

From: SUMMERVILLE Sinead [Sinead.Summerville@des.qld.gov.au]
Sent: Tuesday, 11 September 2018 5:02 PM
To: CORDINGLEY Graham; VARDY Suzanne; BADDILEY Brenda
CC: RICE John; HILL Chris; VENTURA Simone; PFAS Project Team
Subject: FW: RESULTS & EDD & INVOICE for ALS Workorder : EB1821082 | Your Reference: Swanbank
Attachments: EB1821082_0_COA.pdf; EB1821082_0_ENMRG.CSV; EB1821082_0_XTAB.XLS; EB1821082_0_QC.pdf; EB1821082_COC.pdf; EB1821082_0_QCI.pdf; L732507_INV.pdf

Importance: High

Graham / Susi / Brenda

Can you please review the attached results and provide advice (including QC issues) ASAP.

Regards,

Sinead Summerville
A/Compliance Delivery Manager
Energy, Extractive and South West QLD Compliance | Ipswich
Environmental Services and Regulation
Department of Environment and Science



P 07 3894 8157 / M 4(6) Personal Inform
Level 4, 117 Brisbane Street, Ipswich QLD 4305
PO Box 875, Ipswich QLD 4305
Please note I work shorter hours (9am-2:30pm) on Thursday & Friday

...make the move

From: angel-no-reply@alsglobal.com [mailto:angel-no-reply@alsglobal.com]
Sent: Tuesday, 11 September 2018 3:51 PM
To: SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>
Subject: RESULTS & EDD & INVOICE for ALS Workorder : EB1821082 | Your Reference: Swanbank



Deliverables for ALS Workorder EB1821082

Project: Swanbank

Dear SINEAD SUMMERVILLE,

Please find enclosed the following deliverables for **EB1821082**:

- EB1821082_0_COA.pdf
- EB1821082_0_ENMRG.CSV
- EB1821082_0_XTAB.XLS
- EB1821082_0_QC.pdf
- EB1821082_0_QCI.pdf
- L732507_INV.pdf
- EB1821082_COC.pdf

Report Recipients

- SINEAD SUMMERVILLE
 - EB1821082_0_COA.pdf (Email)
 - EB1821082_0_ENMRG.CSV (Email)
 - EB1821082_0_XTAB.XLS (Email)
 - EB1821082_0_QC.pdf (Email)
 - EB1821082_0_QCI.pdf (Email)
 - L732507_INV.pdf (Email)
 - EB1821082_COC.pdf (Email)
- IPSWICH ESR
 - EB1821082_0_COA.pdf (Email)
 - EB1821082_0_ENMRG.CSV (Email)
 - EB1821082_0_XTAB.XLS (Email)
 - EB1821082_0_QC.pdf (Email)
 - EB1821082_0_QCI.pdf (Email)
 - EB1821082_COC.pdf (Email)

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RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATE OF ANALYSIS

Work Order : **EB1821082**
Client : **QLD DEPT OF ENVIRONMENT & SCIENCE**
Contact : **MR SINEAD SUMMERVILLE**
Address : **GPO BOX 2771**
BRISBANE QLD, AUSTRALIA 4001
Telephone : **+61 32245642**
Project : **Swanbank**
Order number :
C-O-C number :
Sampler : **BRENDA BADDILEY, GRAHAM**
Site :
Quote number : **EN/222**
No. of samples received : **11**
No. of samples analysed : **10**

Page : 1 of 15
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 30-Aug-2018 20:20
Date Analysis Commenced : 31-Aug-2018
Issue Date : 11-Sep-2018 15:48



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
Franco Lentini		Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tom Maloney	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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.

- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- EK067G (Total Phosphorous as P): Sample EB1821082_008 was diluted due to matrix interference. LOR adjusted accordingly.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1-B	SW1-B	SW1-TX	SW3-B	BH06-B
Client sampling date / time					28-Aug-2018 10:15	28-Aug-2018 10:30	28-Aug-2018 11:00	28-Aug-2018 11:20	30-Aug-2018 09:20
Compound	CAS Number	LOR	Unit		EB1821082-001	EB1821082-002	EB1821082-003	EB1821082-004	EB1821082-005
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		7.88	----	6.66	8.18	7.95
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		3570	----	<1	954	4770
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		2320	----	<1	620	3100
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		1130	----	<1	266	602
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	----	<1	<1	<1
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	----	<1	<1	<1
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		381	----	5	272	467
Total Alkalinity as CaCO3	----	1	mg/L		381	----	5	272	467
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		590	----	<1	39	325
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		790	----	<1	147	1240
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		131	----	<1	39	101
Magnesium	7439-95-4	1	mg/L		195	----	<1	41	85
Sodium	7440-23-5	1	mg/L		410	----	<1	96	872
Potassium	7440-09-7	1	mg/L		51	----	<1	14	30
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.002	----	<0.001	0.001	0.001
Boron	7440-42-8	0.05	mg/L		0.16	----	<0.05	0.08	0.47
Barium	7440-39-3	0.001	mg/L		0.077	----	<0.001	0.095	0.056
Beryllium	7440-41-7	0.001	mg/L		<0.001	----	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	----	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L		0.007	----	<0.001	<0.001	<0.001
Chromium	7440-47-3	0.001	mg/L		<0.001	----	<0.001	<0.001	<0.001
Copper	7440-50-8	0.001	mg/L		0.002	----	<0.001	0.001	<0.001
Manganese	7439-96-5	0.001	mg/L		1.02	----	<0.001	0.227	0.087
Nickel	7440-02-0	0.001	mg/L		0.015	----	<0.001	0.004	<0.001
Lead	7439-92-1	0.001	mg/L		<0.001	----	<0.001	<0.001	<0.001
Selenium	7782-49-2	0.01	mg/L		<0.01	----	<0.01	<0.01	<0.01



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1-B	SW1-B	SW1-TX	SW3-B	BH06-B
Client sampling date / time					28-Aug-2018 10:15	28-Aug-2018 10:30	28-Aug-2018 11:00	28-Aug-2018 11:20	30-Aug-2018 09:20
Compound	CAS Number	LOR	Unit		EB1821082-001	EB1821082-002	EB1821082-003	EB1821082-004	EB1821082-005
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Vanadium	7440-62-2	0.01	mg/L		0.01	----	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		0.011	----	<0.005	<0.005	0.426
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.6	----	<0.1	0.4	0.6
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	----	----	----	1.05
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		----	----	----	----	<0.01
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	----	----	----	0.06
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	----	----	0.06
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		----	----	----	----	1.0
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		----	----	----	----	1.1
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		----	----	----	----	0.05
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		42.2	----	0.10	10.4	51.1
Total Cations	----	0.01	meq/L		41.7	----	<0.01	9.85	50.7
Ionic Balance	----	0.01	%		0.54	----	----	2.66	0.34
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		----	0.013	<0.002	0.028	<0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		----	0.004	<0.002	0.016	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		----	0.021	<0.002	0.102	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		----	<0.002	<0.002	0.010	<0.002



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW1-B	SW1-B	SW1-TX	SW3-B	BH06-B
Client sampling date / time				28-Aug-2018 10:15	28-Aug-2018 10:30	28-Aug-2018 11:00	28-Aug-2018 11:20	30-Aug-2018 09:20
Compound	CAS Number	LOR	Unit	EB1821082-001	EB1821082-002	EB1821082-003	EB1821082-004	EB1821082-005
				Result	Result	Result	Result	Result
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	----	0.070	0.002	0.342	0.004
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	----	<0.002	<0.002	<0.002	<0.002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	----	0.06	<0.01	0.10	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	----	0.106	<0.002	0.262	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	----	0.090	<0.002	0.212	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	----	0.032	<0.002	0.085	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	----	0.034	<0.002	0.126	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	----	0.004	<0.002	0.011	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	----	<0.002	<0.002	0.005	<0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	----	<0.002	<0.002	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	----	<0.002	<0.002	<0.002	<0.002
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L	----	<0.002	<0.002	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	----	<0.005	<0.005	<0.005	<0.005
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	----	<0.002	<0.002	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	----	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	----	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	----	<0.005	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	----	<0.005	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	----	<0.002	<0.002	<0.002	<0.002



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1-B	SW1-B	SW1-TX	SW3-B	BH06-B
Client sampling date / time					28-Aug-2018 10:15	28-Aug-2018 10:30	28-Aug-2018 11:00	28-Aug-2018 11:20	30-Aug-2018 09:20
Compound	CAS Number	LOR	Unit		EB1821082-001	EB1821082-002	EB1821082-003	EB1821082-004	EB1821082-005
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		----	<0.002	<0.002	<0.002	<0.002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		----	<0.005	<0.005	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		----	<0.005	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		----	<0.005	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		----	<0.005	<0.005	<0.005	<0.005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		----	0.434	0.002	1.30	0.004
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		----	0.091	0.002	0.444	0.004
^ Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L		----	0.282	<0.002	0.844	0.002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		----	0.434	0.002	1.30	0.004
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		----	0.0127	<0.0005	0.0250	0.0010
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		----	0.0038	<0.0005	0.0152	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		----	0.0143	<0.0005	0.0705	0.0007
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		----	0.0020	<0.0005	0.0086	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L		----	0.0874	<0.0003	0.289	0.0039
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		----	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L		----	<0.002	<0.002	<0.002	<0.002
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		----	0.0897	<0.0005	0.169	<0.0005



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW1-B	SW1-B	SW1-TX	SW3-B	BH06-B
Client sampling date / time				28-Aug-2018 10:15	28-Aug-2018 10:30	28-Aug-2018 11:00	28-Aug-2018 11:20	30-Aug-2018 09:20
Compound	CAS Number	LOR	Unit	EB1821082-001	EB1821082-002	EB1821082-003	EB1821082-004	EB1821082-005
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	----	0.0617	<0.0005	0.180	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	----	0.0348	<0.0005	0.0902	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	----	0.0460	<0.0005	0.174	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	----	0.0074	<0.0005	0.0137	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	----	0.0037	<0.0005	0.0088	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	----	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	----	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	----	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	----	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	----	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	----	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	----	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	----	<0.001	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	----	<0.001	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	----	<0.0005	<0.0005	0.0013	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	----	<0.0005	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	----	<0.001	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	----	0.042	<0.001	<0.001	<0.001



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW1-B	SW1-B	SW1-TX	SW3-B	BH06-B
Client sampling date / time					28-Aug-2018 10:15	28-Aug-2018 10:30	28-Aug-2018 11:00	28-Aug-2018 11:20	30-Aug-2018 09:20
Compound	CAS Number	LOR	Unit		EB1821082-001	EB1821082-002	EB1821082-003	EB1821082-004	EB1821082-005
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		----	0.001	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		----	<0.001	<0.001	<0.001	<0.001
EP231P: PFAS Sums									
Sum of PFAS	----	0.0003	µg/L		----	0.406	<0.0003	1.04	0.0056
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0003	µg/L		----	0.102	<0.0003	0.360	0.0046
Sum of PFAS (WA DER List)	----	0.0003	µg/L		----	0.390	<0.0003	0.998	0.0056
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		----	69.9	78.5	86.3	63.4
13C8-PFOA	----	0.002	%		----	92.6	89.2	100	92.3
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		----	74.2	69.0	69.7	72.3
13C8-PFOA	----	0.0005	%		----	92.7	89.5	87.0	95.3



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW3-B	BH01-B	SW1-B	BH10-B	SW1-TX
Client sampling date / time					30-Aug-2018 09:15	30-Aug-2018 09:40	30-Aug-2018 10:10	30-Aug-2018 10:20	30-Aug-2018 14:30
Compound	CAS Number	LOR	Unit		EB1821082-006	EB1821082-008	EB1821082-009	EB1821082-010	EB1821082-011
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		----	7.85	----	6.59	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		----	9530	----	3280	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		----	6190	----	2130	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		----	1230	----	987	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		----	<1	----	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		----	<1	----	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		----	608	----	140	----
Total Alkalinity as CaCO3	----	1	mg/L		----	608	----	140	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		----	<1	----	844	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		----	3500	----	642	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		----	210	----	100	----
Magnesium	7439-95-4	1	mg/L		----	172	----	179	----
Sodium	7440-23-5	1	mg/L		----	1810	----	360	----
Potassium	7440-09-7	1	mg/L		----	40	----	36	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		----	<0.001	----	0.005	----
Boron	7440-42-8	0.05	mg/L		----	0.94	----	0.19	----
Barium	7440-39-3	0.001	mg/L		----	7.12	----	0.032	----
Beryllium	7440-41-7	0.001	mg/L		----	<0.001	----	<0.001	----
Cadmium	7440-43-9	0.0001	mg/L		----	<0.0001	----	<0.0001	----
Cobalt	7440-48-4	0.001	mg/L		----	<0.001	----	0.048	----
Chromium	7440-47-3	0.001	mg/L		----	<0.001	----	<0.001	----
Copper	7440-50-8	0.001	mg/L		----	0.001	----	<0.001	----
Manganese	7439-96-5	0.001	mg/L		----	0.140	----	5.23	----
Nickel	7440-02-0	0.001	mg/L		----	0.006	----	0.051	----
Lead	7439-92-1	0.001	mg/L		----	<0.001	----	<0.001	----
Selenium	7782-49-2	0.01	mg/L		----	<0.01	----	<0.01	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW3-B	BH01-B	SW1-B	BH10-B	SW1-TX
Client sampling date / time					30-Aug-2018 09:15	30-Aug-2018 09:40	30-Aug-2018 10:10	30-Aug-2018 10:20	30-Aug-2018 14:30
Compound	CAS Number	LOR	Unit		EB1821082-006	EB1821082-008	EB1821082-009	EB1821082-010	EB1821082-011
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Vanadium	7440-62-2	0.01	mg/L		----	<0.01	----	<0.01	----
Zinc	7440-66-6	0.005	mg/L		----	1.22	----	0.094	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		----	<0.0001	----	<0.0001	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		----	0.8	----	0.2	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		0.24	3.21	0.26	0.12	0.05
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		----	<0.01	----	0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	0.02	----	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		0.15	0.02	2.54	0.01	0.03
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		1.2	3.3	0.6	0.3	<0.1
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		1.4	3.3	3.1	0.3	<0.1
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		0.04	<0.05	0.04	0.01	0.01
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		----	111	----	38.5	----
Total Cations	----	0.01	meq/L		----	104	----	36.3	----
Ionic Balance	----	0.01	%		----	3.01	----	2.91	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		----	<0.002	----	0.005	<0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		----	<0.002	----	<0.002	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		----	0.002	----	0.003	<0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		----	<0.002	----	<0.002	<0.002



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID				
Client sampling date / time				SW3-B	BH01-B	SW1-B	BH10-B	SW1-TX
Compound				CAS Number	LOR	Unit		
				EB1821082-006	EB1821082-008	EB1821082-009	EB1821082-010	EB1821082-011
				Result	Result	Result	Result	Result
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	----	0.006	----	0.003	<0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	----	<0.002	----	<0.002	<0.002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	----	<0.01	----	<0.01	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	----	<0.002	----	0.026	<0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	----	0.002	----	0.017	<0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	----	<0.002	----	0.003	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	----	<0.002	----	0.002	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	----	<0.002	----	<0.002	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	----	<0.002	----	<0.002	<0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	----	<0.002	----	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	----	<0.002	----	<0.002	<0.002
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L	----	<0.002	----	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	----	<0.005	----	<0.005	<0.005
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	----	<0.002	----	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	----	<0.005	----	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	----	<0.005	----	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	----	<0.005	----	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	----	<0.005	----	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	----	<0.002	----	<0.002	<0.002



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW3-B	BH01-B	SW1-B	BH10-B	SW1-TX
Client sampling date / time					30-Aug-2018 09:15	30-Aug-2018 09:40	30-Aug-2018 10:10	30-Aug-2018 10:20	30-Aug-2018 14:30
Compound	CAS Number	LOR	Unit		EB1821082-006	EB1821082-008	EB1821082-009	EB1821082-010	EB1821082-011
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		----	<0.002	----	<0.002	<0.002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		----	<0.005	----	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		----	<0.005	----	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		----	<0.005	----	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		----	<0.005	----	<0.005	<0.005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		----	0.010	----	0.059	<0.002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		----	0.008	----	0.006	<0.002
^ Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L		----	0.006	----	0.038	<0.002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		----	0.010	----	0.059	<0.002
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		----	<0.0005	----	0.0049	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		----	<0.0005	----	0.0008	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		----	0.0009	----	0.0020	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		----	<0.0005	----	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L		----	0.0055	----	0.0025	<0.0003
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		----	<0.0005	----	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L		----	<0.002	----	<0.002	<0.002
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		----	<0.0005	----	0.0203	<0.0005



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW3-B	BH01-B	SW1-B	BH10-B	SW1-TX
Client sampling date / time				30-Aug-2018 09:15	30-Aug-2018 09:40	30-Aug-2018 10:10	30-Aug-2018 10:20	30-Aug-2018 14:30
Compound	CAS Number	LOR	Unit	EB1821082-006	EB1821082-008	EB1821082-009	EB1821082-010	EB1821082-011
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	----	<0.0005	----	0.0127	<0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	----	<0.0005	----	0.0033	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	----	0.0008	----	0.0028	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	----	<0.0005	----	0.0006	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	----	<0.001	----	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	----	<0.001	----	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	----	<0.001	----	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	----	<0.001	----	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	----	<0.0005	----	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	----	<0.001	----	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	----	<0.001	----	<0.001	<0.001



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW3-B	BH01-B	SW1-B	BH10-B	SW1-TX
Client sampling date / time					30-Aug-2018 09:15	30-Aug-2018 09:40	30-Aug-2018 10:10	30-Aug-2018 10:20	30-Aug-2018 14:30
Compound	CAS Number	LOR	Unit		EB1821082-006	EB1821082-008	EB1821082-009	EB1821082-010	EB1821082-011
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		----	<0.001	----	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		----	<0.001	----	<0.001	<0.001
EP231P: PFAS Sums									
Sum of PFAS	----	0.0003	µg/L		----	0.0072	----	0.0499	<0.0003
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0003	µg/L		----	0.0064	----	0.0045	<0.0003
Sum of PFAS (WA DER List)	----	0.0003	µg/L		----	0.0072	----	0.0485	<0.0003
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		----	68.2	----	68.3	67.1
13C8-PFOA	----	0.002	%		----	95.4	----	84.3	70.8
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		----	74.7	----	72.8	64.2
13C8-PFOA	----	0.0005	%		----	99.6	----	96.1	88.4

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Surrogate Control Limits

Sub-Matrix: **WATER**

		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

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RTI Act 2009

Client - M2 WATER
 Workgroup EB1821082
 Project name Swanbank

Sample Type REG REG REG REG REG
 ALS Sample EB182108; EB182108; EB182108; EB182108; EB182108;
 Sample date #####
 Client sample SW1-B SW1-B SW1-TX SW3-B BH06-B
 Client sample ID (Secondary):
 Sample Site:
 Purchase Order:

Analyte group CAS Number Units LOR

EA005P: pH by PC Titrator

pH Value	pH Unit	0.01	7.88	----	6.66	8.18	7.95
----------	---------	------	------	------	------	------	------

EA010P: Conductivity by PC Titrator

Electrical Conductivity	µS/cm	1	3570	----	<1	954	4770
-------------------------	-------	---	------	------	----	-----	------

EA016: Calculated TDS (from Electrical Conductivity)

Total Dissolved Solids	mg/L	1	2320	----	<1	620	3100
------------------------	------	---	------	------	----	-----	------

EA065: Total Hardness as CaCO3

Total Hardness as Ca	mg/L	1	1130	----	<1	266	602
----------------------	------	---	------	------	----	-----	-----

ED037P: Alkalinity by PC Titrator

Hydroxide DMO-210-	mg/L	1	<1	----	<1	<1	<1
Carbonate 3812-32-6	mg/L	1	<1	---- <td><1</td> <td><1</td> <td><1</td>	<1	<1	<1
Bicarbonate 71-52-3	mg/L	1	381	----	5	272	467
Total Alkalinity as Ca	mg/L	1	381	----	5	272	467

ED041G: Sulfate (Turbidimetric) as SO4 2- by DA

Sulfate as	mg/L	1	590	----	<1	39	325
------------	------	---	-----	------	----	----	-----

ED045G: Chloride by Discrete Analyser

Chloride	mg/L	1	790	----	<1	147	1240
----------	------	---	-----	------	----	-----	------

ED093F: Dissolved Major Cations

Calcium	mg/L	1	131	----	<1	39	101
Magnesium	mg/L	1	195	---- <th><1</th> <td>41</td> <td>85</td>	<1	41	85
Sodium	mg/L	1	410	---- <th><1</th> <td>96</td> <td>872</td>	<1	96	872
Potassium	mg/L	1	51	---- <th><1</th> <td>14</td> <td>30</td>	<1	14	30

EG020T: Total Metals by ICP-MS

Arsenic	mg/L	0.001	0.002	----	<0.001	0.001	0.001
Beryllium	mg/L	0.001	<0.001	---- <th><0.001</th> <td><0.001</td> <td><0.001</td>	<0.001	<0.001	<0.001
Barium	mg/L	0.001	0.077	---- <th><0.001</th> <td>0.095</td> <td>0.056</td>	<0.001	0.095	0.056
Cadmium	mg/L	0.0001	<0.0001	---- <th><0.0001</th> <td><0.0001</td> <td><0.0001</td>	<0.0001	<0.0001	<0.0001
Chromium	mg/L	0.001	<0.001	---- <th><0.001</th> <td><0.001</td> <td><0.001</td>	<0.001	<0.001	<0.001
Cobalt	mg/L	0.001	0.007	---- <th><0.001</th> <td><0.001</td> <td><0.001</td>	<0.001	<0.001	<0.001
Copper	mg/L	0.001	0.002	---- <th><0.001</th> <td>0.001</td> <td><0.001</td>	<0.001	0.001	<0.001
Lead	mg/L	0.001	<0.001	---- <th><0.001</th> <td><0.001</td> <td><0.001</td>	<0.001	<0.001	<0.001
Manganese	mg/L	0.001	1.02	---- <th><0.001</th> <td>0.227</td> <td>0.087</td>	<0.001	0.227	0.087

Nickel	7440-02-0 mg/L	0.001	0.015	----	<0.001	0.004	<0.001
Selenium	7782-49-2 mg/L	0.01	<0.01	----	<0.01	<0.01	<0.01
Vanadium	7440-62-2 mg/L	0.01	0.01	----	<0.01	<0.01	<0.01
Zinc	7440-66-6 mg/L	0.005	0.011	----	<0.005	<0.005	0.426
Boron	7440-42-8 mg/L	0.05	0.16	----	<0.05	0.08	0.47
EG035T: Total Recoverable Mercury by FIMS							
Mercury	7439-97-6 mg/L	0.0001	<0.0001	----	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator							
Fluoride	16984-48-1 mg/L	0.1	0.6	----	<0.1	0.4	0.6
EK055G: Ammonia as N by Discrete Analyser							
Ammonia	7664-41-7 mg/L	0.01	----	----	----	----	1.05
EK057G: Nitrite as N by Discrete Analyser							
Nitrite as N	14797-65-1 mg/L	0.01	----	----	----	----	<0.01
EK058G: Nitrate as N by Discrete Analyser							
Nitrate as N	14797-55-1 mg/L	0.01	----	----	----	----	0.06
EK059G: Nitrite plus Nitrate as N (NO _x) by Discrete Analyser							
Nitrite + Nitrate as N	mg/L	0.01	----	----	----	----	0.06
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Total Kjeldahl Nitrogen	mg/L	0.1	----	----	----	----	1
EK062G: Total Nitrogen as N (TKN + NO _x) by Discrete Analyser							
Total Nitrogen as N	mg/L	0.1	----	----	----	----	1.1
EK067G: Total Phosphorus as P by Discrete Analyser							
Total Phosphorus as P	mg/L	0.01	----	----	----	----	0.05
EN055: Ionic Balance							
Total Anions	meq/L	0.01	42.2	----	0.1	10.4	51.1
Total Cations	meq/L	0.01	41.7	----	<0.01	9.85	50.7
Ionic Balance	%	0.01	0.54	----	----	2.66	0.34
EP231A: Perfluoroalkyl Sulfonic Acids							
Perfluorob	375-73-5 Åµg/L	0.0005	----	0.0127	<0.0005	0.025	0.001
Perfluorop	2706-91-4 Åµg/L	0.0005	----	0.0038	<0.0005	0.0152	<0.0005
Perfluoroh	355-46-4 Åµg/L	0.0005	----	0.0143	<0.0005	0.0705	0.0007
Perfluoroh	375-92-8 Åµg/L	0.0005	----	0.002	<0.0005	0.0086	<0.0005
Perfluoroc	1763-23-1 Åµg/L	0.0003	----	0.0874	<0.0003	0.289	0.0039
Perfluorod	335-77-3 Åµg/L	0.0005	----	<0.0005	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids							
Perfluorob	375-22-4 Åµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002
Perfluorop	2706-90-3 Åµg/L	0.0005	----	0.0897	<0.0005	0.169	<0.0005
Perfluoroh	307-24-4 Åµg/L	0.0005	----	0.0617	<0.0005	0.18	<0.0005
Perfluoroh	375-85-9 Åµg/L	0.0005	----	0.0348	<0.0005	0.0902	<0.0005

Perfluoroc 335-67-1	Âµg/L	0.0005	----	0.046	<0.0005	0.174	<0.0005
Perfluoron 375-95-1	Âµg/L	0.0005	----	0.0074	<0.0005	0.0137	<0.0005
Perfluorod 335-76-2	Âµg/L	0.0005	----	0.0037	<0.0005	0.0088	<0.0005
Perfluorou 2058-94-8	Âµg/L	0.0005	----	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorod 307-55-1	Âµg/L	0.0005	----	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorot 72629-94-1	Âµg/L	0.0005	----	<0.0005	<0.0005	<0.0005	<0.0005
Perfluorot 376-06-7	Âµg/L	0.0005	----	<0.0005	<0.0005	<0.0005	<0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.0005	----	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl 131506-32-1	Âµg/L	0.001	----	<0.001	<0.001	<0.001	<0.001
N-Ethyl 4151-50-2	Âµg/L	0.001	----	<0.001	<0.001	<0.001	<0.001
N-Methyl 24448-09-1	Âµg/L	0.001	----	<0.001	<0.001	<0.001	<0.001
N-Ethyl 1691-99-2	Âµg/L	0.001	----	<0.001	<0.001	<0.001	<0.001
N-Methyl 2355-31-9	Âµg/L	0.0005	----	<0.0005	<0.0005	0.0013	<0.0005
N-Ethyl 2991-50-6	Âµg/L	0.0005	----	<0.0005	<0.0005	<0.0005	<0.0005

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.001	----	<0.001	<0.001	<0.001	<0.001
6:2 Fluoro 27619-97-1	Âµg/L	0.001	----	0.042	<0.001	<0.001	<0.001
8:2 Fluoro 39108-34-1	Âµg/L	0.001	----	0.001	<0.001	<0.001	<0.001
10:2 Fluoro 120226-60	Âµg/L	0.001	----	<0.001	<0.001	<0.001	<0.001

EP231P: PFAS Sums

Sum of PFAS	Âµg/L	0.0003	----	0.406	<0.0003	1.04	0.0056
Sum of PFI 355-46-4/1	Âµg/L	0.0003	----	0.102	<0.0003	0.36	0.0046
Sum of PFAS (WA DEF)	Âµg/L	0.0003	----	0.39	<0.0003	0.998	0.0056

EP231S: PFAS Surrogate

13C4-PFOS	%	0.1	----	74.2	69	69.7	72.3
13C8-PFOA	%	0.1	----	92.7	89.5	87	95.3

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	Âµg/L	0.002	----	0.013	<0.002	0.028	<0.002
Perfluorop 2706-91-4	Âµg/L	0.002	----	0.004	<0.002	0.016	<0.002
Perfluoroh 355-46-4	Âµg/L	0.002	----	0.021	<0.002	0.102	<0.002
Perfluoroh 375-92-8	Âµg/L	0.002	----	<0.002	<0.002	0.01	<0.002
Perfluoroc 1763-23-1	Âµg/L	0.002	----	0.07	0.002	0.342	0.004
Perfluorod 335-77-3	Âµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.01	----	0.06	<0.01	0.1	<0.01
Perfluorop 2706-90-3	Âµg/L	0.002	----	0.106	<0.002	0.262	<0.002
Perfluoroh 307-24-4	Âµg/L	0.002	----	0.09	<0.002	0.212	<0.002
Perfluoroh 375-85-9	Âµg/L	0.002	----	0.032	<0.002	0.085	<0.002
Perfluoroc 335-67-1	Âµg/L	0.002	----	0.034	<0.002	0.126	<0.002
Perfluoron 375-95-1	Âµg/L	0.002	----	0.004	<0.002	0.011	<0.002
Perfluorod 335-76-2	Âµg/L	0.002	----	<0.002	<0.002	0.005	<0.002
Perfluorou 2058-94-8	Âµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002
Perfluorod 307-55-1	Âµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002
Perfluorot 72629-94-1	Âµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002

Perfluorot 376-06-7	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
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EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002
N-Methyl 31506-32-	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
N-Ethyl pe 4151-50-2	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
N-Methyl 24448-09-	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
N-Ethyl pe 1691-99-2	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
N-Methyl 2355-31-9	Âµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002
N-Ethyl pe 2991-50-6	Âµg/L	0.002	----	<0.002	<0.002	<0.002	<0.002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
6:2 Fluoro 27619-97-	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
8:2 Fluoro 39108-34-	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005
10:2 Fluoro 120226-60	Âµg/L	0.005	----	<0.005	<0.005	<0.005	<0.005

EP231_TOP_P: PFAS Sums

Sum of PFAS	Âµg/L	0.002	----	0.434	0.002	1.3	0.004
Sum of PFI 355-46-4/-	Âµg/L	0.002	----	0.091	0.002	0.444	0.004
Sum of TOP C4 - C14	Âµg/L	0.002	----	0.434	0.002	1.3	0.004
Sum of TOP C4 - C14	Âµg/L	0.002	----	0.282	<0.002	0.844	0.002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.1	----	69.9	78.5	86.3	63.4
13C8-PFOA	%	0.1	----	92.6	89.2	100	92.3

QC - Matri WATER

Workgroup EB1821082

Sample Ty	LCS	LCS	DUP	DUP	MB
ALS Sampl	QC-19074	QC-19074	QC-MRG3	QC-MRG4	QC-MRG2
Sample da	#####	#####	#####	#####	#####

Analyte gr	CAS Numb	Units	LOR
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EA005P: pH by PC Titrator

pH Value	%	0.01	100	99.7	7.21	6.56
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EA010P: Conductivity by PC Titrator

Electrical Conductivity	ÂµS/cm	1		1830	3260	<1
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ED037P: Alkalinity by PC Titrator

Hydroxide DMO-210-	mg/L	1		<1	<1
Carbonate 3812-32-6	mg/L	1		<1	<1
Bicarbonat 71-52-3	mg/L	1		755	134
Total Alkalinity as Ca	mg/L	1		755	134

ED041G: Sulfate (Turbidimetric) as SO4 2- by DA

Sulfate as 14808-79-	mg/L	1
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ED045G: Chloride by Discrete Analyser

Chloride	16887-00-1 mg/L	1
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ED093F: Dissolved Major Cations

Calcium	7440-70-2 mg/L	1
Magnesium	7439-95-4 mg/L	1
Sodium	7440-23-5 mg/L	1
Potassium	##### mg/L	1

EG020T: Total Metals by ICP-MS

Arsenic	7440-38-2 mg/L	0.001
Beryllium	7440-41-7 mg/L	0.001
Barium	7440-39-3 mg/L	0.001
Cadmium	7440-43-9 mg/L	0.0001
Chromium	7440-47-3 mg/L	0.001
Cobalt	7440-48-4 mg/L	0.001
Copper	7440-50-8 mg/L	0.001
Lead	7439-92-1 mg/L	0.001
Manganese	7439-96-5 mg/L	0.001
Nickel	7440-02-0 mg/L	0.001
Selenium	7782-49-2 mg/L	0.01
Vanadium	7440-62-2 mg/L	0.01
Zinc	7440-66-6 mg/L	0.005
Boron	7440-42-8 mg/L	0.05

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6 mg/L	0.0001
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EK040P: Fluoride by PC Titrator

Fluoride	16984-48-1 mg/L	0.1	0.2 <0.1
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EK055G: Ammonia as N by Discrete Analyser

Ammonia	7664-41-7 mg/L	0.01
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EK057G: Nitrite as N by Discrete Analyser

Nitrite as N	14797-65-1 mg/L	0.01
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EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

Nitrite + Nitrate as N	mg/L	0.01
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EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

Total Kjeldahl Nitrogen	mg/L	0.1
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EK067G: Total Phosphorus as P by Discrete Analyser

Total Phosphorus as P	mg/L	0.01
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EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorob	375-73-5 µg/L	0.0005
Perfluorop	2706-91-4 µg/L	0.0005
Perfluoroh	355-46-4 µg/L	0.0005
Perfluoroh	375-92-8 µg/L	0.0005

Perfluoroc 1763-23-1	Âµg/L	0.0003
Perfluorod 335-77-3	Âµg/L	0.0005

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.002
Perfluorop 2706-90-3	Âµg/L	0.0005
Perfluoroh 307-24-4	Âµg/L	0.0005
Perfluoroh 375-85-9	Âµg/L	0.0005
Perfluoroc 335-67-1	Âµg/L	0.0005
Perfluoron 375-95-1	Âµg/L	0.0005
Perfluorod 335-76-2	Âµg/L	0.0005
Perfluorou 2058-94-8	Âµg/L	0.0005
Perfluorod 307-55-1	Âµg/L	0.0005
Perfluorot 72629-94-	Âµg/L	0.0005
Perfluorot 376-06-7	Âµg/L	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.0005
N-Methyl 31506-32-	Âµg/L	0.001
N-Ethyl pe 4151-50-2	Âµg/L	0.001
N-Methyl 24448-09-	Âµg/L	0.001
N-Ethyl pe 1691-99-2	Âµg/L	0.001
N-Methyl 2355-31-9	Âµg/L	0.0005
N-Ethyl pe 2991-50-6	Âµg/L	0.0005

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.001
6:2 Fluoro 27619-97-	Âµg/L	0.001
8:2 Fluoro 39108-34-	Âµg/L	0.001
10:2 Fluoro 120226-60	Âµg/L	0.001

EP231P: PFAS Sums

Sum of PFAS	Âµg/L	0.0003
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EP231S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	Âµg/L	0.002
Perfluorop 2706-91-4	Âµg/L	0.002
Perfluoroh 355-46-4	Âµg/L	0.002
Perfluoroh 375-92-8	Âµg/L	0.002
Perfluoroc 1763-23-1	Âµg/L	0.002
Perfluorod 335-77-3	Âµg/L	0.002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.01
Perfluorop 2706-90-3	Âµg/L	0.002
Perfluoroh 307-24-4	Âµg/L	0.002
Perfluoroh 375-85-9	Âµg/L	0.002

Perfluoroc 335-67-1	Âµg/L	0.002
Perfluoron 375-95-1	Âµg/L	0.002
Perfluorod 335-76-2	Âµg/L	0.002
Perfluorou 2058-94-8	Âµg/L	0.002
Perfluorod 307-55-1	Âµg/L	0.002
Perfluorot 72629-94-	Âµg/L	0.002
Perfluorot 376-06-7	Âµg/L	0.005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.002
N-Methyl 31506-32-	Âµg/L	0.005
N-Ethyl pe 4151-50-2	Âµg/L	0.005
N-Methyl 24448-09-	Âµg/L	0.005
N-Ethyl pe 1691-99-2	Âµg/L	0.005
N-Methyl 2355-31-9	Âµg/L	0.002
N-Ethyl pe 2991-50-6	Âµg/L	0.002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.005
6:2 Fluoro 27619-97-	Âµg/L	0.005
8:2 Fluoro 39108-34-	Âµg/L	0.005
10:2 Fluoro 120226-60	Âµg/L	0.005

EP231_TOP_P: PFAS Sums

Sum of PFAS	Âµg/L	0.002
Sum of PFI 355-46-4/	Âµg/L	0.002
Sum of TOP C4 - C14	Âµg/L	0.002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

REG	REG	REG	REG	REG
EB182108	EB182108	EB182108	EB182108	EB1821082009
#####	#####	#####	#####	#####
BH01-B	BH10-B	SW3-B	SW1-TX	SW1-B

7.85	6.59	----	----	----
9530	3280	----	----	----
6190	2130	----	----	----
1230	987	----	----	----
<1	<1	----	----	----
<1	<1	----	----	----
608	140	----	----	----
608	140	----	----	----
<1	844	----	----	----
3500	642	----	----	----
210	100	----	----	----
172	179	----	----	----
1810	360	----	----	----
40	36	----	----	----
<0.001	0.005	----	----	----
<0.001	<0.001	----	----	----
7.12	0.032	----	----	----
<0.0001	<0.0001	----	----	----
<0.001	<0.001	----	----	----
<0.001	0.048	----	----	----
0.001	<0.001	----	----	----
<0.001	<0.001	----	----	----
0.14	5.23	----	----	----

0.006	0.051	----	----	----
<0.01	<0.01	----	----	----
<0.01	<0.01	----	----	----
1.22	0.094	----	----	----
0.94	0.19	----	----	----

<0.0001	<0.0001	----	----	----
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0.8	0.2	----	----	----
-----	-----	------	------	------

3.21	0.12	0.24	0.05	0.26
------	------	------	------	------

<0.01	0.01	----	----	----
-------	------	------	------	------

0.02	<0.01	----	----	----
------	-------	------	------	------

0.02	0.01	0.15	0.03	2.54
------	------	------	------	------

3.3	0.3	1.2	<0.1	0.6
-----	-----	-----	------	-----

3.3	0.3	1.4	<0.1	3.1
-----	-----	-----	------	-----

<0.05	0.01	0.04	0.01	0.04
-------	------	------	------	------

111	38.5	----	----	----
104	36.3	----	----	----
3.01	2.91	----	----	----

<0.0005	0.0049	----	<0.0005	----
<0.0005	0.0008	----	<0.0005	----
0.0009	0.002	----	<0.0005	----
<0.0005	<0.0005	----	<0.0005	----
0.0055	0.0025	----	<0.0003	----
<0.0005	<0.0005	----	<0.0005	----

<0.002	<0.002	----	<0.002	----
<0.0005	0.0203	----	<0.0005	----
<0.0005	0.0127	----	<0.0005	----
<0.0005	0.0033	----	<0.0005	----

0.0008	0.0028	----	<0.0005	----
<0.0005	<0.0005	----	<0.0005	----
<0.0005	0.0006	----	<0.0005	----
<0.0005	<0.0005	----	<0.0005	----
<0.0005	<0.0005	----	<0.0005	----
<0.0005	<0.0005	----	<0.0005	----
<0.0005	<0.0005	----	<0.0005	----

<0.0005	<0.0005	----	<0.0005	----
<0.001	<0.001	----	<0.001	----
<0.001	<0.001	----	<0.001	----
<0.001	<0.001	----	<0.001	----
<0.001	<0.001	----	<0.001	----
<0.0005	<0.0005	----	<0.0005	----
<0.0005	<0.0005	----	<0.0005	----

<0.001	<0.001	----	<0.001	----
<0.001	<0.001	----	<0.001	----
<0.001	<0.001	----	<0.001	----
<0.001	<0.001	----	<0.001	----

0.0072	0.0499	----	<0.0003	----
0.0064	0.0045	----	<0.0003	----
0.0072	0.0485	----	<0.0003	----

74.7	72.8	----	64.2	----
99.6	96.1	----	88.4	----

<0.002	0.005	----	<0.002	----
<0.002	<0.002	----	<0.002	----
0.002	0.003	----	<0.002	----
<0.002	<0.002	----	<0.002	----
0.006	0.003	----	<0.002	----
<0.002	<0.002	----	<0.002	----

<0.01	<0.01	----	<0.01	----
<0.002	0.026	----	<0.002	----
0.002	0.017	----	<0.002	----
<0.002	0.003	----	<0.002	----
<0.002	0.002	----	<0.002	----
<0.002	<0.002	----	<0.002	----
<0.002	<0.002	----	<0.002	----
<0.002	<0.002	----	<0.002	----
<0.002	<0.002	----	<0.002	----
<0.002	<0.002	----	<0.002	----

<0.005 <0.005 ---- <0.005 ----

<0.002 <0.002 ---- <0.002 ----
<0.005 <0.005 ---- <0.005 ----
<0.005 <0.005 ---- <0.005 ----
<0.005 <0.005 ---- <0.005 ----
<0.005 <0.005 ---- <0.005 ----
<0.002 <0.002 ---- <0.002 ----
<0.002 <0.002 ---- <0.002 ----

<0.005 <0.005 ---- <0.005 ----
<0.005 <0.005 ---- <0.005 ----
<0.005 <0.005 ---- <0.005 ----
<0.005 <0.005 ---- <0.005 ----

0.01 0.059 ---- <0.002 ----
0.008 0.006 ---- <0.002 ----
0.01 0.059 ---- <0.002 ----
0.006 0.038 ---- <0.002 ----

68.2 68.3 ---- 67.1 ----
95.4 84.3 ---- 70.8 ----

LCS	LCS	LCS	MB	LCS	LCS	DUP	MS	MB	LCS
QC-MRG2-	QC-19074-	QC-19074-	QC-MRG2-	QC-19076-	QC-MRG2-	QC-MRG3-	QC-19076-	QC-MRG4-	QC-MRG2-
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

98.2 100

99.6

<1 105 93.6 815 ND

642

<1

98.6

99.6

<0.01

101

0.03

<0.01

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LCS	DUP	MS	MB	DUP	DUP	MB	LCS	DUP	DUP
QC-MRG4	QC-MRG2	QC-MRG2	QC-MRG4	QC-MRG2	QC-MRG3	QC-19076	QC-19076	QC-19076	QC-19076
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

105 370 105

<1	51	3
<1	30	2
<1	217	95
<1	3	2

<0.001	105	<0.001	<0.001
<0.001	103	<0.001	<0.001
<0.001	102	0.03	<0.001
<0.0001	99.8	<0.0001	<0.0001
<0.001	101	<0.001	<0.001
<0.001	105	<0.001	<0.001
<0.001	106	0.193	<0.001
<0.001	103	0.001	<0.001
<0.001	105	<0.001	<0.001
<0.001	104	0.014	<0.001
<0.01	102	<0.01	<0.01
<0.01	104	<0.01	<0.01
<0.005	101	0.07	<0.005
<0.05	102	<0.05	<0.05

97.6 <0.01 101

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MS	MB	LCS	DUP	MS	DUP	MB	LCS	DUP	MS
QC-19076	QC-19076	QC-19076	QC-19076	QC-19076	QC-19076	QC-MRG2	QC-MRG2	QC-MRG4	QC-19074
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

104
108
104
102
101
104
105
103
105
102

102
104

<0.0001

110 <0.0001

118 <0.0001

<0.1

96

0.5

83.6

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MS	DUP	DUP	MB	LCS	DUP	MS	DUP	DUP	MB
QC-19074	QC-MRG3	QC-MRG4	QC-MRG2	QC-MRG2	QC-MRG2	QC-MRG2	QC-MRG2	QC-MRG3	QC-MRG2
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

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110

0.2

0.1

<0.01

104

0.2

86.7

0.01

<0.01

<0.01

96.5

0.01

95.1

0.08

<0.1

<0.01

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LCS	DUP	MS	DUP	MB	DUP	DUP	LCS	MB	LCS
QC-MRG2-	QC-MRG2-	QC-MRG2-	QC-MRG2-	QC-19147!	QC-19147!	QC-19147!	QC-19147!	QC-19147!	QC-19147!
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

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77.8	0.3	84.5	0.4
------	-----	------	-----

87.9	0.01	102	0.02
------	------	-----	------

<0.0005	100
<0.0005	94.8
<0.0005	74.2
<0.0005	91.8

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<0.0003	77.2
<0.0005	50.8

<0.002	58.6
<0.0005	113
<0.0005	109
<0.0005	118
<0.0005	107
<0.0005	109
<0.0005	75.8
<0.0005	53
<0.0005	47.2
<0.0005	52.4
<0.0005	64

<0.0005	55.2
<0.001	63.4
<0.001	65.7
<0.001	64.8
<0.001	66.8
<0.0005	51.2
<0.0005	49

<0.001	102
<0.001	100
<0.001	94.4
<0.001	50.2

<0.0003

75.6	70.5
92.5	87.7

<0.002	0.007	<0.002	
<0.002	<0.002	<0.002	
<0.002	0.004	<0.002	77.9
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<0.002	0.004	<0.002	57.7
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<0.002	0.057	<0.002	
<0.002	0.04	<0.002	
<0.002	0.008	<0.002	

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<0.002	<0.002	<0.002	
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<0.005	<0.005	<0.005	

<0.002	<0.002	<0.002
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<0.005	<0.005	<0.005
<0.005	<0.005	<0.005
<0.005	<0.005	<0.005
<0.002	<0.002	<0.002
<0.002	<0.002	<0.002

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<0.005	<0.005	<0.005	
<0.005	<0.005	<0.005	
<0.005	<0.005	<0.005	

<0.002	0.19	<0.002
<0.002	0.008	<0.002
<0.002	0.19	<0.002

76.3	77.8	66.3	75.9
91.4	97.8	70	91.2

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DUP	MS	DUP	REG	REG	REG	REG	REG	REG	REG
QC-19147	QC-19147	QC-19147	EB182003	EB182003	EB182053	EB182053	EB182101	EB182105	EB182105
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

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---	---	---	---	---	---	---
---	---	---	---	---	---	---

[illegible]

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RTI Act 2009

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RTI Act 2009

REG	REG	REG	REG	REG	REG	REG	REG	REG	REG
EB182105	EB182105	EB182106	EB182106	EB182106	EB182108	EB182108	EB182108	EB182108	EB182108
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####
----	----	----	----	----	----	----	----	----	----
----	----	----	----	1840	----	----	----	----	----
----	----	----	----	<1	----	----	----	----	----
----	----	----	----	<1	----	----	----	----	----
----	----	----	----	728	----	----	----	----	----
----	----	----	----	728	----	----	----	----	----
----	----	----	----	----	----	387	----	----	----

---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---
96	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---
---	---	<0.001	<0.001	---	---	---	---	---	---
---	---	<0.001	<0.001	---	---	---	---	---	---
---	---	0.029	0.03	---	---	---	---	---	---
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---	---	<0.001	<0.001	---	---	---	---	---	---
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---	---	0.191	0.019	---	---	---	---	---	---
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---	---	<0.05	---	---	---	---	---	---	---
---	---	---	---	---	<0.0001	<0.0001	---	---	---
---	0.1	---	---	---	---	---	---	---	0.2
---	---	---	---	---	---	---	0.17	0.06	---
---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	0.02	0.23	---
---	---	---	---	---	---	---	---	0.3	---
---	---	---	---	---	---	---	---	0.01	---
---	---	---	---	---	0.0074	0.512	---	---	---
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---	---	---	---	---	0.0023	1.09	---	---	---
---	---	---	---	---	<0.0005	0.0584	---	---	---

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----	----	----	----	----	0.0363	1.41	----	----	----
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----	----	----	----	----	0.0121	0.27	----	----	----
----	----	----	----	----	<0.0005	0.0107	----	----	----
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----	----	----	----	----	0.125	----	----	----	----
----	----	----	----	----	75.4	73.1	----	----	----
----	----	----	----	----	92.7	98.7	----	----	----
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----	----	----	----	----	<0.002	----	----	----	----
----	----	----	----	----	0.004	----	----	----	----
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----	----	----	----	----	0.004	----	----	----	----
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----	----	----	----	----	0.039	----	----	----	----
----	----	----	----	----	0.007	----	----	----	----

----	----	----	----	----	0.009	----	----	----	----
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----	----	----	----	----	<0.002	----	----	----	----
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----	----	----	----	----	<0.002	----	----	----	----
----	----	----	----	----	<0.005	----	----	----	----
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----	----	----	----	----	<0.005	----	----	----	----
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----	----	----	----	----	0.008	----	----	----	----
----	----	----	----	----	0.191	----	----	----	----
----	----	----	----	----	74.1	----	----	----	----
----	----	----	----	----	91.7	----	----	----	----

REG REG REG
EB182108:EB182108:EB1821083002
#####

--- <0.0001

0.4 ---

--- 0.04 ---

--- 0.08 ---

0.0184 ---
0.0109 ---
0.0588 ---
0.0039 ---

0.134 ----
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<0.002 ----
0.0933 ----
0.108 ----
0.0269 ----
0.038 ----
0.0085 ----
0.0011 ----
0.0007 ----
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<0.0005 ----

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<0.001 ----
<0.001 ----
<0.0005 ----
<0.0005 ----

<0.001 ----
0.013 ----
<0.001 ----
<0.001 ----

0.516 ----

66.7 ----
90.4 ----

QUALITY CONTROL REPORT

Work Order	: EB1821082	Page	: 1 of 16
Client	: QLD DEPT OF ENVIRONMENT & SCIENCE	Laboratory	: Environmental Division Brisbane
Contact	: MR SINEAD SUMMERVILLE	Contact	: Customer Services EB
Address	: GPO BOX 2771 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 32245642	Telephone	: +61-7-3243 7222
Project	: Swanbank	Date Samples Received	: 30-Aug-2018
Order number	: ----	Date Analysis Commenced	: 31-Aug-2018
C-O-C number	: ----	Issue Date	: 11-Sep-2018
Sampler	: BRENDA BADDILEY, GRAHAM		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 11		
No. of samples analysed	: 10		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Franco Lentini		Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tom Maloney	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA005P: pH by PC Titrator (QC Lot: 1907481)									
EB1821063-008	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.18	7.21	0.417	0% - 20%
EB1821082-010	BH10-B	EA005-P: pH Value	----	0.01	pH Unit	6.59	6.56	0.456	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 1907480)									
EB1821063-008	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1840	1830	0.789	0% - 20%
EB1821082-010	BH10-B	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	3280	3260	0.631	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 1907482)									
EB1821063-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	728	755	3.63	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	728	755	3.63	0% - 20%
EB1821082-010	BH10-B	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	140	134	4.70	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	140	134	4.70	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 1907614)									
EB1821082-010	BH10-B	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	844	815	3.58	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 1907611)									
EB1820038-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	376	370	1.54	0% - 20%
EB1821082-010	BH10-B	ED045G: Chloride	16887-00-6	1	mg/L	642	642	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 1907575)									
EB1820038-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	51	51	0.00	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	31	30	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	219	217	0.816	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED093F: Dissolved Major Cations (QC Lot: 1907575) - continued									
EB1821056-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	3	3	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	96	95	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 1907670)									
EB1821061-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Barium	7440-39-3	0.001	mg/L	0.029	0.030	0.00	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.191	0.193	0.629	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.013	0.014	7.67	0% - 50%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.068	0.070	2.64	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EB1821082-003	SW1-TX	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Barium	7440-39-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1907672)									
EB1821081-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1821083-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 1907478)									
EB1821056-007	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.00	No Limit
EB1821050-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.5	0.5	0.00	No Limit



Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EK040P: Fluoride by PC Titrator (QC Lot: 1907483)									
EB1821084-005	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.00	No Limit
EB1821082-010	BH10-B	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1911997)									
EB1821081-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.17	0.20	18.8	0% - 20%
EB1821083-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.01	114	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 1907610)									
EB1820038-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1821019-009	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 1907615)									
EB1821082-010	BH10-B	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.01	0.03	64.8	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 1911998)									
EB1821081-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.01	76.8	No Limit
EB1821083-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.08	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 1912290)									
EB1820532-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	0.3	0.00	No Limit
EB1821081-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.4	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 1912291)									
EB1820532-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.01	0.00	No Limit
EB1821081-006	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.02	67.7	No Limit
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	0.007	0.007	0.00	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	0.004	0.004	0.00	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	0.004	0.004	0.00	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EB1821082-011	SW1-TX	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914791) - continued									
EB1821082-011	SW1-TX	EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	0.061	0.057	6.62	0% - 20%
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	0.039	0.040	0.00	0% - 50%
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	0.007	0.008	0.00	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	0.009	0.010	0.00	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	0.06	0.06	0.00	No Limit
EB1821082-011	SW1-TX	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1914791) - continued									
EB1821081-001	Anonymous	EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EB1821082-011	SW1-TX	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EB1821082-011	SW1-TX	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: Sum of PFAS	----	0.002	µg/L	0.191	0.190	0.525	0% - 20%
		EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	0.008	0.008	0.00	No Limit
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	0.191	0.190	0.525	0% - 20%
EB1821082-011	SW1-TX	EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	<0.002	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_P: PFAS Sums (QC Lot: 1914791) - continued									
EB1821082-011	SW1-TX	EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914796)									
EB1821081-001	Anonymous	EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	0.0018	0.0023	22.2	No Limit
		EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0074	0.0077	4.26	0% - 50%
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0015	0.0016	9.15	No Limit
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0023	0.0025	8.20	No Limit
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	0.134	0.125	6.88	0% - 20%
		EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0184	0.0192	4.26	0% - 20%
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0109	0.0109	0.00	0% - 20%
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0588	0.0609	3.61	0% - 20%
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	0.0039	0.0038	3.62	No Limit
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914796)									
EB1821081-001	Anonymous	EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0549	0.0639	15.2	0% - 20%
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0363	0.0412	12.6	0% - 20%
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0091	0.0094	2.80	0% - 50%
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0121	0.0134	10.2	0% - 20%
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914796) - continued									
EB1821081-001	Anonymous	EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0933	0.0941	0.875	0% - 20%
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.108	0.106	2.54	0% - 20%
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0269	0.0264	1.95	0% - 20%
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0380	0.0385	1.26	0% - 20%
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	0.0085	0.0082	3.84	0% - 50%
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	0.0011	0.0011	0.00	No Limit
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	0.0007	0.0009	23.4	No Limit
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1914796)									
EB1821081-001	Anonymous	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1914796) - continued									
EB1821083-001	Anonymous	EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1914796)									
EB1821081-001	Anonymous	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.013	0.014	0.00	0% - 50%
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1914796)									
EB1821081-001	Anonymous	EP231X-ST: Sum of PFAS	----	0.0003	µg/L	0.125	0.142	12.4	0% - 20%
EB1821083-001	Anonymous	EP231X-ST: Sum of PFAS	----	0.0003	µg/L	0.516	0.509	1.27	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: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound	CAS Number	LOR	Unit		Result	Spike	Spike Recovery (%)	Recovery Limits (%)	
						Concentration	LCS	Low	High
EA005P: pH by PC Titrator (QCLot: 1907481)									
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	100	98	102	
				----	7 pH Unit	99.7	98	102	
EA010P: Conductivity by PC Titrator (QCLot: 1907480)									
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	2100 µS/cm	98.2	91	107	
				<1	24800 µS/cm	100	91	107	
ED037P: Alkalinity by PC Titrator (QCLot: 1907482)									
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.6	80	120	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1907614)									
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	105	85	118	
				<1	100 mg/L	93.6	85	118	
ED045G: Chloride by Discrete Analyser (QCLot: 1907611)									
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.6	90	115	
				<1	1000 mg/L	105	90	115	
ED093F: Dissolved Major Cations (QCLot: 1907575)									
ED093F: Calcium	7440-70-2	1	mg/L	<1	----	----	----	----	
ED093F: Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----	
ED093F: Sodium	7440-23-5	1	mg/L	<1	----	----	----	----	
ED093F: Potassium	7440-09-7	1	mg/L	<1	----	----	----	----	
EG020T: Total Metals by ICP-MS (QCLot: 1907670)									
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	88	112	
EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	103	81	119	
EG020A-T: Barium	7440-39-3	0.001	mg/L	<0.001	0.5 mg/L	102	70	130	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.8	88	111	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	89	115	
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	105	89	115	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.2 mg/L	106	88	116	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	89	112	
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	105	88	114	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	88	116	
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	79	111	
EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	104	87	114	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.2 mg/L	101	84	114	
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	102	82	128	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907672)									



Sub-Matrix: **WATER**

Method Blank (MB) Report				Laboratory Control Spike (LCS) Report				
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result	LCS	Low	High	
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907672) - continued								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	84	118
EK040P: Fluoride by PC Titrator (QCLot: 1907478)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	96.0	80	117
EK040P: Fluoride by PC Titrator (QCLot: 1907483)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	99.6	80	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1911997)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	104	86	112
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1907610)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	97.6	90	110
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1907615)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1911998)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.5	89	115
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1912290)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	77.8	70	111
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1912291)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	87.9	77	109
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914791)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.5 µg/L	77.9	50	150
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.5 µg/L	57.7	50	150
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914791)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	77.2	50	150
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 1914791)								



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 1914791) - continued								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914791)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.025 µg/L	-10.8	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 1914791)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914796)								
EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.01 µg/L	100	50	130
EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.01 µg/L	94.8	50	130
EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.01 µg/L	74.2	50	130
EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.01 µg/L	91.8	50	130
EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	<0.0003	0.01 µg/L	77.2	50	130
EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.01 µg/L	50.8	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914796)								
EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	0.05 µg/L	58.6	30	130
EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.01 µg/L	113	50	130
EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.01 µg/L	109	50	130
EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.01 µg/L	118	50	130
EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.01 µg/L	107	50	130
EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.01 µg/L	109	50	130
EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.01 µg/L	75.8	50	130
EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.01 µg/L	53.0	40	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914796) - continued								
EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.01 µg/L	47.2	40	130
EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.01 µg/L	52.4	40	130
EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.025 µg/L	64.0	40	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1914796)								
EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.01 µg/L	55.2	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.025 µg/L	63.4	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.025 µg/L	65.7	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.025 µg/L	64.8	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.025 µg/L	66.8	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.01 µg/L	51.2	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.01 µg/L	49.0	40	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914796)								
EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.01 µg/L	102	50	130
EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.01 µg/L	100	50	130
EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.01 µg/L	94.4	50	130
EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.01 µg/L	50.2	50	130
EP231P: PFAS Sums (QCLot: 1914796)								
EP231X-ST: Sum of PFAS	----	0.0003	µg/L	<0.0003	----	----	----	----

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.

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike Concentration	Spike Recovery (%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number			Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1907614)							
EB1821081-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 1907611)							
EB1820038-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	105	70	130
EG020T: Total Metals by ICP-MS (QCLot: 1907670)							
EB1821061-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	104	70	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 1907670) - continued							
EB1821061-002	Anonymous	EG020A-T: Beryllium	7440-41-7	0.1 mg/L	108	70	130
		EG020A-T: Barium	7440-39-3	1 mg/L	104	70	130
		EG020A-T: Cadmium	7440-43-9	0.5 mg/L	102	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	101	70	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	104	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	105	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	103	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	105	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	102	70	130
		EG020A-T: Vanadium	7440-62-2	1 mg/L	102	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907672)							
EB1821081-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	118	70	130
EK040P: Fluoride by PC Titrator (QCLot: 1907478)							
EB1821050-002	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	83.6	70	130
EK040P: Fluoride by PC Titrator (QCLot: 1907483)							
EB1821083-001	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	110	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1911997)							
EB1821081-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	86.7	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1907610)							
EB1820038-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	101	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1911998)							
EB1821081-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.1	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1912290)							
EB1820532-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	84.5	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1912291)							
EB1820532-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	102	70	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914796)							
EB1821081-002	Anonymous	EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.01 µg/L	# Not Determined	50	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914796) - continued							
EB1821081-002	Anonymous	EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.01 µg/L	50.4	30	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914796)							
EB1821081-002	Anonymous	EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.05 µg/L	98.6	30	130
		EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.01 µg/L	113	50	130
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.01 µg/L	84.2	50	130
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.01 µg/L	61.6	30	130
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.01 µg/L	50.4	30	130
		EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.01 µg/L	47.6	30	130
EB1821081-002	Anonymous	EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.025 µg/L	43.1	30	130
		EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1914796)					
EB1821081-002	Anonymous	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.01 µg/L	54.6	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.025 µg/L	61.6	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.025 µg/L	66.4	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.025 µg/L	56.5	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.025 µg/L	54.5	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.01 µg/L	53.2	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.01 µg/L	49.2	30	130
		EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914796)					
EB1821081-002	Anonymous	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.01 µg/L	86.2	50	130
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.01 µg/L	83.4	50	130
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.01 µg/L	51.0	50	130



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QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1821082	Page	: 1 of 12
Client	: QLD DEPT OF ENVIRONMENT & SCIENCE	Laboratory	: Environmental Division Brisbane
Contact	: MR SINEAD SUMMERVILLE	Telephone	: +61-7-3243 7222
Project	: Swanbank	Date Samples Received	: 30-Aug-2018
Site	: ----	Issue Date	: 11-Sep-2018
Sampler	: BRENDA BADDILEY, GRAHAM	No. of samples received	: 11
Order number	:	No. of samples analysed	: 10

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.**
- Matrix Spike outliers exist - please see following pages for full details.
- For all regular sample matrices, **NO** surrogate recovery outliers occur.

Outliers : Analysis Holding Time Compliance

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers exist - please see following pages for full details.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO ₄ 2- by DA	EB1821081--002	Anonymous	Sulfate as SO ₄ - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	Anonymous	Perfluorobutane sulfonic acid (PFBS)	375-73-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	Anonymous	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	Anonymous	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	Anonymous	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	Anonymous	Perfluoropentanoic acid (PFPeA)	2706-90-3	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	Anonymous	Perfluorohexanoic acid (PFHxA)	307-24-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	Anonymous	Perfluoroheptanoic acid (PFHpA)	375-85-9	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	Anonymous	Perfluorooctanoic acid (PFOA)	335-67-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB1821081--002	Anonymous	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue

EA005P: pH by PC Titrator

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File A

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Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural						
SW1-B, SW3-B	SW1-TX,	----	----	31-Aug-2018	28-Aug-2018	3
Clear Plastic Bottle - Natural						
BH06-B, BH10-B	BH01-B,	----	----	31-Aug-2018	30-Aug-2018	1

Outliers : Frequency of Quality Control Samples

Matrix: **WATER**

Quality Control Sample Type	Count		Rate (%)		Quality Control Specification
	QC	Regular	Actual	Expected	
Method					
Matrix Spikes (MS)					
Nitrite as N by Discrete Analyser	1	21	4.76	5.00	NEPM 2013 B3 & ALS QC Standard

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: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis			
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation	
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	----	----	----	31-Aug-2018	28-Aug-2018	✘
Clear Plastic Bottle - Natural (EA005-P) BH06-B, BH10-B	BH01-B,	30-Aug-2018	----	----	----	31-Aug-2018	30-Aug-2018	✘
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✔
Clear Plastic Bottle - Natural (EA010-P) BH06-B, BH10-B	BH01-B,	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✔



Matrix: **WATER**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA065: Total Hardness as CaCO3								
Clear Plastic Bottle - Natural (ED093F) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	----	----	----	04-Sep-2018	04-Sep-2018	✓
Clear Plastic Bottle - Natural (ED093F) BH06-B, BH10-B	BH01-B,	30-Aug-2018	----	----	----	04-Sep-2018	06-Sep-2018	✓
ED037P: Alkalinity by PC Titrator								
Clear Plastic Bottle - Natural (ED037-P) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	----	----	----	31-Aug-2018	11-Sep-2018	✓
Clear Plastic Bottle - Natural (ED037-P) BH06-B, BH10-B	BH01-B,	30-Aug-2018	----	----	----	31-Aug-2018	13-Sep-2018	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (ED041G) BH06-B, BH10-B	BH01-B,	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (ED045G) BH06-B, BH10-B	BH01-B,	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
ED093F: Dissolved Major Cations								
Clear Plastic Bottle - Natural (ED093F) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	----	----	----	04-Sep-2018	04-Sep-2018	✓
Clear Plastic Bottle - Natural (ED093F) BH06-B, BH10-B	BH01-B,	30-Aug-2018	----	----	----	04-Sep-2018	06-Sep-2018	✓
EG020T: Total Metals by ICP-MS								
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) BH06-B, BH10-B	BH01-B,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓



Matrix: **WATER**

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
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) SW1-B, SW3-B	SW1-TX, 28-Aug-2018	----	----	----	05-Sep-2018	25-Sep-2018	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) BH06-B, BH10-B	BH01-B, 30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) SW1-B, SW3-B	SW1-TX, 28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (EK040P) BH06-B, BH10-B	BH01-B, 30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) BH06-B, BH01-B, BH10-B	SW3-B, SW1-B, SW1-TX 30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) BH06-B, BH10-B	BH01-B, 30-Aug-2018	----	----	----	31-Aug-2018	01-Sep-2018	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) BH06-B, BH01-B, BH10-B	SW3-B, SW1-B, SW1-TX 30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) BH06-B, BH01-B, BH10-B	SW3-B, SW1-B, SW1-TX 30-Aug-2018	04-Sep-2018	27-Sep-2018	✓	04-Sep-2018	27-Sep-2018	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) BH06-B, BH01-B, BH10-B	SW3-B, SW1-B, SW1-TX 30-Aug-2018	04-Sep-2018	27-Sep-2018	✓	04-Sep-2018	27-Sep-2018	✓



Matrix: **WATER**

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
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) SW1-B, SW3-B SW1-TX,	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH06-B, BH10-B, BH01-B, SW1-TX	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) SW1-B, SW3-B SW1-TX,	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH06-B, BH10-B, BH01-B, SW1-TX	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP)) SW1-B, SW3-B SW1-TX,	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH06-B, BH10-B, BH01-B, SW1-TX	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) SW1-B, SW3-B SW1-TX,	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH06-B, BH10-B, BH01-B, SW1-TX	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_P: PFAS Sums							
HDPE (no PTFE) (EP231X-LL (TOP)) SW1-B, SW3-B SW1-TX,	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH06-B, BH10-B, BH01-B, SW1-TX	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-ST) SW1-B, SW3-B SW1-TX,	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH06-B, BH10-B, BH01-B, SW1-TX	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-ST) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH06-B, BH10-B,	BH01-B, SW1-TX	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X-ST) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH06-B, BH10-B,	BH01-B, SW1-TX	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X-ST) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH06-B, BH10-B,	BH01-B, SW1-TX	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X-ST) SW1-B, SW3-B	SW1-TX,	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH06-B, BH10-B,	BH01-B, SW1-TX	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓

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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: **WATER**

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)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	4	31	12.90	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	9	22.22	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Evaluation	Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected		
Method Blanks (MB) - Continued							
Fluoride by PC Titrator	EK040P	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	21	9.52	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	21	4.76	5.00	✗	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	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
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO ₄ ²⁻ by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ ²⁻ concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G. Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by 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. Sample extracts are analysed 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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction and LC-Electrospray-MS-MS, Negative Mode using MRM. This method is targeted to pristine environmental and drinking waters reportin at sub-parts per trillion. 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. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1
Preparation Methods	Method	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)



Preparation Methods	Method	Matrix	Method Descriptions
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
SPE preparation for LL and saline PFCs	EP231-SPE	WATER	In house
Total Oxidisable Precursor Digest for PFAS - Low Level	* ORG70-SPE	WATER	<p>In-House SPE followed by 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:</p> <p>A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.</p>

Published on DES Disclosure Log
RTI Act 2009

Matrix: WATER
 Workgroup: EB1821082
 Project name/number: Swanbank

Sample Type:
 ALS Sample Number:
 Sample Date:
 Client sample ID (1st):
 Client sample ID (2nd):
 Depth Type:
 Depth (m):
 Site:
 Purchase Order:

Analyte grouping/Analyte	CAS Number	Unit	Limit of reporting
EA005P: pH by PC Titrator			
pH Value		pH Unit	0.01
EA010P: Conductivity by PC Titrator			
Electrical Conductivity @ 25°C		µS/cm	1
EA016: Calculated TDS (from Electrical Conductivity)			
Total Dissolved Solids (Calc.)		mg/L	1
EA065: Total Hardness as CaCO₃			
Total Hardness as CaCO ₃		mg/L	1
ED037P: Alkalinity by PC Titrator			
Hydroxide Alkalinity as CaCO ₃	DMO-210-001	mg/L	1
Carbonate Alkalinity as CaCO ₃	3812-32-6	mg/L	1
Bicarbonate Alkalinity as CaCO ₃	71-52-3	mg/L	1
Total Alkalinity as CaCO ₃		mg/L	1
ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA			
Sulfate as SO ₄ - Turbidimetric	14808-79-8	mg/L	1
ED045G: Chloride by Discrete Analyser			
Chloride	16887-00-6	mg/L	1
ED093F: Dissolved Major Cations			
Calcium	7440-70-2	mg/L	1
Magnesium	7439-95-4	mg/L	1
Sodium	7440-23-5	mg/L	1
Potassium	7440-09-7	mg/L	1
EG020T: Total Metals by ICP-MS			
Arsenic	7440-38-2	mg/L	0.001
Beryllium	7440-41-7	mg/L	0.001
Barium	7440-39-3	mg/L	0.001
Cadmium	7440-43-9	mg/L	0.0001

Chromium	7440-47-3	mg/L	0.001
Cobalt	7440-48-4	mg/L	0.001
Copper	7440-50-8	mg/L	0.001
Lead	7439-92-1	mg/L	0.001
Manganese	7439-96-5	mg/L	0.001
Nickel	7440-02-0	mg/L	0.001
Selenium	7782-49-2	mg/L	0.01
Vanadium	7440-62-2	mg/L	0.01
Zinc	7440-66-6	mg/L	0.005
Boron	7440-42-8	mg/L	0.05

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6	mg/L	0.0001
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EK040P: Fluoride by PC Titrator

Fluoride	16984-48-8	mg/L	0.1
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EK055G: Ammonia as N by Discrete Analyser

Ammonia as N	7664-41-7	mg/L	0.01
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EK057G: Nitrite as N by Discrete Analyser

Nitrite as N	14797-65-0	mg/L	0.01
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EK058G: Nitrate as N by Discrete Analyser

Nitrate as N	14797-55-8	mg/L	0.01
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EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

Nitrite + Nitrate as N		mg/L	0.01
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EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

Total Kjeldahl Nitrogen as N		mg/L	0.1
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EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser

Total Nitrogen as N		mg/L	0.1
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EK067G: Total Phosphorus as P by Discrete Analyser

Total Phosphorus as P		mg/L	0.01
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EN055: Ionic Balance

Total Anions		meq/L	0.01
Total Cations		meq/L	0.01
Ionic Balance		%	0.01

EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorobutane sulfonic acid (PFBS)	375-73-5	µg/L	0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	µg/L	0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	µg/L	0.0005

Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	µg/L	0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	µg/L	0.0003
Perfluorodecane sulfonic acid (PFDS)	335-77-3	µg/L	0.0005

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA)	375-22-4	µg/L	0.002
Perfluoropentanoic acid (PFPeA)	2706-90-3	µg/L	0.0005
Perfluorohexanoic acid (PFHxA)	307-24-4	µg/L	0.0005
Perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L	0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	µg/L	0.0005
Perfluorononanoic acid (PFNA)	375-95-1	µg/L	0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	µg/L	0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	µg/L	0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	µg/L	0.0005
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	µg/L	0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	µg/L	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	µg/L	0.0005
N-Methyl perfluorooctane sulfonamide (MeFOS)	31506-32-8	µg/L	0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	µg/L	0.001
N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	µg/L	0.001
N-Ethyl perfluorooctane sulfonamidoethanol (E)	1691-99-2	µg/L	0.001
N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	µg/L	0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	µg/L	0.0005

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	µg/L	0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	µg/L	0.001
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	µg/L	0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	µg/L	0.001

EP231P: PFAS Sums

Sum of PFAS		µg/L	0.0003
Sum of PFHxS and PFOS	355-46-4/1763-23-1	µg/L	0.0003
Sum of PFAS (WA DER List)		µg/L	0.0003

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorobutane sulfonic acid (PFBS)	375-73-5	µg/L	0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	µg/L	0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	µg/L	0.002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	µg/L	0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	µg/L	0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	µg/L	0.002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA)	375-22-4	µg/L	0.01
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Perfluoropentanoic acid (PFPeA)	2706-90-3	µg/L	0.002
Perfluorohexanoic acid (PFHxA)	307-24-4	µg/L	0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	µg/L	0.002
Perfluorooctanoic acid (PFOA)	335-67-1	µg/L	0.002
Perfluorononanoic acid (PFNA)	375-95-1	µg/L	0.002
Perfluorodecanoic acid (PFDA)	335-76-2	µg/L	0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	µg/L	0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	µg/L	0.002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	µg/L	0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	µg/L	0.005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	µg/L	0.002
N-Methyl perfluorooctane sulfonamide (MeFOS)	31506-32-8	µg/L	0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	µg/L	0.005
N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	µg/L	0.005
N-Ethyl perfluorooctane sulfonamidoethanol (E)	1691-99-2	µg/L	0.005
N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	µg/L	0.002
N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	µg/L	0.002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	µg/L	0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	µg/L	0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	µg/L	0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	µg/L	0.005

EP231_TOP_P: PFAS Sums

Sum of PFAS		µg/L	0.002
Sum of PFHxS and PFOS	355-46-4/1763-23	µg/L	0.002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 S		µg/L	0.002
Sum of TOP C4 - C14 as Fluorine		µg/L	0.002

EP231S: PFAS Surrogate

13C4-PFOS	%	0.0005
13C8-PFOA	%	0.0005

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.002
13C8-PFOA	%	0.002

REG	REG	REG	REG	REG
EB1821082001	EB1821082002	EB1821082003	EB1821082004	EB1821082005
28/08/2018	28/08/2018	28/08/2018	28/08/2018	30/08/2018
SW1-B	SW1-B	SW1-TX	SW3-B	BH06-B

7.88	----	6.66	8.18	7.95
3570	----	<1	954	4770
2320	----	<1	620	3100
1130	----	<1	266	602
<1	----	<1	<1	<1
<1	----	<1	<1	<1
381	----	5	272	467
381	----	5	272	467
590	----	<1	39	325
790	----	<1	147	1240
131	----	<1	39	101
195	----	<1	41	85
410	----	<1	96	872
51	----	<1	14	30
0.002	----	<0.001	0.001	0.001
<0.001	----	<0.001	<0.001	<0.001
0.077	----	<0.001	0.095	0.056
<0.0001	----	<0.0001	<0.0001	<0.0001

<0.001	----	<0.001	<0.001	<0.001
0.007	----	<0.001	<0.001	<0.001
0.002	----	<0.001	0.001	<0.001
<0.001	----	<0.001	<0.001	<0.001
1.02	----	<0.001	0.227	0.087
0.015	----	<0.001	0.004	<0.001
<0.01	----	<0.01	<0.01	<0.01
0.01	----	<0.01	<0.01	<0.01
0.011	----	<0.005	<0.005	0.426
0.16	----	<0.05	0.08	0.47

<0.0001	----	<0.0001	<0.0001	<0.0001
---------	------	---------	---------	---------

0.6	----	<0.1	0.4	0.6
------------	------	------	------------	------------

----	----	----	----	1.05
------	------	------	------	-------------

----	----	----	----	<0.01
------	------	------	------	-------

----	----	----	----	0.06
------	------	------	------	-------------

----	----	----	----	0.06
------	------	------	------	-------------

----	----	----	----	1.0
------	------	------	------	------------

----	----	----	----	1.1
------	------	------	------	------------

----	----	----	----	0.05
------	------	------	------	-------------

42.2	----	0.10	10.4	51.1
-------------	------	-------------	-------------	-------------

41.7	----	<0.01	9.85	50.7
-------------	------	-------	-------------	-------------

0.54	----	----	2.66	0.34
-------------	------	------	-------------	-------------

----	0.0127	<0.0005	0.0250	0.0010
------	---------------	---------	---------------	---------------

----	0.0038	<0.0005	0.0152	<0.0005
------	---------------	---------	---------------	---------

----	0.0143	<0.0005	0.0705	0.0007
------	---------------	---------	---------------	---------------

----	0.106	<0.002	0.262	<0.002
----	0.090	<0.002	0.212	<0.002
----	0.032	<0.002	0.085	<0.002
----	0.034	<0.002	0.126	<0.002
----	0.004	<0.002	0.011	<0.002
----	<0.002	<0.002	0.005	<0.002
----	<0.002	<0.002	<0.002	<0.002
----	<0.002	<0.002	<0.002	<0.002
----	<0.002	<0.002	<0.002	<0.002
----	<0.005	<0.005	<0.005	<0.005

----	<0.002	<0.002	<0.002	<0.002
----	<0.005	<0.005	<0.005	<0.005
----	<0.005	<0.005	<0.005	<0.005
----	<0.005	<0.005	<0.005	<0.005
----	<0.005	<0.005	<0.005	<0.005
----	<0.002	<0.002	<0.002	<0.002
----	<0.002	<0.002	<0.002	<0.002

----	<0.005	<0.005	<0.005	<0.005
----	<0.005	<0.005	<0.005	<0.005
----	<0.005	<0.005	<0.005	<0.005
----	<0.005	<0.005	<0.005	<0.005

----	0.434	0.002	1.30	0.004
----	0.091	0.002	0.444	0.004
----	0.434	0.002	1.30	0.004
----	0.282	<0.002	0.844	0.002

----	74.2	69.0	69.7	72.3
----	92.7	89.5	87.0	95.3

----	69.9	78.5	86.3	63.4
----	92.6	89.2	100	92.3

REG	REG	REG	REG	REG
EB1821082006	EB1821082008	EB1821082009	EB1821082010	EB1821082011
30/08/2018	30/08/2018	30/08/2018	30/08/2018	30/08/2018
SW3-B	BH01-B	SW1-B	BH10-B	SW1-TX

----	7.85	----	6.59	----
----	9530	----	3280	----
----	6190	----	2130	----
----	1230	----	987	----
----	<1	----	<1	----
----	<1	----	<1	----
----	608	----	140	----
----	608	----	140	----
----	<1	----	844	----
----	3500	----	642	----
----	210	----	100	----
----	172	----	179	----
----	1810	----	360	----
----	40	----	36	----
----	<0.001	----	0.005	----
----	<0.001	----	<0.001	----
----	7.12	----	0.032	----
----	<0.0001	----	<0.0001	----

----	<0.001	----	<0.001	----
----	<0.001	----	0.048	----
----	0.001	----	<0.001	----
----	<0.001	----	<0.001	----
----	0.140	----	5.23	----
----	0.006	----	0.051	----
----	<0.01	----	<0.01	----
----	<0.01	----	<0.01	----
----	1.22	----	0.094	----
----	0.94	----	0.19	----

----	<0.0001	----	<0.0001	----
------	---------	------	---------	------

----	0.8	----	0.2	----
------	------------	------	------------	------

0.24	3.21	0.26	0.12	0.05
-------------	-------------	-------------	-------------	-------------

----	<0.01	----	0.01	----
------	-------	------	-------------	------

----	0.02	----	<0.01	----
------	-------------	------	-------	------

0.15	0.02	2.54	0.01	0.03
-------------	-------------	-------------	-------------	-------------

1.2	3.3	0.6	0.3	<0.1
------------	------------	------------	------------	------

1.4	3.3	3.1	0.3	<0.1
------------	------------	------------	------------	------

0.04	<0.05	0.04	0.01	0.01
-------------	-------	-------------	-------------	-------------

----	111	----	38.5	----
------	------------	------	-------------	------

----	104	----	36.3	----
------	------------	------	-------------	------

----	3.01	----	2.91	----
------	-------------	------	-------------	------

----	<0.0005	----	0.0049	<0.0005
------	---------	------	---------------	---------

----	<0.0005	----	0.0008	<0.0005
------	---------	------	---------------	---------

----	0.0009	----	0.0020	<0.0005
------	---------------	------	---------------	---------

----	<0.0005	----	<0.0005	<0.0005
----	0.0055	----	0.0025	<0.0003
----	<0.0005	----	<0.0005	<0.0005
----	<0.002	----	<0.002	<0.002
----	<0.0005	----	0.0203	<0.0005
----	<0.0005	----	0.0127	<0.0005
----	<0.0005	----	0.0033	<0.0005
----	0.0008	----	0.0028	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	0.0006	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.001	----	<0.001	<0.001
----	<0.001	----	<0.001	<0.001
----	<0.001	----	<0.001	<0.001
----	<0.001	----	<0.001	<0.001
----	<0.001	----	<0.001	<0.001
----	<0.0005	----	<0.0005	<0.0005
----	<0.0005	----	<0.0005	<0.0005
----	<0.001	----	<0.001	<0.001
----	<0.001	----	<0.001	<0.001
----	<0.001	----	<0.001	<0.001
----	<0.001	----	<0.001	<0.001
----	0.0072	----	0.0499	<0.0003
----	0.0064	----	0.0045	<0.0003
----	0.0072	----	0.0485	<0.0003
----	<0.002	----	0.005	<0.002
----	<0.002	----	<0.002	<0.002
----	0.002	----	0.003	<0.002
----	<0.002	----	<0.002	<0.002
----	0.006	----	0.003	<0.002
----	<0.002	----	<0.002	<0.002
----	<0.01	----	<0.01	<0.01

----	<0.002	----	0.026	<0.002
----	0.002	----	0.017	<0.002
----	<0.002	----	0.003	<0.002
----	<0.002	----	0.002	<0.002
----	<0.002	----	<0.002	<0.002
----	<0.002	----	<0.002	<0.002
----	<0.002	----	<0.002	<0.002
----	<0.002	----	<0.002	<0.002
----	<0.002	----	<0.002	<0.002
----	<0.005	----	<0.005	<0.005
----	<0.002	----	<0.002	<0.002
----	<0.005	----	<0.005	<0.005
----	<0.005	----	<0.005	<0.005
----	<0.005	----	<0.005	<0.005
----	<0.005	----	<0.005	<0.005
----	<0.002	----	<0.002	<0.002
----	<0.002	----	<0.002	<0.002
----	<0.005	----	<0.005	<0.005
----	<0.005	----	<0.005	<0.005
----	<0.005	----	<0.005	<0.005
----	<0.005	----	<0.005	<0.005
----	0.010	----	0.059	<0.002
----	0.008	----	0.006	<0.002
----	0.010	----	0.059	<0.002
----	0.006	----	0.038	<0.002
----	74.7	----	72.8	64.2
----	99.6	----	96.1	88.4
----	68.2	----	68.3	67.1
----	95.4	----	84.3	70.8



CHAIN OF CUSTODY

ALS Laboratory:
please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callenmondah Drive Clinton QLD 4680
Ph: 07 7471 5900 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee@mail@alsglobal.com

NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

Environmental Division
Brisbane
Work Order Reference
EB1821082



Telephone : + 61-7-3243 7222

CLIENT: Dept of Environment and Science	TURNAROUND REQUIREMENTS : ☒ Standard TAT (List due date): (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY Custody Seal intact Free Ice / frozen ice receipt? Random Sample Test Other comment:
OFFICE: Brisbane	ALS QUOTE NO.:	
PROJECT: Swanbank		
ORDER NUMBER:		
PROJECT MANAGER: Sinead Summerville	CONTACT PH: 38948157	
SAMPLER: Brenda Baddiley / Graham	SAMPLER MOBILE: sch4p4 (6) Personal Information	
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	
Email Reports to (will default to PM if no other addresses are listed): ipswich.esr@des.qld.gov.au	RELINQUISHED BY: sch4p4 (6) Personal Information	RECEIVED BY: Grog
Email Invoice to (will default to PM if no other addresses are listed): sinead.summerville@des.qld.gov.au	DATE/TIME: 29/8/18	DATE/TIME: 30/6/16 20:20
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)		CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to	TOTAL CONTAINERS	NT-12	EP231X- ST	EP231X- LC (TOP)	W3 (Total)	NT-6	EP321X	EP321X	S3	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	SW1-B	10:15 (28/8)	W	P.N		2	X			X					
2	SW1-B	10:30 (28/8)	W	P.P.P		3		X	X						
3	SW1-TX	11:00 (28/8)	W	P.N		4	X	X	X	X					
4	SW3-B	11:20 (28/8)	W	P.N		5	X	X	X	X					
5	BH06-B	9:20	W			5	X	X	X	X	X				
6	SW3-B	9:15 (30/8)	W	S		1					X				
7	SW3-B	9:20 30/8	S			2									
8	BH01-B	9:40 (30/8)	W			5	X	X	X	X	X				
9	SW1-B	10:10 30/8	W			1					X				
10	BH10-B	10:20 30/8	W			5	X	X	X	X	X				
11	BH06-B	9:20 30/8	W			5	X	X	X	X	X				
12	SW1-TX	14:30 30/8	W			2		X	X		X				
TOTAL															

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

TAX INVOICE: L732507

QLD DEPT OF ENVIRONMENT & SCIENCE
MR SINEAD SUMMERVILLE
GPO BOX 2771
BRISBANE
QLD, AUSTRALIA 4001

Page : 1 of 1

Work Order	Project / Overall Description	Site	Order number	C-O-C number	Contact
EB1821082	Swanbank / ----	----		----	MR SINEAD SUMMERVILLE

Issue Date	: 11-Sep-2018	Taxable value	: AUD\$	4,730.00
		Tax Incurred (GST)	: AUD\$	473.00
Due Date	: 11-Oct-2018	Amount Payable	: AUD\$	5,203.00

Work Order Breakdown

Method	Sale Item Descriptions	Quantity	Unit Value (AUD\$)	Value (AUD\$)	GST (AUD\$)	Line Total (AUD\$)
Work Order: EB1821082		Quote number: EN/222		Submatrix summary: 10 WATERS, 1 SOIL		
*Misc	Workorder Admin Fee	1.00	40.00	40.00	4.00	44.00
EK055G	Ammonia as N By Discrete Analyser	3.00	14.00	42.00	4.20	46.20
EP231X-LL (TOP)	PFAS - Total Oxidisable Precursor (TOP) Assay - Low Level	7.00	260.00	1,820.00	182.00	2,002.00
EP231X-ST	PFAS - Super Trace Waters Long Suite (28 analytes)	7.00	290.00	2,030.00	203.00	2,233.00
NT-08	Total Nitrogen + NO2 + NO3 + NH3 + Total P	3.00	57.00	171.00	17.10	188.10
NT-11	Total Nitrogen and Total Phosphorus	3.00	41.00	123.00	12.30	135.30
NT-12	General Water Suite	6.00	46.00	276.00	27.60	303.60
W-03T	15 Metals (Total) (NEPM)	6.00	38.00	228.00	22.80	250.80

* denotes non-deductible item

• Please direct all queries to Environmental Division Brisbane on +61-7-3243 7222.

REMITTANCE ADVICE

POST TO: Australian Laboratory Services Pty Ltd
P.O. Box 66 Everton Park
QLD 4053 Australia

EMAIL TO: remittances@alsglobal.com

Vendor bank details

Bank: Commonwealth Bank
BSB: 064 000
Account: 12672843
Swift Code: CTBAAU2S

or

Cheque

Payable to Australian Laboratory Services Pty Ltd

or **Credit Card**

Visa
Mastercard

Amount Payable
AUD\$ 5,203.00
ALS Client Reference
ENVPRO
TAX INVOICE
L732507

From: SUMMERVILLE Sinead [Sinead.Summerville@des.qld.gov.au]
Sent: Tuesday, 11 September 2018 5:03 PM
To: CORDINGLEY Graham; VARDY Suzanne; BADDILEY Brenda
CC: RICE John; HILL Chris; VENTURA Simone; PFAS Project Team
Subject: FW: RESULTS & EDD & INVOICE for ALS Workorder : EB1821081 | Your Reference: Swanbank
Attachments: EB1821081_0_COA.pdf; EB1821081_0_ENMRG.CSV; EB1821081_0_XTAB.XLS; EB1821081_0_QC.pdf; EB1821081_COC.pdf; EB1821081_0_QCI.pdf; L732526_INV.pdf

Importance: High

Graham / Susi / Brenda

Can you please review the attached results and provide advice (including QC issues) ASAP.

Regards,

Sinead Summerville

Team Leader

Energy, Extractive and South West Queensland Compliance | Ipswich

Environmental Services and Regulation

Department of Environment and Science

P 07 3894 8157

Level 4, 117 Brisbane Street, Ipswich QLD 4305

PO Box 875, Ipswich QLD 4305

Please note I work shorter hours (9am-2:30pm) on Thursday & Friday

Pollution Hotline (to report an incident): P 1300 130 372 Option 2

Document Submission: ipswich.esr@des.qld.gov.au

Do Business with DES on line: <http://www.des.qld.gov.au/connect/>



...make the move

From: angel-no-reply@alsglobal.com [mailto:angel-no-reply@alsglobal.com]

Sent: Tuesday, 11 September 2018 4:03 PM

To: SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>

Subject: RESULTS & EDD & INVOICE for ALS Workorder : EB1821081 | Your Reference: Swanbank



Deliverables for ALS Workorder EB1821081

Project: Swanbank

Dear SINEAD SUMMERVILLE,

Please find enclosed the following deliverables for **EB1821081**:

- EB1821081_0_COA.pdf
- EB1821081_0_ENMRG.CSV
- EB1821081_0_XTAB.XLS
- EB1821081_0_QC.pdf
- EB1821081_0_QCI.pdf
- L732526_INV.pdf
- EB1821081_COC.pdf

Report Recipients

- IPSWICH ESR
 - EB1821081_0_COA.pdf (Email)
 - EB1821081_0_ENMRG.CSV (Email)
 - EB1821081_0_XTAB.XLS (Email)
 - EB1821081_0_QC.pdf (Email)
 - EB1821081_0_QCI.pdf (Email)
 - EB1821081_COC.pdf (Email)
- SINEAD SUMMERVILLE
 - EB1821081_0_COA.pdf (Email)
 - EB1821081_0_ENMRG.CSV (Email)
 - EB1821081_0_XTAB.XLS (Email)
 - EB1821081_0_QC.pdf (Email)
 - EB1821081_0_QCI.pdf (Email)
 - L732526_INV.pdf (Email)
 - EB1821081_COC.pdf (Email)

www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATE OF ANALYSIS

Work Order : **EB1821081**
Client : **QLD DEPT OF ENVIRONMENT & SCIENCE**
Contact : IPSWICH ESR
Address : GPO BOX 2771
 BRISBANE QLD, AUSTRALIA 4001
Telephone : ----
Project : Swanbank
Order number :
C-O-C number : ----
Sampler : Brenda Baddiley, Graham
Site : ----
Quote number : EN/222
No. of samples received : 7
No. of samples analysed : 7

Page : 1 of 14
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 30-Aug-2018 20:20
Date Analysis Commenced : 31-Aug-2018
Issue Date : 11-Sep-2018 16:02



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
Franco Lentini		Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tom Maloney	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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.

- EG005T (Total Metals): Sample EB1821052-027 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW11-R	SW06-R	----	----	----
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB1821081-003	EB1821081-004	-----	-----	-----
				Result	Result		----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		33.8	20.0	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		5	<5	----	----	----
Barium	7440-39-3	10	mg/kg		90	90	----	----	----
Beryllium	7440-41-7	1	mg/kg		<1	<1	----	----	----
Boron	7440-42-8	50	mg/kg		<50	<50	----	----	----
Cadmium	7440-43-9	1	mg/kg		<1	<1	----	----	----
Chromium	7440-47-3	2	mg/kg		6	4	----	----	----
Cobalt	7440-48-4	2	mg/kg		10	6	----	----	----
Copper	7440-50-8	5	mg/kg		33	18	----	----	----
Lead	7439-92-1	5	mg/kg		13	8	----	----	----
Manganese	7439-96-5	5	mg/kg		332	206	----	----	----
Nickel	7440-02-0	2	mg/kg		13	7	----	----	----
Selenium	7782-49-2	5	mg/kg		<5	<5	----	----	----
Vanadium	7440-62-2	5	mg/kg		22	18	----	----	----
Zinc	7440-66-6	5	mg/kg		77	49	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		0.1	<0.1	----	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		0.0004	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		0.0002	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		0.0020	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.0127	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		0.0008	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		0.0016	<0.0002	----	----	----



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SW11-R	SW06-R	----	----	----
Client sampling date / time				30-Aug-2018 00:00	30-Aug-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit	EB1821081-003	EB1821081-004	-----	-----	-----
				Result	Result	----	----	----

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued

Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0008	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0015	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0003	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0006	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0002	<0.0002	----	----	----
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<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	<0.0005	----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005	----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW11-R	SW06-R	----	----	----
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB1821081-003	EB1821081-004	-----	-----	-----
				Result	Result		----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	----	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		0.0213	<0.0002	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.0147	<0.0002	----	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg		0.0213	<0.0002	----	----	----
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg		0.0138	<0.0002	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		0.0002	<0.0002	----	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		0.0003	<0.0002	----	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		0.0019	<0.0002	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		0.0002	<0.0002	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.0121	<0.0002	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		<0.001	<0.001	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		0.0003	<0.0002	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		0.0007	<0.0002	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		0.0002	<0.0002	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		0.0006	<0.0002	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		0.0004	<0.0002	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		<0.0002	<0.0002	----	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		<0.0002	<0.0002	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW11-R	SW06-R	----	----	----
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB1821081-003	EB1821081-004	-----	-----	-----
				Result	Result		----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002		----	----	----
Perfluorotetradecanoic acid (PFTTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002		----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002		----	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	<0.0002		----	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005		----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0169	<0.0002		----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0140	<0.0002		----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0160	<0.0002		----	----	----
EP231_TOP_S: PFAS Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW11-R	SW06-R	----	----	----
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	----	----	----
Compound	CAS Number	LOR	Unit		EB1821081-003	EB1821081-004	-----	-----	-----
					Result	Result	----	----	----
EP231_TOP_S: PFAS Surrogate - Continued									
13C4-PFOS	----	0.0002	%		90.0	91.0	----	----	----
13C8-PFOA	----	0.0002	%		92.5	92.0	----	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		84.0	70.0	----	----	----
13C8-PFOA	----	0.0002	%		93.5	82.0	----	----	----

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Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW6-R	SW11-R	GMB-15R	SW06-R	SW11-R
Client sampling date / time					28-Aug-2018 14:15	28-Aug-2018 14:35	30-Aug-2018 14:00	30-Aug-2018 13:45	30-Aug-2018 14:00
Compound	CAS Number	LOR	Unit		EB1821081-001	EB1821081-002	EB1821081-005	EB1821081-006	EB1821081-007
					Result	Result	Result	Result	Result
EA005P: pH by PC Titrator									
pH Value	----	0.01	pH Unit		8.25	8.18	7.71	----	----
EA010P: Conductivity by PC Titrator									
Electrical Conductivity @ 25°C	----	1	µS/cm		3040	2120	2830	----	----
EA016: Calculated TDS (from Electrical Conductivity)									
Total Dissolved Solids (Calc.)	----	1	mg/L		1980	1380	1840	----	----
EA065: Total Hardness as CaCO3									
Total Hardness as CaCO3	----	1	mg/L		599	651	270	----	----
ED037P: Alkalinity by PC Titrator									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L		<1	<1	<1	----	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L		<1	<1	<1	----	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L		825	292	696	----	----
Total Alkalinity as CaCO3	----	1	mg/L		825	292	696	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L		254	387	51	----	----
ED045G: Chloride by Discrete Analyser									
Chloride	16887-00-6	1	mg/L		520	373	598	----	----
ED093F: Dissolved Major Cations									
Calcium	7440-70-2	1	mg/L		75	81	24	----	----
Magnesium	7439-95-4	1	mg/L		100	109	51	----	----
Sodium	7440-23-5	1	mg/L		523	220	576	----	----
Potassium	7440-09-7	1	mg/L		29	47	16	----	----
EG020T: Total Metals by ICP-MS									
Arsenic	7440-38-2	0.001	mg/L		0.001	<0.001	0.004	----	----
Boron	7440-42-8	0.05	mg/L		0.30	0.18	0.12	----	----
Barium	7440-39-3	0.001	mg/L		0.066	0.059	0.103	----	----
Beryllium	7440-41-7	0.001	mg/L		<0.001	<0.001	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
Cobalt	7440-48-4	0.001	mg/L		<0.001	0.004	0.002	----	----
Chromium	7440-47-3	0.001	mg/L		<0.001	<0.001	0.001	----	----
Copper	7440-50-8	0.001	mg/L		<0.001	0.003	0.003	----	----
Manganese	7439-96-5	0.001	mg/L		0.064	0.189	0.132	----	----
Nickel	7440-02-0	0.001	mg/L		0.002	0.014	0.004	----	----
Lead	7439-92-1	0.001	mg/L		<0.001	<0.001	0.003	----	----
Selenium	7782-49-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW6-R	SW11-R	GMB-15R	SW06-R	SW11-R
Client sampling date / time					28-Aug-2018 14:15	28-Aug-2018 14:35	30-Aug-2018 14:00	30-Aug-2018 13:45	30-Aug-2018 14:00
Compound	CAS Number	LOR	Unit		EB1821081-001	EB1821081-002	EB1821081-005	EB1821081-006	EB1821081-007
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Vanadium	7440-62-2	0.01	mg/L		<0.01	<0.01	<0.01	----	----
Zinc	7440-66-6	0.005	mg/L		<0.005	0.009	0.034	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	<0.0001	<0.0001	----	----
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.9	0.4	0.7	----	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	----	0.17	0.06	0.07
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		----	----	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	----	0.02	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	----	0.02	0.23	0.64
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		----	----	0.5	0.3	0.5
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		----	----	0.5	0.5	1.1
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		----	----	0.01	0.01	0.01
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	<0.01	----	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		36.4	24.4	31.8	----	----
Total Cations	----	0.01	meq/L		35.5	23.8	30.8	----	----
Ionic Balance	----	0.01	%		1.36	1.30	1.56	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		0.007	0.609	0.064	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		<0.002	0.380	0.035	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		0.004	1.22	0.164	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW6-R	SW11-R	GMB-15R	SW06-R	SW11-R
Client sampling date / time					28-Aug-2018 14:15	28-Aug-2018 14:35	30-Aug-2018 14:00	30-Aug-2018 13:45	30-Aug-2018 14:00
Compound	CAS Number	LOR	Unit		EB1821081-001	EB1821081-002	EB1821081-005	EB1821081-006	EB1821081-007
					Result	Result	Result	Result	Result
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids - Continued									
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L		<0.002	0.063	0.004	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L		0.004	0.871	0.035	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L		<0.002	<0.002	<0.002	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L		0.06	0.83	0.07	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L		0.061	1.08	0.034	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L		0.039	2.34	0.130	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L		0.007	0.244	0.006	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L		0.009	0.177	0.006	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L		<0.002	0.006	<0.002	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L		<0.002	<0.002	<0.002	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L		<0.005	<0.005	<0.005	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L		<0.002	<0.002	<0.002	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L		<0.002	<0.002	<0.002	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW6-R	SW11-R	GMB-15R	SW06-R	SW11-R
Client sampling date / time					28-Aug-2018 14:15	28-Aug-2018 14:35	30-Aug-2018 14:00	30-Aug-2018 13:45	30-Aug-2018 14:00
Compound	CAS Number	LOR	Unit		EB1821081-001	EB1821081-002	EB1821081-005	EB1821081-006	EB1821081-007
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	<0.002	<0.002	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	<0.005	<0.005	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	<0.005	<0.005	----	----
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	<0.005	<0.005	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	<0.005	<0.005	----	----
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		0.191	7.82	0.548	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		0.008	2.09	0.199	----	----
^ Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L		0.123	4.99	0.344	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		0.191	7.82	0.548	----	----
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		0.0074	0.512	0.0665	----	----
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		0.0015	0.359	0.0367	----	----
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		0.0023	1.09	0.126	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		<0.0005	0.0584	0.0050	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L		0.0018	1.08	0.0483	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L		<0.002	0.061	<0.002	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		0.0549	0.569	0.0096	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW6-R	SW11-R	GMB-15R	SW06-R	SW11-R
Client sampling date / time					28-Aug-2018 14:15	28-Aug-2018 14:35	30-Aug-2018 14:00	30-Aug-2018 13:45	30-Aug-2018 14:00
Compound	CAS Number	LOR	Unit		EB1821081-001	EB1821081-002	EB1821081-005	EB1821081-006	EB1821081-007
					Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L		0.0363	1.41	0.0372	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L		0.0091	0.242	0.0059	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L		0.0121	0.270	0.0117	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L		<0.0005	0.0107	0.0007	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L		<0.0005	0.0021	<0.0005	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L		<0.001	<0.001	<0.001	----	----
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L		<0.0005	<0.0005	<0.0005	----	----
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L		<0.001	<0.001	<0.001	----	----
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L		<0.001	0.050	<0.001	----	----



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW6-R	SW11-R	GMB-15R	SW06-R	SW11-R
Client sampling date / time					28-Aug-2018 14:15	28-Aug-2018 14:35	30-Aug-2018 14:00	30-Aug-2018 13:45	30-Aug-2018 14:00
Compound	CAS Number	LOR	Unit		EB1821081-001	EB1821081-002	EB1821081-005	EB1821081-006	EB1821081-007
					Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L		<0.001	<0.001	<0.001	----	----
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L		<0.001	<0.001	<0.001	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0003	µg/L		0.125	5.71	0.348	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0003	µg/L		0.0041	2.17	0.174	----	----
Sum of PFAS (WA DER List)	----	0.0003	µg/L		0.124	5.28	0.305	----	----
EP231_TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.002	%		74.1	65.2	63.9	----	----
13C8-PFOA	----	0.002	%		91.7	84.9	83.9	----	----
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0005	%		75.4	73.1	87.2	----	----
13C8-PFOA	----	0.0005	%		92.7	98.7	101	----	----



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Published on DES Disclosure Log
 RTI Act 2009

Client - M& SOIL
Workgroup EB1821081
Project name Swanbank

Sample Type REG REG
ALS Sample EB1821081 EB1821081004
Sample date #####
Client sample SW11-R SW06-R
Client sample ID (Secondary):
Sample Site:
Purchase Order:

Analyte group CAS Number Units LOR

EA055: Moisture Content (Dried @ 105-110°C)

Moisture Content	%	1	33.8	20
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EG005T: Total Metals by ICP-AES

Arsenic	7440-38-2 mg/kg	5	5	<5
Barium	7440-39-3 mg/kg	10	90	90
Beryllium	7440-41-7 mg/kg	1	<1	<1
Boron	7440-42-8 mg/kg	50	<50	<50
Cadmium	7440-43-9 mg/kg	1	<1	<1
Chromium	7440-47-3 mg/kg	2	6	4
Cobalt	7440-48-4 mg/kg	2	10	6
Copper	7440-50-8 mg/kg	5	33	18
Lead	7439-92-1 mg/kg	5	13	8
Manganese	7439-96-5 mg/kg	5	332	206
Nickel	7440-02-0 mg/kg	2	13	7
Selenium	7782-49-2 mg/kg	5	<5	<5
Vanadium	7440-62-2 mg/kg	5	22	18
Zinc	7440-66-6 mg/kg	5	77	49

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6 mg/kg	0.1	0.1	<0.1
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EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorob	375-73-5 mg/kg	0.0002	0.0002	<0.0002
Perfluorop	2706-91-4 mg/kg	0.0002	0.0003	<0.0002
Perfluoroh	355-46-4 mg/kg	0.0002	0.0019	<0.0002
Perfluoroh	375-92-8 mg/kg	0.0002	0.0002	<0.0002
Perfluoroc	1763-23-1 mg/kg	0.0002	0.0121	<0.0002
Perfluorod	335-77-3 mg/kg	0.0002	<0.0002	<0.0002

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob	375-22-4 mg/kg	0.001	<0.001	<0.001
Perfluorop	2706-90-3 mg/kg	0.0002	0.0003	<0.0002
Perfluoroh	307-24-4 mg/kg	0.0002	0.0007	<0.0002
Perfluoroh	375-85-9 mg/kg	0.0002	0.0002	<0.0002
Perfluoroc	335-67-1 mg/kg	0.0002	0.0006	<0.0002
Perfluoron	375-95-1 mg/kg	0.0002	<0.0002	<0.0002
Perfluorod	335-76-2 mg/kg	0.0002	0.0004	<0.0002
Perfluorou	2058-94-8 mg/kg	0.0002	<0.0002	<0.0002
Perfluorod	307-55-1 mg/kg	0.0002	<0.0002	<0.0002

Perfluorot 72629-94-1 mg/kg	0.0002	<0.0002	<0.0002
Perfluorot 376-06-7 mg/kg	0.0005	<0.0005	<0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6 mg/kg	0.0002	<0.0002	<0.0002
N-Methyl 131506-32-1 mg/kg	0.0005	<0.0005	<0.0005
N-Ethyl pe 4151-50-2 mg/kg	0.0005	<0.0005	<0.0005
N-Methyl 124448-09-1 mg/kg	0.0005	<0.0005	<0.0005
N-Ethyl pe 1691-99-2 mg/kg	0.0005	<0.0005	<0.0005
N-Methyl 12355-31-9 mg/kg	0.0002	<0.0002	<0.0002
N-Ethyl pe 2991-50-6 mg/kg	0.0002	<0.0002	<0.0002

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 1757124-72 mg/kg	0.0005	<0.0005	<0.0005
6:2 Fluoro 127619-97-1 mg/kg	0.0005	<0.0005	<0.0005
8:2 Fluoro 139108-34-1 mg/kg	0.0005	<0.0005	<0.0005
10:2 Fluoro 1120226-60 mg/kg	0.0005	<0.0005	<0.0005

EP231P: PFAS Sums

Sum of PFAS mg/kg	0.0002	0.0169	<0.0002
Sum of PFI 355-46-4 mg/kg	0.0002	0.014	<0.0002
Sum of PFAS (WA DEF) mg/kg	0.0002	0.016	<0.0002

EP231S: PFAS Surrogate

13C4-PFOS %	0.1	84	70
13C8-PFOA %	0.1	93.5	82

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5 mg/kg	0.0002	0.0004	<0.0002
Perfluorop 2706-91-4 mg/kg	0.0002	0.0002	<0.0002
Perfluoroh 355-46-4 mg/kg	0.0002	0.002	<0.0002
Perfluoroh 375-92-8 mg/kg	0.0002	0.0002	<0.0002
Perfluoroc 1763-23-1 mg/kg	0.0002	0.0127	<0.0002
Perfluorod 335-77-3 mg/kg	0.0002	<0.0002	<0.0002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4 mg/kg	0.001	<0.001	<0.001
Perfluorop 2706-90-3 mg/kg	0.0002	0.0008	<0.0002
Perfluoroh 307-24-4 mg/kg	0.0002	0.0016	<0.0002
Perfluoroh 375-85-9 mg/kg	0.0002	0.0008	<0.0002
Perfluoroc 335-67-1 mg/kg	0.0002	0.0015	<0.0002
Perfluoron 375-95-1 mg/kg	0.0002	0.0003	<0.0002
Perfluorod 335-76-2 mg/kg	0.0002	0.0006	<0.0002
Perfluorou 2058-94-8 mg/kg	0.0002	<0.0002	<0.0002
Perfluorod 307-55-1 mg/kg	0.0002	0.0002	<0.0002
Perfluorot 72629-94-1 mg/kg	0.0002	<0.0002	<0.0002
Perfluorot 376-06-7 mg/kg	0.0005	<0.0005	<0.0005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6 mg/kg	0.0002	<0.0002	<0.0002
N-Methyl 131506-32-1 mg/kg	0.0005	<0.0005	<0.0005

N-Ethyl pe 4151-50-2 mg/kg	0.0005	<0.0005	<0.0005
N-Methyl 24448-09- mg/kg	0.0005	<0.0005	<0.0005
N-Ethyl pe 1691-99-2 mg/kg	0.0005	<0.0005	<0.0005
N-Methyl 2355-31-9 mg/kg	0.0002	<0.0002	<0.0002
N-Ethyl pe 2991-50-6 mg/kg	0.0002	<0.0002	<0.0002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72 mg/kg	0.0005	<0.0005	<0.0005
6:2 Fluoro 27619-97- mg/kg	0.0005	<0.0005	<0.0005
8:2 Fluoro 39108-34- mg/kg	0.0005	<0.0005	<0.0005
10:2 Fluoro 120226-60 mg/kg	0.0005	<0.0005	<0.0005

EP231_TOP_P: PFAS Sums

Sum of PFAS mg/kg	0.0002	0.0213	<0.0002
Sum of PFI 355-46-4- mg/kg	0.0002	0.0147	<0.0002
Sum of TOP C4 - C14 mg/kg	0.0002	0.0213	<0.0002
Sum of TOP C4 - C14 mg/kg	0.0002	0.0138	<0.0002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS %	0.1	90	91
13C8-PFOA %	0.1	92.5	92

Client - M& WATER
Workgroup EB1821081
Project na Swanbank

Sample Ty REG REG REG REG REG
ALS Sampl EB182108 EB182108 EB182108 EB182108 EB182108
Sample da #####
Client sam SW6-R SW11-R GMB-15R SW06-R SW11-R
Client sample ID (Secondary):
Sample Site:
Purchase Order:

Analyte gr CAS Numb Units LOR

EA005P: pH by PC Titrator

pH Value pH Unit	0.01	8.25	8.18	7.71	----	----
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EA010P: Conductivity by PC Titrator

Electrical Conductivity ÂµS/cm	1	3040	2120	2830	----	----
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EA016: Calculated TDS (from Electrical Conductivity)

Total Dissolved Solids mg/L	1	1980	1380	1840	----	----
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EA065: Total Hardness as CaCO3

Total Hardness as Ca mg/L	1	599	651	270	----	----
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ED037P: Alkalinity by PC Titrator

Hydroxide DMO-210- mg/L	1	<1	<1	<1	----	----
Carbonate 3812-32-6 mg/L	1	<1	<1	<1	----	----
Bicarbonate 71-52-3 mg/L	1	825	292	696	----	----

Total Alkalinity as CaC mg/L	1	825	292	696	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA						
Sulfate as 14808-79-1 mg/L	1	254	387	51	----	----
ED045G: Chloride by Discrete Analyser						
Chloride 16887-00-1 mg/L	1	520	373	598	----	----
ED093F: Dissolved Major Cations						
Calcium 7440-70-2 mg/L	1	75	81	24	----	----
Magnesium 7439-95-4 mg/L	1	100	109	51	----	----
Sodium 7440-23-5 mg/L	1	523	220	576	----	----
Potassium ##### mg/L	1	29	47	16	----	----
EG020T: Total Metals by ICP-MS						
Arsenic 7440-38-2 mg/L	0.001	0.001	<0.001	0.004	----	----
Beryllium 7440-41-7 mg/L	0.001	<0.001	<0.001	<0.001	----	----
Barium 7440-39-3 mg/L	0.001	0.066	0.059	0.103	----	----
Cadmium 7440-43-9 mg/L	0.0001	<0.0001	<0.0001	<0.0001	----	----
Chromium 7440-47-3 mg/L	0.001	<0.001	<0.001	0.001	----	----
Cobalt 7440-48-4 mg/L	0.001	<0.001	0.004	0.002	----	----
Copper 7440-50-8 mg/L	0.001	<0.001	0.003	0.003	----	----
Lead 7439-92-1 mg/L	0.001	<0.001	<0.001	0.003	----	----
Manganese 7439-96-5 mg/L	0.001	0.064	0.189	0.132	----	----
Nickel 7440-02-0 mg/L	0.001	0.002	0.014	0.004	----	----
Selenium 7782-49-2 mg/L	0.01	<0.01	<0.01	<0.01	----	----
Vanadium 7440-62-2 mg/L	0.01	<0.01	<0.01	<0.01	----	----
Zinc 7440-66-6 mg/L	0.005	<0.005	0.009	0.034	----	----
Boron 7440-42-8 mg/L	0.05	0.3	0.18	0.12	----	----
EG035T: Total Recoverable Mercury by FIMS						
Mercury 7439-97-6 mg/L	0.0001	<0.0001	<0.0001	<0.0001	----	----
EK040P: Fluoride by PC Titrator						
Fluoride 16984-48-1 mg/L	0.1	0.9	0.4	0.7	----	----
EK055G: Ammonia as N by Discrete Analyser						
Ammonia 7664-41-7 mg/L	0.01	----	----	0.17	0.06	0.07
EK057G: Nitrite as N by Discrete Analyser						
Nitrite as 14797-65-1 mg/L	0.01	----	----	<0.01	----	----
EK058G: Nitrate as N by Discrete Analyser						
Nitrate as 14797-55-1 mg/L	0.01	----	----	0.02	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser						
Nitrite + Nitrate as N mg/L	0.01	----	----	0.02	0.23	0.64
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser						
Total Kjeldahl Nitrogen mg/L	0.1	----	----	0.5	0.3	0.5

EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser

Total Nitrogen as N	mg/L	0.1	----	----	0.5	0.5	1.1
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EK067G: Total Phosphorus as P by Discrete Analyser

Total Phosphorus as P	mg/L	0.01	----	----	0.01	0.01	0.01
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EK071G: Reactive Phosphorus as P by discrete analyser

Reactive P 14265-44-	mg/L	0.01	----	----	<0.01	----	----
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EN055: Ionic Balance

Total Anions	meq/L	0.01	36.4	24.4	31.8	----	----
Total Cations	meq/L	0.01	35.5	23.8	30.8	----	----
Ionic Balance	%	0.01	1.36	1.3	1.56	----	----

EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	Âµg/L	0.0005	0.0074	0.512	0.0665	----	----
Perfluorop 2706-91-4	Âµg/L	0.0005	0.0015	0.359	0.0367	----	----
Perfluoroh 355-46-4	Âµg/L	0.0005	0.0023	1.09	0.126	----	----
Perfluoroh 375-92-8	Âµg/L	0.0005	<0.0005	0.0584	0.005	----	----
Perfluoroc 1763-23-1	Âµg/L	0.0003	0.0018	1.08	0.0483	----	----
Perfluorod 335-77-3	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.002	<0.002	0.061	<0.002	----	----
Perfluorop 2706-90-3	Âµg/L	0.0005	0.0549	0.569	0.0096	----	----
Perfluoroh 307-24-4	Âµg/L	0.0005	0.0363	1.41	0.0372	----	----
Perfluoroh 375-85-9	Âµg/L	0.0005	0.0091	0.242	0.0059	----	----
Perfluoroc 335-67-1	Âµg/L	0.0005	0.0121	0.27	0.0117	----	----
Perfluoron 375-95-1	Âµg/L	0.0005	<0.0005	0.0107	0.0007	----	----
Perfluorod 335-76-2	Âµg/L	0.0005	<0.0005	0.0021	<0.0005	----	----
Perfluorou 2058-94-8	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----
Perfluorod 307-55-1	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----
Perfluorot 72629-94-	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----
Perfluorot 376-06-7	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----
N-Methyl p 31506-32-	Âµg/L	0.001	<0.001	<0.001	<0.001	----	----
N-Ethyl pe 4151-50-2	Âµg/L	0.001	<0.001	<0.001	<0.001	----	----
N-Methyl p 24448-09-	Âµg/L	0.001	<0.001	<0.001	<0.001	----	----
N-Ethyl pe 1691-99-2	Âµg/L	0.001	<0.001	<0.001	<0.001	----	----
N-Methyl p 2355-31-9	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----
N-Ethyl pe 2991-50-6	Âµg/L	0.0005	<0.0005	<0.0005	<0.0005	----	----

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.001	<0.001	<0.001	<0.001	----	----
6:2 Fluoro 27619-97-	Âµg/L	0.001	<0.001	0.05	<0.001	----	----
8:2 Fluoro 39108-34-	Âµg/L	0.001	<0.001	<0.001	<0.001	----	----
10:2 Fluoro 120226-60	Âµg/L	0.001	<0.001	<0.001	<0.001	----	----

EP231P: PFAS Sums

Sum of PFAS	Âµg/L	0.0003	0.125	5.71	0.348	----	----
Sum of PFI 355-46-4/	Âµg/L	0.0003	0.0041	2.17	0.174	----	----
Sum of PFAS (WA DEF	Âµg/L	0.0003	0.124	5.28	0.305	----	----

EP231S: PFAS Surrogate

13C4-PFOS	%	0.1	75.4	73.1	87.2	----	----
13C8-PFOA	%	0.1	92.7	98.7	101	----	----

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	Âµg/L	0.002	0.007	0.609	0.064	----	----
Perfluorop 2706-91-4	Âµg/L	0.002	<0.002	0.38	0.035	----	----
Perfluoroh 355-46-4	Âµg/L	0.002	0.004	1.22	0.164	----	----
Perfluoroh 375-92-8	Âµg/L	0.002	<0.002	0.063	0.004	----	----
Perfluoroc 1763-23-1	Âµg/L	0.002	0.004	0.871	0.035	----	----
Perfluorod 335-77-3	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.01	0.06	0.83	0.07	----	----
Perfluorop 2706-90-3	Âµg/L	0.002	0.061	1.08	0.034	----	----
Perfluoroh 307-24-4	Âµg/L	0.002	0.039	2.34	0.13	----	----
Perfluoroh 375-85-9	Âµg/L	0.002	0.007	0.244	0.006	----	----
Perfluoroc 335-67-1	Âµg/L	0.002	0.009	0.177	0.006	----	----
Perfluoron 375-95-1	Âµg/L	0.002	<0.002	0.006	<0.002	----	----
Perfluorod 335-76-2	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----
Perfluorou 2058-94-8	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----
Perfluorod 307-55-1	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----
Perfluorot 72629-94-	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----
Perfluorot 376-06-7	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----
N-Methyl 31506-32-	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----
N-Ethyl pe 4151-50-2	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----
N-Methyl 24448-09-	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----
N-Ethyl pe 1691-99-2	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----
N-Methyl 2355-31-9	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----
N-Ethyl pe 2991-50-6	Âµg/L	0.002	<0.002	<0.002	<0.002	----	----

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----
6:2 Fluoro 27619-97-	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----
8:2 Fluoro 39108-34-	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----
10:2 Fluoro 120226-60	Âµg/L	0.005	<0.005	<0.005	<0.005	----	----

EP231_TOP_P: PFAS Sums

Sum of PFAS	Âµg/L	0.002	0.191	7.82	0.548	----	----
Sum of PFI 355-46-4/	Âµg/L	0.002	0.008	2.09	0.199	----	----
Sum of TOP C4 - C14	Âµg/L	0.002	0.191	7.82	0.548	----	----
Sum of TOP C4 - C14	Âµg/L	0.002	0.123	4.99	0.344	----	----

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.1	74.1	65.2	63.9	----	----
13C8-PFOA	%	0.1	91.7	84.9	83.9	----	----

QC - Matri SOIL	Sample Ty	DUP	DUP	MB	DUP	DUP
Workgroup EB1821081	ALS Sampl	QC-19073	QC-19073	QC-MRG2	QC-MRG2	QC-MRG2
	Sample da	#####	#####	#####	#####	#####

Analyte gr CAS Numb Units LOR

EA055: Moisture Content (Dried @ 105-110Â°C)

Moisture Content	%	1	27.7	20.9
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EG005T: Total Metals by ICP-AES

Arsenic	7440-38-2 mg/kg	5	<5	<5	7
Barium	7440-39-3 mg/kg	10	<10	10	30
Beryllium	7440-41-7 mg/kg	1	<1	<1	<1
Boron	7440-42-8 mg/kg	50	<50	<50	<50
Cadmium	7440-43-9 mg/kg	1	<1	<1	<1
Chromium	7440-47-3 mg/kg	2	<2	30	40
Cobalt	7440-48-4 mg/kg	2	<2	2	6
Copper	7440-50-8 mg/kg	5	<5	13	44
Lead	7439-92-1 mg/kg	5	<5	7	5
Manganese	7439-96-5 mg/kg	5	<5	21	188
Nickel	7440-02-0 mg/kg	2	<2	6	17
Selenium	7782-49-2 mg/kg	5	<5	<5	<5
Vanadium	7440-62-2 mg/kg	5	<5	56	16
Zinc	7440-66-6 mg/kg	5	<5	17	35

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6 mg/kg	0.1	<0.1	<0.1	<0.1
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EK071G: Reactive Phosphorus as P by discrete analyser

Reactive P	14265-44- mg/L	0.01
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EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorob	375-73-5 mg/kg	0.0002
Perfluorop	2706-91-4 mg/kg	0.0002
Perfluoroh	355-46-4 mg/kg	0.0002
Perfluoroh	375-92-8 mg/kg	0.0002
Perfluoroc	1763-23-1 mg/kg	0.0002
Perfluorod	335-77-3 mg/kg	0.0002

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob	375-22-4 mg/kg	0.001
Perfluorop	2706-90-3 mg/kg	0.0002
Perfluoroh	307-24-4 mg/kg	0.0002
Perfluoroh	375-85-9 mg/kg	0.0002

Perfluoroc 335-67-1	mg/kg	0.0002
Perfluoron 375-95-1	mg/kg	0.0002
Perfluorod 335-76-2	mg/kg	0.0002
Perfluorou 2058-94-8	mg/kg	0.0002
Perfluorod 307-55-1	mg/kg	0.0002
Perfluorot 72629-94-	mg/kg	0.0002
Perfluorot 376-06-7	mg/kg	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	mg/kg	0.0002
N-Methyl 31506-32-	mg/kg	0.0005
N-Ethyl pe 4151-50-2	mg/kg	0.0005
N-Methyl 24448-09-	mg/kg	0.0005
N-Ethyl pe 1691-99-2	mg/kg	0.0005
N-Methyl 2355-31-9	mg/kg	0.0002
N-Ethyl pe 2991-50-6	mg/kg	0.0002

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	mg/kg	0.0005
6:2 Fluoro 27619-97-	mg/kg	0.0005
8:2 Fluoro 39108-34-	mg/kg	0.0005
10:2 Fluoro 120226-60	mg/kg	0.0005

EP231S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	mg/kg	0.0002
Perfluorop 2706-91-4	mg/kg	0.0002
Perfluoroh 355-46-4	mg/kg	0.0002
Perfluoroh 375-92-8	mg/kg	0.0002
Perfluoroc 1763-23-1	mg/kg	0.0002
Perfluorod 335-77-3	mg/kg	0.0002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	mg/kg	0.001
Perfluorop 2706-90-3	mg/kg	0.0002
Perfluoroh 307-24-4	mg/kg	0.0002
Perfluoroh 375-85-9	mg/kg	0.0002
Perfluoroc 335-67-1	mg/kg	0.0002
Perfluoron 375-95-1	mg/kg	0.0002
Perfluorod 335-76-2	mg/kg	0.0002
Perfluorou 2058-94-8	mg/kg	0.0002
Perfluorod 307-55-1	mg/kg	0.0002
Perfluorot 72629-94-	mg/kg	0.0002
Perfluorot 376-06-7	mg/kg	0.0005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	mg/kg	0.0002
N-Methyl 31506-32-	mg/kg	0.0005

N-Ethyl pe 4151-50-2 mg/kg	0.0005
N-Methyl 24448-09- mg/kg	0.0005
N-Ethyl pe 1691-99-2 mg/kg	0.0005
N-Methyl 2355-31-9 mg/kg	0.0002
N-Ethyl pe 2991-50-6 mg/kg	0.0002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72 mg/kg	0.0005
6:2 Fluoro 27619-97- mg/kg	0.0005
8:2 Fluoro 39108-34- mg/kg	0.0005
10:2 Fluor 120226-60 mg/kg	0.0005

EP231_TOP_P: PFAS Sums

Sum of PFAS mg/kg	0.0002
Sum of PFI 355-46-4/ mg/kg	0.0002
Sum of TOP C4 - C14 mg/kg	0.0002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS %	0.1
13C8-PFOA %	0.1

QC - Matri WATER
Workgroup EB1821081

Sample Ty	LCS	LCS	DUP	DUP	MB
ALS Sampl	QC-19074	QC-19074	QC-MRG3	QC-MRG4	QC-MRG2
Sample da	#####	#####	#####	#####	#####

Analyte gr CAS Numb Units LOR

EA005P: pH by PC Titrator					
pH Value %	0.01	100	99.7	7.21	6.56

EA010P: Conductivity by PC Titrator				
Electrical Conductivity µS/cm	1		1830	3260 <1

ED037P: Alkalinity by PC Titrator

Hydroxide DMO-210- mg/L	1	<1	<1
Carbonate 3812-32-6 mg/L	1	<1	<1
Bicarbonat 71-52-3 mg/L	1	755	134
Total Alkalinity as Ca mg/L	1	755	134

ED041G: Sulfate (Turbidimetric) as SO4 2- by DA

Sulfate as 14808-79- mg/L	1
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ED045G: Chloride by Discrete Analyser

Chloride 16887-00- mg/L	1
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ED093F: Dissolved Major Cations

Calcium 7440-70-2 mg/L	1
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Magnesium 7439-95-4 mg/L	1
Sodium 7440-23-5 mg/L	1
Potassium ##### mg/L	1

EG020T: Total Metals by ICP-MS

Arsenic 7440-38-2 mg/L	0.001
Beryllium 7440-41-7 mg/L	0.001
Barium 7440-39-3 mg/L	0.001
Cadmium 7440-43-9 mg/L	0.0001
Chromium 7440-47-3 mg/L	0.001
Cobalt 7440-48-4 mg/L	0.001
Copper 7440-50-8 mg/L	0.001
Lead 7439-92-1 mg/L	0.001
Manganese 7439-96-5 mg/L	0.001
Nickel 7440-02-0 mg/L	0.001
Selenium 7782-49-2 mg/L	0.01
Vanadium 7440-62-2 mg/L	0.01
Zinc 7440-66-6 mg/L	0.005
Boron 7440-42-8 mg/L	0.05

EG035T: Total Recoverable Mercury by FIMS

Mercury 7439-97-6 mg/L	0.0001
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EK040P: Fluoride by PC Titrator

Fluoride 16984-48-1 mg/L	0.1
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EK055G: Ammonia as N by Discrete Analyser

Ammonia 7664-41-7 mg/L	0.01
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EK057G: Nitrite as N by Discrete Analyser

Nitrite as N 14797-65-1 mg/L	0.01
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EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

Nitrite + Nitrate as N mg/L	0.01
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EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

Total Kjeldahl Nitrogen mg/L	0.1
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EK067G: Total Phosphorus as P by Discrete Analyser

Total Phosphorus as P mg/L	0.01
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EK071G: Reactive Phosphorus as P by discrete analyser

Reactive P 14265-44-1 mg/L	0.01
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EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5 $\hat{\text{A}}\mu\text{g/L}$	0.0005
Perfluorop 2706-91-4 $\hat{\text{A}}\mu\text{g/L}$	0.0005
Perfluoroh 355-46-4 $\hat{\text{A}}\mu\text{g/L}$	0.0005
Perfluoroh 375-92-8 $\hat{\text{A}}\mu\text{g/L}$	0.0005
Perfluoroc 1763-23-1 $\hat{\text{A}}\mu\text{g/L}$	0.0003
Perfluorod 335-77-3 $\hat{\text{A}}\mu\text{g/L}$	0.0005

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.002
Perfluorop 2706-90-3	Âµg/L	0.0005
Perfluoroh 307-24-4	Âµg/L	0.0005
Perfluoroh 375-85-9	Âµg/L	0.0005
Perfluoroc 335-67-1	Âµg/L	0.0005
Perfluoron 375-95-1	Âµg/L	0.0005
Perfluorod 335-76-2	Âµg/L	0.0005
Perfluorou 2058-94-8	Âµg/L	0.0005
Perfluorod 307-55-1	Âµg/L	0.0005
Perfluorot 72629-94-1	Âµg/L	0.0005
Perfluorot 376-06-7	Âµg/L	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.0005
N-Methyl 31506-32-1	Âµg/L	0.001
N-Ethyl 4151-50-2	Âµg/L	0.001
N-Methyl 24448-09-1	Âµg/L	0.001
N-Ethyl 1691-99-2	Âµg/L	0.001
N-Methyl 2355-31-9	Âµg/L	0.0005
N-Ethyl 2991-50-6	Âµg/L	0.0005

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.001
6:2 Fluoro 27619-97-1	Âµg/L	0.001
8:2 Fluoro 39108-34-1	Âµg/L	0.001
10:2 Fluoro 120226-60	Âµg/L	0.001

EP231P: PFAS Sums

Sum of PFAS	Âµg/L	0.0003
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EP231S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	Âµg/L	0.002
Perfluorop 2706-91-4	Âµg/L	0.002
Perfluoroh 355-46-4	Âµg/L	0.002
Perfluoroh 375-92-8	Âµg/L	0.002
Perfluoroc 1763-23-1	Âµg/L	0.002
Perfluorod 335-77-3	Âµg/L	0.002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.01
Perfluorop 2706-90-3	Âµg/L	0.002
Perfluoroh 307-24-4	Âµg/L	0.002
Perfluoroh 375-85-9	Âµg/L	0.002
Perfluoroc 335-67-1	Âµg/L	0.002
Perfluoron 375-95-1	Âµg/L	0.002

Perfluorod 335-76-2	Âµg/L	0.002
Perfluorou 2058-94-8	Âµg/L	0.002
Perfluorod 307-55-1	Âµg/L	0.002
Perfluorot 72629-94-	Âµg/L	0.002
Perfluorot 376-06-7	Âµg/L	0.005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.002
N-Methyl 31506-32-	Âµg/L	0.005
N-Ethyl pe 4151-50-2	Âµg/L	0.005
N-Methyl 24448-09-	Âµg/L	0.005
N-Ethyl pe 1691-99-2	Âµg/L	0.005
N-Methyl 2355-31-9	Âµg/L	0.002
N-Ethyl pe 2991-50-6	Âµg/L	0.002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.005
6:2 Fluoro 27619-97-	Âµg/L	0.005
8:2 Fluoro 39108-34-	Âµg/L	0.005
10:2 Fluoro 120226-60	Âµg/L	0.005

EP231_TOP_P: PFAS Sums

Sum of PFAS	Âµg/L	0.002
Sum of PFI 355-46-4/	Âµg/L	0.002
Sum of TOP C4 - C14	Âµg/L	0.002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

Sl. No.	Category	Value	Unit	Value	Unit
113	67.2	---	7	15	
101	87.8	---	10	<10	
109	102	---	<1	<1	
		---	<50	---	
94	89.1	---	<1	<1	
115	91.8	---	34	30	
103	92.2	---	2	6	
106	100	---	14	14	
115	90	---	8	7	
102	92.4	---	24	54	
111	87.4	---	6	10	
		---	<5	---	
106	83.1	---	67	70	
106	96.4	---	20	53	
6.2	99	---	<0.1	<0.1	
		<0.01	---	---	

99

<0.01

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<0.0002	0.0006	106	96.8	----	----	----	----
<0.0002	<0.0002	101	116	----	----	----	----
<0.0002	0.0004	94.4	98	----	----	----	----
<0.0002	<0.0002	101	114	----	----	----	----
<0.0002	<0.0002	64.8	60	----	----	----	----
<0.0002	<0.0002	60	57.2	----	----	----	----
<0.0005	<0.0005	84.1	87	----	----	----	----
<0.0002	<0.0002	76	80.4	----	----	----	----
<0.0005	<0.0005	104	103	----	----	----	----
<0.0005	<0.0005	85.6	95.4	----	----	----	----
<0.0005	<0.0005	79.5	80.6	----	----	----	----
<0.0005	<0.0005	101	99.8	----	----	----	----
<0.0002	<0.0002	110	108	----	----	----	----
<0.0002	<0.0002	120	108	----	----	----	----
<0.0005	<0.0005	83.2	88.8	----	----	----	----
<0.0005	<0.0005	84	105	----	----	----	----
<0.0005	<0.0005	101	109	----	----	----	----
<0.0005	<0.0005	83.6	59.2	----	----	----	----
64	90	74	77.5	----	----	----	----
63	95.5	93	89.5	----	----	----	----
<0.0002	0.0003			----	----	----	----
<0.0002	0.0002			----	----	----	----
<0.0002	0.0018	63		----	----	----	----
<0.0002	<0.0002			----	----	----	----
<0.0002	0.0108	70.6		----	----	----	----
<0.0002	<0.0002			----	----	----	----
<0.001	<0.001			----	----	----	----
<0.0002	0.0007			----	----	----	----
<0.0002	0.0014			----	----	----	----
<0.0002	0.0006			----	----	----	----
<0.0002	0.0013	93.8		----	----	----	----
<0.0002	0.0002			----	----	----	----
<0.0002	0.0005			----	----	----	----
<0.0002	<0.0002			----	----	----	----
<0.0002	0.0002			----	----	----	----
<0.0002	<0.0002			----	----	----	----
<0.0005	<0.0005			----	----	----	----
<0.0002	<0.0002			----	----	----	----
<0.0005	<0.0005			----	----	----	----

<0.0005	<0.0005		----	----	----	----
<0.0005	<0.0005		----	----	----	----
<0.0005	<0.0005		----	----	----	----
<0.0002	<0.0002		----	----	----	----
<0.0002	<0.0002		----	----	----	----

<0.0005	<0.0005		----	----	----	----
<0.0005	<0.0005	-158	----	----	----	----
<0.0005	<0.0005		----	----	----	----
<0.0005	<0.0005		----	----	----	----

<0.0002	0.018		----	----	----	----
<0.0002	0.0126		----	----	----	----
<0.0002	0.018		----	----	----	----

68.5	102	102	----	----	----	----
64.5	108	95.5	----	----	----	----

LCS	LCS	LCS	MB	LCS	LCS	DUP	MS	MB	LCS
QC-MRG2-	QC-19074	QC-19074	QC-MRG2-	QC-19076	QC-MRG2-	QC-MRG3-	QC-19076	QC-MRG4-	QC-MRG2-
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

98.2	100
------	-----

99.6

<1	105	93.6	815 ND
----	-----	------	--------

642	<1	98.6
-----	----	------

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<0.01

<0.01

REG
EB1821084008
#####

30
30
<1
<50
<1
40
5
34
7
183
16
<5
16
33

<0.1

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LCS	DUP	MS	MB	DUP	DUP	MB	LCS	DUP	DUP
QC-MRG4	QC-MRG2	QC-MRG2	QC-MRG4	QC-MRG2	QC-MRG3	QC-19076	QC-19076	QC-19076	QC-19076
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

105 370 105

<1 51 3

<1	30	2
<1	217	95
<1	3	2

<0.001	105	<0.001	<0.001
<0.001	103	<0.001	<0.001
<0.001	102	0.03	<0.001
<0.0001	99.8	<0.0001	<0.0001
<0.001	101	<0.001	<0.001
<0.001	105	<0.001	<0.001
<0.001	106	0.193	<0.001
<0.001	103	0.001	<0.001
<0.001	105	<0.001	<0.001
<0.001	104	0.014	<0.001
<0.01	102	<0.01	<0.01
<0.01	104	<0.01	<0.01
<0.005	101	0.07	<0.005
<0.05	102	<0.05	<0.05

97.6 <0.01 101

95.6

MS MB LCS DUP MS DUP MB LCS DUP MS
QC-19076 QC-19076 QC-19076 QC-19076 QC-19076 QC-19076 QC-MRG2 QC-MRG2 QC-MRG4 QC-19074
#####

104
108
104
102
101
104
105
103
105
102

102
104

<0.0001

110 <0.0001

118 <0.0001

<0.1

96

0.5

83.6

DUP MB LCS DUP MS DUP DUP MB LCS DUP
QC-MRG4- QC-MRG2- QC-MRG2- QC-MRG2- QC-MRG2- QC-MRG2- QC-MRG3- QC-MRG2- QC-MRG2- QC-MRG2-
#####

0.1

<0.01

104

0.2

86.7

0.01

<0.01

<0.01

96.5

0.01

95.1

0.08

<0.1

77.8

0.3

<0.01

87.9

0.01

<0.01

MS DUP DUP MS MB DUP DUP LCS MB LCS
QC-MRG2- QC-MRG2- QC-MRG2- QC-MRG2- QC-19147! QC-19147! QC-19147! QC-19147! QC-19147! QC-19147!
#####

84.5 0.4

102 0.02

<0.01 93.8

<0.0005	100
<0.0005	94.8
<0.0005	74.2
<0.0005	91.8
<0.0003	77.2
<0.0005	50.8

<0.002	58.6
<0.0005	113
<0.0005	109
<0.0005	118
<0.0005	107
<0.0005	109
<0.0005	75.8
<0.0005	53
<0.0005	47.2
<0.0005	52.4
<0.0005	64
<0.0005	55.2
<0.001	63.4
<0.001	65.7
<0.001	64.8
<0.001	66.8
<0.0005	51.2
<0.0005	49
<0.001	102
<0.001	100
<0.001	94.4
<0.001	50.2
<0.0003	
75.6	70.5
92.5	87.7

<0.002	0.007	<0.002	
<0.002	<0.002	<0.002	
<0.002	0.004	<0.002	77.9
<0.002	<0.002	<0.002	
<0.002	0.004	<0.002	57.7
<0.002	<0.002	<0.002	

<0.01	0.06	<0.01	
<0.002	0.057	<0.002	
<0.002	0.04	<0.002	
<0.002	0.008	<0.002	
<0.002	0.01	<0.002	77.2
<0.002	<0.002	<0.002	

<0.002	<0.002	<0.002
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<0.002	<0.002	<0.002
<0.002	<0.002	<0.002
<0.005	<0.005	<0.005

<0.002	<0.002	<0.002
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<0.005	<0.005	<0.005
<0.005	<0.005	<0.005
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<0.002	<0.002	<0.002

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<0.005	<0.005	<0.005	-10.8
<0.005	<0.005	<0.005	
<0.005	<0.005	<0.005	

<0.002	0.19	<0.002
<0.002	0.008	<0.002
<0.002	0.19	<0.002

76.3	77.8	66.3	75.9
91.4	97.8	70	91.2

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DUP	MS	DUP	REG	REG	REG	REG	REG	REG	REG
QC-19147	QC-19147	QC-19147	EB182003	EB182003	EB182053	EB182053	EB182101	EB182101	EB182105
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

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376	370	---	---	---	---	---	---
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51	---	---	---	---	---	---	---
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31	----	----	----	----	----	----
219	----	----	----	----	----	----
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----	----	0.4	0.5	----	----	----
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----	----	0.01	0.26	----	----	----
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0.0077 ND	0.0192	----	----	----	----	----
0.0016 ND	0.0109	----	----	----	----	----
0.0025 ND	0.0609	----	----	----	----	----
<0.0005 ND	0.0038	----	----	----	----	----
0.0023 ND	0.125	----	----	----	----	----
<0.0005	50.4 <0.0005	----	----	----	----	----

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REG	REG	REG	REG	REG	REG	REG	REG	REG	REG
EB182105	EB182105	EB182105	EB182106	EB182106	EB182106	EB182108	EB182108	EB182108	EB182108
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####
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----	----	----	----	----	1840	3280	----	----	----
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---	---	---	0.191	0.019	---	---	<0.001	---	---
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---	---	---	<0.01	<0.01	---	---	<0.01	---	---
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[illegible]

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REG REG
EB182108 EB1821083002
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0.04 ---

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0.08 ---

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QUALITY CONTROL REPORT

Work Order	: EB1821081	Page	: 1 of 23
Client	: QLD DEPT OF ENVIRONMENT & SCIENCE	Laboratory	: Environmental Division Brisbane
Contact	: IPSWICH ESR	Contact	: Customer Services EB
Address	: GPO BOX 2771 BRISBANE QLD, AUSTRALIA 4001	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Swanbank	Date Samples Received	: 30-Aug-2018
Order number	: ----	Date Analysis Commenced	: 31-Aug-2018
C-O-C number	: ----	Issue Date	: 11-Sep-2018
Sampler	: Brenda Baddiley, Graham		
Site	: ----		
Quote number	: EN/222		
No. of samples received	: 7		
No. of samples analysed	: 7		



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
Franco Lentini		Sydney Organics, Smithfield, NSW
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Tom Maloney	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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: 1907310)									
EB1821052-018	Anonymous	EA055: Moisture Content	----	0.1	%	27.3	27.7	1.48	0% - 20%
EB1821078-005	Anonymous	EA055: Moisture Content	----	0.1	%	20.8	20.9	0.560	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1907302)									
EB1821052-018	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	10	10	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	34	30	11.8	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	2	2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	<5	33.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	13	9.84	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	7	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	24	21	15.7	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	67	56	17.2	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	20	17	16.6	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EB1821084-008	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	30	30	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	40	40	0.00	0% - 20%
		EG005T: Cobalt	7440-48-4	2	mg/kg	5	6	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	16	17	9.12	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	30	7	127	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	34	44	24.4	No Limit



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 (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1907302) - continued									
EB1821084-008	Anonymous	EG005T: Lead	7439-92-1	5	mg/kg	7	5	27.4	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	183	188	2.55	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	16	16	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	35	4.97	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1907303)									
EB1821052-018	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EB1821084-008	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1915532)									
EB1821081-003	SW11-R	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0004	0.0003	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	0.0020	0.0018	13.8	0% - 50%
		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	0.0127	0.0108	15.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1915532)									
EB1821081-003	SW11-R	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0008	0.0007	18.7	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0016	0.0014	11.8	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0008	0.0006	32.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0015	0.0013	14.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0003	0.0002	45.3	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0006	0.0005	24.1	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0002	0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1915532)									
EB1821081-003	SW11-R	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		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	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit



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 (%)
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1915532) - continued									
EB1821081-003	SW11-R	EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1915532)									
EB1821081-003	SW11-R	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 1915532)									
EB1821081-003	SW11-R	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0213	0.0180	16.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0147	0.0126	15.4	0% - 20%
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	0.0213	0.0180	16.8	0% - 20%
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1915531)									
EB1821081-003	SW11-R	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	0.0003	0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0019	0.0017	10.6	No Limit
		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	0.0121	0.0111	8.60	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1915531)									
EB1821081-003	SW11-R	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	0.0003	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0007	0.0006	26.3	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0006	0.0006	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0004	0.0004	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTriDA)	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1915531)									
EB1821081-003	SW11-R	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit



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 (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1915531) - continued									
EB1821081-003	SW11-R	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1915531)									
EB1821081-003	SW11-R	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA005P: pH by PC Titrator (QC Lot: 1907481)									
EB1821063-008	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	7.18	7.21	0.417	0% - 20%
EB1821082-010	Anonymous	EA005-P: pH Value	----	0.01	pH Unit	6.59	6.56	0.456	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 1907480)									
EB1821063-008	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	1840	1830	0.789	0% - 20%
EB1821082-010	Anonymous	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	3280	3260	0.631	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 1907482)									
EB1821063-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	728	755	3.63	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	728	755	3.63	0% - 20%
EB1821082-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	140	134	4.70	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	140	134	4.70	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 1907614)									
EB1821082-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	844	815	3.58	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 1907611)									



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
ED045G: Chloride by Discrete Analyser (QC Lot: 1907611) - continued									
EB1820038-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	376	370	1.54	0% - 20%
EB1821082-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	642	642	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 1907575)									
EB1820038-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	51	51	0.00	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	31	30	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	219	217	0.816	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	3	3	0.00	No Limit
EB1821056-001	Anonymous	ED093F: Calcium	7440-70-2	1	mg/L	3	3	0.00	No Limit
		ED093F: Magnesium	7439-95-4	1	mg/L	2	2	0.00	No Limit
		ED093F: Sodium	7440-23-5	1	mg/L	96	95	0.00	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	2	2	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 1907670)									
EB1821061-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Barium	7440-39-3	0.001	mg/L	0.029	0.030	0.00	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.191	0.193	0.629	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.013	0.014	7.67	0% - 50%
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.068	0.070	2.64	0% - 50%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EB1821082-003	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Barium	7440-39-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit



Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1907672)									
EB1821081-001	SW6-R	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1821083-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 1907478)									
EB1821056-007	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.1	0.1	0.00	No Limit
EB1821050-003	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.5	0.5	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1911997)									
EB1821081-005	GMB-15R	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.17	0.20	18.8	0% - 20%
EB1821083-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.01	114	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 1907610)									
EB1820038-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1821019-009	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 1911998)									
EB1821081-005	GMB-15R	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.01	76.8	No Limit
EB1821083-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.08	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 1912290)									
EB1820532-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.4	0.3	0.00	No Limit
EB1821081-006	SW06-R	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.3	0.4	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 1912291)									
EB1820532-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.01	0.00	No Limit
EB1821081-006	SW06-R	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.02	67.7	No Limit
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 1907613)									
EB1820154-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1821019-009	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914791)									
EB1821081-001	SW6-R	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	0.007	0.007	0.00	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	0.004	0.004	0.00	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	0.004	0.004	0.00	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EB1821082-011	Anonymous	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914791) - continued									
EB1821082-011	Anonymous	EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914791)									
EB1821081-001	SW6-R	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	0.061	0.057	6.62	0% - 20%
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	0.039	0.040	0.00	0% - 50%
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	0.007	0.008	0.00	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	0.009	0.010	0.00	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	0.06	0.06	0.00	No Limit
		EB1821082-011	Anonymous	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	<0.002
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8			0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7			0.005	µg/L	<0.005	<0.005	0.00	No Limit
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4			0.01	µg/L	<0.01	<0.01	0.00	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1914791)									
EB1821081-001	SW6-R	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1914791) - continued									
EB1821081-001	SW6-R	EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EB1821082-011	Anonymous	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1914791)							
EB1821081-001	SW6-R	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EB1821082-011	Anonymous	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 1914791)									
EB1821081-001	SW6-R	EP231X-LL: Sum of PFAS	----	0.002	µg/L	0.191	0.190	0.525	0% - 20%



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_P: PFAS Sums (QC Lot: 1914791) - continued									
EB1821081-001	SW6-R	EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	0.008	0.008	0.00	No Limit
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	0.191	0.190	0.525	0% - 20%
EB1821082-011	Anonymous	EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914796)									
EB1821081-001	SW6-R	EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	0.0018	0.0023	22.2	No Limit
		EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0074	0.0077	4.26	0% - 50%
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0015	0.0016	9.15	No Limit
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0023	0.0025	8.20	No Limit
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	0.134	0.125	6.88	0% - 20%
		EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	0.0184	0.0192	4.26	0% - 20%
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	0.0109	0.0109	0.00	0% - 20%
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0588	0.0609	3.61	0% - 20%
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	0.0039	0.0038	3.62	No Limit
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914796)									
EB1821081-001	SW6-R	EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0549	0.0639	15.2	0% - 20%
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0363	0.0412	12.6	0% - 20%
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0091	0.0094	2.80	0% - 50%
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0121	0.0134	10.2	0% - 20%
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914796) - continued									
EB1821081-001	SW6-R	EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	0.0933	0.0941	0.875	0% - 20%
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.108	0.106	2.54	0% - 20%
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.0269	0.0264	1.95	0% - 20%
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0380	0.0385	1.26	0% - 20%
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	0.0085	0.0082	3.84	0% - 50%
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	0.0011	0.0011	0.00	No Limit
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	0.0007	0.0009	23.4	No Limit
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1914796)									
EB1821081-001	SW6-R	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1914796) - continued									
EB1821083-001	Anonymous	EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1914796)									
EB1821081-001	SW6-R	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EB1821083-001	Anonymous	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.013	0.014	0.00	0% - 50%
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1914796)									
EB1821081-001	SW6-R	EP231X-ST: Sum of PFAS	----	0.0003	µg/L	0.125	0.142	12.4	0% - 20%
EB1821083-001	Anonymous	EP231X-ST: Sum of PFAS	----	0.0003	µg/L	0.516	0.509	1.27	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**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit		Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High
EG005T: Total Metals by ICP-AES (QCLot: 1907302)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	106 mg/kg	113	84	123
EG005T: Barium	7440-39-3	10	mg/kg	<10	84.8 mg/kg	101	89	129
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.6 mg/kg	109	70	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.4 mg/kg	94.0	88	117
EG005T: Chromium	7440-47-3	2	mg/kg	<2	16.5 mg/kg	115	83	125
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	9.5 mg/kg	103	89	125
EG005T: Copper	7440-50-8	5	mg/kg	<5	50.6 mg/kg	106	86	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	64.4 mg/kg	91.5	84	119
EG005T: Manganese	7439-96-5	5	mg/kg	<5	522 mg/kg	102	84	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	13.3 mg/kg	111	89	126
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	55.3 mg/kg	106	91	127
EG005T: Zinc	7440-66-6	5	mg/kg	<5	151 mg/kg	106	87	127
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907303)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.09821 mg/kg	86.2	78	122
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 1915532)								
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	0.0025 mg/kg	63.0	50	150
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	70.6	50	150
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915532)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	93.8	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	----	----	----	----



Sub-Matrix: SOIL

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915532) - continued								
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 1915532)								
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)	24448-09-7	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: 1915532)								
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	0.00012 mg/kg	-158	0	200
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 1915532)								
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	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1915531)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	69.6	57	121
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.4	55	125
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.8	52	126
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	54	123
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	55	127
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	54	125
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915531)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	73.2	52	128
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	54	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	58	127
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	57	128
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	60	134
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	63	130

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915531) - continued								
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	55	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	62	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	64.8	53	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	60.0	49	129
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.1	59	129
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1915531)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	52	132
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65	126
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.6	64	126
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	79.5	63	124
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	58	125
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	61	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	55	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1915531)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.2	54	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	84.0	61	130
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	101	62	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.6	60	130

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report				
Method: Compound		CAS Number	LOR		Unit	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low	High
EA005P: pH by PC Titrator (QCLot: 1907481)									
EA005-P: pH Value		----	----	pH Unit	----	4 pH Unit	100	98	102
					----	7 pH Unit	99.7	98	102
EA010P: Conductivity by PC Titrator (QCLot: 1907480)									
EA010-P: Electrical Conductivity @ 25°C		----	1	µS/cm	<1	2100 µS/cm	98.2	91	107
					<1	24800 µS/cm	100	91	107
ED037P: Alkalinity by PC Titrator (QCLot: 1907482)									
ED037-P: Total Alkalinity as CaCO3		----	----	mg/L	----	200 mg/L	99.6	80	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1907614)									
ED041G: Sulfate as SO4 - Turbidimetric		14808-79-8	1	mg/L	<1	25 mg/L	105	85	118
					<1	100 mg/L	93.6	85	118
ED045G: Chloride by Discrete Analyser (QCLot: 1907611)									



Sub-Matrix: **WATER**

Method Blank (MB) Report				Laboratory Control Spike (LCS) Report				
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
ED045G: Chloride by Discrete Analyser (QCLot: 1907611) - continued								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.6	90	115
				<1	1000 mg/L	105	90	115
ED093F: Dissolved Major Cations (QCLot: 1907575)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	----	----	----	----
ED093F: Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
ED093F: Sodium	7440-23-5	1	mg/L	<1	----	----	----	----
ED093F: Potassium	7440-09-7	1	mg/L	<1	----	----	----	----
EG020T: Total Metals by ICP-MS (QCLot: 1907670)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	88	112
EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	103	81	119
EG020A-T: Barium	7440-39-3	0.001	mg/L	<0.001	0.5 mg/L	102	70	130
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.8	88	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	101	89	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	105	89	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.2 mg/L	106	88	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	103	89	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	105	88	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	88	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	79	111
EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	104	87	114
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.2 mg/L	101	84	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	102	82	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907672)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	84	118
EK040P: Fluoride by PC Titrator (QCLot: 1907478)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	0.5 mg/L	96.0	80	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1911997)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	104	86	112
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1907610)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	97.6	90	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1911998)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.5	89	115
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1912290)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	77.8	70	111
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1912291)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	87.9	77	109
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1907613)								



Sub-Matrix: **WATER**

Method Blank (MB) Report				Laboratory Control Spike (LCS) Report				
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result	LCS	Low	High	
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1907613) - continued								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	95.6	88	115
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914791)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.5 µg/L	77.9	50	150
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.5 µg/L	57.7	50	150
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914791)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	77.2	50	150
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 1914791)								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914791)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.025 µg/L	-10.8	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231_TOP_P: PFAS Sums (QCLot: 1914791)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914796)								
EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.01 µg/L	100	50	130
EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.01 µg/L	94.8	50	130
EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.01 µg/L	74.2	50	130
EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.01 µg/L	91.8	50	130
EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	<0.0003	0.01 µg/L	77.2	50	130
EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.01 µg/L	50.8	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914796)								
EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	0.05 µg/L	58.6	30	130
EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.01 µg/L	113	50	130
EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.01 µg/L	109	50	130
EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.01 µg/L	118	50	130
EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.01 µg/L	107	50	130
EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.01 µg/L	109	50	130
EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.01 µg/L	75.8	50	130
EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.01 µg/L	53.0	40	130
EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.01 µg/L	47.2	40	130
EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.01 µg/L	52.4	40	130
EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.025 µg/L	64.0	40	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1914796)								
EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.01 µg/L	55.2	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.025 µg/L	63.4	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.025 µg/L	65.7	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.025 µg/L	64.8	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.025 µg/L	66.8	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.01 µg/L	51.2	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.01 µg/L	49.0	40	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914796)								
EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.01 µg/L	102	50	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914796) - continued								
EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.01 µg/L	100	50	130
EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.01 µg/L	94.4	50	130
EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.01 µg/L	50.2	50	130
EP231P: PFAS Sums (QCLot: 1914796)								
EP231X-ST: Sum of PFAS	----	0.0003	µg/L	<0.0003	----	----	----	----

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.

Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike Concentration	SpikeRecovery(%) MS	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1907302)							
EB1821052-027	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	# 67.2	70	130
		EG005T: Barium	7440-39-3	50 mg/kg	87.8	70	130
		EG005T: Beryllium	7440-41-7	5 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	25 mg/kg	89.1	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	91.8	70	130
		EG005T: Cobalt	7440-48-4	50 mg/kg	92.2	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	100.0	70	130
		EG005T: Lead	7439-92-1	50 mg/kg	90.0	70	130
		EG005T: Manganese	7439-96-5	50 mg/kg	92.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	87.4	70	130
		EG005T: Vanadium	7440-62-2	50 mg/kg	83.1	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	96.4	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907303)							
EB1821052-027	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	99.0	70	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1915531)							
EB1821081-003	SW11-R	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	79.2	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	89.6	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	97.6	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	102	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	113	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915531)							
EB1821081-003	SW11-R	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	69.0	30	130

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Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915531) - continued							
EB1821081-003	SW11-R	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.8	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	82.8	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	100	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	96.8	50	130
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	116	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.0	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	114	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	60.0	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	57.2	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	87.0	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1915531)							
EB1821081-003	SW11-R	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	80.4	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	103	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	95.4	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	80.6	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.8	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	108	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	108	30	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1915531)							
EB1821081-003	SW11-R	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.8	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	105	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	109	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	59.2	50	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1907614)							
EB1821081-002	SW11-R	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 1907611)							
EB1820038-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	105	70	130
EG020T: Total Metals by ICP-MS (QCLot: 1907670)							



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 1907670) - continued							
EB1821061-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	104	70	130
		EG020A-T: Beryllium	7440-41-7	0.1 mg/L	108	70	130
		EG020A-T: Barium	7440-39-3	1 mg/L	104	70	130
		EG020A-T: Cadmium	7440-43-9	0.5 mg/L	102	70	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	101	70	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	104	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	105	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	103	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	105	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	102	70	130
		EG020A-T: Vanadium	7440-62-2	1 mg/L	102	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907672)							
EB1821081-002	SW11-R	EG035T: Mercury	7439-97-6	0.01 mg/L	118	70	130
EK040P: Fluoride by PC Titrator (QCLot: 1907478)							
EB1821050-002	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	83.6	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1911997)							
EB1821081-006	SW06-R	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	86.7	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1907610)							
EB1820038-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	101	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1911998)							
EB1821081-006	SW06-R	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.1	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1912290)							
EB1820532-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	84.5	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1912291)							
EB1820532-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	102	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1907613)							
EB1821019-001	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	93.8	70	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914796)							
EB1821081-002	SW11-R	EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 µg/L	# Not Determined	50	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914796) - continued							
EB1821081-002	SW11-R	EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.01 µg/L	50.4	30	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914796)							
EB1821081-002	SW11-R	EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.05 µg/L	98.6	30	130
		EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.01 µg/L	# Not Determined	50	130
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.01 µg/L	113	50	130
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.01 µg/L	84.2	50	130
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.01 µg/L	61.6	30	130
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.01 µg/L	50.4	30	130
		EP231X-ST: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.01 µg/L	47.6	30	130
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.025 µg/L	43.1	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1914796)							
EB1821081-002	SW11-R	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.01 µg/L	54.6	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.025 µg/L	61.6	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.025 µg/L	66.4	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.025 µg/L	56.5	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.025 µg/L	54.5	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.01 µg/L	53.2	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.01 µg/L	49.2	30	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914796)							
EB1821081-002	SW11-R	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.01 µg/L	86.2	50	130
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.01 µg/L	# Not Determined	50	130



Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
Laboratory sample ID		Client sample ID		Spike	SpikeRecovery(%)	Recovery Limits (%)	
		Method: Compound	CAS Number	Concentration	MS	Low	High
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914796) - continued							
EB1821081-002	SW11-R	EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.01 µg/L	83.4	50	130
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.01 µg/L	51.0	50	130

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QA/QC Compliance Assessment to assist with Quality Review

Work Order : **EB1821081**

Page : 1 of 14

Client : **QLD DEPT OF ENVIRONMENT & SCIENCE**
 Contact : **IPSWICH ESR**
 Project : **Swanbank**
 Site : **----**
 Sampler : **Brenda Baddiley, Graham**
 Order number :

Laboratory : **Environmental Division Brisbane**
 Telephone : **+61-7-3243 7222**
 Date Samples Received : **30-Aug-2018**
 Issue Date : **11-Sep-2018**
 No. of samples received : **7**
 No. of samples analysed : **7**

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **For all regular sample matrices, NO surrogate recovery outliers occur.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: SOIL

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EB1821052--027	Anonymous	Arsenic	7440-38-2	67.2 %	70-130%	Recovery less than lower data quality objective
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--003	SW11-R	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO ₄ 2- by DA	EB1821081--002	SW11-R	Sulfate as SO ₄ - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	SW11-R	Perfluorobutane sulfonic acid (PFBS)	375-73-5	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	SW11-R	Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	SW11-R	Perfluorohexane sulfonic acid (PFHxS)	355-46-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	SW11-R	Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--002	SW11-R	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	SW11-R	Perfluoropentanoic acid (PFPeA)	2706-90-3	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	SW11-R	Perfluorohexanoic acid (PFHxA)	307-24-4	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	SW11-R	Perfluoroheptanoic acid (PFHpA)	375-85-9	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231B: Perfluoroalkyl Carboxylic Acids	EB1821081--002	SW11-R	Perfluorooctanoic acid (PFOA)	335-67-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.



Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries - Continued							
EP231D: (n:2) Fluorotelomer Sulfonic Acids	EB1821081--002	SW11-R	6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method		Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural SW6-R,	SW11-R	----	----	----	31-Aug-2018	28-Aug-2018	3
Clear Plastic Bottle - Natural GMB-15R		----	----	----	31-Aug-2018	30-Aug-2018	1

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	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SW11-R, SW06-R	30-Aug-2018	----	----	----	31-Aug-2018	13-Sep-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SW11-R, SW06-R	30-Aug-2018	31-Aug-2018	26-Feb-2019	✓	03-Sep-2018	26-Feb-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SW11-R, SW06-R	30-Aug-2018	31-Aug-2018	27-Sep-2018	✓	03-Sep-2018	27-Sep-2018	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE Soil Jar (EP231X (TOP)) SW11-R, SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE Soil Jar (EP231X (TOP)) SW11-R, SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X (TOP)) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X (TOP)) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231_TOP_P: PFAS Sums								
HDPE Soil Jar (EP231X (TOP)) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X) SW11-R,	SW06-R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator								
Clear Plastic Bottle - Natural (EA005-P) SW6-R,	SW11-R	28-Aug-2018	----	----	----	31-Aug-2018	28-Aug-2018	✘
Clear Plastic Bottle - Natural (EA005-P) GMB-15R		30-Aug-2018	----	----	----	31-Aug-2018	30-Aug-2018	✘
EA010P: Conductivity by PC Titrator								
Clear Plastic Bottle - Natural (EA010-P) SW6-R,	SW11-R	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✔
Clear Plastic Bottle - Natural (EA010-P) GMB-15R		30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✔



Matrix: **WATER**

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
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Natural (ED093F) SW6-R, SW11-R	28-Aug-2018	----	----	----	04-Sep-2018	04-Sep-2018	✓
Clear Plastic Bottle - Natural (ED093F) GMB-15R	30-Aug-2018	----	----	----	04-Sep-2018	06-Sep-2018	✓
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) SW6-R, SW11-R	28-Aug-2018	----	----	----	31-Aug-2018	11-Sep-2018	✓
Clear Plastic Bottle - Natural (ED037-P) GMB-15R	30-Aug-2018	----	----	----	31-Aug-2018	13-Sep-2018	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) SW6-R, SW11-R	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (ED041G) GMB-15R	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) SW6-R, SW11-R	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (ED045G) GMB-15R	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) SW6-R, SW11-R	28-Aug-2018	----	----	----	04-Sep-2018	04-Sep-2018	✓
Clear Plastic Bottle - Natural (ED093F) GMB-15R	30-Aug-2018	----	----	----	04-Sep-2018	06-Sep-2018	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) SW6-R, SW11-R	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) GMB-15R	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) SW6-R, SW11-R	28-Aug-2018	----	----	----	05-Sep-2018	25-Sep-2018	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) GMB-15R	30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) SW6-R, SW11-R	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (EK040P) GMB-15R	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓



Matrix: **WATER**

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	
EK055G: Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK055G) GMB-15R, SW11-R	SW06-R,	30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK057G: Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural (EK057G) GMB-15R		30-Aug-2018	----	----	----	31-Aug-2018	01-Sep-2018	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G) GMB-15R, SW11-R	SW06-R,	30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK061G) GMB-15R, SW11-R	SW06-R,	30-Aug-2018	04-Sep-2018	27-Sep-2018	✓	04-Sep-2018	27-Sep-2018	✓
EK067G: Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK067G) GMB-15R, SW11-R	SW06-R,	30-Aug-2018	04-Sep-2018	27-Sep-2018	✓	04-Sep-2018	27-Sep-2018	✓
EK071G: Reactive Phosphorus as P by discrete analyser								
Clear Plastic Bottle - Natural (EK071G) GMB-15R		30-Aug-2018	----	----	----	31-Aug-2018	01-Sep-2018	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X-LL (TOP)) SW6-R,	SW11-R	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) GMB-15R		30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-LL (TOP)) SW6-R,	SW11-R	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) GMB-15R		30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X-LL (TOP)) SW6-R,	SW11-R	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) GMB-15R		30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X-LL (TOP)) SW6-R,	SW11-R	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) GMB-15R		30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_P: PFAS Sums								
HDPE (no PTFE) (EP231X-LL (TOP)) SW6-R,	SW11-R	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) GMB-15R		30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X-ST) SW6-R,	SW11-R	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) GMB-15R		30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-ST) SW6-R,	SW11-R	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) GMB-15R		30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X-ST) SW6-R,	SW11-R	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) GMB-15R		30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X-ST) SW6-R,	SW11-R	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) GMB-15R		30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X-ST) SW6-R,	SW11-R	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) GMB-15R		30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓



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
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	2	16	12.50	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	2	17	11.76	10.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER** Evaluation: * = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Evaluation	Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected		
Laboratory Duplicates (DUP) - Continued							
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	9	22.22	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix Spikes (MS)



Matrix: **WATER**

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	
Matrix Spikes (MS) - Continued							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	16	6.25	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	17	5.88	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	9	11.11	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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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).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICPAES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-House. A portion of soil is extracted with MTBE. The extract is taken to dryness, made up in mobile phase. Analysis is by LC/MSMS, ESI 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. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1
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.
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H+ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO ₄ ²⁻ by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ ²⁻ concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Total Nitrogen as N (TKN + Nox) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with orthophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO4 DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by 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. Sample extracts are analysed 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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction and LC-Electrospray-MS-MS, Negative Mode using MRM. This method is targeted to pristine environmental and drinking waters reportin at sub-parts per trillion. 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. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Sample Extraction for PFAS	EP231-PR	SOIL	In house
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
SPE preparation for LL and saline PFCs	EP231-SPE	WATER	In house



Preparation Methods	Method	Matrix	Method Descriptions
Total Oxidisable Precursor Digest for PFAS - Low Level	* ORG70-SPE	WATER	<p>In-House SPE followed by 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:</p> <p>A 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.</p>

Published on DES Disclosure Log
RTI Act 2009

Matrix: SOIL
 Workgroup: EB1821081
 Project name/number: Swanbank

Sample Type:
 ALS Sample Number:
 Sample Date:
 Client sample ID (1st):
 Client sample ID (2nd):
 Depth Type:
 Depth (m):
 Site:
 Purchase Order:

Analyte grouping/Analyte	CAS Number	Unit	Limit of reporting
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EA055: Moisture Content (Dried @ 105-110°C)

Moisture Content		%	1.0
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EG005T: Total Metals by ICP-AES

Arsenic	7440-38-2	mg/kg	5
Barium	7440-39-3	mg/kg	10
Beryllium	7440-41-7	mg/kg	1
Boron	7440-42-8	mg/kg	50
Cadmium	7440-43-9	mg/kg	1
Chromium	7440-47-3	mg/kg	2
Cobalt	7440-48-4	mg/kg	2
Copper	7440-50-8	mg/kg	5
Lead	7439-92-1	mg/kg	5
Manganese	7439-96-5	mg/kg	5
Nickel	7440-02-0	mg/kg	2
Selenium	7782-49-2	mg/kg	5
Vanadium	7440-62-2	mg/kg	5
Zinc	7440-66-6	mg/kg	5

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6	mg/kg	0.1
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EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorobutane sulfonic acid (PFBS)	375-73-5	mg/kg	0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	mg/kg	0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	mg/kg	0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	mg/kg	0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	mg/kg	0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	mg/kg	0.0002

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg	0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg	0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg	0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg	0.0002

Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	0.0002
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg	0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg	0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	mg/kg	0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	mg/kg	0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	mg/kg	0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	mg/kg	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	mg/kg	0.0002
N-Methyl perfluorooctane sulfonamide (MeFOS)	31506-32-8	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (E)	1691-99-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	mg/kg	0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	mg/kg	0.0002

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	mg/kg	0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	mg/kg	0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	mg/kg	0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	mg/kg	0.0005

EP231P: PFAS Sums

Sum of PFAS		mg/kg	0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	mg/kg	0.0002
Sum of PFAS (WA DER List)		mg/kg	0.0002

EP231 TOP A: Perfluoroalkyl Sulfonic Acids

Perfluorobutane sulfonic acid (PFBS)	375-73-5	mg/kg	0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	mg/kg	0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	mg/kg	0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	mg/kg	0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	mg/kg	0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	mg/kg	0.0002

EP231 TOP B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg	0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg	0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg	0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg	0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	0.0002
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg	0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg	0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	mg/kg	0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	mg/kg	0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	mg/kg	0.0002

Perfluorotetradecanoic acid (PFTeDA)	376-06-7	mg/kg	0.0005
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EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	mg/kg	0.0002
N-Methyl perfluorooctane sulfonamide (MeFOS)	31506-32-8	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (E)	1691-99-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	mg/kg	0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	mg/kg	0.0002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	mg/kg	0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	mg/kg	0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	mg/kg	0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	mg/kg	0.0005

EP231_TOP_P: PFAS Sums

Sum of PFAS		mg/kg	0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23	mg/kg	0.0002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 S		mg/kg	0.0002
Sum of TOP C4 - C14 as Fluorine		mg/kg	0.0002

EP231S: PFAS Surrogate

13C4-PFOS	%	0.0002
13C8-PFOA	%	0.0002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.0002
13C8-PFOA	%	0.0002

REG	REG
EB1821081003	EB1821081004
30/08/2018	30/08/2018
SW11-R	SW06-R

33.8 **20.0**

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90 **90**
<1 <1
<50 <50
<1 <1
6 **4**
10 **6**
33 **18**
13 **8**
332 **206**
13 **7**
<5 <5
22 **18**
77 **49**

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0.0121 <0.0002
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0.0002 <0.0002

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0.0160	<0.0002

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<0.0005	<0.0005

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0.0147	<0.0002
0.0213	<0.0002
0.0138	<0.0002

84.0	70.0
93.5	82.0

90.0	91.0
92.5	92.0



CHAIN OF CUSTODY

ALS Laboratory:
please tick →

LADELAIDE 21 Burma Road Pooraka SA 5095
Ph: 08 9359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

MACKAY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
MUDGEE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee@mail@alsglobal.com

NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6060
Ph: 08 9209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-280 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Desma Court Bohle QLD 4818
Ph: 07 4796 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkembla@alsglobal.com

CLIENT: Dept of Environment and Science	TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY (Circle) Custody Seal intact? Yes No N/A Free ice / frozen ice packs present upon receipt? Yes No N/A Random Sample Temperature on Receipt: C Other comment:
OFFICE: Brisbane	ALS QUOTE NO.:	
PROJECT: Swanbank	COC SEQUENCE NUMBER (Circle) COC: 8 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	
ORDER NUMBER:		
PROJECT MANAGER: Sinead Summerville	CONTACT PH: 3894 8157	
SAMPLER: Brenda Baddley (Gratam)	SAMPLER MOBILE: 4p4(6) Personal Informal	RELINQUISHED BY: sch4p4(6) Personal Information
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: 6res
Email Reports to (will default to PM if no other addresses are listed): ipswich.esr@des.qld.gov.au	DATE/TIME: 29/8/18	DATE/TIME: 30/8/18 20:20
Email Invoice to (will default to PM if no other addresses are listed): + Reports sinead.summerville@des.qld.gov.au		
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)		CONTAINER INFORMATION			ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE <small>codes below</small>	<small>(refer to)</small>	TOTAL CONTAINERS	UT-12	EP23IX- ST	EP23IX- CL(TOP)	W3 (Total)	NT8a	EP32IX	EP32IX (TOP)	S-3	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	SW6-R	14:15 (28/8)	W	P N		4	X	X	X	X					
2	SW11-R	14:35 (28/8)	W	P N		4	X	X	X	X					
3	SW11-R	30/8	S			2						X	X	X	
4	SW06-R	30/8	S			2						X	X	X	
5	GMB-15R	1400 30/8	W			5	X	X	X	X	X				
6	SW06-R	1345 30/8	W			1					X				
7	SW11-R	1400 30/8	W			1					X				
TOTAL															

Environmental Division
Brisbane
Work Order Reference
EB1821081



Telephone : + 61-7-3243 7222

Environmental Division
Brisbane
Work Order Reference
EB1821081



Telephone : + 61-7-3243 7222

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

TAX INVOICE: L732526

QLD DEPT OF ENVIRONMENT & SCIENCE
 IPSWICH ESR
 GPO BOX 2771
 BRISBANE
 QLD, AUSTRALIA 4001

Page : 1 of 1

Work Order	Project / Overall Description	Site	Order number	C-O-C number	Contact
EB1821081	Swanbank / ----	----		----	IPSWICH ESR

Issue Date	: 11-Sep-2018	Taxable value	: AUD\$	2,926.00
		Tax Incurred (GST)	: AUD\$	292.60
Due Date	: 11-Oct-2018	Amount Payable	: AUD\$	3,218.60

Work Order Breakdown

Method	Sale Item Descriptions	Quantity	Unit Value (AUD\$)	Value (AUD\$)	GST (AUD\$)	Line Total (AUD\$)
Work Order: EB1821081		Quote number: EN/222		Submatrix summary: 5 WATERS, 2 SOILS		
*Misc	Workorder Admin Fee	1.00	40.00	40.00	4.00	44.00
*Misc	Freight Recharge - sample/s sent to Eurofins	1.00	50.00	50.00	5.00	55.00
EK055G	Ammonia as N By Discrete Analyser	2.00	14.00	28.00	2.80	30.80
EP231X (solids)	PFAS - Full Suite (28 analytes)	2.00	160.00	320.00	32.00	352.00
EP231X (TOP) (solids)	PFAS - Total Oxidisable Precursor (TOP) Assay	2.00	190.00	380.00	38.00	418.00
EP231X-LL (TOP)	PFAS - Total Oxidisable Precursor (TOP) Assay - Low Level	3.00	260.00	780.00	78.00	858.00
EP231X-ST	PFAS - Super Trace Waters Long Suite (28 analytes)	3.00	290.00	870.00	87.00	957.00
NT-08A	Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P	1.00	62.00	62.00	6.20	68.20
NT-11	Total Nitrogen and Total Phosphorus	2.00	41.00	82.00	8.20	90.20
NT-12	General Water Suite	3.00	46.00	138.00	13.80	151.80
S-03	15 Metals (NEPM 2013 Suite - incl. Digestion)	2.00	31.00	62.00	6.20	68.20
W-03T	15 Metals (Total) (NEPM)	3.00	38.00	114.00	11.40	125.40

* denotes non-discountable item

• Please direct all queries to Environmental Division Brisbane on +61-7-3243 7222.

REMITTANCE ADVICE

POST TO: Australian Laboratory Services Pty Ltd
 P.O. Box 66 Everton Park
 QLD 4053 Australia

EMAIL TO: remittances@alsglobal.com

Vendor bank details

Bank: **Commonwealth Bank**
 BSB: **064 000**
 Account: **12672843**
 Swift Code: **CTBAAU2S**

or

Cheque

Payable to Australian Laboratory Services Pty Ltd

or **Credit Card**

Visa
 Mastercard

Amount Payable
AUD\$ 3,218.60
ALS Client Reference
ENVPRO
TAX INVOICE
L732526

From: SUMMERVILLE Sinead [Sinead.Summerville@des.qld.gov.au]
Sent: Wednesday, 12 September 2018 10:09 AM
To: CORDINGLEY Graham; VARDY Suzanne; BADDILEY Brenda
CC: RICE John; HILL Chris; VENTURA Simone; PFAS Project Team
Subject: FW: RESULTS & EDD & INVOICE for ALS Workorder : EB1821084 | Your Reference: Swanbank
Attachments: EB1821084_0_COA.pdf; EB1821084_0_ENMRG.CSV; EB1821084_0_XTAB.XLS; EB1821084_0_QC.pdf; EB1821084_COC.pdf; EB1821084_0_QCI.pdf; L732742_INV.pdf

Graham / Susi / Brenda

Can you please review the attached results and provide advice (including QC issues) ASAP.

Regards,



Sinead Summerville

Team Leader

Energy, Extractive and South West Queensland Compliance | Ipswich

Environmental Services and Regulation

Department of Environment and Science

P 07 3894 8157

Level 4, 117 Brisbane Street, Ipswich QLD 4305

PO Box 875, Ipswich QLD 4305

Please note I work shorter hours (9am-2:30pm) on Thursday & Friday

Pollution Hotline (to report an incident): P 1300 130 372 Option 2

Document Submission: ipswich.esr@des.qld.gov.au

Do Business with DES on line: <http://www.des.qld.gov.au/connect/>



...make the move

From: angel-no-reply@alsglobal.com [mailto:angel-no-reply@alsglobal.com]

Sent: Tuesday, 11 September 2018 6:42 PM

To: SUMMERVILLE Sinead <Sinead.Summerville@des.qld.gov.au>

Subject: RESULTS & EDD & INVOICE for ALS Workorder : EB1821084 | Your Reference: Swanbank



Deliverables for ALS Workorder EB1821084

Project: Swanbank

Dear SINEAD SUMMERVILLE,

Please find enclosed the following deliverables for **EB1821084**:

- EB1821084_0_COA.pdf
- EB1821084_0_ENMRG.CSV
- EB1821084_0_XTAB.XLS
- EB1821084_0_QC.pdf
- EB1821084_0_QCI.pdf
- L732742_INV.pdf
- EB1821084_COC.pdf

Report Recipients

- IPSWICH ESR
 - EB1821084_0_COA.pdf (Email)
 - EB1821084_0_ENMRG.CSV (Email)
 - EB1821084_0_XTAB.XLS (Email)
 - EB1821084_0_QC.pdf (Email)
 - EB1821084_0_QCI.pdf (Email)
 - EB1821084_COC.pdf (Email)
- SINEAD SUMMERVILLE
 - EB1821084_0_COA.pdf (Email)
 - EB1821084_0_ENMRG.CSV (Email)
 - EB1821084_0_XTAB.XLS (Email)
 - EB1821084_0_QC.pdf (Email)
 - EB1821084_0_QCI.pdf (Email)
 - L732742_INV.pdf (Email)
 - EB1821084_COC.pdf (Email)

www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

CERTIFICATE OF ANALYSIS

Work Order : **EB1821084**
Client : **QLD DEPT OF ENVIRONMENT & SCIENCE**
Contact : IPSWICH ESR
Address : GPO BOX 2771
 BRISBANE QLD, AUSTRALIA 4001
Telephone : ----
Project : Swanbank
Order number :
C-O-C number : ----
Sampler : BRENDA BADDILEY, GRAHAM
Site : ----
Quote number : EN/222
No. of samples received : 11
No. of samples analysed : 11

Page : 1 of 20
Laboratory : Environmental Division Brisbane
Contact : Customer Services EB
Address : 2 Byth Street Stafford QLD Australia 4053
Telephone : +61-7-3243 7222
Date Samples Received : 30-Aug-2018 20:20
Date Analysis Commenced : 31-Aug-2018
Issue Date : 11-Sep-2018 18:41



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
Franco Lentini		Sydney Organics, Smithfield, NSW
Greg Vogel	Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Senior Organic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
Tom Maloney	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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.

- EG005T (Total Metals): Sample EB1821052-027 shows poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- EP231X, EP231X TOP: Poor surrogate recovery on samples due to sample matrix interferences. Confirmed by re-extraction and re-analysis
- **PFAS analysis will be conducted by ALS Environmental, Sydney, NATA accreditation no. 825, Site No. 10911 (Micro site no. 14913).**
- ED041G (Sulfate as SO₄): Sample EB1821084_001 was diluted due to matrix interference. LOR adjusted accordingly.
- EP071: Poor matrix spike recovery due to sample heterogeneity. Confirmed by visual inspection.
- It is recognised that EK067G (Total Phosphorus) is less than EK071G (Reactive Phosphorus) for sample EB1821084_005. However, the difference is within experimental variation of the methods.
- EK059G (Nitrite + Nitrate as N (NO_x)): Sample EB1821084_002 was diluted due to matrix interference. LOR adjusted accordingly.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- Sodium Adsorption Ratio (where reported): Where results for Na, Ca or Mg are <LOR, a concentration at half the reported LOR is incorporated into the SAR calculation. This represents a conservative approach for Na relative to the assumption that <LOR = zero concentration and a conservative approach for Ca & Mg relative to the assumption that <LOR is equivalent to the LOR concentration.



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW Pond-N	SS06-N	SS01-N	SS02-N	SS03-N
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit		EB1821084-003	EB1821084-007	EB1821084-008	EB1821084-009	EB1821084-010
					Result	Result	Result	Result	Result
EA055: Moisture Content									
Moisture Content	----	1.0	%		32.2	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%		----	33.7	25.2	34.5	25.7
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg		<5	16	30	11	<5
Barium	7440-39-3	10	mg/kg		----	40	30	100	40
Beryllium	7440-41-7	1	mg/kg		----	<1	<1	<1	<1
Boron	7440-42-8	50	mg/kg		----	<50	<50	<50	<50
Cadmium	7440-43-9	1	mg/kg		<1	<1	<1	<1	<1
Chromium	7440-47-3	2	mg/kg		8	37	40	32	21
Cobalt	7440-48-4	2	mg/kg		----	6	5	6	7
Copper	7440-50-8	5	mg/kg		28	44	34	61	20
Lead	7439-92-1	5	mg/kg		13	6	7	17	9
Manganese	7439-96-5	5	mg/kg		----	203	183	260	226
Nickel	7440-02-0	2	mg/kg		7	16	16	18	34
Selenium	7782-49-2	5	mg/kg		----	<5	<5	<5	<5
Vanadium	7440-62-2	5	mg/kg		----	15	16	33	18
Zinc	7440-66-6	5	mg/kg		96	48	33	128	45
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
EP080/071: Total Petroleum Hydrocarbons									
C6 - C9 Fraction	----	10	mg/kg		<10	----	----	----	----
C10 - C14 Fraction	----	50	mg/kg		60	----	----	----	----
C15 - C28 Fraction	----	100	mg/kg		750	----	----	----	----
C29 - C36 Fraction	----	100	mg/kg		440	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	mg/kg		1250	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	10	mg/kg		10	----	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	10	mg/kg		<10	----	----	----	----
>C10 - C16 Fraction	----	50	mg/kg		90	----	----	----	----
>C16 - C34 Fraction	----	100	mg/kg		1060	----	----	----	----
>C34 - C40 Fraction	----	100	mg/kg		220	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	50	mg/kg		1370	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW Pond-N	SS06-N	SS01-N	SS02-N	SS03-N
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit		EB1821084-003	EB1821084-007	EB1821084-008	EB1821084-009	EB1821084-010
					Result	Result	Result	Result	Result
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions - Continued									
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	50	mg/kg		90	----	----	----	----
EP080: BTEXN									
Benzene	71-43-2	0.2	mg/kg		<0.2	----	----	----	----
Toluene	108-88-3	0.5	mg/kg		7.6	----	----	----	----
Ethylbenzene	100-41-4	0.5	mg/kg		<0.5	----	----	----	----
meta- & para-Xylene	108-38-3 106-42-3	0.5	mg/kg		<0.5	----	----	----	----
ortho-Xylene	95-47-6	0.5	mg/kg		<0.5	----	----	----	----
^ Sum of BTEX	----	0.2	mg/kg		7.6	----	----	----	----
^ Total Xylenes	----	0.5	mg/kg		<0.5	----	----	----	----
Naphthalene	91-20-3	1	mg/kg		<1	----	----	----	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg		0.0006	0.0009	0.0006	0.0004	0.0004
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg		0.0097	0.0032	0.0023	0.0022	0.0011
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg		0.004	0.003	0.002	0.002	0.003
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg		0.0112	0.0016	0.0019	0.0016	0.0007
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg		0.0099	0.0022	0.0022	0.0020	0.0013
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg		0.0074	0.0004	0.0006	0.0005	0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg		0.0072	0.0004	0.0005	0.0005	0.0003
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg		0.0051	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg		0.0038	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg		0.0012	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW Pond-N	SS06-N	SS01-N	SS02-N	SS03-N
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit		EB1821084-003	EB1821084-007	EB1821084-008	EB1821084-009	EB1821084-010
					Result	Result	Result	Result	Result
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg		0.0008	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<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	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		<0.0005	0.0007	<0.0005	0.0006	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		0.0609	0.0124	0.0101	0.0098	0.0070
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.0103	0.0041	0.0029	0.0026	0.0015



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID				
Client sampling date / time				SW Pond-N	SS06-N	SS01-N	SS02-N	SS03-N
Compound				CAS Number	LOR	Unit		
				EB1821084-003	EB1821084-007	EB1821084-008	EB1821084-009	EB1821084-010
				Result	Result	Result	Result	Result
EP231_TOP_P: PFAS Sums - Continued								
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	0.0609	0.0117	0.0101	0.0092	0.0070
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg	0.0406	0.0075	0.0065	0.0060	0.0045
EP231A: Perfluoroalkyl Sulfonic Acids								
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0004	0.0003	0.0005	0.0004	<0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0086	0.0015	0.0020	0.0025	0.0004
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0020	<0.0002	0.0003	0.0003	<0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0022	0.0006	0.0011	0.0009	0.0003
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0013	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0007	<0.0002	0.0002	0.0004	<0.0002
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0004	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW Pond-N	SS06-N	SS01-N	SS02-N	SS03-N
Client sampling date / time					30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit		EB1821084-003	EB1821084-007	EB1821084-008	EB1821084-009	EB1821084-010
					Result	Result	Result	Result	Result
EP231C: Perfluoroalkyl Sulfonamides - Continued									
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
EP231D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg		0.0014	<0.0005	0.0008	0.0009	<0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg		0.0010	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg		0.0182	0.0024	0.0049	0.0054	0.0007
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg		0.0090	0.0018	0.0025	0.0029	0.0004
Sum of PFAS (WA DER List)	----	0.0002	mg/kg		0.0176	0.0024	0.0049	0.0054	0.0007
EP080S: TPH(V)/BTEX Surrogates									
1,2-Dichloroethane-D4	17060-07-0	0.2	%		78.3	----	----	----	----
Toluene-D8	2037-26-5	0.2	%		77.8	----	----	----	----
4-Bromofluorobenzene	460-00-4	0.2	%		88.4	----	----	----	----
EP231 TOP_S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		102	104	97.5	27.0	67.0
13C8-PFOA	----	0.0002	%		110	122	100	17.0	120



Analytical Results

Sub-Matrix: SOIL
 (Matrix: SOIL)

Client sample ID

				SW Pond-N	SS06-N	SS01-N	SS02-N	SS03-N
Client sampling date / time				30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	EB1821084-003	EB1821084-007	EB1821084-008	EB1821084-009	EB1821084-010
				Result	Result	Result	Result	Result
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0002	%	76.5	79.5	81.5	71.5	60.0
13C8-PFOA	----	0.0002	%	84.0	64.0	92.0	22.5	61.5

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Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW1-N	----	----	----	----
Client sampling date / time				30-Aug-2018 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1821084-011	-----	-----	-----	-----	-----
Result				----	----	----	----	----	----
EA055: Moisture Content (Dried @ 105-110°C)									
Moisture Content	----	1.0	%	26.5	----	----	----	----	----
EG005T: Total Metals by ICP-AES									
Arsenic	7440-38-2	5	mg/kg	<5	----	----	----	----	----
Barium	7440-39-3	10	mg/kg	70	----	----	----	----	----
Beryllium	7440-41-7	1	mg/kg	<1	----	----	----	----	----
Boron	7440-42-8	50	mg/kg	<50	----	----	----	----	----
Cadmium	7440-43-9	1	mg/kg	<1	----	----	----	----	----
Chromium	7440-47-3	2	mg/kg	8	----	----	----	----	----
Cobalt	7440-48-4	2	mg/kg	9	----	----	----	----	----
Copper	7440-50-8	5	mg/kg	24	----	----	----	----	----
Lead	7439-92-1	5	mg/kg	12	----	----	----	----	----
Manganese	7439-96-5	5	mg/kg	109	----	----	----	----	----
Nickel	7440-02-0	2	mg/kg	8	----	----	----	----	----
Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----	----
Vanadium	7440-62-2	5	mg/kg	24	----	----	----	----	----
Zinc	7440-66-6	5	mg/kg	65	----	----	----	----	----
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.1	mg/kg	<0.1	----	----	----	----	----
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	0.0004	----	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0029	----	----	----	----	----
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	0.002	----	----	----	----	----
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0060	----	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0048	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW1-N	----	----	----	----
Client sampling date / time				30-Aug-2018 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1821084-011	-----	-----	-----	-----	-----
Result				----	----	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0024	----	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0021	----	----	----	----	----
Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0014	----	----	----	----	----
Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0012	----	----	----	----	----
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	0.0003	----	----	----	----	----
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	<0.0005	----	----	----	----	----
EP231_TOP_C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----	----
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	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW1-N	----	----	----	----
Client sampling date / time				30-Aug-2018 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1821084-011	-----	-----	-----	-----	-----
Result				----	----	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids - Continued									
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	0.0237	----	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0033	----	----	----	----	----
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	0.0237	----	----	----	----	----
Sum of TOP C4 - C14 as Fluorine	----	0.0002	mg/kg	0.0157	----	----	----	----	----
EP231A: 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	0.0004	----	----	----	----	----
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----	----
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	0.0030	----	----	----	----	----
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----	----
EP231B: 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	0.0034	----	----	----	----	----
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0025	----	----	----	----	----
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0009	----	----	----	----	----
Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0005	----	----	----	----	----
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	----	----	----	----	----



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW1-N	----	----	----	----
Client sampling date / time				30-Aug-2018 00:00	----	----	----	----	----
Compound	CAS Number	LOR	Unit	EB1821084-011	-----	-----	-----	-----	-----
Result				----	----	----	----	----	----
EP231B: Perfluoroalkyl Carboxylic Acids - Continued									
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	----	----	----	----	----
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	----	----	----	----	----
EP231C: Perfluoroalkyl Sulfonamides									
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	----	----	----	----	----
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	----	----	----	----	----
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	----	----	----	----	----
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	----	----	----	----	----
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	----	----	----	----	----
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	----	----	----	----	----
EP231D: (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	0.0011	----	----	----	----	----
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	----	----	----	----	----
EP231P: PFAS Sums									
Sum of PFAS	----	0.0002	mg/kg	0.0118	----	----	----	----	----
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0034	----	----	----	----	----
Sum of PFAS (WA DER List)	----	0.0002	mg/kg	0.0118	----	----	----	----	----
EP231_TOP_S: PFAS Surrogate									



Analytical Results

Sub-Matrix: SOIL (Matrix: SOIL)				Client sample ID	SW1-N	---	---	---	---
				Client sampling date / time	30-Aug-2018 00:00	---	---	---	---
Compound	CAS Number	LOR	Unit		EB1821084-011	-----	-----	-----	-----
				Result		---	---	---	---
EP231_TOP_S: PFAS Surrogate - Continued									
13C4-PFOS	----	0.0002	%		94.5	---	---	---	---
13C8-PFOA	----	0.0002	%		85.0	---	---	---	---
EP231S: PFAS Surrogate									
13C4-PFOS	----	0.0002	%		78.0	---	---	---	---
13C8-PFOA	----	0.0002	%		85.0	---	---	---	---

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Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW Pond-N	SW Pond-N	BH01-N	BH05-N	BH07-N
Client sampling date / time				28-Aug-2018 12:35	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	EB1821084-001	EB1821084-002	EB1821084-004	EB1821084-005	EB1821084-006
				Result	Result	Result	Result	Result
EA005P: pH by PC Titrator								
pH Value	----	0.01	pH Unit	9.25	----	7.45	7.77	----
EA010P: Conductivity by PC Titrator								
Electrical Conductivity @ 25°C	----	1	µS/cm	9920	----	4260	2740	----
EA016: Calculated TDS (from Electrical Conductivity)								
Total Dissolved Solids (Calc.)	----	1	mg/L	6450	----	2770	1780	----
EA065: Total Hardness as CaCO3								
Total Hardness as CaCO3	----	1	mg/L	579	----	1130	466	----
ED037P: Alkalinity by PC Titrator								
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	----	<1	<1	----
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	386	----	<1	<1	----
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	519	----	589	662	----
Total Alkalinity as CaCO3	----	1	mg/L	905	----	589	662	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	----	738	62	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	3360	----	888	635	----
ED093F: Dissolved Major Cations								
Calcium	7440-70-2	1	mg/L	39	----	146	81	----
Magnesium	7439-95-4	1	mg/L	117	----	185	64	----
Sodium	7440-23-5	1	mg/L	1740	----	632	453	----
Potassium	7440-09-7	1	mg/L	540	----	36	22	----
EG020T: Total Metals by ICP-MS								
Arsenic	7440-38-2	0.001	mg/L	0.035	----	0.013	<0.001	0.020
Boron	7440-42-8	0.05	mg/L	0.92	----	0.08	0.12	0.13
Barium	7440-39-3	0.001	mg/L	0.072	----	0.045	0.097	0.071
Beryllium	7440-41-7	0.001	mg/L	<0.001	----	<0.001	<0.001	<0.001
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	----	<0.0001	<0.0001	<0.0001
Cobalt	7440-48-4	0.001	mg/L	0.005	----	<0.001	<0.001	0.005
Chromium	7440-47-3	0.001	mg/L	0.012	----	<0.001	<0.001	0.001
Copper	7440-50-8	0.001	mg/L	0.014	----	<0.001	<0.001	0.006
Manganese	7439-96-5	0.001	mg/L	0.422	----	0.459	0.103	0.557
Nickel	7440-02-0	0.001	mg/L	0.044	----	0.004	<0.001	0.010
Lead	7439-92-1	0.001	mg/L	0.005	----	<0.001	<0.001	0.005
Selenium	7782-49-2	0.01	mg/L	<0.01	----	<0.01	<0.01	<0.01



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW Pond-N	SW Pond-N	BH01-N	BH05-N	BH07-N
Client sampling date / time					28-Aug-2018 12:35	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit		EB1821084-001	EB1821084-002	EB1821084-004	EB1821084-005	EB1821084-006
					Result	Result	Result	Result	Result
EG020T: Total Metals by ICP-MS - Continued									
Vanadium	7440-62-2	0.01	mg/L		0.01	----	<0.01	<0.01	<0.01
Zinc	7440-66-6	0.005	mg/L		0.048	----	<0.005	0.129	0.025
EG035T: Total Recoverable Mercury by FIMS									
Mercury	7439-97-6	0.0001	mg/L		<0.0001	----	<0.0001	<0.0001	<0.0001
EK040P: Fluoride by PC Titrator									
Fluoride	16984-48-8	0.1	mg/L		0.7	----	0.2	0.2	----
EK055G: Ammonia as N by Discrete Analyser									
Ammonia as N	7664-41-7	0.01	mg/L		----	2.12	0.40	1.72	0.40
EK057G: Nitrite as N by Discrete Analyser									
Nitrite as N	14797-65-0	0.01	mg/L		----	----	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser									
Nitrate as N	14797-55-8	0.01	mg/L		----	----	0.02	0.02	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser									
Nitrite + Nitrate as N	----	0.01	mg/L		----	<0.01	0.02	0.02	0.01
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L		----	56.2	0.5	1.8	1.0
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser									
^ Total Nitrogen as N	----	0.1	mg/L		----	56.2	0.5	1.8	1.0
EK067G: Total Phosphorus as P by Discrete Analyser									
Total Phosphorus as P	----	0.01	mg/L		----	6.78	0.05	0.13	0.11
EK071G: Reactive Phosphorus as P by discrete analyser									
Reactive Phosphorus as P	14265-44-2	0.01	mg/L		----	----	<0.01	0.14	----
EN055: Ionic Balance									
Total Anions	----	0.01	meq/L		113	----	52.2	32.4	----
Total Cations	----	0.01	meq/L		101	----	50.9	29.6	----
Ionic Balance	----	0.01	%		5.51	----	1.22	4.60	----
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L		0.157	----	<0.002	<0.002	<0.002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L		0.059	----	<0.002	<0.002	<0.002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L		0.326	----	<0.002	<0.002	<0.002



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW Pond-N	SW Pond-N	BH01-N	BH05-N	BH07-N
Client sampling date / time				28-Aug-2018 12:35	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	EB1821084-001	EB1821084-002	EB1821084-004	EB1821084-005	EB1821084-006
				Result	Result	Result	Result	Result
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids - Continued								
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	0.028	----	<0.002	<0.002	<0.002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	0.343	----	0.002	0.004	0.002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	<0.002	<0.002	<0.002
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	0.80	----	<0.01	<0.01	<0.01
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	1.66	----	0.006	0.002	0.005
Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	1.57	----	0.006	0.002	0.002
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	0.415	----	<0.002	<0.002	<0.002
Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	0.289	----	<0.002	<0.002	<0.002
Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	0.049	----	<0.002	<0.002	<0.002
Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	0.013	----	<0.002	<0.002	<0.002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	0.002	----	<0.002	<0.002	<0.002
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	<0.002	<0.002	<0.002
Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L	<0.002	----	<0.002	<0.002	<0.002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	<0.005	<0.005	<0.005
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	<0.002	<0.002	<0.002
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	<0.005	<0.005	<0.005
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	<0.005	<0.005	<0.005
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	<0.002	<0.002	<0.002



Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	SW Pond-N	SW Pond-N	BH01-N	BH05-N	BH07-N
Client sampling date / time					28-Aug-2018 12:35	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit		EB1821084-001	EB1821084-002	EB1821084-004	EB1821084-005	EB1821084-006
					Result	Result	Result	Result	Result
EP231_TOP_C: Perfluoroalkyl Sulfonamides - Continued									
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L		<0.002	----	<0.002	<0.002	<0.002
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids									
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L		<0.005	----	<0.005	<0.005	<0.005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L		<0.005	----	<0.005	<0.005	<0.005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L		<0.005	----	<0.005	<0.005	<0.005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L		<0.005	----	<0.005	<0.005	<0.005
EP231_TOP_P: PFAS Sums									
Sum of PFAS	----	0.002	µg/L		5.71	----	0.014	0.008	0.009
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L		0.669	----	0.002	0.004	0.002
^ Sum of TOP C4 - C14 as Fluorine	----	0.002	µg/L		3.71	----	0.009	0.005	0.006
Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L		5.71	----	0.014	0.008	0.009
EP231A: Perfluoroalkyl Sulfonic Acids									
Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L		0.0133	----	<0.0005	<0.0005	<0.0005
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L		0.101	----	<0.0005	<0.0005	<0.0005
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L		0.297	----	<0.0005	0.0015	<0.0005
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L		0.0211	----	<0.0005	<0.0005	<0.0005
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L		0.402	----	0.0012	0.0035	0.0004
Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L		<0.0005	----	<0.0005	<0.0005	<0.0005
EP231B: Perfluoroalkyl Carboxylic Acids									
Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L		<0.002	----	<0.002	<0.002	<0.002
Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L		0.686	----	<0.0005	<0.0005	<0.0005



Analytical Results

Sub-Matrix: WATER
 (Matrix: WATER)

Client sample ID

				SW Pond-N	SW Pond-N	BH01-N	BH05-N	BH07-N
Client sampling date / time				28-Aug-2018 12:35	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	EB1821084-001	EB1821084-002	EB1821084-004	EB1821084-005	EB1821084-006
				Result	Result	Result	Result	Result
EP231B: Perfluoroalkyl Carboxylic Acids - Continued								
Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.382	----	0.0012	0.0009	0.0012
Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	0.307	----	<0.0005	<0.0005	<0.0005
Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.264	----	0.0006	0.0009	<0.0005
Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	0.0361	----	<0.0005	<0.0005	<0.0005
Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	0.0092	----	<0.0005	0.0007	<0.0005
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	0.0005	----	<0.0005	<0.0005	<0.0005
Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	----	<0.0005	<0.0005	<0.0005
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	----	<0.0005	<0.0005	<0.0005
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	----	<0.0005	<0.0005	<0.0005
EP231C: Perfluoroalkyl Sulfonamides								
Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	----	<0.0005	<0.0005	<0.0005
N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	----	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	----	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	----	<0.001	<0.001	<0.001
N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	----	<0.001	<0.001	<0.001
N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	0.0016	----	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	0.0009	----	<0.0005	<0.0005	<0.0005
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	0.007	----	<0.001	<0.001	<0.001
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	0.826	----	<0.001	<0.001	<0.001



Analytical Results

Sub-Matrix: **WATER**
 (Matrix: **WATER**)

Client sample ID

				SW Pond-N	SW Pond-N	BH01-N	BH05-N	BH07-N
Client sampling date / time				28-Aug-2018 12:35	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00	30-Aug-2018 00:00
Compound	CAS Number	LOR	Unit	EB1821084-001	EB1821084-002	EB1821084-004	EB1821084-005	EB1821084-006
				Result	Result	Result	Result	Result
EP231D: (n:2) Fluorotelomer Sulfonic Acids - Continued								
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	0.024	----	<0.001	<0.001	<0.001
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	----	<0.001	<0.001	<0.001
EP231P: PFAS Sums								
Sum of PFAS	----	0.0003	µg/L	3.38	----	0.0030	0.0075	0.0016
Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0003	µg/L	0.699	----	0.0012	0.0050	0.0004
Sum of PFAS (WA DER List)	----	0.0003	µg/L	3.20	----	0.0030	0.0068	0.0016
EP231_TOP_S: PFAS Surrogate								
13C4-PFOS	----	0.002	%	73.8	----	65.8	70.7	73.6
13C8-PFOA	----	0.002	%	97.8	----	79.3	94.3	97.3
EP231S: PFAS Surrogate								
13C4-PFOS	----	0.0005	%	64.5	----	75.8	77.6	77.4
13C8-PFOA	----	0.0005	%	77.9	----	92.1	87.1	93.7



Surrogate Control Limits

Sub-Matrix: SOIL		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP080S: TPH(V)/BTEX Surrogates			
1,2-Dichloroethane-D4	17060-07-0	53	134
Toluene-D8	2037-26-5	60	131
4-Bromofluorobenzene	460-00-4	59	127
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
EP231_TOP_S: PFAS Surrogate			
13C4-PFOS	----	60	130
13C8-PFOA	----	60	130
EP231S: PFAS Surrogate			
13C4-PFOS	----	60	120
13C8-PFOA	----	60	120

Published on DES Disclosure Log
 RTI Act 2009

Client - M& SOIL
Workgroup EB1821084
Project name Swanbank

Sample Type REG REG REG REG REG
ALS Sample EB1821084 EB1821084 EB1821084 EB1821084 EB1821084
Sample date #####
Client sample SW Pond-1 SS06-N SS01-N SS02-N SS03-N
Client sample ID (Secondary):
Sample Site:
Purchase Order:

Analyte group CAS Number Units LOR

EA055: Moisture Content

Moisture Content	%	1	32.2	----	----	----	----
------------------	---	---	------	------	------	------	------

EA055: Moisture Content (Dried @ 105-110°C)

Moisture Content	%	1	----	33.7	25.2	34.5	25.7
------------------	---	---	------	------	------	------	------

EG005T: Total Metals by ICP-AES

Arsenic	7440-38-2 mg/kg	5	<5	16	30	11	<5
Barium	7440-39-3 mg/kg	10	----	40	30	100	40
Beryllium	7440-41-7 mg/kg	1	----	<1	<1	<1	<1
Boron	7440-42-8 mg/kg	50	----	<50	<50	<50	<50
Cadmium	7440-43-9 mg/kg	1	<1	<1	<1	<1	<1
Chromium	7440-47-3 mg/kg	2	8	37	40	32	21
Cobalt	7440-48-4 mg/kg	2	----	6	5	6	7
Copper	7440-50-8 mg/kg	5	28	44	34	61	20
Lead	7439-92-1 mg/kg	5	13	6	7	17	9
Manganese	7439-96-5 mg/kg	5	----	203	183	260	226
Nickel	7440-02-0 mg/kg	2	7	16	16	18	34
Selenium	7782-49-2 mg/kg	5	<5	<5	<5	<5	<5
Vanadium	7440-62-2 mg/kg	5	----	15	16	33	18
Zinc	7440-66-6 mg/kg	5	96	48	33	128	45

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6 mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
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EP080/071: Total Petroleum Hydrocarbons

C6 - C9 Fraction	mg/kg	10	<10	----	----	----	----
C10 - C14 Fraction	mg/kg	50	60	----	----	----	----
C15 - C28 Fraction	mg/kg	100	750	----	----	----	----
C29 - C36 Fraction	mg/kg	100	440	----	----	----	----
C10 - C36 Fraction (sum)	mg/kg	50	1250	----	----	----	----

EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions

C6 - C10 Fr C6_C10	mg/kg	10	10	----	----	----	----
C6 - C10 Fr C6_C10-B1	mg/kg	10	<10	----	----	----	----
>C10 - C16 Fraction	mg/kg	50	90	----	----	----	----
>C16 - C34 Fraction	mg/kg	100	1060	----	----	----	----
>C34 - C40 Fraction	mg/kg	100	220	----	----	----	----
>C10 - C40 Fraction (sum)	mg/kg	50	1370	----	----	----	----
>C10 - C16 Fraction n	mg/kg	50	90	----	----	----	----

EP080: BTEXN

Benzene 71-43-2	mg/kg	0.2	<0.2	----	----	----	----
Toluene 108-88-3	mg/kg	0.5	7.6	----	----	----	----
Ethylbenzene 100-41-4	mg/kg	0.5	<0.5	----	----	----	----
meta- & para 108-38-3	1 mg/kg	0.5	<0.5	----	----	----	----
ortho-Xylene 95-47-6	mg/kg	0.5	<0.5	----	----	----	----
Total Xylenes	mg/kg	0.5	<0.5	----	----	----	----
Sum of BTEX	mg/kg	0.2	7.6	----	----	----	----
Naphthalene 91-20-3	mg/kg	1	<1	----	----	----	----

EP080S: TPH(V)/BTEX Surrogates

1,2-Dichlorobenzene 17060-07-1	%	0.1	78.3	----	----	----	----
Toluene-D 2037-26-5	%	0.1	77.8	----	----	----	----
4-Bromobenzene 1460-00-4	%	0.1	88.4	----	----	----	----

EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorobenzene 375-73-5	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentane 2706-91-4	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexane 355-46-4	mg/kg	0.0002	0.0004	0.0003	0.0005	0.0004	<0.0002
Perfluorooctane 375-92-8	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecane 1763-23-1	mg/kg	0.0002	0.0086	0.0015	0.002	0.0025	0.0004
Perfluorododecane 335-77-3	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorobenzene 375-22-4	mg/kg	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Perfluoropentanoic acid 2706-90-3	mg/kg	0.0002	0.002	<0.0002	0.0003	0.0003	<0.0002
Perfluorohexanoic acid 307-24-4	mg/kg	0.0002	0.0022	0.0006	0.0011	0.0009	0.0003
Perfluorooctanoic acid 375-85-9	mg/kg	0.0002	0.0013	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorodecanoic acid 335-67-1	mg/kg	0.0002	0.0007	<0.0002	0.0002	0.0004	<0.0002
Perfluorododecanoic acid 375-95-1	mg/kg	0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotridecanoic acid 335-76-2	mg/kg	0.0002	0.0004	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorotetradecanoic acid 2058-94-8	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoropentadecanoic acid 307-55-1	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorohexadecanoic acid 72629-94-1	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorooctadecanoic acid 376-06-7	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluorooctanesulfonamide 754-91-6	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl perfluorooctanesulfonamide 31506-32-1	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorooctanesulfonamide 4151-50-2	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorodecane sulfonamide 24448-09-1	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl perfluorodecane sulfonamide 1691-99-2	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl perfluorododecane sulfonamide 2355-31-9	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl perfluorododecane sulfonamide 2991-50-6	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer 757124-72	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorotelomer 27619-97-1	mg/kg	0.0005	0.0014	<0.0005	0.0008	0.0009	<0.0005
8:2 Fluorotelomer 39108-34-1	mg/kg	0.0005	0.001	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorotelomer 120226-60	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

EP231P: PFAS Sums

Sum of PFAS	mg/kg	0.0002	0.0182	0.0024	0.0049	0.0054	0.0007
Sum of PFI 355-46-4/	mg/kg	0.0002	0.009	0.0018	0.0025	0.0029	0.0004
Sum of PFAS (WA DEF	mg/kg	0.0002	0.0176	0.0024	0.0049	0.0054	0.0007

EP231S: PFAS Surrogate

13C4-PFOS	%	0.1	76.5	79.5	81.5	71.5	60
13C8-PFOA	%	0.1	84	64	92	22.5	61.5

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorop 2706-91-4	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroh 355-46-4	mg/kg	0.0002	0.0006	0.0009	0.0006	0.0004	0.0004
Perfluoroh 375-92-8	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluoroc 1763-23-1	mg/kg	0.0002	0.0097	0.0032	0.0023	0.0022	0.0011
Perfluorod 335-77-3	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	mg/kg	0.001	0.004	0.003	0.002	0.002	0.003
Perfluorop 2706-90-3	mg/kg	0.0002	0.0112	0.0016	0.0019	0.0016	0.0007
Perfluoroh 307-24-4	mg/kg	0.0002	0.0099	0.0022	0.0022	0.002	0.0013
Perfluoroh 375-85-9	mg/kg	0.0002	0.0074	0.0004	0.0006	0.0005	0.0002
Perfluoroc 335-67-1	mg/kg	0.0002	0.0072	0.0004	0.0005	0.0005	0.0003
Perfluoron 375-95-1	mg/kg	0.0002	0.0051	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorod 335-76-2	mg/kg	0.0002	0.0038	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorou 2058-94-8	mg/kg	0.0002	0.0012	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorod 307-55-1	mg/kg	0.0002	0.0008	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorot 72629-94-	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Perfluorot 376-06-7	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Methyl 31506-32-	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl pe 4151-50-2	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl 24448-09-	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Ethyl pe 1691-99-2	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
N-Methyl 2355-31-9	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
N-Ethyl pe 2991-50-6	mg/kg	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorot 757124-72	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
6:2 Fluorot 27619-97-	mg/kg	0.0005	<0.0005	0.0007	<0.0005	0.0006	<0.0005
8:2 Fluorot 39108-34-	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
10:2 Fluorot 120226-60	mg/kg	0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

EP231_TOP_P: PFAS Sums

Sum of PFAS	mg/kg	0.0002	0.0609	0.0124	0.0101	0.0098	0.007
Sum of PFI 355-46-4/	mg/kg	0.0002	0.0103	0.0041	0.0029	0.0026	0.0015
Sum of TOP C4 - C14	mg/kg	0.0002	0.0609	0.0117	0.0101	0.0092	0.007
Sum of TOP C4 - C14	mg/kg	0.0002	0.0406	0.0075	0.0065	0.006	0.0045

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.1	102	104	97.5	27	67
13C8-PFOA	%	0.1	110	122	100	17	120

Client - M₂ WATER
 Workgroup EB1821084
 Project na Swanbank

Sample Ty REG REG REG REG REG
 ALS Sampl EB182108 EB182108 EB182108 EB182108 EB182108
 Sample da #####
 Client sam SW Pond-1 SW Pond-1 BH01-N BH05-N BH07-N
 Client sample ID (Secondary):
 Sample Site:
 Purchase Order:

Analyte gr CAS Numb Units LOR

EA005P: pH by PC Titrator

pH Value	pH Unit	0.01	9.25	----	7.45	7.77	----
----------	---------	------	------	------	------	------	------

EA010P: Conductivity by PC Titrator

Electrical Conductivity	µS/cm	1	9920	----	4260	2740	----
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EA016: Calculated TDS (from Electrical Conductivity)

Total Dissolved Solids	mg/L	1	6450	----	2770	1780	----
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EA065: Total Hardness as CaCO₃

Total Hardness as Ca	mg/L	1	579	----	1130	466	----
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ED037P: Alkalinity by PC Titrator

Hydroxide DMO-210-	mg/L	1	<1	----	<1	<1	----
--------------------	------	---	----	------	----	----	------

Carbonate 3812-32-6	mg/L	1	386	----	<1	<1	----
---------------------	------	---	-----	------	----	----	------

Bicarbonate 71-52-3	mg/L	1	519	----	589	662	----
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Total Alkalinity as Ca	mg/L	1	905	----	589	662	----
------------------------	------	---	-----	------	-----	-----	------

ED041G: Sulfate (Turbidimetric) as SO₄ 2- by DA

Sulfate as 14808-79-	mg/L	1	<5	----	738	62	----
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ED045G: Chloride by Discrete Analyser

Chloride 16887-00-	mg/L	1	3360	----	888	635	----
--------------------	------	---	------	------	-----	-----	------

ED093F: Dissolved Major Cations

Calcium 7440-70-2	mg/L	1	39	----	146	81	----
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Magnesium 7439-95-4	mg/L	1	117	----	185	64	----
---------------------	------	---	-----	------	-----	----	------

Sodium 7440-23-5	mg/L	1	1740	----	632	453	----
------------------	------	---	------	------	-----	-----	------

Potassium #####	mg/L	1	540	----	36	22	----
-----------------	------	---	-----	------	----	----	------

EG020T: Total Metals by ICP-MS

Arsenic 7440-38-2	mg/L	0.001	0.035	----	0.013	<0.001	0.02
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Beryllium 7440-41-7	mg/L	0.001	<0.001	----	<0.001	<0.001	<0.001
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Barium	7440-39-3 mg/L	0.001	0.072	----	0.045	0.097	0.071
Cadmium	7440-43-9 mg/L	0.0001	<0.0001	----	<0.0001	<0.0001	<0.0001
Chromium	7440-47-3 mg/L	0.001	0.012	----	<0.001	<0.001	0.001
Cobalt	7440-48-4 mg/L	0.001	0.005	----	<0.001	<0.001	0.005
Copper	7440-50-8 mg/L	0.001	0.014	----	<0.001	<0.001	0.006
Lead	7439-92-1 mg/L	0.001	0.005	----	<0.001	<0.001	0.005
Manganese	7439-96-5 mg/L	0.001	0.422	----	0.459	0.103	0.557
Nickel	7440-02-0 mg/L	0.001	0.044	----	0.004	<0.001	0.01
Selenium	7782-49-2 mg/L	0.01	<0.01	----	<0.01	<0.01	<0.01
Vanadium	7440-62-2 mg/L	0.01	0.01	----	<0.01	<0.01	<0.01
Zinc	7440-66-6 mg/L	0.005	0.048	----	<0.005	0.129	0.025
Boron	7440-42-8 mg/L	0.05	0.92	----	0.08	0.12	0.13

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6 mg/L	0.0001	<0.0001	----	<0.0001	<0.0001	<0.0001
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EK040P: Fluoride by PC Titrator

Fluoride	16984-48-1 mg/L	0.1	0.7	----	0.2	0.2	----
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EK055G: Ammonia as N by Discrete Analyser

Ammonia	7664-41-7 mg/L	0.01	----	2.12	0.4	1.72	0.4
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EK057G: Nitrite as N by Discrete Analyser

Nitrite as N	14797-65-1 mg/L	0.01	----	----	<0.01	<0.01	----
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EK058G: Nitrate as N by Discrete Analyser

Nitrate as N	14797-55-1 mg/L	0.01	----	----	0.02	0.02	----
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EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser

Nitrite + Nitrate as N	mg/L	0.01	----	<0.01	0.02	0.02	0.01
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EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

Total Kjeldahl Nitrogen	mg/L	0.1	----	56.2	0.5	1.8	1
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EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser

Total Nitrogen as N	mg/L	0.1	----	56.2	0.5	1.8	1
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EK067G: Total Phosphorus as P by Discrete Analyser

Total Phosphorus as P	mg/L	0.01	----	6.78	0.05	0.13	0.11
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EK071G: Reactive Phosphorus as P by discrete analyser

Reactive P	14265-44-1 mg/L	0.01	----	----	<0.01	0.14	----
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EN055: Ionic Balance

Total Anions	meq/L	0.01	113	----	52.2	32.4	----
Total Cations	meq/L	0.01	101	----	50.9	29.6	----
Ionic Balance	%	0.01	5.51	----	1.22	4.6	----

EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorob	375-73-5 Åµg/L	0.0005	0.0133	----	<0.0005	<0.0005	<0.0005
Perfluorop	2706-91-4 Åµg/L	0.0005	0.101	----	<0.0005	<0.0005	<0.0005

Perfluoroh 355-46-4	Âµg/L	0.0005	0.297 ----	<0.0005	0.0015	<0.0005
Perfluoroh 375-92-8	Âµg/L	0.0005	0.0211 ----	<0.0005	<0.0005	<0.0005
Perfluoroc 1763-23-1	Âµg/L	0.0003	0.402 ----	0.0012	0.0035	0.0004
Perfluorod 335-77-3	Âµg/L	0.0005	<0.0005 ----	<0.0005	<0.0005	<0.0005

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.002	<0.002 ----	<0.002	<0.002	<0.002
Perfluorop 2706-90-3	Âµg/L	0.0005	0.686 ----	<0.0005	<0.0005	<0.0005
Perfluoroh 307-24-4	Âµg/L	0.0005	0.382 ----	0.0012	0.0009	0.0012
Perfluoroh 375-85-9	Âµg/L	0.0005	0.307 ----	<0.0005	<0.0005	<0.0005
Perfluoroc 335-67-1	Âµg/L	0.0005	0.264 ----	0.0006	0.0009	<0.0005
Perfluoron 375-95-1	Âµg/L	0.0005	0.0361 ----	<0.0005	<0.0005	<0.0005
Perfluorod 335-76-2	Âµg/L	0.0005	0.0092 ----	<0.0005	0.0007	<0.0005
Perfluorou 2058-94-8	Âµg/L	0.0005	0.0005 ----	<0.0005	<0.0005	<0.0005
Perfluorod 307-55-1	Âµg/L	0.0005	<0.0005 ----	<0.0005	<0.0005	<0.0005
Perfluorot 72629-94-1	Âµg/L	0.0005	<0.0005 ----	<0.0005	<0.0005	<0.0005
Perfluorot 376-06-7	Âµg/L	0.0005	<0.0005 ----	<0.0005	<0.0005	<0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.0005	<0.0005 ----	<0.0005	<0.0005	<0.0005
N-Methyl p 31506-32-1	Âµg/L	0.001	<0.001 ----	<0.001	<0.001	<0.001
N-Ethyl pe 4151-50-2	Âµg/L	0.001	<0.001 ----	<0.001	<0.001	<0.001
N-Methyl p 24448-09-1	Âµg/L	0.001	<0.001 ----	<0.001	<0.001	<0.001
N-Ethyl pe 1691-99-2	Âµg/L	0.001	<0.001 ----	<0.001	<0.001	<0.001
N-Methyl p 2355-31-9	Âµg/L	0.0005	0.0016 ----	<0.0005	<0.0005	<0.0005
N-Ethyl pe 2991-50-6	Âµg/L	0.0005	0.0009 ----	<0.0005	<0.0005	<0.0005

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro p 757124-72	Âµg/L	0.001	0.007 ----	<0.001	<0.001	<0.001
6:2 Fluoro p 27619-97-1	Âµg/L	0.001	0.826 ----	<0.001	<0.001	<0.001
8:2 Fluoro p 39108-34-1	Âµg/L	0.001	0.024 ----	<0.001	<0.001	<0.001
10:2 Fluoro p 120226-60	Âµg/L	0.001	<0.001 ----	<0.001	<0.001	<0.001

EP231P: PFAS Sums

Sum of PFAS	Âµg/L	0.0003	3.38 ----	0.003	0.0075	0.0016
Sum of PFI 355-46-4/	Âµg/L	0.0003	0.699 ----	0.0012	0.005	0.0004
Sum of PFAS (WA DEF	Âµg/L	0.0003	3.2 ----	0.003	0.0068	0.0016

EP231S: PFAS Surrogate

13C4-PFOS	%	0.1	64.5 ----	75.8	77.6	77.4
13C8-PFOA	%	0.1	77.9 ----	92.1	87.1	93.7

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	Âµg/L	0.002	0.157 ----	<0.002	<0.002	<0.002
Perfluorop 2706-91-4	Âµg/L	0.002	0.059 ----	<0.002	<0.002	<0.002
Perfluoroh 355-46-4	Âµg/L	0.002	0.326 ----	<0.002	<0.002	<0.002
Perfluoroh 375-92-8	Âµg/L	0.002	0.028 ----	<0.002	<0.002	<0.002
Perfluoroc 1763-23-1	Âµg/L	0.002	0.343 ----	0.002	0.004	0.002
Perfluorod 335-77-3	Âµg/L	0.002	<0.002 ----	<0.002	<0.002	<0.002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.01	0.8	----	<0.01	<0.01	<0.01
Perfluorop 2706-90-3	Âµg/L	0.002	1.66	----	0.006	0.002	0.005
Perfluoroh 307-24-4	Âµg/L	0.002	1.57	----	0.006	0.002	0.002
Perfluoroh 375-85-9	Âµg/L	0.002	0.415	----	<0.002	<0.002	<0.002
Perfluoroc 335-67-1	Âµg/L	0.002	0.289	----	<0.002	<0.002	<0.002
Perfluoron 375-95-1	Âµg/L	0.002	0.049	----	<0.002	<0.002	<0.002
Perfluorod 335-76-2	Âµg/L	0.002	0.013	----	<0.002	<0.002	<0.002
Perfluorou 2058-94-8	Âµg/L	0.002	0.002	----	<0.002	<0.002	<0.002
Perfluorod 307-55-1	Âµg/L	0.002	<0.002	----	<0.002	<0.002	<0.002
Perfluorot 72629-94-	Âµg/L	0.002	<0.002	----	<0.002	<0.002	<0.002
Perfluorot 376-06-7	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.002	<0.002	----	<0.002	<0.002	<0.002
N-Methyl p 31506-32-	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005
N-Ethyl pe 4151-50-2	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005
N-Methyl p 24448-09-	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005
N-Ethyl pe 1691-99-2	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005
N-Methyl p 2355-31-9	Âµg/L	0.002	<0.002	----	<0.002	<0.002	<0.002
N-Ethyl pe 2991-50-6	Âµg/L	0.002	<0.002	----	<0.002	<0.002	<0.002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005
6:2 Fluoro 27619-97-	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005
8:2 Fluoro 39108-34-	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005
10:2 Fluoro 120226-60	Âµg/L	0.005	<0.005	----	<0.005	<0.005	<0.005

EP231_TOP_P: PFAS Sums

Sum of PFAS	Âµg/L	0.002	5.71	----	0.014	0.008	0.009
Sum of PFI 355-46-4/-	Âµg/L	0.002	0.669	----	0.002	0.004	0.002
Sum of TOP C4 - C14	Âµg/L	0.002	5.71	----	0.014	0.008	0.009
Sum of TOP C4 - C14	Âµg/L	0.002	3.71	----	0.009	0.005	0.006

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.1	73.8	----	65.8	70.7	73.6
13C8-PFOA	%	0.1	97.8	----	79.3	94.3	97.3

QC - Matri SOIL
Workgroup EB1821084

Sample Ty DUP DUP DUP MB DUP
ALS Sampl QC-19073: QC-19073: QC-19073: QC-MRG2- QC-MRG2-
Sample da #####

Analyte gr CAS Numb Units LOR

EA055: Moisture Content (Dried @ 105-110Â°C)

Moisture Content	%	1	27.7	27.1	20.9
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EG005T: Total Metals by ICP-AES

Arsenic	7440-38-2 mg/kg	5	<5	<5	
Barium	7440-39-3 mg/kg	10	<10		10
Beryllium	7440-41-7 mg/kg	1	<1	<1	
Boron	7440-42-8 mg/kg	50	<50	<50	
Cadmium	7440-43-9 mg/kg	1	<1	<1	
Chromium	7440-47-3 mg/kg	2	<2		30
Cobalt	7440-48-4 mg/kg	2	<2		2
Copper	7440-50-8 mg/kg	5	<5		13
Lead	7439-92-1 mg/kg	5	<5		7
Manganese	7439-96-5 mg/kg	5	<5		21
Nickel	7440-02-0 mg/kg	2	<2		6
Selenium	7782-49-2 mg/kg	5	<5	<5	
Vanadium	7440-62-2 mg/kg	5	<5		56
Zinc	7440-66-6 mg/kg	5	<5		17

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6 mg/kg	0.1	<0.1	<0.1	
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EP080/071: Total Petroleum Hydrocarbons

C6 - C9 Fraction	mg/kg	10
C10 - C14 Fraction	mg/kg	50
C15 - C28 Fraction	mg/kg	100
C29 - C36 Fraction	mg/kg	100

EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions

C6 - C10 Fr C6_C10	mg/kg	10
>C10 - C16 Fraction	mg/kg	50
>C16 - C34 Fraction	mg/kg	100
>C34 - C40 Fraction	mg/kg	100

EP080: BTEXN

Benzene	71-43-2 mg/kg	0.2
Toluene	108-88-3 mg/kg	0.5
Ethylbenzene	100-41-4 mg/kg	0.5
meta- & p-Xylene	108-38-3 mg/kg	0.5
ortho-Xylene	95-47-6 mg/kg	0.5
Naphthalene	91-20-3 mg/kg	1

EP080S: TPH(V)/BTEX Surrogates

1,2-Dichlorobenzene	17060-07-1 %	0.1
Toluene-D	2037-26-5 %	0.1
4-Bromofluorobenzene	460-00-4 %	0.1

EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorobenzene	375-73-5 mg/kg	0.0002
Perfluoropropyl	2706-91-4 mg/kg	0.0002
Perfluorohexyl	355-46-4 mg/kg	0.0002
Perfluorooctyl	375-92-8 mg/kg	0.0002
Perfluorodecyl	1763-23-1 mg/kg	0.0002
Perfluorododecyl	335-77-3 mg/kg	0.0002

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	mg/kg	0.001
Perfluorop 2706-90-3	mg/kg	0.0002
Perfluoroh 307-24-4	mg/kg	0.0002
Perfluoroh 375-85-9	mg/kg	0.0002
Perfluoroc 335-67-1	mg/kg	0.0002
Perfluoron 375-95-1	mg/kg	0.0002
Perfluorod 335-76-2	mg/kg	0.0002
Perfluorou 2058-94-8	mg/kg	0.0002
Perfluorod 307-55-1	mg/kg	0.0002
Perfluorot 72629-94-1	mg/kg	0.0002
Perfluorot 376-06-7	mg/kg	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	mg/kg	0.0002
N-Methyl p 31506-32-1	mg/kg	0.0005
N-Ethyl pe 4151-50-2	mg/kg	0.0005
N-Methyl p 24448-09-1	mg/kg	0.0005
N-Ethyl pe 1691-99-2	mg/kg	0.0005
N-Methyl p 2355-31-9	mg/kg	0.0002
N-Ethyl pe 2991-50-6	mg/kg	0.0002

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro i 757124-72	mg/kg	0.0005
6:2 Fluoro i 27619-97-1	mg/kg	0.0005
8:2 Fluoro i 39108-34-1	mg/kg	0.0005
10:2 Fluoro i 120226-60	mg/kg	0.0005

EP231S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	mg/kg	0.0002
Perfluorop 2706-91-4	mg/kg	0.0002
Perfluoroh 355-46-4	mg/kg	0.0002
Perfluoroh 375-92-8	mg/kg	0.0002
Perfluoroc 1763-23-1	mg/kg	0.0002
Perfluorod 335-77-3	mg/kg	0.0002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	mg/kg	0.001
Perfluorop 2706-90-3	mg/kg	0.0002
Perfluoroh 307-24-4	mg/kg	0.0002
Perfluoroh 375-85-9	mg/kg	0.0002
Perfluoroc 335-67-1	mg/kg	0.0002
Perfluoron 375-95-1	mg/kg	0.0002
Perfluorod 335-76-2	mg/kg	0.0002
Perfluorou 2058-94-8	mg/kg	0.0002
Perfluorod 307-55-1	mg/kg	0.0002
Perfluorot 72629-94-1	mg/kg	0.0002

Perfluorot 376-06-7 mg/kg 0.0005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6 mg/kg 0.0002

N-Methyl 31506-32- mg/kg 0.0005

N-Ethyl pe 4151-50-2 mg/kg 0.0005

N-Methyl 24448-09- mg/kg 0.0005

N-Ethyl pe 1691-99-2 mg/kg 0.0005

N-Methyl 2355-31-9 mg/kg 0.0002

N-Ethyl pe 2991-50-6 mg/kg 0.0002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72 mg/kg 0.0005

6:2 Fluoro 27619-97- mg/kg 0.0005

8:2 Fluoro 39108-34- mg/kg 0.0005

10:2 Fluor 120226-60 mg/kg 0.0005

EP231_TOP_P: PFAS Sums

Sum of PFAS mg/kg 0.0002

Sum of PFI 355-46-4/ mg/kg 0.0002

Sum of TOP C4 - C14 mg/kg 0.0002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS % 0.1

13C8-PFOA % 0.1

QC - Matri WATER

Workgroup EB1821084

Sample Ty LCS

LCS

DUP

MB

LCS

ALS Sampl QC-19074{ QC-19074{ QC-MRG3- QC-19074{ QC-19074{

Sample da #####

Analyte gr CAS Numb Units LOR

EA005P: pH by PC Titrator

pH Value % 0.01 101 100 7.77

EA010P: Conductivity by PC Titrator

Electrical Conductivity ÂµS/cm 1 2760 <1 99.3

ED037P: Alkalinity by PC Titrator

Hydroxide DMO-210- mg/L 1

Carbonate 3812-32-6 mg/L 1

Bicarbonat 71-52-3 mg/L 1

Total Alkalinity as CaC mg/L 1

ED041G: Sulfate (Turbidimetric) as SO4 2- by DA

Sulfate as 14808-79- mg/L 1

ED045G: Chloride by Discrete Analyser

Chloride	16887-00- mg/L	1
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ED093F: Dissolved Major Cations

Calcium	7440-70-2 mg/L	1
Magnesium	7439-95-4 mg/L	1
Sodium	7440-23-5 mg/L	1
Potassium	##### mg/L	1

EG020T: Total Metals by ICP-MS

Arsenic	7440-38-2 mg/L	0.001
Beryllium	7440-41-7 mg/L	0.001
Barium	7440-39-3 mg/L	0.001
Cadmium	7440-43-9 mg/L	0.0001
Chromium	7440-47-3 mg/L	0.001
Cobalt	7440-48-4 mg/L	0.001
Copper	7440-50-8 mg/L	0.001
Lead	7439-92-1 mg/L	0.001
Manganese	7439-96-5 mg/L	0.001
Nickel	7440-02-0 mg/L	0.001
Selenium	7782-49-2 mg/L	0.01
Vanadium	7440-62-2 mg/L	0.01
Zinc	7440-66-6 mg/L	0.005
Boron	7440-42-8 mg/L	0.05

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6 mg/L	0.0001
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EK040P: Fluoride by PC Titrator

Fluoride	16984-48- mg/L	0.1	0.2
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EK055G: Ammonia as N by Discrete Analyser

Ammonia	7664-41-7 mg/L	0.01
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EK057G: Nitrite as N by Discrete Analyser

Nitrite as N	14797-65- mg/L	0.01
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EK059G: Nitrite plus Nitrate as N (NO_x) by Discrete Analyser

Nitrite + Nitrate as N	mg/L	0.01
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EK061G: Total Kjeldahl Nitrogen By Discrete Analyser

Total Kjeldahl Nitrogen	mg/L	0.1
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EK067G: Total Phosphorus as P by Discrete Analyser

Total Phosphorus as P	mg/L	0.01
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EK071G: Reactive Phosphorus as P by discrete analyser

Reactive P	14265-44- mg/L	0.01
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EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorob	375-73-5 µg/L	0.0005
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Perfluorop 2706-91-4	Âµg/L	0.0005
Perfluoroh 355-46-4	Âµg/L	0.0005
Perfluoroh 375-92-8	Âµg/L	0.0005
Perfluoroc 1763-23-1	Âµg/L	0.0003
Perfluorod 335-77-3	Âµg/L	0.0005

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.002
Perfluorop 2706-90-3	Âµg/L	0.0005
Perfluoroh 307-24-4	Âµg/L	0.0005
Perfluoroh 375-85-9	Âµg/L	0.0005
Perfluoroc 335-67-1	Âµg/L	0.0005
Perfluoron 375-95-1	Âµg/L	0.0005
Perfluorod 335-76-2	Âµg/L	0.0005
Perfluorou 2058-94-8	Âµg/L	0.0005
Perfluorod 307-55-1	Âµg/L	0.0005
Perfluorot 72629-94-	Âµg/L	0.0005
Perfluorot 376-06-7	Âµg/L	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.0005
N-Methyl 31506-32-	Âµg/L	0.001
N-Ethyl pe 4151-50-2	Âµg/L	0.001
N-Methyl 24448-09-	Âµg/L	0.001
N-Ethyl pe 1691-99-2	Âµg/L	0.001
N-Methyl 2355-31-9	Âµg/L	0.0005
N-Ethyl pe 2991-50-6	Âµg/L	0.0005

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.001
6:2 Fluoro 27619-97-	Âµg/L	0.001
8:2 Fluoro 39108-34-	Âµg/L	0.001
10:2 Fluoro 120226-60	Âµg/L	0.001

EP231P: PFAS Sums

Sum of PFAS	Âµg/L	0.0003
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EP231S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorob 375-73-5	Âµg/L	0.002
Perfluorop 2706-91-4	Âµg/L	0.002
Perfluoroh 355-46-4	Âµg/L	0.002
Perfluoroh 375-92-8	Âµg/L	0.002
Perfluoroc 1763-23-1	Âµg/L	0.002
Perfluorod 335-77-3	Âµg/L	0.002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorob 375-22-4	Âµg/L	0.01
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Perfluorop 2706-90-3	Âµg/L	0.002
Perfluoroh 307-24-4	Âµg/L	0.002
Perfluoroh 375-85-9	Âµg/L	0.002
Perfluoroc 335-67-1	Âµg/L	0.002
Perfluoron 375-95-1	Âµg/L	0.002
Perfluorod 335-76-2	Âµg/L	0.002
Perfluorou 2058-94-8	Âµg/L	0.002
Perfluorod 307-55-1	Âµg/L	0.002
Perfluorot 72629-94-	Âµg/L	0.002
Perfluorot 376-06-7	Âµg/L	0.005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluoroc 754-91-6	Âµg/L	0.002
N-Methyl 31506-32-	Âµg/L	0.005
N-Ethyl pe 4151-50-2	Âµg/L	0.005
N-Methyl 24448-09-	Âµg/L	0.005
N-Ethyl pe 1691-99-2	Âµg/L	0.005
N-Methyl 2355-31-9	Âµg/L	0.002
N-Ethyl pe 2991-50-6	Âµg/L	0.002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluoro 757124-72	Âµg/L	0.005
6:2 Fluoro 27619-97-	Âµg/L	0.005
8:2 Fluoro 39108-34-	Âµg/L	0.005
10:2 Fluoro 120226-60	Âµg/L	0.005

EP231_TOP_P: PFAS Sums

Sum of PFAS	Âµg/L	0.002
Sum of PFI 355-46-4/	Âµg/L	0.002
Sum of TOP C4 - C14	Âµg/L	0.002

EP231_TOP_S: PFAS Surrogate

13C4-PFOS	%	0.1
13C8-PFOA	%	0.1

REG
EB1821084011

SW1-N

26.5

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0.0033
0.0237
0.0157

94.5
85

1006

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DUP	LCS	MS	MB	LCS	DUP	MS	MB	LCS	DUP
QC-MRG2-	QC-MRG2-	QC-MRG2-	QC-19073(	QC-19073(	QC-19073(	QC-19073(	QC-MRG2-	QC-19073(	QC-19073(
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

7	113	67.2
30	101	87.8
<1	109	102
<50		
<1	94	89.1
40	115	91.8
6	103	92.2
44	106	100
5	91.5	90
188	102	92.4
17	111	87.4
<5		
16	106	83.1
35	106	96.4
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				<100	103	<100
				<100		<100

<10	96.1	<10	ND	<50	98.7	<50
				<100	101	<100
				<100		<100

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<0.5	92.1	<0.5	
<0.5	90.4	<0.5	
<0.5	91.1	<0.5	
<1	89.7	<1	

105	102	98.5	70.7
94.3	95.6	90.4	75.9
109	111	107	74.8

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LCS	DUP	DUP	LCS	MB	LCS	LCS	DUP	MS	DUP
QC-19074	QC-MRG3	QC-MRG4	QC-19074	QC-MRG4	QC-MRG2	QC-MRG4	QC-MRG4	QC-MRG4	QC-MRG2
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

91.8

<1	<1
<1	<1
755	134
755	134
	99.6

<1	89.6	93.6	9 ND	8
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<1	98.1	114	392	109	638
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0.2

<0.01	90.4	<0.01	99.2
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<0.01	104	<0.01	104
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MS	MB	DUP	LCS	MS	REG	REG	REG	REG	REG
QC-19073	QC-MRG2	QC-MRG2	QC-MRG2	QC-19155	EB182105	EB182105	EB182107	EB182107	EB182107
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			<1	<1	----	----	----	----
			<50	----	----	----	----	----
			<1	<1	----	----	----	----
				34	30	----	----	----
				2	6	----	----	----
				14	14	----	----	----
				8	7	----	----	----
				24	54	----	----	----
				6	10	----	----	----
			<5	----	----	----	----	----
				67	70	----	----	----
				20	53	----	----	----
			<0.1	<0.1	----	----	----	----
			----	----	<10		87	----
153			----	----	<50		600	----
97.7			----	----	<100	<100		----
			----	----	<100	----		----
			----	----	<10		180	----
131			----	----	<50		480	----
94			----	----	<100	<100		----
			----	----	<100	----		----
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			----	----	<0.5	<0.5		----
			----	----	<0.5	----		----
			----	----	<0.5	----		----
			----	----	<0.5	----		----
			----	----	<1	----		----
			----	----		99.7	77.2	----
			----	----		90.6	81.2	----
			----	----		111	80	----
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	<0.0002	0.0002	78.4	89.6	----	----	----	----
	<0.0002	0.0017	70.8	97.6	----	----	----	----
	<0.0002	<0.0002	98.4	102	----	----	----	----
	<0.0002	0.0111	86 ND		----	----	----	----
	<0.0002	<0.0002	98.4	113	----	----	----	----

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<0.0002	0.0004	94.4	98	----	----	----	----	----
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<0.0005	<0.0005	101	109	----	----	----	----	----
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64	90	74	77.5	----	----	----	----	----
63	95.5	93	89.5	----	----	----	----	----
<0.0002	0.0003			----	----	----	----	----
<0.0002	0.0002			----	----	----	----	----
<0.0002	0.0018	63		----	----	----	----	----
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<0.0002	0.0007			----	----	----	----	----
<0.0002	0.0014			----	----	----	----	----
<0.0002	0.0006			----	----	----	----	----
<0.0002	0.0013	93.8		----	----	----	----	----
<0.0002	0.0002			----	----	----	----	----
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<0.0002	0.0126			----	----	----	----	----
<0.0002	0.018			----	----	----	----	----
68.5	102	102		----	----	----	----	----
64.5	108	95.5		----	----	----	----	----

MB	DUP	MB	LCS	DUP	MS	MB	LCS	DUP	MS
QC-MRG2-	QC-19075	QC-19076	QC-19076	QC-19076	QC-19076	QC-19076	QC-19076	QC-19076	QC-19076
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<1	117
<1	1740
<1	547

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<0.001	102	<0.001	113
<0.001	101	0.21	110
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<0.001	104	<0.001	102
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<0.001	104	<0.001	101
<0.001	103	0.978	101
<0.001	104	<0.001	95.6
<0.01	101	<0.01	
<0.01	103	<0.01	106
<0.005	97.6	<0.005	101
<0.05	99.8	0.41	

<0.0001	110	<0.0001	118
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REG
EB1821081003
#####

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RTI Act 2009

0.0002
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0.0121
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84
93.5

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92.5

DUP	MB	LCS	MS	MB	LCS	DUP	MS	DUP	MB
QC-19076	QC-MRG2	QC-MRG2	QC-19074	QC-MRG2	QC-MRG2	QC-MRG2	QC-MRG2	QC-MRG2	QC-MRG2
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

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<0.0001

<0.1

99.6

110

<0.01

104

0.2

86.7

0.01

<0.01

96.5

0.01

95.1

0.08

<0.1

<0.01

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LCS	DUP	MS	DUP	MB	DUP	DUP	LCS	MB	LCS
QC-MRG2-	QC-MRG2-	QC-MRG2-	QC-MRG2-	QC-19147!	QC-19147!	QC-19147!	QC-19147!	QC-19147!	QC-19147!
#####	#####	#####	#####	#####	#####	#####	#####	#####	#####

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77.2	1.1	84.1	15.8
------	-----	------	------

87.7	0.07	103	11.5
------	------	-----	------

<0.0005	105
---------	-----

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<0.0005	76.2
<0.0005	90.6
<0.0003	78.4
<0.0005	51.8

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<0.0005	51.6

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<0.001	97.4
<0.001	51

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117	71.3
87.3	94.1

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76.3	77.8	66.3	75.9
91.4	97.8	70	91.2

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DUP	MS	DUP	REG	REG	REG	REG	REG	REG	REG
QC-19147	QC-19147	QC-19147	EB182102	EB182102	EB182106	EB182108	EB182108	EB182108	EB182108
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---	---	<1	---	---	---	---
---	---	<1	---	---	---	---
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---	---		728	---	---	---

9	127	---	---	---	---	---
---	-----	-----	-----	-----	-----	-----

[illegible]

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0.0013	101	<0.0005	----	----	----	----	----	----	----
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0.0008	109	0.0012	----	----	----	----	----	----	----
<0.0005	111	<0.0005	----	----	----	----	----	----	----
0.001	104	0.0005	----	----	----	----	----	----	----
<0.0005	111	<0.0005	----	----	----	----	----	----	----
0.0007	94.6	<0.0005	----	----	----	----	----	----	----
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0.0075		0.0025	----	----	----	----	----	----	----
81.9	68.1	80.2	----	----	----	----	----	----	----
96	86.2	94.5	----	----	----	----	----	----	----
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			----	----	----	0.004	----	----	----
			----	----	----	<0.002	----	----	----
			----	----	----	0.004	----	----	----
			----	----	----	<0.002	----	----	----
			----	----	----	0.06	----	----	----

----	----	----	0.061	----	----	----
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----	----	----	0.191	----	----	----
----	----	----	74.1	----	----	----
----	----	----	91.7	----	----	----

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REG	REG	REG	REG	REG	REG	REG	REG	REG	REG
EB182108	EB182108	EB182108	EB182108	EB182108	EB182108	EB182108	EB182108	EB182108	EB1821114
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<1	---	---	---	---	---	---	---	---	---
140	---	---	---	---	---	---	---	---	---
140	---	---	---	---	---	---	---	---	---
---	---	---	8	---	---	---	---	---	---

----	----	----	637	----	----	----	----	----	----
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----	----	----	----	----	----	----	----	----	----
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----	----	----	----	----	----	----	----	<0.001	----
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0.2	----	0.4	----	----	----	----	----	----	----
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----	----	----	----	----	----	----	----	----	----
----	----	----	----	0.08	----	----	----	----	----
----	----	----	----	----	1	0.5	----	----	17.6
----	----	----	----	----	0.07	0.07	----	----	11.6
----	----	----	----	----	----	----	----	----	----
----	----	----	----	----	----	----	----	----	----

[illegible]

QUALITY CONTROL REPORT

Work Order : **EB1821084**

Page : 1 of 23

Client : **QLD DEPT OF ENVIRONMENT & SCIENCE**

Contact : IPSWICH ESR

Address : GPO BOX 2771
BRISBANE QLD, AUSTRALIA 4001

Telephone : ----

Project : Swanbank

Order number :

C-O-C number : ----

Sampler : BRENDA BADDILEY, GRAHAM

Site : ----

Quote number : EN/222

No. of samples received : 11

No. of samples analysed : 11

Laboratory : Environmental Division Brisbane

Contact : Customer Services EB

Address : 2 Byth Street Stafford QLD Australia 4053

Telephone : +61-7-3243 7222

Date Samples Received : 30-Aug-2018

Date Analysis Commenced : 31-Aug-2018

Issue Date : 11-Sep-2018



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
Franco Lentini		Sydney Organics, Smithfield, NSW
Greg Vogel	Laboratory Manager	Brisbane Inorganics, Stafford, QLD
Kim McCabe	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Mark Hallas	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Senior Organic Chemist	Brisbane Inorganics, Stafford, QLD
Matt Frost	Senior Organic Chemist	Brisbane Organics, Stafford, QLD
Tom Maloney	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD



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: 1907310)									
EB1821052-018	Anonymous	EA055: Moisture Content	----	0.1	%	27.3	27.7	1.48	0% - 20%
EB1821078-005	Anonymous	EA055: Moisture Content	----	0.1	%	20.8	20.9	0.560	0% - 20%
EA055: Moisture Content (Dried @ 105-110°C) (QC Lot: 1907311)									
EB1821084-011	SW1-N	EA055: Moisture Content	----	0.1	%	26.5	27.1	2.35	0% - 20%
EG005T: Total Metals by ICP-AES (QC Lot: 1907302)									
EB1821052-018	Anonymous	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	10	10	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	34	30	11.8	0% - 50%
		EG005T: Cobalt	7440-48-4	2	mg/kg	2	2	0.00	No Limit
		EG005T: Nickel	7440-02-0	2	mg/kg	6	6	0.00	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	7	<5	33.9	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	14	13	9.84	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	8	7	0.00	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	24	21	15.7	No Limit
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	67	56	17.2	0% - 50%
		EG005T: Zinc	7440-66-6	5	mg/kg	20	17	16.6	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EB1821084-008	SS01-N	EG005T: Beryllium	7440-41-7	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Cadmium	7440-43-9	1	mg/kg	<1	<1	0.00	No Limit
		EG005T: Barium	7440-39-3	10	mg/kg	30	30	0.00	No Limit
		EG005T: Chromium	7440-47-3	2	mg/kg	40	40	0.00	0% - 20%
		EG005T: Cobalt	7440-48-4	2	mg/kg	5	6	0.00	No Limit



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 (%)
EG005T: Total Metals by ICP-AES (QC Lot: 1907302) - continued									
EB1821084-008	SS01-N	EG005T: Nickel	7440-02-0	2	mg/kg	16	17	9.12	No Limit
		EG005T: Arsenic	7440-38-2	5	mg/kg	30	7	127	No Limit
		EG005T: Copper	7440-50-8	5	mg/kg	34	44	24.4	No Limit
		EG005T: Lead	7439-92-1	5	mg/kg	7	5	27.4	No Limit
		EG005T: Manganese	7439-96-5	5	mg/kg	183	188	2.55	0% - 20%
		EG005T: Selenium	7782-49-2	5	mg/kg	<5	<5	0.00	No Limit
		EG005T: Vanadium	7440-62-2	5	mg/kg	16	16	0.00	No Limit
		EG005T: Zinc	7440-66-6	5	mg/kg	33	35	4.97	No Limit
		EG005T: Boron	7440-42-8	50	mg/kg	<50	<50	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1907303)									
EB1821052-018	Anonymous	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EB1821084-008	SS01-N	EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	<0.1	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1907305)									
EB1821078-001	Anonymous	EP071: C15 - C28 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C29 - C36 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: C10 - C14 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Petroleum Hydrocarbons (QC Lot: 1907309)									
EB1821078-001	Anonymous	EP080: C6 - C9 Fraction	----	10	mg/kg	<10	<10	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1907305)									
EB1821078-001	Anonymous	EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	<100	0.00	No Limit
		EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	<50	0.00	No Limit
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QC Lot: 1907309)									
EB1821078-001	Anonymous	EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	<10	0.00	No Limit
EP080: BTEXN (QC Lot: 1907309)									
EB1821078-001	Anonymous	EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	<0.2	0.00	No Limit
		EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
		EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
			106-42-3						
		EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	<0.5	0.00	No Limit
	EP080: Naphthalene	91-20-3	1	mg/kg	<1	<1	0.00	No Limit	
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1915532)									
EB1821081-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	0.0004	0.0003	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	0.0020	0.0018	13.8	0% - 50%
		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	0.0127	0.0108	15.4	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit



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 (%)
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1915532)									
EB1821081-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0008	0.0007	18.7	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0016	0.0014	11.8	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0008	0.0006	32.0	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0015	0.0013	14.0	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	0.0003	0.0002	45.3	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0006	0.0005	24.1	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	0.0002	0.0002	0.00	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	<0.0005	<0.0005	0.00	No Limit
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit		
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1915532)									
EB1821081-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		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	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1915532)									
EB1821081-003	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 1915532)									
EB1821081-003	Anonymous	EP231X: Sum of PFAS	----	0.0002	mg/kg	0.0213	0.0180	16.8	0% - 20%
		EP231X: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.0002	mg/kg	0.0147	0.0126	15.4	0% - 20%
		EP231X: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.0002	mg/kg	0.0213	0.0180	16.8	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 (%)
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1915531)									
EB1821081-003	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	0.0003	0.0002	0.00	No Limit
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	0.0019	0.0017	10.6	No Limit
		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	0.0121	0.0111	8.60	0% - 20%
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1915531)									
EB1821081-003	Anonymous	EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	0.0003	0.0003	0.00	No Limit
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	0.0007	0.0006	26.3	No Limit
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	0.0006	0.0006	0.00	No Limit
		EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	0.0004	0.0004	0.00	No Limit
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		EP231X: Perfluorotridecanoic acid (PFTTrDA)	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	<0.001	0.00	No Limit
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1915531)									
EB1821081-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	<0.0002	0.00	No Limit
		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	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1915531)									
EB1821081-003	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	<0.0005	<0.0005	0.00	No Limit
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit



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 (%)
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1915531) - continued									
EB1821081-003	Anonymous	EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	<0.0005	0.00	No Limit
Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EA005P: pH by PC Titrator (QC Lot: 1907485)									
EB1821084-005	BH05-N	EA005-P: pH Value	----	0.01	pH Unit	7.77	7.77	0.00	0% - 20%
EA010P: Conductivity by PC Titrator (QC Lot: 1907484)									
EB1821084-005	BH05-N	EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	2740	2760	0.376	0% - 20%
ED037P: Alkalinity by PC Titrator (QC Lot: 1907482)									
EB1821063-008	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	728	755	3.63	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	728	755	3.63	0% - 20%
EB1821082-010	Anonymous	ED037-P: Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	0.00	No Limit
		ED037-P: Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	140	134	4.70	0% - 20%
		ED037-P: Total Alkalinity as CaCO3	----	1	mg/L	140	134	4.70	0% - 20%
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 1907384)									
EB1821083-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	8	8	0.00	No Limit
EB1821026-016	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	9	9	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 1907383)									
EB1821083-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	637	638	0.00	0% - 20%
EB1821026-016	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	393	392	0.00	0% - 20%
ED093F: Dissolved Major Cations (QC Lot: 1907579)									
EB1821084-001	SW Pond-N	ED093F: Calcium	7440-70-2	1	mg/L	39	39	0.00	0% - 20%
		ED093F: Magnesium	7439-95-4	1	mg/L	117	117	0.00	0% - 20%
		ED093F: Sodium	7440-23-5	1	mg/L	1740	1740	0.436	0% - 20%
		ED093F: Potassium	7440-09-7	1	mg/L	540	547	1.28	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 1907671)									
EB1821083-011	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Barium	7440-39-3	0.001	mg/L	0.205	0.210	2.52	0% - 20%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.962	0.978	1.68	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit



Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020T: Total Metals by ICP-MS (QC Lot: 1907671) - continued									
EB1821083-011	Anonymous	EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.39	0.41	3.73	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 1907672)									
EB1821081-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1821083-002	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EK040P: Fluoride by PC Titrator (QC Lot: 1907483)									
EB1821084-005	BH05-N	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.00	No Limit
EB1821082-010	Anonymous	EK040P: Fluoride	16984-48-8	0.1	mg/L	0.2	0.2	0.00	No Limit
EK055G: Ammonia as N by Discrete Analyser (QC Lot: 1911997)									
EB1821081-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.17	0.20	18.8	0% - 20%
EB1821083-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.04	0.01	114	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 1907382)									
EB1821026-016	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 1911998)									
EB1821081-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.01	76.8	No Limit
EB1821083-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.08	0.08	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 1912292)									
EB1821083-008	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.0	1.1	0.00	0% - 50%
EB1821114-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	17.6	15.8	10.6	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 1912293)									
EB1821083-008	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.07	0.07	0.00	No Limit
EB1821114-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	11.6	11.5	1.14	0% - 20%
EK071G: Reactive Phosphorus as P by discrete analyser (QC Lot: 1907385)									
EB1821026-016	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	0.007	0.007	0.00	No Limit
		EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	0.004	0.004	0.00	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	0.004	0.004	0.00	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EB1821082-011	Anonymous	EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	<0.002	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914791) - continued									
EB1821082-011	Anonymous	EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	0.061	0.057	6.62	0% - 20%
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	0.039	0.040	0.00	0% - 50%
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	0.007	0.008	0.00	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	0.009	0.010	0.00	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	0.06	0.06	0.00	No Limit
EB1821082-011	Anonymous	EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QC Lot: 1914791) - continued									
EB1821081-001	Anonymous	EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EB1821082-011	Anonymous	EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1914791)									
EB1821081-001	Anonymous	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EB1821082-011	Anonymous	EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	<0.005	0.00	No Limit
		EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	<0.005	0.00	No Limit
EP231_TOP_P: PFAS Sums (QC Lot: 1914791)									



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231_TOP_P: PFAS Sums (QC Lot: 1914791) - continued									
EB1821081-001	Anonymous	EP231X-LL: Sum of PFAS	----	0.002	µg/L	0.191	0.190	0.525	0% - 20%
		EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	0.008	0.008	0.00	No Limit
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	0.191	0.190	0.525	0% - 20%
EB1821082-011	Anonymous	EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Sum of PFHxS and PFOS	355-46-4/1763-23-1	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EP231A: Perfluoroalkyl Sulfonic Acids (QC Lot: 1914797)									
EB1821084-005	BH05-N	EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	0.0035	0.0037	6.67	0% - 50%
		EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	0.0015	0.0013	20.0	No Limit
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
EB1821084-006	BH07-N	EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	0.0004	0.0008	57.6	No Limit
		EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914797)									
EB1821084-005	BH05-N	EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0009	0.0008	14.0	No Limit
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	0.0009	0.0010	12.8	No Limit
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231B: Perfluoroalkyl Carboxylic Acids (QC Lot: 1914797) - continued									
EB1821084-005	BH05-N	EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	0.0007	0.0007	0.00	No Limit
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
EB1821084-006	BH07-N	EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	0.0012	0.0012	0.00	No Limit
		EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.0005	0.00	No Limit
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	<0.002	0.00	No Limit
		EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1914797)							
EB1821084-005	BH05-N	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EB1821084-006	BH07-N	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	<0.0005	0.00	No Limit



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EP231C: Perfluoroalkyl Sulfonamides (QC Lot: 1914797) - continued									
EB1821084-006	BH07-N	EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QC Lot: 1914797)									
EB1821084-005	BH05-N	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EB1821084-006	BH07-N	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	<0.001	0.00	No Limit
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	<0.001	0.00	No Limit
EP231P: PFAS Sums (QC Lot: 1914797)									
EB1821084-005	BH05-N	EP231X-ST: Sum of PFAS	----	0.0003	µg/L	0.0075	0.0075	0.00	0% - 20%
EB1821084-006	BH07-N	EP231X-ST: Sum of PFAS	----	0.0003	µg/L	0.0016	0.0025	43.9	No Limit



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			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%)	
							Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1907302)								
EG005T: Arsenic	7440-38-2	5	mg/kg	<5	106 mg/kg	113	84	123
EG005T: Barium	7440-39-3	10	mg/kg	<10	84.8 mg/kg	101	89	129
EG005T: Beryllium	7440-41-7	1	mg/kg	<1	0.6 mg/kg	109	70	130
EG005T: Boron	7440-42-8	50	mg/kg	<50	----	----	----	----
EG005T: Cadmium	7440-43-9	1	mg/kg	<1	1.4 mg/kg	94.0	88	117
EG005T: Chromium	7440-47-3	2	mg/kg	<2	16.5 mg/kg	115	83	125
EG005T: Cobalt	7440-48-4	2	mg/kg	<2	9.5 mg/kg	103	89	125
EG005T: Copper	7440-50-8	5	mg/kg	<5	50.6 mg/kg	106	86	122
EG005T: Lead	7439-92-1	5	mg/kg	<5	64.4 mg/kg	91.5	84	119
EG005T: Manganese	7439-96-5	5	mg/kg	<5	522 mg/kg	102	84	113
EG005T: Nickel	7440-02-0	2	mg/kg	<2	13.3 mg/kg	111	89	126
EG005T: Selenium	7782-49-2	5	mg/kg	<5	----	----	----	----
EG005T: Vanadium	7440-62-2	5	mg/kg	<5	55.3 mg/kg	106	91	127
EG005T: Zinc	7440-66-6	5	mg/kg	<5	151 mg/kg	106	87	127
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907303)								
EG035T: Mercury	7439-97-6	0.1	mg/kg	<0.1	0.09821 mg/kg	86.2	78	122
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1907305)								
EP071: C10 - C14 Fraction	----	50	mg/kg	<50	318 mg/kg	95.3	79	123
EP071: C15 - C28 Fraction	----	100	mg/kg	<100	531 mg/kg	103	77	123
EP071: C29 - C36 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1907309)								
EP080: C6 - C9 Fraction	----	10	mg/kg	<10	16 mg/kg	96.9	72	120
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1907305)								
EP071: >C10 - C16 Fraction	----	50	mg/kg	<50	428 mg/kg	98.7	81	122
EP071: >C16 - C34 Fraction	----	100	mg/kg	<100	395 mg/kg	101	74	122
EP071: >C34 - C40 Fraction	----	100	mg/kg	<100	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1907309)								
EP080: C6 - C10 Fraction	C6_C10	10	mg/kg	<10	18.5 mg/kg	96.1	70	119
EP080: BTEXN (QCLot: 1907309)								
EP080: Benzene	71-43-2	0.2	mg/kg	<0.2	1 mg/kg	88.9	69	118
EP080: Toluene	108-88-3	0.5	mg/kg	<0.5	1 mg/kg	91.6	73	123
EP080: Ethylbenzene	100-41-4	0.5	mg/kg	<0.5	1 mg/kg	92.1	73	115
EP080: meta- & para-Xylene	108-38-3	0.5	mg/kg	<0.5	2 mg/kg	90.4	75	115
	106-42-3							



Sub-Matrix: SOIL

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP080: BTEXN (QCLot: 1907309) - continued								
EP080: ortho-Xylene	95-47-6	0.5	mg/kg	<0.5	1 mg/kg	91.1	75	115
EP080: Naphthalene	91-20-3	1	mg/kg	<1	1 mg/kg	89.7	71	113
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 1915532)								
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	0.0025 mg/kg	63.0	50	150
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	70.6	50	150
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915532)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	----	----	----	----
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	----	----	----	----
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.0025 mg/kg	93.8	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: 1915532)								
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)	24448-09-7	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: 1915532)								
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	0.00012 mg/kg	-158	0	200
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	----	----	----	----
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	----	----	----	----



Sub-Matrix: SOIL

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231_TOP_P: PFAS Sums (QCLot: 1915532)								
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	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1915531)								
EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0002	mg/kg	<0.0002	0.00125 mg/kg	69.6	57	121
EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	78.4	55	125
EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	70.8	52	126
EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	54	123
EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	86.0	55	127
EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	98.4	54	125
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915531)								
EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.001	mg/kg	<0.001	0.00625 mg/kg	73.2	52	128
EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0002	mg/kg	<0.0002	0.00125 mg/kg	89.6	54	129
EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0002	mg/kg	<0.0002	0.00125 mg/kg	80.0	58	127
EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	88.8	57	128
EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	106	60	134
EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	63	130
EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.0002	mg/kg	<0.0002	0.00125 mg/kg	94.4	55	130
EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	101	62	130
EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0002	mg/kg	<0.0002	0.00125 mg/kg	64.8	53	134
EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.0002	mg/kg	<0.0002	0.00125 mg/kg	60.0	49	129
EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	84.1	59	129
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1915531)								
EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	76.0	52	132
EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.0005	mg/kg	<0.0005	0.00312 mg/kg	104	65	126
EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	85.6	64	126
EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.0005	mg/kg	<0.0005	0.00312 mg/kg	79.5	63	124
EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.0005	mg/kg	<0.0005	0.00312 mg/kg	101	58	125
EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0002	mg/kg	<0.0002	0.00125 mg/kg	110	61	130
EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0002	mg/kg	<0.0002	0.00125 mg/kg	120	55	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1915531)								
EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.2	54	130
EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.0005	mg/kg	<0.0005	0.00125 mg/kg	84.0	61	130



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1915531) - continued								
EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.0005	mg/kg	<0.0005	0.00125 mg/kg	101	62	130
EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.0005	mg/kg	<0.0005	0.00125 mg/kg	83.6	60	130

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
Method: Compound	CAS Number	LOR	Unit	Result	Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
EA005P: pH by PC Titrator (QCLot: 1907485)								
EA005-P: pH Value	----	----	pH Unit	----	4 pH Unit	101	98	102
				----	7 pH Unit	100	98	102
EA010P: Conductivity by PC Titrator (QCLot: 1907484)								
EA010-P: Electrical Conductivity @ 25°C	----	1	µS/cm	<1	220 µS/cm	99.3	91	107
				<1	12890 µS/cm	91.8	91	107
ED037P: Alkalinity by PC Titrator (QCLot: 1907482)								
ED037-P: Total Alkalinity as CaCO3	----	----	mg/L	----	200 mg/L	99.6	80	120
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1907384)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	89.6	85	118
				<1	100 mg/L	93.6	85	118
ED045G: Chloride by Discrete Analyser (QCLot: 1907383)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.1	90	115
				<1	1000 mg/L	114	90	115
ED093F: Dissolved Major Cations (QCLot: 1907579)								
ED093F: Calcium	7440-70-2	1	mg/L	<1	----	----	----	----
ED093F: Magnesium	7439-95-4	1	mg/L	<1	----	----	----	----
ED093F: Sodium	7440-23-5	1	mg/L	<1	----	----	----	----
ED093F: Potassium	7440-09-7	1	mg/L	<1	----	----	----	----
EG020T: Total Metals by ICP-MS (QCLot: 1907671)								
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88	112
EG020A-T: Beryllium	7440-41-7	0.001	mg/L	<0.001	0.1 mg/L	102	81	119
EG020A-T: Barium	7440-39-3	0.001	mg/L	<0.001	0.5 mg/L	101	70	130
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.3	88	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.3	89	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	104	89	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.2 mg/L	104	88	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	104	89	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	103	88	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	88	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	101	79	111
EG020A-T: Vanadium	7440-62-2	0.01	mg/L	<0.01	0.1 mg/L	103	87	114
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.2 mg/L	97.6	84	114



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%) LCS	Recovery Limits (%) Low High	
Method: Compound	CAS Number	LOR	Unit	Result				
EG020T: Total Metals by ICP-MS (QCLot: 1907671) - continued								
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	99.8	82	128
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907672)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	84	118
EK040P: Fluoride by PC Titrator (QCLot: 1907483)								
EK040P: Fluoride	16984-48-8	0.1	mg/L	<0.1	5 mg/L	99.6	80	117
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1911997)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	104	86	112
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1907382)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.4	90	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1911998)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.5	89	115
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1912292)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1 mg/L	77.2	70	111
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1912293)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.442 mg/L	87.7	77	109
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1907385)								
EK071G: Reactive Phosphorus as P	14265-44-2	0.01	mg/L	<0.01	0.5 mg/L	104	88	115
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914791)								
EP231X-LL: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.002	µg/L	<0.002	0.5 µg/L	77.9	50	150
EP231X-LL: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.002	µg/L	<0.002	0.5 µg/L	57.7	50	150
EP231X-LL: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914791)								
EP231X-LL: Perfluorobutanoic acid (PFBA)	375-22-4	0.01	µg/L	<0.01	----	----	----	----
EP231X-LL: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorohexanoic acid (PFHxA)	307-24-4	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorooctanoic acid (PFOA)	335-67-1	0.002	µg/L	<0.002	0.5 µg/L	77.2	50	150
EP231X-LL: Perfluorononanoic acid (PFNA)	375-95-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorodecanoic acid (PFDA)	335-76-2	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.005	µg/L	<0.005	----	----	----	----
EP231 TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 1914791)								



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result		LCS	Low	High
EP231_TOP_C: Perfluoroalkyl Sulfonamides (QCLot: 1914791) - continued								
EP231X-LL: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.002	µg/L	<0.002	----	----	----	----
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914791)								
EP231X-LL: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.005	µg/L	<0.005	0.025 µg/L	-10.8	0	200
EP231X-LL: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.005	µg/L	<0.005	----	----	----	----
EP231X-LL: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.005	µg/L	<0.005	----	----	----	----
EP231_TOP_P: PFAS Sums (QCLot: 1914791)								
EP231X-LL: Sum of PFAS	----	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of PFHxS and PFOS	355-46-4/17 63-23-1	0.002	µg/L	<0.002	----	----	----	----
EP231X-LL: Sum of TOP C4 - C14 Carboxylates and C4 - C8 Sulfonates	----	0.002	µg/L	<0.002	----	----	----	----
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914797)								
EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.0005	µg/L	<0.0005	0.01 µg/L	105	50	130
EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.0005	µg/L	<0.0005	0.01 µg/L	96.4	50	130
EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.0005	µg/L	<0.0005	0.01 µg/L	76.2	50	130
EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.0005	µg/L	<0.0005	0.01 µg/L	90.6	50	130
EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.0003	µg/L	<0.0003	0.01 µg/L	78.4	50	130
EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.0005	µg/L	<0.0005	0.01 µg/L	51.8	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914797)								
EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.002	µg/L	<0.002	0.05 µg/L	71.4	30	130
EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.0005	µg/L	<0.0005	0.01 µg/L	116	50	130
EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.0005	µg/L	<0.0005	0.01 µg/L	107	50	130
EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.0005	µg/L	<0.0005	0.01 µg/L	111	50	130
EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.0005	µg/L	<0.0005	0.01 µg/L	114	50	130
EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.0005	µg/L	<0.0005	0.01 µg/L	107	50	130
EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.0005	µg/L	<0.0005	0.01 µg/L	76.6	50	130
EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.0005	µg/L	<0.0005	0.01 µg/L	55.6	40	130



Sub-Matrix: **WATER**

Method Blank (MB) Report				Laboratory Control Spike (LCS) Report				
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)		
Method: Compound	CAS Number	LOR	Unit	Result	LCS	Low	High	
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914797) - continued								
EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.0005	µg/L	<0.0005	0.01 µg/L	54.6	40	130
EP231X-ST: Perfluorotridecanoic acid (PFTTrDA)	72629-94-8	0.0005	µg/L	<0.0005	0.01 µg/L	58.4	40	130
EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.0005	µg/L	<0.0005	0.025 µg/L	63.3	40	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1914797)								
EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.0005	µg/L	<0.0005	0.01 µg/L	58.8	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.001	µg/L	<0.001	0.025 µg/L	60.4	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.001	µg/L	<0.001	0.025 µg/L	60.6	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.001	µg/L	<0.001	0.025 µg/L	68.5	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.001	µg/L	<0.001	0.025 µg/L	72.8	40	130
EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.0005	µg/L	<0.0005	0.01 µg/L	51.2	40	130
EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.0005	µg/L	<0.0005	0.01 µg/L	51.6	40	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914797)								
EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.001	µg/L	<0.001	0.01 µg/L	105	50	130
EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.001	µg/L	<0.001	0.01 µg/L	103	50	130
EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.001	µg/L	<0.001	0.01 µg/L	97.4	50	130
EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.001	µg/L	<0.001	0.01 µg/L	51.0	50	130
EP231P: PFAS Sums (QCLot: 1914797)								
EP231X-ST: Sum of PFAS	----	0.0003	µg/L	<0.0003	----	----	----	----

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.

Sub-Matrix: **SOIL**

Matrix Spike (MS) Report							
				Spike Concentration	Spike Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1907302)							
EB1821052-027	Anonymous	EG005T: Arsenic	7440-38-2	50 mg/kg	# 67.2	70	130
		EG005T: Barium	7440-39-3	50 mg/kg	87.8	70	130
		EG005T: Beryllium	7440-41-7	5 mg/kg	102	70	130
		EG005T: Cadmium	7440-43-9	25 mg/kg	89.1	70	130
		EG005T: Chromium	7440-47-3	50 mg/kg	91.8	70	130
		EG005T: Cobalt	7440-48-4	50 mg/kg	92.2	70	130
		EG005T: Copper	7440-50-8	50 mg/kg	100.0	70	130



Sub-Matrix: SOIL

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG005T: Total Metals by ICP-AES (QCLot: 1907302) - continued							
EB1821052-027	Anonymous	EG005T: Lead	7439-92-1	50 mg/kg	90.0	70	130
		EG005T: Manganese	7439-96-5	50 mg/kg	92.4	70	130
		EG005T: Nickel	7440-02-0	50 mg/kg	87.4	70	130
		EG005T: Vanadium	7440-62-2	50 mg/kg	83.1	70	130
		EG005T: Zinc	7440-66-6	50 mg/kg	96.4	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907303)							
EB1821052-027	Anonymous	EG035T: Mercury	7439-97-6	5 mg/kg	99.0	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1907305)							
EB1821078-002	Anonymous	EP071: C10 - C14 Fraction	----	318 mg/kg	# 153	70	130
		EP071: C15 - C28 Fraction	----	531 mg/kg	97.7	70	130
EP080/071: Total Petroleum Hydrocarbons (QCLot: 1907309)							
EB1821078-002	Anonymous	EP080: C6 - C9 Fraction	----	8 mg/kg	# Not Determined	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1907305)							
EB1821078-002	Anonymous	EP071: >C10 - C16 Fraction	----	428 mg/kg	# 131	70	130
		EP071: >C16 - C34 Fraction	----	395 mg/kg	94.0	70	130
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions (QCLot: 1907309)							
EB1821078-002	Anonymous	EP080: C6 - C10 Fraction	C6_C10	8 mg/kg	# Not Determined	70	130
EP080: BTEXN (QCLot: 1907309)							
EB1821078-002	Anonymous	EP080: Benzene	71-43-2	2 mg/kg	81.3	70	130
		EP080: Toluene	108-88-3	2 mg/kg	80.8	70	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1915531)							
EB1821081-003	Anonymous	EP231X: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.00125 mg/kg	79.2	50	130
		EP231X: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.00125 mg/kg	89.6	50	130
		EP231X: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.00125 mg/kg	97.6	50	130
		EP231X: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.00125 mg/kg	102	50	130
		EP231X: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.00125 mg/kg	# Not Determined	50	130
		EP231X: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.00125 mg/kg	113	50	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915531)							
EB1821081-003	Anonymous	EP231X: Perfluorobutanoic acid (PFBA)	375-22-4	0.00625 mg/kg	69.0	30	130
		EP231X: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.00125 mg/kg	96.8	50	130
		EP231X: Perfluorohexanoic acid (PFHxA)	307-24-4	0.00125 mg/kg	82.8	50	130
		EP231X: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.00125 mg/kg	100	50	130
		EP231X: Perfluorooctanoic acid (PFOA)	335-67-1	0.00125 mg/kg	96.8	50	130



Sub-Matrix: **SOIL**

Sub-Matrix: SOIL				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1915531) - continued							
EB1821081-003	Anonymous	EP231X: Perfluorononanoic acid (PFNA)	375-95-1	0.00125 mg/kg	116	50	130
		EP231X: Perfluorodecanoic acid (PFDA)	335-76-2	0.00125 mg/kg	98.0	50	130
		EP231X: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.00125 mg/kg	114	50	130
		EP231X: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.00125 mg/kg	60.0	50	130
		EP231X: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.00125 mg/kg	57.2	30	130
		EP231X: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.00312 mg/kg	87.0	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1915531)							
EB1821081-003	Anonymous	EP231X: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.00125 mg/kg	80.4	50	130
		EP231X: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.00312 mg/kg	103	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.00312 mg/kg	95.4	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.00312 mg/kg	80.6	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.00312 mg/kg	99.8	30	130
		EP231X: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.00125 mg/kg	108	30	130
		EP231X: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.00125 mg/kg	108	30	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1915531)							
EB1821081-003	Anonymous	EP231X: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.00125 mg/kg	88.8	50	130
		EP231X: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.00125 mg/kg	105	50	130
		EP231X: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.00125 mg/kg	109	50	130
		EP231X: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.00125 mg/kg	59.2	50	130

Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 1907384)							
EB1821026-017	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70	130
ED045G: Chloride by Discrete Analyser (QCLot: 1907383)							
EB1821026-017	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	109	70	130
EG020T: Total Metals by ICP-MS (QCLot: 1907671)							
EB1821084-001	SW Pond-N	EG020A-T: Arsenic	7440-38-2	1 mg/L	110	70	130
		EG020A-T: Beryllium	7440-41-7	0.1 mg/L	113	70	130
		EG020A-T: Barium	7440-39-3	1 mg/L	110	70	130
		EG020A-T: Cadmium	7440-43-9	0.5 mg/L	105	70	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 1907671) - continued							
EB1821084-001	SW Pond-N	EG020A-T: Chromium	7440-47-3	1 mg/L	100	70	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	102	70	130
		EG020A-T: Copper	7440-50-8	1 mg/L	98.9	70	130
		EG020A-T: Lead	7439-92-1	1 mg/L	101	70	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	101	70	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	95.6	70	130
		EG020A-T: Vanadium	7440-62-2	1 mg/L	106	70	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	101	70	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 1907672)							
EB1821081-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	118	70	130
EK040P: Fluoride by PC Titrator (QCLot: 1907483)							
EB1821083-001	Anonymous	EK040P: Fluoride	16984-48-8	5 mg/L	110	70	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 1911997)							
EB1821081-006	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	86.7	70	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 1907382)							
EB1821026-017	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.2	70	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 1911998)							
EB1821081-006	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.1	70	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 1912292)							
EB1821083-009	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	84.1	70	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 1912293)							
EB1821083-009	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	103	70	130
EK071G: Reactive Phosphorus as P by discrete analyser (QCLot: 1907385)							
EB1821026-017	Anonymous	EK071G: Reactive Phosphorus as P	14265-44-2	0.4 mg/L	104	70	130
EP231A: Perfluoroalkyl Sulfonic Acids (QCLot: 1914797)							
EB1821084-004	BH01-N	EP231X-ST: Perfluorobutane sulfonic acid (PFBS)	375-73-5	0.01 µg/L	116	50	130
		EP231X-ST: Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	0.01 µg/L	84.0	50	130
		EP231X-ST: Perfluorohexane sulfonic acid (PFHxS)	355-46-4	0.01 µg/L	101	50	130
		EP231X-ST: Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	0.01 µg/L	86.6	50	130
		EP231X-ST: Perfluorooctane sulfonic acid (PFOS)	1763-23-1	0.01 µg/L	71.2	50	130
		EP231X-ST: Perfluorodecane sulfonic acid (PFDS)	335-77-3	0.01 µg/L	53.4	30	130
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914797)							
EB1821084-004	BH01-N	EP231X-ST: Perfluorobutanoic acid (PFBA)	375-22-4	0.05 µg/L	38.4	30	130
		EP231X-ST: Perfluoropentanoic acid (PFPeA)	2706-90-3	0.01 µg/L	119	50	130
		EP231X-ST: Perfluorohexanoic acid (PFHxA)	307-24-4	0.01 µg/L	109	50	130



Sub-Matrix: **WATER**

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EP231B: Perfluoroalkyl Carboxylic Acids (QCLot: 1914797) - continued							
EB1821084-004	BH01-N	EP231X-ST: Perfluoroheptanoic acid (PFHpA)	375-85-9	0.01 µg/L	111	50	130
		EP231X-ST: Perfluorooctanoic acid (PFOA)	335-67-1	0.01 µg/L	104	50	130
		EP231X-ST: Perfluorononanoic acid (PFNA)	375-95-1	0.01 µg/L	111	50	130
		EP231X-ST: Perfluorodecanoic acid (PFDA)	335-76-2	0.01 µg/L	94.6	50	130
		EP231X-ST: Perfluoroundecanoic acid (PFUnDA)	2058-94-8	0.01 µg/L	67.0	30	130
		EP231X-ST: Perfluorododecanoic acid (PFDoDA)	307-55-1	0.01 µg/L	48.8	30	130
		EP231X-ST: Perfluorotridecanoic acid (PFTrDA)	72629-94-8	0.01 µg/L	53.8	30	130
		EP231X-ST: Perfluorotetradecanoic acid (PFTeDA)	376-06-7	0.025 µg/L	53.8	30	130
EP231C: Perfluoroalkyl Sulfonamides (QCLot: 1914797)							
EB1821084-004	BH01-N	EP231X-ST: Perfluorooctane sulfonamide (FOSA)	754-91-6	0.01 µg/L	44.8	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamide (MeFOSA)	31506-32-8	0.025 µg/L	62.5	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	0.025 µg/L	53.4	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoethanol (MeFOSE)	24448-09-7	0.025 µg/L	54.2	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoethanol (EtFOSE)	1691-99-2	0.025 µg/L	53.5	30	130
		EP231X-ST: N-Methyl perfluorooctane sulfonamidoacetic acid (MeFOSAA)	2355-31-9	0.01 µg/L	61.8	30	130
		EP231X-ST: N-Ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	2991-50-6	0.01 µg/L	54.2	30	130
EP231D: (n:2) Fluorotelomer Sulfonic Acids (QCLot: 1914797)							
EB1821084-004	BH01-N	EP231X-ST: 4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	0.01 µg/L	96.6	50	130
		EP231X-ST: 6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	0.01 µg/L	94.6	50	130
		EP231X-ST: 8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	0.01 µg/L	83.6	50	130
		EP231X-ST: 10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	0.01 µg/L	51.4	50	130

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB1821084	Page	: 1 of 15
Client	: QLD DEPT OF ENVIRONMENT & SCIENCE	Laboratory	: Environmental Division Brisbane
Contact	: IPSWICH ESR	Telephone	: +61-7-3243 7222
Project	: Swanbank	Date Samples Received	: 30-Aug-2018
Site	: ----	Issue Date	: 11-Sep-2018
Sampler	: BRENDA BADDILEY, GRAHAM	No. of samples received	: 11
Order number	:	No. of samples analysed	: 11

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.**
- **Matrix Spike outliers exist - please see following pages for full details.**
- **Surrogate recovery outliers exist for all regular sample matrices - please see following pages for full details.**

Outliers : Analysis Holding Time Compliance

- **Analysis Holding Time Outliers exist - please see following pages for full details.**

Outliers : Frequency of Quality Control Samples

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



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
EG005T: Total Metals by ICP-AES	EB1821052--027	Anonymous	Arsenic	7440-38-2	67.2 %	70-130%	Recovery less than lower data quality objective
EP080/071: Total Petroleum Hydrocarbons	EB1821078--002	Anonymous	C10 - C14 Fraction	----	153 %	70-130%	Recovery greater than upper data quality objective
EP080/071: Total Petroleum Hydrocarbons	EB1821078--002	Anonymous	C6 - C9 Fraction	----	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EB1821078--002	Anonymous	>C10 - C16 Fraction	----	131 %	70-130%	Recovery greater than upper data quality objective
EP080/071: Total Recoverable Hydrocarbons - NEPM 2	EB1821078--002	Anonymous	C6 - C10 Fraction	C6_C10	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.
EP231A: Perfluoroalkyl Sulfonic Acids	EB1821081--003	Anonymous	Perfluorooctane sulfonic acid (PFOS)	1763-23-1	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Matrix: **WATER**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB1821026--017	Anonymous	Sulfate as SO4 - Turbidimetric	14808-79-8	Not Determined	----	MS recovery not determined, background level greater than or equal to 4x spike level.

Regular Sample Surrogates

Sub-Matrix: **SOIL**

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number	Data	Limits	Comment
Samples Submitted							
EP231_TOP_S: PFAS Surrogate	EB1821084-009	SS02-N	13C4-PFOS	----	27.0 %	60-130 %	Recovery less than lower data quality objective
EP231_TOP_S: PFAS Surrogate	EB1821084-009	SS02-N	13C8-PFOA	----	17.0 %	60-130 %	Recovery less than lower data quality objective
EP231S: PFAS Surrogate	EB1821084-009	SS02-N	13C8-PFOA	----	22.5 %	60-120 %	Recovery less than lower data quality objective

Outliers : Analysis Holding Time Compliance

Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator						



Matrix: **WATER**

Method	Extraction / Preparation			Analysis		
	Date extracted	Due for extraction	Days overdue	Date analysed	Due for analysis	Days overdue
EA005P: pH by PC Titrator - Analysis Holding Time Compliance						
Clear Plastic Bottle - Natural SW Pond-N	----	----	----	31-Aug-2018	28-Aug-2018	3
Clear Plastic Bottle - Natural BH01-N, BH05-N	----	----	----	31-Aug-2018	30-Aug-2018	1

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	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA055: Moisture Content							
Soil Glass Jar - Unpreserved (EA055) SW Pond-N	30-Aug-2018	----	----	----	31-Aug-2018	13-Sep-2018	✓
EA055: Moisture Content (Dried @ 105-110°C)							
Soil Glass Jar - Unpreserved (EA055) SS06-N, SS01-N, SS02-N, SS03-N, SW1-N	30-Aug-2018	----	----	----	31-Aug-2018	13-Sep-2018	✓
EG005T: Total Metals by ICP-AES							
Soil Glass Jar - Unpreserved (EG005T) SW Pond-N, SS06-N, SS01-N, SS02-N, SS03-N, SW1-N	30-Aug-2018	31-Aug-2018	26-Feb-2019	✓	03-Sep-2018	26-Feb-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Soil Glass Jar - Unpreserved (EG035T) SW Pond-N, SS06-N, SS01-N, SS02-N, SS03-N, SW1-N	30-Aug-2018	31-Aug-2018	27-Sep-2018	✓	03-Sep-2018	27-Sep-2018	✓
EP080/071: Total Petroleum Hydrocarbons							
Soil Glass Jar - Unpreserved (EP071) SW Pond-N	30-Aug-2018	31-Aug-2018	13-Sep-2018	✓	03-Sep-2018	10-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080) SW Pond-N	30-Aug-2018	31-Aug-2018	13-Sep-2018	✓	31-Aug-2018	13-Sep-2018	✓



Matrix: **SOIL**

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

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions								
Soil Glass Jar - Unpreserved (EP071) SW Pond-N		30-Aug-2018	31-Aug-2018	13-Sep-2018	✓	03-Sep-2018	10-Oct-2018	✓
Soil Glass Jar - Unpreserved (EP080) SW Pond-N		30-Aug-2018	31-Aug-2018	13-Sep-2018	✓	31-Aug-2018	13-Sep-2018	✓
EP080: BTEXN								
Soil Glass Jar - Unpreserved (EP080) SW Pond-N		30-Aug-2018	31-Aug-2018	13-Sep-2018	✓	31-Aug-2018	13-Sep-2018	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X (TOP)) SW Pond-N, SS01-N, SS03-N,	SS06-N, SS02-N, SW1-N	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X (TOP)) SW Pond-N, SS01-N, SS03-N,	SS06-N, SS02-N, SW1-N	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X (TOP)) SW Pond-N, SS01-N, SS03-N,	SS06-N, SS02-N, SW1-N	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X (TOP)) SW Pond-N, SS01-N, SS03-N,	SS06-N, SS02-N, SW1-N	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231_TOP_P: PFAS Sums								
HDPE Soil Jar (EP231X (TOP)) SW Pond-N, SS01-N, SS03-N,	SS06-N, SS02-N, SW1-N	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	06-Sep-2018	15-Oct-2018	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE Soil Jar (EP231X) SW Pond-N, SS01-N, SS03-N,	SS06-N, SS02-N, SW1-N	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓



Matrix: **SOIL**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE Soil Jar (EP231X)								
SW Pond-N,	SS06-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
SS01-N,	SS02-N,							
SS03-N,	SW1-N							
EP231C: Perfluoroalkyl Sulfonamides								
HDPE Soil Jar (EP231X)								
SW Pond-N,	SS06-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
SS01-N,	SS02-N,							
SS03-N,	SW1-N							
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE Soil Jar (EP231X)								
SW Pond-N,	SS06-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
SS01-N,	SS02-N,							
SS03-N,	SW1-N							
EP231P: PFAS Sums								
HDPE Soil Jar (EP231X)								
SW Pond-N,	SS06-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	15-Oct-2018	✓
SS01-N,	SS02-N,							
SS03-N,	SW1-N							

Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method	Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EA005P: pH by PC Titrator							
Clear Plastic Bottle - Natural (EA005-P) SW Pond-N	28-Aug-2018	----	----	----	31-Aug-2018	28-Aug-2018	✘
Clear Plastic Bottle - Natural (EA005-P) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	30-Aug-2018	✘
EA010P: Conductivity by PC Titrator							
Clear Plastic Bottle - Natural (EA010-P) SW Pond-N	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✔
Clear Plastic Bottle - Natural (EA010-P) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✔
EA065: Total Hardness as CaCO3							
Clear Plastic Bottle - Natural (ED093F) SW Pond-N	28-Aug-2018	----	----	----	04-Sep-2018	04-Sep-2018	✔
Clear Plastic Bottle - Natural (ED093F) BH01-N, BH05-N	30-Aug-2018	----	----	----	04-Sep-2018	06-Sep-2018	✔



Matrix: **WATER**

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
ED037P: Alkalinity by PC Titrator							
Clear Plastic Bottle - Natural (ED037-P) SW Pond-N	28-Aug-2018	----	----	----	31-Aug-2018	11-Sep-2018	✓
Clear Plastic Bottle - Natural (ED037-P) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	13-Sep-2018	✓
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA							
Clear Plastic Bottle - Natural (ED041G) SW Pond-N	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (ED041G) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G) SW Pond-N	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (ED045G) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
ED093F: Dissolved Major Cations							
Clear Plastic Bottle - Natural (ED093F) SW Pond-N	28-Aug-2018	----	----	----	04-Sep-2018	04-Sep-2018	✓
Clear Plastic Bottle - Natural (ED093F) BH01-N, BH05-N	30-Aug-2018	----	----	----	04-Sep-2018	06-Sep-2018	✓
EG020T: Total Metals by ICP-MS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) SW Pond-N	28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG020A-T) BH01-N, BH05-N, BH07-N	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) SW Pond-N	28-Aug-2018	----	----	----	05-Sep-2018	25-Sep-2018	✓
Clear Plastic Bottle - Nitric Acid; Unfiltered (EG035T) BH01-N, BH05-N, BH07-N	30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK040P: Fluoride by PC Titrator							
Clear Plastic Bottle - Natural (EK040P) SW Pond-N	28-Aug-2018	----	----	----	31-Aug-2018	25-Sep-2018	✓
Clear Plastic Bottle - Natural (EK040P) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	27-Sep-2018	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G) SW Pond-N, BH01-N, BH05-N, BH07-N	30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓



Matrix: **WATER**

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
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	01-Sep-2018	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G) SW Pond-N, BH01-N, BH05-N, BH07-N	30-Aug-2018	----	----	----	05-Sep-2018	27-Sep-2018	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G) SW Pond-N, BH01-N, BH05-N, BH07-N	30-Aug-2018	04-Sep-2018	27-Sep-2018	✓	04-Sep-2018	27-Sep-2018	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G) SW Pond-N, BH01-N, BH05-N, BH07-N	30-Aug-2018	04-Sep-2018	27-Sep-2018	✓	04-Sep-2018	27-Sep-2018	✓
EK071G: Reactive Phosphorus as P by discrete analyser							
Clear Plastic Bottle - Natural (EK071G) BH01-N, BH05-N	30-Aug-2018	----	----	----	31-Aug-2018	01-Sep-2018	✓
EP231_TOP_A: Perfluoroalkyl Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) SW Pond-N	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH01-N, BH05-N, BH07-N	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_B: Perfluoroalkyl Carboxylic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) SW Pond-N	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH01-N, BH05-N, BH07-N	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_C: Perfluoroalkyl Sulfonamides							
HDPE (no PTFE) (EP231X-LL (TOP)) SW Pond-N	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH01-N, BH05-N, BH07-N	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids							
HDPE (no PTFE) (EP231X-LL (TOP)) SW Pond-N	28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH01-N, BH05-N, BH07-N	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓



Matrix: **WATER**

Evaluation: ✖ = Holding time breach ; ✔ = Within holding time.

Method		Sample Date	Extraction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EP231_TOP_P: PFAS Sums								
HDPE (no PTFE) (EP231X-LL (TOP)) SW Pond-N		28-Aug-2018	06-Sep-2018	24-Feb-2019	✓	07-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-LL (TOP)) BH01-N, BH07-N	BH05-N,	30-Aug-2018	06-Sep-2018	26-Feb-2019	✓	07-Sep-2018	26-Feb-2019	✓
EP231A: Perfluoroalkyl Sulfonic Acids								
HDPE (no PTFE) (EP231X-ST) SW Pond-N		28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH01-N, BH07-N	BH05-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231B: Perfluoroalkyl Carboxylic Acids								
HDPE (no PTFE) (EP231X-ST) SW Pond-N		28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH01-N, BH07-N	BH05-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231C: Perfluoroalkyl Sulfonamides								
HDPE (no PTFE) (EP231X-ST) SW Pond-N		28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH01-N, BH07-N	BH05-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231D: (n:2) Fluorotelomer Sulfonic Acids								
HDPE (no PTFE) (EP231X-ST) SW Pond-N		28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH01-N, BH07-N	BH05-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓
EP231P: PFAS Sums								
HDPE (no PTFE) (EP231X-ST) SW Pond-N		28-Aug-2018	05-Sep-2018	24-Feb-2019	✓	05-Sep-2018	24-Feb-2019	✓
HDPE (no PTFE) (EP231X-ST) BH01-N, BH07-N	BH05-N,	30-Aug-2018	05-Sep-2018	26-Feb-2019	✓	05-Sep-2018	26-Feb-2019	✓

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	3	21	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	2	14	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	6	16.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after oxidation (TOP)	EP231X (TOP)	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-AES	EG005T	1	14	7.14	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH - Semivolatile Fraction	EP071	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
TRH Volatiles/BTEX	EP080	1	6	16.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

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)							
Alkalinity by PC Titrator	ED037-P	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard



Matrix: **WATER**

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

Quality Control Sample Type		Count		Rate (%)		Evaluation	Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected		
Laboratory Duplicates (DUP) - Continued							
Fluoride by PC Titrator	EK040P	2	11	18.18	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	10	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	1	3	33.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	14.29	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	20.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	10.53	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Alkalinity by PC Titrator	ED037-P	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	2	5	40.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
pH by PC Titrator	EA005-P	2	3	66.67	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	13.33	10.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Conductivity by PC Titrator	EA010-P	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Major Cations - Dissolved	ED093F	1	3	33.33	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard

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Matrix: **WATER**

Evaluation: ✖ = Quality Control frequency not within specification ; ✔ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)		Evaluation	Quality Control Specification
Analytical Methods	Method	QC	Regular	Actual	Expected		
Method Blanks (MB) - Continued							
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Fluoride by PC Titrator	EK040P	1	11	9.09	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	10	10.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Reactive Phosphorus as P-By Discrete Analyser	EK071G	1	7	14.29	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	15	6.67	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	5	20.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	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).
Total Metals by ICP-AES	EG005T	SOIL	In house: Referenced to APHA 3120; USEPA SW 846 - 6010. Metals are determined following an appropriate acid digestion of the soil. The ICP-AES technique ionises samples in a plasma, emitting a characteristic spectrum based on metals present. Intensities at selected wavelengths are compared against those of matrix matched standards. This method is compliant with NEPM (2013) Schedule B(3)
Total Mercury by FIMS	EG035T	SOIL	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂) (Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. Mercury in solids are determined following an appropriate acid digestion. Ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
TRH - Semivolatile Fraction	EP071	SOIL	In house: Referenced to USEPA SW 846 - 8015A Sample extracts are analysed by Capillary GC/FID and quantified against alkane standards over the range C10 - C40. Compliant with NEPM amended 2013.
TRH Volatiles/BTEX	EP080	SOIL	In house: Referenced to USEPA SW 846 - 8260B. Extracts are analysed by Purge and Trap, Capillary GC/MS. Quantification is by comparison against an established 5 point calibration curve. Compliant with NEPM amended 2013.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X	SOIL	In-House. A portion of soil is extracted with MTBE. The extract is taken to dryness, made up in mobile phase. Analysis is by LC/MSMS, ESI 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. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1
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.
pH by PC Titrator	EA005-P	WATER	In house: Referenced to APHA 4500 H ⁺ B. This procedure determines pH of water samples by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)
Conductivity by PC Titrator	EA010-P	WATER	In house: Referenced to APHA 2510 B. This procedure determines conductivity by automated ISE. This method is compliant with NEPM (2013) Schedule B(3)

Analytical Methods	Method	Matrix	Method Descriptions
Calculated TDS (from Electrical Conductivity)	EA016	WATER	In house: Calculation from Electrical Conductivity (APHA 2510 B) using a conversion factor specified in the analytical report. This method is compliant with NEPM (2013) Schedule B(3)
Alkalinity by PC Titrator	ED037-P	WATER	In house: Referenced to APHA 2320 B This procedure determines alkalinity by automated measurement (e.g. PC Titrate) using pH 4.5 for indicating the total alkalinity end-point. This method is compliant with NEPM (2013) Schedule B(3)
Sulfate (Turbidimetric) as SO ₄ 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO ₄ . Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO ₄ suspension is measured by a photometer and the SO ₄ -2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM (2013) Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 Cl - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride. In the presence of ferric ions the liberated thiocyanate forms highly-coloured ferric thiocyanate which is measured at 480 nm APHA 21st edition seal method 2 017-1-L april 2003
Major Cations - Dissolved	ED093F	WATER	In house: Referenced to APHA 3120 and 3125; USEPA SW 846 - 6010 and 6020; Cations are determined by either ICP-AES or ICP-MS techniques. This method is compliant with NEPM (2013) Schedule B(3) Sodium Adsorption Ratio is calculated from Ca, Mg and Na which determined by ALS in house method QWI-EN/ED093F. This method is compliant with NEPM (2013) Schedule B(3) Hardness parameters are calculated based on APHA 2340 B. This method is compliant with NEPM (2013) Schedule B(3)
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl ₂)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl ₂ which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM (2013) Schedule B(3)
Fluoride by PC Titrator	EK040P	WATER	In house: Referenced to APHA 4500-F C: CDTA is added to the sample to provide a uniform ionic strength background, adjust pH, and break up complexes. Fluoride concentration is determined by either manual or automatic ISE measurement. This method is compliant with NEPM (2013) Schedule B(3)
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH ₃ G Ammonia is determined by direct colorimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO ₂ - B. Nitrite is determined by direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Nitrate is reduced to nitrite by way of a chemical reduction followed by quantification by Discrete Analyser. Nitrite is determined separately by direct colourimetry and result for Nitrate calculated as the difference between the two results. This method is compliant with NEPM (2013) Schedule B(3)



Analytical Methods	Method	Matrix	Method Descriptions
Nitrite and Nitrate as N (NO _x) by Discrete Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO ₃ - F. Combined oxidised Nitrogen (NO ₂ +NO ₃) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined colorimetrically by discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Total Nitrogen as N (TKN + No _x) By Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO ₃ -. This method is compliant with NEPM (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). This procedure involves sulphuric acid digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its concentration measured at 880nm using discrete analyser. This method is compliant with NEPM (2013) Schedule B(3)
Reactive Phosphorus as P-By Discrete Analyser	EK071G	WATER	In house: Referenced to APHA 4500-P F Ammonium molybdate and potassium antimonyl tartrate reacts in acid medium with orthophosphate to form a heteropoly acid -phosphomolybdic acid - which is reduced to intensely coloured molybdenum blue by ascorbic acid. Quantification is by Discrete Analyser. This method is compliant with NEPM (2013) Schedule B(3)
Ionic Balance by PCT DA and Turbi SO ₄ DA	EN055 - PG	WATER	In house: Referenced to APHA 1030F. This method is compliant with NEPM (2013) Schedule B(3)
PFAS by LCMSMS after SPE and oxidation (TOP)	EP231X-LL (TOP)	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction followed by 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. Sample extracts are analysed 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.
Per- and Polyfluoroalkyl Substances (PFAS) by LCMSMS	EP231X-ST	WATER	In-house: Analysis of fresh and saline waters by solid phase extraction and LC-Electrospray-MS-MS, Negative Mode using MRM. This method is targetted to pristine environmental and drinking waters reportin at sub-parts per trillion. 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. The DQO for internal standard response is 50-150% of that established at initial calibration. PFOS is quantified using a certified, traceable standard consisting of linear and branched PFOS isomers. This method complies with the quality control definitions as stated in QSM 5.1. Data is reviewed in line with the DQOs as stated in QSM5.1

Preparation Methods	Method	Matrix	Method Descriptions
Hot Block Digest for metals in soils sediments and sludges	EN69	SOIL	In house: Referenced to USEPA 200.2. Hot Block Acid Digestion 1.0g of sample is heated with Nitric and Hydrochloric acids, then cooled. Peroxide is added and samples heated and cooled again before being filtered and bulked to volume for analysis. Digest is appropriate for determination of selected metals in sludge, sediments, and soils. This method is compliant with NEPM (2013) Schedule B(3) (Method 202)
Sample Extraction for PFAS	EP231-PR	SOIL	In house



Preparation Methods	Method	Matrix	Method Descriptions
Methanolic Extraction of Soils for Purge and Trap	ORG16	SOIL	In house: Referenced to USEPA SW 846 - 5030A. 5g of solid is shaken with surrogate and 10mL methanol prior to analysis by Purge and Trap - GC/MS.
Tumbler Extraction of Solids	ORG17	SOIL	In house: Mechanical agitation (tumbler). 10g of sample, Na ₂ SO ₄ and surrogate are extracted with 30mL 1:1 DCM/Acetone by end over end tumble. The solvent is decanted, dehydrated and concentrated (by KD) to the desired volume for analysis.
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM (2013) Schedule B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant with NEPM (2013) Schedule B(3)
SPE preparation for LL and saline PFCs	EP231-SPE	WATER	In house
Total Oxidisable Precursor Digest for PFAS - Low Level	* ORG70-SPE	WATER	In-House SPE followed by 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 50 mL sample is concentrated by SPE, taken to near dryness and made up to 5 mL in a reagent solution. The sample is digested with persulfate under alkaline conditions, neutralised and prepared for analysis per EP231.

Matrix: SOIL
 Workgroup: EB1821084
 Project name/number: Swanbank

Sample Type:
 ALS Sample Number:
 Sample Date:
 Client sample ID (1st):
 Client sample ID (2nd):
 Depth Type:
 Depth (m):
 Site:
 Purchase Order:

Analyte grouping/Analyte	CAS Number	Unit	Limit of reporting
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EA055: Moisture Content

Moisture Content		%	1.0
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EA055: Moisture Content (Dried @ 105-110°C)

Moisture Content		%	1.0
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EG005T: Total Metals by ICP-AES

Arsenic	7440-38-2	mg/kg	5
Barium	7440-39-3	mg/kg	10
Beryllium	7440-41-7	mg/kg	1
Boron	7440-42-8	mg/kg	50
Cadmium	7440-43-9	mg/kg	1
Chromium	7440-47-3	mg/kg	2
Cobalt	7440-48-4	mg/kg	2
Copper	7440-50-8	mg/kg	5
Lead	7439-92-1	mg/kg	5
Manganese	7439-96-5	mg/kg	5
Nickel	7440-02-0	mg/kg	2
Selenium	7782-49-2	mg/kg	5
Vanadium	7440-62-2	mg/kg	5
Zinc	7440-66-6	mg/kg	5

EG035T: Total Recoverable Mercury by FIMS

Mercury	7439-97-6	mg/kg	0.1
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EP080/071: Total Petroleum Hydrocarbons

C6 - C9 Fraction		mg/kg	10
C10 - C14 Fraction		mg/kg	50
C15 - C28 Fraction		mg/kg	100
C29 - C36 Fraction		mg/kg	100
C10 - C36 Fraction (sum)		mg/kg	50

EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions

C6 - C10 Fraction	C6_C10	mg/kg	10
C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	mg/kg	10

>C10 - C16 Fraction	mg/kg	50
>C16 - C34 Fraction	mg/kg	100
>C34 - C40 Fraction	mg/kg	100
>C10 - C40 Fraction (sum)	mg/kg	50
>C10 - C16 Fraction minus Naphthalene (F2)	mg/kg	50

EP080: BTEXN

Benzene	71-43-2	mg/kg	0.2
Toluene	108-88-3	mg/kg	0.5
Ethylbenzene	100-41-4	mg/kg	0.5
meta- & para-Xylene	108-38-3 106-42-3	mg/kg	0.5
ortho-Xylene	95-47-6	mg/kg	0.5
Total Xylenes		mg/kg	0.5
Sum of BTEX		mg/kg	0.2
Naphthalene	91-20-3	mg/kg	1

EP231A: Perfluoroalkyl Sulfonic Acids

Perfluorobutane sulfonic acid (PFBS)	375-73-5	mg/kg	0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	mg/kg	0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	mg/kg	0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	mg/kg	0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	mg/kg	0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	mg/kg	0.0002

EP231B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg	0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg	0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg	0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg	0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	0.0002
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg	0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg	0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	mg/kg	0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	mg/kg	0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	mg/kg	0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	mg/kg	0.0005

EP231C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	mg/kg	0.0002
N-Methyl perfluorooctane sulfonamide (MeFOS)	31506-32-8	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (E)	1691-99-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	mg/kg	0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	mg/kg	0.0002

EP231D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	mg/kg	0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	mg/kg	0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	mg/kg	0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	mg/kg	0.0005

EP231P: PFAS Sums

Sum of PFAS		mg/kg	0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23-1	mg/kg	0.0002
Sum of PFAS (WA DER List)		mg/kg	0.0002

EP231_TOP_A: Perfluoroalkyl Sulfonic Acids

Perfluorobutane sulfonic acid (PFBS)	375-73-5	mg/kg	0.0002
Perfluoropentane sulfonic acid (PFPeS)	2706-91-4	mg/kg	0.0002
Perfluorohexane sulfonic acid (PFHxS)	355-46-4	mg/kg	0.0002
Perfluoroheptane sulfonic acid (PFHpS)	375-92-8	mg/kg	0.0002
Perfluorooctane sulfonic acid (PFOS)	1763-23-1	mg/kg	0.0002
Perfluorodecane sulfonic acid (PFDS)	335-77-3	mg/kg	0.0002

EP231_TOP_B: Perfluoroalkyl Carboxylic Acids

Perfluorobutanoic acid (PFBA)	375-22-4	mg/kg	0.001
Perfluoropentanoic acid (PFPeA)	2706-90-3	mg/kg	0.0002
Perfluorohexanoic acid (PFHxA)	307-24-4	mg/kg	0.0002
Perfluoroheptanoic acid (PFHpA)	375-85-9	mg/kg	0.0002
Perfluorooctanoic acid (PFOA)	335-67-1	mg/kg	0.0002
Perfluorononanoic acid (PFNA)	375-95-1	mg/kg	0.0002
Perfluorodecanoic acid (PFDA)	335-76-2	mg/kg	0.0002
Perfluoroundecanoic acid (PFUnDA)	2058-94-8	mg/kg	0.0002
Perfluorododecanoic acid (PFDoDA)	307-55-1	mg/kg	0.0002
Perfluorotridecanoic acid (PFTrDA)	72629-94-8	mg/kg	0.0002
Perfluorotetradecanoic acid (PFTeDA)	376-06-7	mg/kg	0.0005

EP231_TOP_C: Perfluoroalkyl Sulfonamides

Perfluorooctane sulfonamide (FOSA)	754-91-6	mg/kg	0.0002
N-Methyl perfluorooctane sulfonamide (MeFOS)	31506-32-8	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamide (EtFOSA)	4151-50-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoethanol	24448-09-7	mg/kg	0.0005
N-Ethyl perfluorooctane sulfonamidoethanol (E)	1691-99-2	mg/kg	0.0005
N-Methyl perfluorooctane sulfonamidoacetic acid	2355-31-9	mg/kg	0.0002
N-Ethyl perfluorooctane sulfonamidoacetic acid	2991-50-6	mg/kg	0.0002

EP231_TOP_D: (n:2) Fluorotelomer Sulfonic Acids

4:2 Fluorotelomer sulfonic acid (4:2 FTS)	757124-72-4	mg/kg	0.0005
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	27619-97-2	mg/kg	0.0005
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	39108-34-4	mg/kg	0.0005
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	120226-60-0	mg/kg	0.0005

EP231_TOP_P: PFAS Sums

Sum of PFAS		mg/kg	0.0002
Sum of PFHxS and PFOS	355-46-4/1763-23	mg/kg	0.0002
Sum of TOP C4 - C14 Carboxylates and C4 - C8 S		mg/kg	0.0002
Sum of TOP C4 - C14 as Fluorine		mg/kg	0.0002

EP080S: TPH(V)/BTEX Surrogates

1,2-Dichloroethane-D4	17060-07-0	%	0.2
Toluene-D8	2037-26-5	%	0.2
4-Bromofluorobenzene	460-00-4	%	0.2

EP231S: PFAS Surrogate

13C4-PFOS	%	0.0002
13C8-PFOA	%	0.0002

EP231 TOP_S: PFAS Surrogate

13C4-PFOS	%	0.0002
13C8-PFOA	%	0.0002

REG	REG	REG	REG	REG
EB1821084003	EB1821084007	EB1821084008	EB1821084009	EB1821084010
30/08/2018	30/08/2018	30/08/2018	30/08/2018	30/08/2018
SW Pond-N	SS06-N	SS01-N	SS02-N	SS03-N

32.2	----	----	----	----
----	33.7	25.2	34.5	25.7
<5	16	30	11	<5
----	40	30	100	40
----	<1	<1	<1	<1
----	<50	<50	<50	<50
<1	<1	<1	<1	<1
8	37	40	32	21
----	6	5	6	7
28	44	34	61	20
13	6	7	17	9
----	203	183	260	226
7	16	16	18	34
----	<5	<5	<5	<5
----	15	16	33	18
96	48	33	128	45
<0.1	<0.1	<0.1	<0.1	<0.1
<10	----	----	----	----
60	----	----	----	----
750	----	----	----	----
440	----	----	----	----
1250	----	----	----	----
10	----	----	----	----
<10	----	----	----	----

90	----	----	----	----
1060	----	----	----	----
220	----	----	----	----
1370	----	----	----	----
90	----	----	----	----

<0.2	----	----	----	----
7.6	----	----	----	----
<0.5	----	----	----	----
<0.5	----	----	----	----
<0.5	----	----	----	----
<0.5	----	----	----	----
7.6	----	----	----	----
<1	----	----	----	----

<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0.0004	0.0003	0.0005	0.0004	<0.0002
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0.0086	0.0015	0.0020	0.0025	0.0004
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

<0.001	<0.001	<0.001	<0.001	<0.001
0.0020	<0.0002	0.0003	0.0003	<0.0002
0.0022	0.0006	0.0011	0.0009	0.0003
0.0013	<0.0002	<0.0002	<0.0002	<0.0002
0.0007	<0.0002	0.0002	0.0004	<0.0002
0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0.0004	<0.0002	<0.0002	<0.0002	<0.0002
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<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
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<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
0.0014	<0.0005	0.0008	0.0009	<0.0005
0.0010	<0.0005	<0.0005	<0.0005	<0.0005
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

0.0182	0.0024	0.0049	0.0054	0.0007
0.0090	0.0018	0.0025	0.0029	0.0004
0.0176	0.0024	0.0049	0.0054	0.0007

<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0.0006	0.0009	0.0006	0.0004	0.0004
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
0.0097	0.0032	0.0023	0.0022	0.0011
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0.004	0.003	0.002	0.002	0.003
0.0112	0.0016	0.0019	0.0016	0.0007
0.0099	0.0022	0.0022	0.0020	0.0013
0.0074	0.0004	0.0006	0.0005	0.0002
0.0072	0.0004	0.0005	0.0005	0.0003
0.0051	<0.0002	<0.0002	<0.0002	<0.0002
0.0038	<0.0002	<0.0002	<0.0002	<0.0002
0.0012	<0.0002	<0.0002	<0.0002	<0.0002
0.0008	<0.0002	<0.0002	<0.0002	<0.0002
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
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<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
<0.0005	0.0007	<0.0005	0.0006	<0.0005
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

0.0609	0.0124	0.0101	0.0098	0.0070
0.0103	0.0041	0.0029	0.0026	0.0015
0.0609	0.0117	0.0101	0.0092	0.0070
0.0406	0.0075	0.0065	0.0060	0.0045

78.3	----	----	----	----
77.8	----	----	----	----
88.4	----	----	----	----

76.5	79.5	81.5	71.5	60.0
84.0	64.0	92.0	22.5	61.5

102	104	97.5	27.0	67.0
110	122	100	17.0	120

REG

EB1821084011

30/08/2018

SW1-N

26.5

<5

70

<1

<50

<1

8

9

24

12

109

8

<5

24

65

<0.1

<0.0002
<0.0002
0.0004
<0.0002
0.0030
<0.0002

<0.001
0.0034
0.0025
0.0009
0.0005
<0.0002
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<0.0005

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<0.0002

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0.0024
0.0021
0.0014
0.0012
0.0003
0.0002
<0.0002
<0.0005

<0.0002
<0.0005
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<0.0002
<0.0002

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<0.0005
<0.0005
<0.0005

0.0237
0.0033
0.0237
0.0157

78.0
85.0

94.5
85.0

Published on DES Disclosure Log
RTI Act 2009



CHAIN OF CUSTODY

ALS Laboratory
please tick →

ADELAIDE 21 Burma Road Pooraka SA 5096
Ph: 08 8359 0890 E: adelaide@alsglobal.com
BRISBANE 32 Shand Street Stafford QLD 4053
Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
GLADSTONE 46 Callemondah Drive Clinton QLD 4680
Ph: 07 7471 5600 E: gladstone@alsglobal.com

MACKEY 78 Harbour Road Mackay QLD 4740
Ph: 07 4944 0177 E: mackay@alsglobal.com
MELBOURNE 2-4 Westall Road Springvale VIC 3171
Ph: 03 8549 9500 E: samples.melbourne@alsglobal.com
MUDGE 27 Sydney Road Mudgee NSW 2850
Ph: 02 6372 6735 E: mudgee.mai@alsglobal.com

NEWCASTLE 5/585 Maitland Rd Mayfield West NSW 2304
Ph: 02 4014 2500 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541
Ph: 024423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6060
Ph: 08 6209 7655 E: samples.perth@alsglobal.com

SYDNEY 277-285 Woodpark Road Smithfield NSW 2164
Ph: 02 8784 8555 E: samples.sydney@alsglobal.com
TOWNSVILLE 14-15 Deema Court Bohle QLD 4818
Ph: 07 4795 0600 E: townsville.environmental@alsglobal.com
WOLLONGONG 99 Kenny Street Wollongong NSW 2500
Ph: 02 4225 3125 E: portkenbis@alsglobal.com

CLIENT: Dept of Environment and Science	TURNAROUND REQUIREMENTS: ☒ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):	FOR LABORATORY USE ONLY: (Circle) Custody Seal intact? Yes No N/A Free ice / frozen ice bricks present upon receipt? Yes No N/A Random Sample Temperature on Receipt: °C Other comment:
OFFICE: Brisbane	ALS QUOTE NO.:	
PROJECT: Swanbank		
ORDER NUMBER:		
PROJECT MANAGER: Sinead Summerville	CONTACT PH: 3894 8157	
SAMPLER: Brenda Baddley (Gladstone)	SAMPLER MOBILE: sch4p4 (6) Personal Information	RELINQUISHED BY: sch4p4 (6) Personal Information
COC emailed to ALS? (YES / NO)	EDD FORMAT (or default):	RECEIVED BY: Grea
Email Reports to (will default to PM if no other addresses are listed): ipswich.esr@des.qld.gov.au	DATE/TIME: 29/8/18	DATE/TIME: 30/8/18 20:20
Email Invoice to (will default to PM if no other addresses are listed): sinead.summerville@des.qld.gov.au		
COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:		

ALS USE	SAMPLE DETAILS MATRIX: SOLID (S) WATER (W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).							Additional Information	
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE codes below)	(refer to)	TOTAL CONTAINERS	WT-12	EP231X -ST	EP231X- CL (TOP)	W3 (Totals)	WT-8a	EP321X	EP321X (TOP)	SB
1	SW Pond - N	12:35 (28/8)	W	P.N		4	X	X	X	X				
2	SW Pond - N	30/8	W			1					X			
3	SW Pond - N	30/8	S			2								
4	BH01 - N	30/8	W			5	X	X	X	X	X			
5	BH05 - N	30/8	W			5	X	X	X	X	X			
6	BH07 - N	30/8	W			5	X	X	X	X	X			
7	SS01 - N	30/8	S			2								
8	SS06 - N	30/8	S			2						X	X	X
9	SS01 - N	30/8	S			2						X	X	X
10	SS02 - N	30/8	S			2						X	X	X
11	SS03 - N	30/8	S			2						X	X	X
12	SW1 - N	30/8	S			2						X	X	X
TOTAL														

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP = Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag.

Environmental Division
Brisbane
Work Order Reference
EB1821084



Telephone : + 61-7-3243 7222

TAX INVOICE: L732742

QLD DEPT OF ENVIRONMENT & SCIENCE
 IPSWICH ESR
 GPO BOX 2771
 BRISBANE
 QLD, AUSTRALIA 4001

Page : 1 of 1

Work Order	Project / Overall Description	Site	Order number	C-O-C number	Contact
EB1821084	Swanbank / ----	----		----	IPSWICH ESR

Issue Date	: 11-Sep-2018	Taxable value	: AUD\$	5,081.00
		Tax Incurred (GST)	: AUD\$	508.10
Due Date	: 11-Oct-2018	Amount Payable	: AUD\$	5,589.10

Work Order Breakdown

Method	Sale Item Descriptions	Quantity	Unit Value (AUD\$)	Value (AUD\$)	GST (AUD\$)	Line Total (AUD\$)
Work Order: EB1821084		Quote number: EN/222		Submatrix summary: 5 WATERS, 6 SOILS		
*Misc	Workorder Admin Fee					
EK055G	Ammonia as N By Discrete Analyser					
EP231X (solids)	PFAS - Full Suite (28 analytes)					
EP231X (TOP) (solids)	PFAS - Total Oxidisable Precursor (TOP) Assay					
EP231X-LL (TOP)	PFAS - Total Oxidisable Precursor (TOP) Assay - Low Level					
EP231X-ST	PFAS - Super Trace Waters Long Suite (28 analytes)					
NT-08A	Total Nitrogen + NO2 + NO3 + NH3 + Total P + Reactive P					
NT-11	Total Nitrogen and Total Phosphorus					
NT-12	General Water Suite					
S-03	15 Metals (NEPM 2013 Suite - incl. Digestion)					
S-05	TRH/BTEXN/8 Metals					
W-03T	15 Metals (Total) (NEPM)					

* denotes non-discountable item

• Please direct all queries to Environmental Division Brisbane on +61-7-3243 7222.

REMITTANCE ADVICE

POST TO: Australian Laboratory Services Pty Ltd
 P.O. Box 66 Everton Park
 QLD 4053 Australia

EMAIL TO: remittances@alsglobal.com

Vendor bank details

Bank: **Commonwealth Bank**
 BSB: **064 000**
 Account: **12672843**
 Swift Code: **CTBAAU2S**

or **Cheque**

Payable to Australian Laboratory Services Pty Ltd

or **Credit Card**

Visa
 Mastercard

Amount Payable
AUD\$ 5,589.10
ALS Client Reference
ENVPRO
TAX INVOICE
L732742