Stormwater Management Plan (Job No. 17PEACH1, Drawing No. DA04 issue C, dated 6/06/2017, prepared by Pierre Dragh Consulting Engineers Pty Ltd).

Response:

Matters noted have been incorporated as **conditions of approval.**

ENVIRONMENT PROTECTION AUTHORITY (EPA)

1. On 30 May 2017 advice was received from EPA in relation to the proposal. The advice states that the proposal is supported subject to conditions of approval.
2. On 3 July 2017 further advice was received from EPA in relation to the proposal. The advice states that the proposal is supported as per the conditions of approval provided previously.

Conditions:

Contaminated Sites:

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

(b) All soil subject to disposal from site must be assessed in accordance with Environment *Protection Authority Information Sheet 4 - Requirements for the reuse and disposal of contaminated soil in the ACT; and*

(c) No soil is to be disposed from site without EPA approval.

Hazardous Materials:

(d) A hazardous materials survey prepared by a suitably qualified consultant in accordance with section 8.1 of the *Authority's Hazardous Materials Environment Protection Policy November 2010* must be submitted to and be endorsed by the Environmental Quality Unit prior to works commencing.

(e) The survey must identify all potential hazardous materials associated with the alteration of the structure and any residues or wastes remaining within the structure. The survey must identify all hazardous material including fuel tanks, asbestos, lead, PCB containing materials, Synthetic Mineral Fibre (SMF), Ozone Depleting Substances etc.

(f) Appropriately ACT licensed contractors must be engaged for the removal, transport and disposal of all hazardous materials found on the site.

Environment Protection:

(g) Construction and development works should be in accordance with *"Environment Protection Guidelines for Construction and Land Development, 2011".*

Construction/development on a site of 0.3 hectares or greater is an activity listed in Schedule 1 of the *Environment Protection Act 1997* as a Class B activity. Therefore, the contractor/builder proposing to develop the site must hold an Environmental Authorisation or enter into an Environment Protection Agreement with the EPA in respect of that activity **prior to works commencing**.

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

Response:

Matters noted have been incorporated as **conditions of approval** and **advice.**

Note: *Relevant EPA conditions and advice has been included under* ***PART 1 CONDITIONS OF APPROVAL.***

CUSTODIAN OF THE LAND – TRANSPORT CANBERRA AND CITY SERVICES (TCCS)

1. On 23 May 2017 and 25 May 2017 advice was received from TCCS in relation to the proposal. The advice states that the proposal is supported subject to conditions of approval.
2. On 24 July 2017 further advice was received from TCCS in relation to the proposal. The advice states that the proposal is supported (as per the conditions of approval provided previously).

Conditions:

Verge Crossing

(a) The verge crossing must be constructed in accordance with TCCS Design Standards;

(b) The levels on the verge must not be altered as a result of the new constructed verge crossing;

(c) Any infrastructure assets such as street lighting, mini-pillars, signage etc must be a minimum of 1.5m away from the closest edge of the driveway. In case of stormwater sumps this minimum distance must be 1.2m;

Pedestrian Network

(d) The pedestrian footpath must take precedence over the verge crossings so pedestrians have right of way over vehicles;

Verge

(e) The verge must be protected at all times during construction;

(f) There must be no encroachments on Unleased Territory Land;

(g) All excavation within the tree protection zones of the verge trees must be carried out through hand digging, hydro excavation or any other recommended methods to ensure minimal damage to the tree roots;

(h) Any new services located within tree protection zones (canopy plus 2m) must be installed by using trenchless methodology beneath tree root systems (i.e. under-boring beneath 650mm);

(i) A Landscape Management and Protection Plan (LMPP) must be submitted to Development Review & Coordination and approved prior to commencement of works;

(j) A dilapidation report for all Govt. assets adjacent to the site must be submitted to Development Review & Coordination prior to commencement and on completion of works;

Waste

(k) Waste Truck Dimensions must not exceed 3.4m long and 2.4m in height;

On-Street Parking

(l) On-street parking spaces must comply with TCCS requirements for on-street parking;

(m) Any proposed parking signs and line-marking must be as per the Australian Standards, AS 1742.11; and

(n) Compliance with the above must be demonstrated at the Design Acceptance Stage.

Standard Conditions:

(a) Certificate of Design Review and Operational Acceptance

In accordance with the *Public Unleased Land Act 2013* no work is to be undertaken on road verges and other unleased Territory Land without the approval of the Territory. Such approval must be obtained from the Senior Manager, Development Review and Coordination, TCCS by the ways of:

1. A Letter of Design Review prior to the commencement of any work; and
2. A certificate of Operational Acceptance on completion of all works to be handed over to TCCS.

A Letter of Design Review is required for all off-site works from the Senior Manager, Development Review and Coordination, TCCS, prior to the construction.

In order to obtain the Letter of Design Review, fully detailed drawings (civil, landscape) prepared by suitably qualified persons for all off-site works including roads, driveways, footpaths, street lighting, storm water, landscaping (and any other issues that may be found by audit of the plans) and a design report in accordance with Ref No 06:"Requirements for Design Review Submissions", must be certified by a Chartered Engineer/Landscape Architect and submitted to the Senior Manager, Development Review and Coordination, TCCS.

A Certificate of Operational Acceptance on completion of the works is required from the Senior Manager, Development Review and Coordination, TCCS, prior to the issue of a Certificate of Occupancy.

Similarly a Chartered Engineer/Landscape Architect should certify compliance with TCCS Ref No 08: "Requirements for Works as Executed Quality Records Requirements" when the request for Operational Acceptance is made to the Senior Manager, Development Review and Coordination, TCCS on completion of all off-site works.

A Waste Management Plan in accordance with the Development Control Code for Best Practice Waste Management in the ACT should also be included if not approved at the Development Application stage.

(b) Temporary Traffic Management (TTM)

A TTM plan approval is required from the Manager, Traffic Management & Safety, Roads ACT, TCCS. All times during construction the site and surrounds shall be managed in accordance with a Temporary Traffic Management Plan, prepared by a suitably qualified person and approved by the Manager, Traffic Management & Safety. This plan is to address, as a minimum, measures to be employed during construction to manage all traffic, including construction traffic, in and around the site, provision of safe pedestrian movement around the site, the provision of parking for construction workers, and associated traffic control devices.

(c) Landscape Management & Protection Plan (LMPP)

LMPP approval is required from the Senior Manager, Development Review and Coordination, TCCS. During construction, all existing vegetation (trees, shrubs and grass) located on the verge and unleased Territory land immediately adjacent to the development shall be managed, protected and maintained in accordance with the Landscape Management Protection Plan (LMPP) approved by the Senior Manager, Development Review and Coordination, TCCS. This plan is to be implemented before the commencement of works, including demolition on the site and is to be in accordance with *TCCS Guidelines for the Protection of Public Landscape Assets Adjacent to Development Works-REF-04.*

(d) Use of Verges or other Unleased Territory land

In accordance with the *Public Unleased Land Act 2013*, road verges and other unleased Territory land must not be used for carrying out of works, including storage of materials or waste, without prior approval of the Territory. Such approval can be obtained from Licensing and Compliance, City Services, Parks and Territory Services, TCCS.

(e) Repair of Damage to Public Assets

The applicant/lessee is held responsible for all damages to ACT Government assets (including footpaths) caused by the development and they must properly repair any damages to those assets. Before work commences, they should notify TCCS of any existing damage to public facilities.

(f) Notice of Commencement of Construction

Notice of Commencement for the Works in Unleased Territory Land shall be submitted to the Senior Manager, Development Review and Coordination, TCCS one week prior to the commencement of works. The Notice shall also include the confirmation of any protective measures installed in accordance with the approved LMPP and the programmed implementation of TTM.

Response:

Matters noted have been incorporated as **conditions of approval.**

Note: *Relevant TCCS conditions and advice has been included under* ***PART 1 CONDITIONS OF APPROVAL.***

ACT EDUCATION DIRECTORATE – CHILDREN'S EDUCATION AND CARE ASSURANCE (CECA)

1. On 3 May 2017 advice was received from Education Directorate in relation to the proposal requesting further information on feasibility, needs analysis and the selection of an approved provider to operate the proposed child care centre.

   - The applicant provided additional information, which was also referred back to the CECA for further review.

2. On 26 July 2017 further advice was received from CECA supporting the proposal in principle with following condition of approval:

   (a) The applicant/lessee/service provider must contact CECA for further details and information regarding the proposed child care centre design and operations **prior to final design and works commencing on site**.

Response:

Matters noted have been incorporated as **conditions of approval.**

EMERGENCY SERVICES AGENCY (ESA)

On 23 May 2017 advice was received from ESA in relation to the proposal. The advice states that the proposal is supported with advice included in the letter dated 18 May 2017.

Response:

Matters noted have been incorporated as **advice to the applicant.**

A copy of the letter is included at ***Attachment B***.

ICON WATER

On 10 May 2017, a Statement of Conditional Acceptance was issued by ICON WATER in relation to the proposal.

Response:

Matters noted have been incorporated as **advice to the applicant.**

A copy of the Statement is included at ***Attachment C***.

ACTEW*AGL*

Electricity Networks Division

On 23 May 2017, a Statement of Conditional Compliance was issued by Actew*AGL* – Electricity Networks Division in relation to the proposal.

Response:

Matters noted have been incorporated as **advice to the applicant.**

A copy of the Statement is included at ***Attachment D.***

Gas Networks Division (Jemena)

On 16 May 20172017, a Statement of Conditional Compliance was issued by Actew*AGL* – Gas Networks Division (Jemena) in relation to the proposal.

Response:

Matters noted have been incorporated as **advice to the applicant.**

A copy of the Statement is included at ***Attachment E***.

PART 4
ADMINISTRATIVE INFORMATION

DATE THAT THIS APPROVAL TAKES EFFECT

Unless a condition of approval provides for otherwise this approval is effective from the day after the date of this notice. The effective date for development applications approved subject conditions could also be adjusted if the approval is reconsidered by the planning and land authority or if an application is made to the ACT Civil and Administrative Tribunal.

Pursuant to section 184 of the Act, this approval will expire if:

- the development or any stage of the development is not started within two years after the day the approval takes effect;
- the development is not finished two years after the day the development begins; or
- the development approval relates to land comprised in a lease that requires the development to be completed on a stated date – the date stated in the lease for completion of the development, or the approval is revoked under section 189 of the Act.

Under section 184 of the Act, the applicant may apply to the planning and land authority to extend the prescribed period to finish the development, but such an application must be made within the original period specified for completion.

A development approval, to which section 184 of the Act applies, continues unless the approval ends under sections 184, 185, 186 or 187 of the Act.

INSPECTION OF THE APPLICATION AND DECISION

A copy of the application and the decision can be inspected between 8:30am and 4:30pm weekdays at the Environment, Planning and Sustainable Development Directorate (EPSDD) Dickson Customer Service Centre at16 Challis Street, Dickson, ACT.

RECONSIDERATION OF THE DECISION

If the applicant is not satisfied with the decision to approve the application subject to conditions, they are entitled to apply to the planning and land authority for reconsideration within 20 working days of being told of this decision or within any longer period allowed by the planning and land authority.

To submit an application for reconsideration, documents must be provided electrically by email to epdcustomerservices@act.gov.au or provided at the customer service centre on a CD/DVD. The delegate of the Authority reconsidering the decision must be different from, and senior to, the original decision maker. An application for reconsideration does not prevent an application for a review of the same decision being made to the ACT Civil and Administrative Tribunal. Application forms and further information about reconsideration are available from the planning and land authority's website and Customer Service Centres.

REVIEW BY THE ACT CIVIL AND ADMINISTRATIVE TRIBUNAL (ACAT)

Decisions that are reviewable by the ACAT are identified in Schedule 1 of the *Planning and Development Act 2007*, except for those precluded under Schedule 3 of the *Planning and Development Regulation 2008* – Matters exempt from third-party ACAT review.

APPENDIX 1

CONTACT DETAILS OF RELEVANT AGENCIES

Health Directorate - health protection	Website: www.health.act.gov.au Telephone: (02) 6205 1700
Environment, Planning and Sustainable Development Directorate (EPSDD) *Planning and land authority* - list of certifiers for building approval - demolition information - asbestos information *Environment Protection Authority* - environment protection - water resources - asbestos information *Conservation, Planning and Research* - threatened species/wildlife management	 Website: www.planning.act.gov.au Telephone: (02) 6207 1923 Website: www.environment.act.gov.au Telephone: (02) 6207 6251 Website: www.environment.act.gov.au Telephone: (02) 6207 1911
Transport Canberra and City Services Directorate - tree damaging activity approval - use of verges or other unleased Territory land - works on unleased Territory land - design acceptance - damage to public assets	Website: www.tccs.act.gov.au Telephone: 132 281 Telephone for asset acceptance: (02) 6207 7480
Utilities - Telstra (networks) - TransACT (networks) - ActewAGL - Electricity reticulation	Telephone: (02) 8576 9799 Telephone: (02) 6229 8000 Telephone: 1100 Telephone: (02) 6293 5738

ADVICE TO APPLICANT

SUBMISSION OF REVISED DRAWINGS AND DOCUMENTATION

If a condition of approval requires the applicant to lodge revised drawings and/or documentation with the planning and land authority for approval under section 165 of the *Planning and Development Act 2007* the submission shall be made by:

- Completing an application for S165 Satisfying Conditions of Approval and submitting the documentation online using edevelopment. More information on edevelopment can be found at http://www.actpla.act.gov.au/tools_resources/e-services/edevelopment

For further information regarding the lodgement of this information please contact Customer Service Centre by Phone: (02) 6207 1923, Email: **epdcustomerservices@act.gov.au** or on the planning and land authority website at **www.planning.act.gov.au.**

FURTHER APPROVALS FOR CONSTRUCTION

The Notice of Decision grants development approval, but does not cover building approval or approvals which may be required during construction, which commonly include the following.

BUILDING APPROVAL

Most building work requires building approval to ensure it complies with building laws such as the Building Code of Australia. If this applies to this proposal, the lessee should engage a private building certifier to assess and approve the building plans before construction begins. A list of licensed certifiers and information about building approval is available from the planning and land authority's website and Customer Service Centres.

PERMITTED VARIATIONS TO APPROVED DEVELOPMENT

Under section 35 of the *Planning and Development Regulation 2008* the development as built may vary from the approved development in accordance with section 35 and the permitted construction tolerances and other permitted variations identified in Schedule 1A of that regulation.

Note 1 The development may still need building approval, or further building approval, under the *Building Act 2004*

Note 2 The development must also comply with the lease for the land on which it is carried out.

"TREE DAMAGING ACTIVITY" APPROVAL

A Tree Management Plan under the *Tree Protection Act 2005* is required for approval where it is proposed to undertake groundwork within the tree protection zone of a protected tree or likely to cause damage to, or remove, any trees defined as protected trees by that Act. More information is available from the Transport Canberra and City Services (TCCS).

USE OF VERGES OR OTHER UNLEASED TERRITORY LAND

In accordance with the *Public Unleased Land Act of 2013,* road verges and other unleased Territory land must not be used for the carrying out of works, including the storage of materials or waste, without prior approval of the Territory. Approval can be obtained from the Transport Canberra and City Services (TCCS).

WORKS ON UNLEASED TERRITORY LAND – DESIGN AND OPERATIONAL ACCEPTANCE

In accordance with the *Public Unleased Land Act of 2013,* no work can be undertaken on unleased Territory land without the approval of the Territory. Such approval must be obtained from the Manager Asset Acceptance, Asset Services Group, TCCS by way of:

1. a certificate of design acceptance prior to the commencement of any work and
2. a certificate of operational acceptance on completion of all works to be handed over to TCCS.

Works on unleased Territory land may include the construction or upgrading of driveway verge crossings, public footpaths, roads, street lighting, stormwater works, waste collection amenities, street signs and line marking, road furniture and landscaping.

A certificate of compliance under s296 of the *Planning and Development Act 2007* may not be issued unless a certificate of design acceptance **AND** a certificate of operational acceptance has both been obtained from TCCS.

CONSTRUCTION REQUIREMENTS

The following information are some key requirements that apply to building work in the Territory. Other requirements may apply to this development.

DEMOLITION AND ASBESTOS MANAGEMENT

Demolition and asbestos management must be undertaken in accordance with the *Building Act 2004* (including the Building Code of Australia) and the *Dangerous Substances Act 2004*. Information about demolition and asbestos management is available from the planning and land authority's web site and Customer Service Centres.

ENVIRONMENT PROTECTION

All building work must be undertaken in accordance with the *Environment Protection Act 1997*, particularly but not exclusively in relation to noise and pollution control. More information is available from the Environment Protection Authority.

REPAIR OF DAMAGE TO PUBLIC ASSETS

The applicant/lessee is held responsible for all damage to ACT Government assets (including footpaths) caused by the development and they must properly repair any damage to those assets. Before work commences, they should notify the Transport Canberra and City Services (TCCS) of any existing damage to public facilities.

UTILITY ASSETS RETENTION

The lessee should obtain a plant location advice from ActewAGL to avoid conflict with existing plant or electrical easements. The lessee will be responsible for the costs associated with the relocation of assets, if necessary. The lessee is to ensure that the water service and water meter are retained in position and in good condition. ActewAGL water meters are accountable items and must not be removed from the site or otherwise disposed of.

REVIEW OF THE DECISION

The following notes are provided in accordance with regulation 7 of the *ACT Civil and Administrative Tribunal Regulation 2009*. Refer to the Review by the ACT Civil and Administrative Tribunal (ACAT) section of the Notice of Decision for information about its relevance to this development application.

CONTACT DETAILS

The review authority is the ACT Civil and Administrative Tribunal (ACAT).

Location	Contact details
ACT Civil and Administrative Tribunal Level 4, 1 Moore Street CANBERRA CITY ACT 2601	Website: www.acat.act.gov.au Email: tribunal@act.gov.au Telephone: (02) 6207 1740 Facsimile: (02) 6205 4855 Post: GPO Box 370, CANBERRA, ACT, 2601

POWERS OF THE ACAT

The ACAT is an independent body. It can review on their merits a large number of decisions made by ACT Government ministers, officials and statutory authorities. The ACAT can agree with, change or reject the original decision, substitute its own decision or send the matter back to the decision maker for reconsideration in accordance with ACAT recommendations.