

## CERTIFICATE OF ANALYSIS

**Work Order** : **ES1620826**  
**Client** : **ORIGIN ENERGY RESOURCES LTD**  
**Contact** : [REDACTED]  
**Address** : [REDACTED]  
  
**Telephone** : [REDACTED]  
**Project** : **BEETALOO GROUNDWATER MONITORING**  
**Order number** : **16231417**  
**C-O-C number** : **ALS001\_959**  
**Sampler** : [REDACTED]  
**Site** : **BEETALOO**  
**Quote number** : ----  
**No. of samples received** : **12**  
**No. of samples analysed** : **12**

**Page** : 1 of 18  
**Laboratory** : Environmental Division Sydney  
**Contact** : EB ProjectManager  
**Address** : 277-289 Woodpark Road Smithfield NSW Australia 2164  
  
**Telephone** : [REDACTED]  
**Date Samples Received** : 16-Sep-2016 09:30  
**Date Analysis Commenced** : 17-Sep-2016  
**Issue Date** : 04-Oct-2016 12:54



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.

<i>Signatories</i>	<i>Position</i>	<i>Accreditation Category</i>
[REDACTED]	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
[REDACTED]	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
[REDACTED]	Organic Coordinator	Sydney Organics, Smithfield, NSW
[REDACTED]	Senior Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
[REDACTED]	Metals Teamleader	Radionuclides, Fyshwick, ACT



## 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.

- Gross Alpha and Beta Activity analyses are performed by ALS Fyshwick (NATA Accreditation number 992).
- EP050: The MBAS reported is calculated as LAS, mol wt 342.
- TDS by method EA-015 may bias high for samples 1,8,9,11 due to the presence of fine particulate matter, which may pass through the prescribed GF/C paper.
- EP071: Samples not received in a suitable time frame to conduct the analysis TPH within the recommended holding time.
- EA016: Calculated TDS is determined from Electrical conductivity using a conversion factor of 0.65.
- EA250 LSC : LOR for Gross Alpha and Beta raised due to high solid content
- Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) is the sum total of the concentration of the eight carcinogenic PAHs multiplied by their Toxicity Equivalence Factor (TEF) relative to Benzo(a)pyrene. TEF values are provided in brackets as follows: Benz(a)anthracene (0.1), Chrysene (0.01), Benzo(b+j) & Benzo(k)fluoranthene (0.1), Benzo(a)pyrene (1.0), Indeno(1.2.3.cd)pyrene (0.1), Dibenz(a,h)anthracene (1.0), Benzo(g,h,i)perylene (0.01). Less than LOR results for 'TEQ Zero' are treated as zero.



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BET-PW001_FF_11	BET-LB013	BET-LB004	BET-LB026	BET-LB037
Client sampling date / time				07-Sep-2016 15:26	10-Sep-2016 09:00	10-Sep-2016 12:30	10-Sep-2016 14:30	11-Sep-2016 06:30	
Compound	CAS Number	LOR	Unit	ES1620826-001	ES1620826-002	ES1620826-003	ES1620826-004	ES1620826-005	
				Result	Result	Result	Result	Result	
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	8.04	7.32	6.28	6.67	7.60	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	2610	1150	362	451	1100	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	2490	607	178	230	614	
<b>EA016: Calculated TDS (from Electrical Conductivity)</b>									
Total Dissolved Solids (Calc.)	----	1	mg/L	1700	748	235	293	715	
<b>EA065: Total Hardness as CaCO3</b>									
Total Hardness as CaCO3	----	1	mg/L	451	305	84	104	406	
<b>EA250: Gross Alpha and Beta Activity</b>									
Gross alpha	----	0.05	Bq/L	<0.05	----	----	----	----	
Gross beta activity - 40K	----	0.1	Bq/L	<0.10	----	----	----	----	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	393	247	39	52	364	
Total Alkalinity as CaCO3	----	1	mg/L	393	247	39	52	364	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	250	82	41	38	104	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	518	160	45	65	78	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	95	58	14	17	95	
Magnesium	7439-95-4	1	mg/L	52	39	12	15	41	
Sodium	7440-23-5	1	mg/L	114	106	28	35	78	
Potassium	7440-09-7	1	mg/L	10	11	6	7	8	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	0.001	<0.001	<0.001	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	0.22	0.23	0.06	<0.05	0.15	
Barium	7440-39-3	0.001	mg/L	0.060	0.051	0.110	0.082	0.057	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.006	0.005	<0.001	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BET-PW001_FF_11	BET-LB013	BET-LB004	BET-LB026	BET-LB037
Client sampling date / time				07-Sep-2016 15:26	10-Sep-2016 09:00	10-Sep-2016 12:30	10-Sep-2016 14:30	11-Sep-2016 06:30	
Compound	CAS Number	LOR	Unit	ES1620826-001	ES1620826-002	ES1620826-003	ES1620826-004	ES1620826-005	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	0.024	0.003	0.008	0.001	0.006	
Manganese	7439-96-5	0.001	mg/L	0.005	<0.001	0.015	0.007	<0.001	
Nickel	7440-02-0	0.001	mg/L	0.002	<0.001	0.006	0.007	<0.001	
Lead	7439-92-1	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	0.184	0.053	1.75	0.047	0.058	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	0.5	0.7	0.2	0.1	0.5	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	3.39	----	----	----	----	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	180	----	----	----	----	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	183	----	----	----	----	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	1.22	----	----	----	----	
<b>EN055: Ionic Balance</b>									
Total Anions	----	0.01	meq/L	27.9	----	----	----	----	
Total Anions	----	0.01	meq/L	----	11.2	2.90	3.66	11.6	
Total Cations	----	0.01	meq/L	27.1	----	----	----	----	
Total Cations	----	0.01	meq/L	----	11.0	3.06	3.78	11.7	
Ionic Balance	----	0.01	%	1.61	----	----	----	----	
Ionic Balance	----	0.01	%	----	0.73	2.60	1.62	0.32	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	<10	<10	<10	<10	<10	
Ethene	74-85-1	10	µg/L	<10	<10	<10	<10	<10	
Ethane	74-84-0	10	µg/L	<10	<10	<10	<10	<10	
Propene	115-07-1	10	µg/L	<10	<10	<10	<10	<10	
Propane	74-98-6	10	µg/L	<10	<10	<10	<10	<10	
Butene	25167-67-3	10	µg/L	<10	<10	<10	<10	<10	



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Client sampling date / time				07-Sep-2016 15:26	10-Sep-2016 09:00	10-Sep-2016 12:30	10-Sep-2016 14:30	11-Sep-2016 06:30	
Compound	CAS Number	LOR	Unit	ES1620826-001	ES1620826-002	ES1620826-003	ES1620826-004	ES1620826-005	
				Result	Result	Result	Result	Result	
<b>EP033: C1 - C4 Hydrocarbon Gases - Continued</b>									
Butane	106-97-8	10	µg/L	<10	<10	<10	<10	<10	
<b>EP041A: Nonionic Surfactants</b>									
Nonionic Surfactants as CTAS	----	5	mg/L	60	----	----	----	----	
<b>EP050: Anionic Surfactants as MBAS</b>									
Anionic Surfactants as MBAS	----	0.1	mg/L	<0.1	----	----	----	----	
<b>EP075(SIM)A: Phenolic Compounds</b>									
Phenol	108-95-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Chlorophenol	95-57-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2-Methylphenol	95-48-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
2-Nitrophenol	88-75-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dimethylphenol	105-67-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4-Dichlorophenol	120-83-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,6-Dichlorophenol	87-65-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,6-Trichlorophenol	88-06-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
2,4,5-Trichlorophenol	95-95-4	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pentachlorophenol	87-86-5	2	µg/L	<2.0	<2.0	<2.0	<2.0	<2.0	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>									
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Phenanthrene	85-01-8	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benz(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BET-PW001_FF_11	BET-LB013	BET-LB004	BET-LB026	BET-LB037
Client sampling date / time				07-Sep-2016 15:26	10-Sep-2016 09:00	10-Sep-2016 12:30	10-Sep-2016 14:30	11-Sep-2016 06:30	
Compound	CAS Number	LOR	Unit	ES1620826-001	ES1620826-002	ES1620826-003	ES1620826-004	ES1620826-005	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	1210	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	2170	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	3460	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	6840	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	1050	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	4480	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	2440	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	7970	<100	<100	<100	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	1050	<100	<100	<100	<100	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2	
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1	%	17.0	22.1	22.4	24.0	24.6	
2-Chlorophenol-D4	93951-73-6	1	%	59.4	50.2	51.4	50.9	58.4	
2,4,6-Tribromophenol	118-79-6	1	%	35.9	34.4	34.8	35.4	33.0	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1	%	87.4	62.0	74.2	91.0	90.8	



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Client sampling date / time					07-Sep-2016 15:26	10-Sep-2016 09:00	10-Sep-2016 12:30	10-Sep-2016 14:30	11-Sep-2016 06:30
Compound	CAS Number	LOR	Unit	ES1620826-001	ES1620826-002	ES1620826-003	ES1620826-004	ES1620826-005	
				Result	Result	Result	Result	Result	Result
<b>EP075(SIM)T: PAH Surrogates - Continued</b>									
Anthracene-d10	1719-06-8	1	%	61.8	64.3	64.8	67.4	73.0	
4-Terphenyl-d14	1718-51-0	1	%	95.9	68.7	70.2	77.1	79.0	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	106	114	95.0	110	100	
Toluene-D8	2037-26-5	2	%	121	112	95.1	109	102	
4-Bromofluorobenzene	460-00-4	2	%	116	113	93.3	108	101	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BET-LB021	BET-LB019	BET-LB025	BET-MB002	BET-LB008
Client sampling date / time					11-Sep-2016 08:15	11-Sep-2016 08:45	11-Sep-2016 12:00	11-Sep-2016 12:20	11-Sep-2016 17:40
Compound	CAS Number	LOR	Unit	ES1620826-006	ES1620826-007	ES1620826-008	ES1620826-009	ES1620826-010	
				Result	Result	Result	Result	Result	
<b>EA005P: pH by PC Titrator</b>									
pH Value	----	0.01	pH Unit	7.45	7.47	7.63	6.25	7.38	
<b>EA010P: Conductivity by PC Titrator</b>									
Electrical Conductivity @ 25°C	----	1	µS/cm	1240	1210	1230	154	1170	
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>									
Total Dissolved Solids @180°C	----	10	mg/L	664	713	1550	156	671	
<b>EA016: Calculated TDS (from Electrical Conductivity)</b>									
Total Dissolved Solids (Calc.)	----	1	mg/L	806	786	800	100	760	
<b>EA065: Total Hardness as CaCO3</b>									
Total Hardness as CaCO3	----	1	mg/L	492	488	493	17	468	
<b>EA250: Gross Alpha and Beta Activity</b>									
Gross alpha	----	0.05	Bq/L	----	----	0.10	0.32	----	
Gross beta activity - 40K	----	0.1	Bq/L	----	----	<0.10	0.25	----	
<b>ED037P: Alkalinity by PC Titrator</b>									
Hydroxide Alkalinity as CaCO3	DMO-210-001	1	mg/L	<1	<1	<1	<1	<1	
Carbonate Alkalinity as CaCO3	3812-32-6	1	mg/L	<1	<1	<1	<1	<1	
Bicarbonate Alkalinity as CaCO3	71-52-3	1	mg/L	412	408	422	26	413	
Total Alkalinity as CaCO3	----	1	mg/L	412	408	422	26	413	
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>									
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	129	129	128	<1	105	
<b>ED045G: Chloride by Discrete Analyser</b>									
Chloride	16887-00-6	1	mg/L	82	81	79	24	74	
<b>ED093F: Dissolved Major Cations</b>									
Calcium	7440-70-2	1	mg/L	118	118	120	2	115	
Magnesium	7439-95-4	1	mg/L	48	47	47	3	44	
Sodium	7440-23-5	1	mg/L	66	66	65	19	62	
Potassium	7440-09-7	1	mg/L	9	10	9	<1	9	
<b>EG020F: Dissolved Metals by ICP-MS</b>									
Arsenic	7440-38-2	0.001	mg/L	<0.001	0.001	<0.001	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	0.16	0.15	0.16	0.10	0.15	
Barium	7440-39-3	0.001	mg/L	0.052	0.056	0.067	0.025	0.055	
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	0.001	<0.001	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BET-LB021	BET-LB019	BET-LB025	BET-MB002	BET-LB008
Client sampling date / time				11-Sep-2016 08:15	11-Sep-2016 08:45	11-Sep-2016 12:00	11-Sep-2016 12:20	11-Sep-2016 17:40	
Compound	CAS Number	LOR	Unit	ES1620826-006	ES1620826-007	ES1620826-008	ES1620826-009	ES1620826-010	
				Result	Result	Result	Result	Result	
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>									
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	0.002	<0.001	<0.001	<0.001	<0.001	
Manganese	7439-96-5	0.001	mg/L	0.001	0.038	0.003	0.054	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	7440-66-6	0.005	mg/L	0.014	0.112	0.018	0.010	<0.005	
<b>EG035F: Dissolved Mercury by FIMS</b>									
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
<b>EK040P: Fluoride by PC Titrator</b>									
Fluoride	16984-48-8	0.1	mg/L	0.5	0.5	0.5	0.1	0.4	
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>									
Nitrite + Nitrate as N	----	0.01	mg/L	----	----	0.04	0.04	----	
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>									
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	----	----	<0.1	1.9	----	
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>									
^ Total Nitrogen as N	----	0.1	mg/L	----	----	<0.1	1.9	----	
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>									
Total Phosphorus as P	----	0.01	mg/L	----	----	<0.01	1.61	----	
<b>EN055: Ionic Balance</b>									
Total Anions	----	0.01	meq/L	----	----	----	----	----	
Total Anions	----	0.01	meq/L	13.2	13.1	13.3	1.20	12.5	
Total Cations	----	0.01	meq/L	----	----	----	----	----	
Total Cations	----	0.01	meq/L	12.9	12.9	12.9	1.17	12.3	
Ionic Balance	----	0.01	%	----	----	----	----	----	
Ionic Balance	----	0.01	%	1.10	0.91	1.56	----	0.95	
<b>EP033: C1 - C4 Hydrocarbon Gases</b>									
Methane	74-82-8	10	µg/L	<10	30	<10	68	<10	
Ethene	74-85-1	10	µg/L	<10	<10	<10	<10	<10	
Ethane	74-84-0	10	µg/L	<10	<10	<10	<10	<10	
Propene	115-07-1	10	µg/L	<10	<10	<10	<10	<10	
Propane	74-98-6	10	µg/L	<10	<10	<10	<10	<10	
Butene	25167-67-3	10	µg/L	<10	<10	<10	<10	<10	





## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BET-LB021	BET-LB019	BET-LB025	BET-MB002	BET-LB008
Client sampling date / time					11-Sep-2016 08:15	11-Sep-2016 08:45	11-Sep-2016 12:00	11-Sep-2016 12:20	11-Sep-2016 17:40
Compound	CAS Number	LOR	Unit	ES1620826-006	ES1620826-007	ES1620826-008	ES1620826-009	ES1620826-010	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>									
Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	<1.0	<1.0	<1.0	<1.0	
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	
<b>EP080/071: Total Petroleum Hydrocarbons</b>									
C6 - C9 Fraction	----	20	µg/L	<20	<20	<20	<20	<20	
C10 - C14 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
C15 - C28 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
C29 - C36 Fraction	----	50	µg/L	<50	<50	<50	<50	<50	
^ C10 - C36 Fraction (sum)	----	50	µg/L	<50	<50	<50	<50	<50	
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>									
C6 - C10 Fraction	C6_C10	20	µg/L	<20	<20	<20	<20	<20	
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C40 Fraction (sum)	----	100	µg/L	<100	<100	<100	<100	<100	
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L	<100	<100	<100	<100	<100	
<b>EP080: BTEXN</b>									
Benzene	71-43-2	1	µg/L	<1	<1	<1	<1	<1	
Toluene	108-88-3	2	µg/L	<2	<2	<2	<2	<2	
Ethylbenzene	100-41-4	2	µg/L	<2	<2	<2	<2	<2	
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	<2	<2	<2	
ortho-Xylene	95-47-6	2	µg/L	<2	<2	<2	<2	<2	
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	<2	<2	<2	
^ Sum of BTEX	----	1	µg/L	<1	<1	<1	<1	<1	
Naphthalene	91-20-3	5	µg/L	<5	<5	<5	<5	<5	
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>									
Phenol-d6	13127-88-3	1	%	22.7	23.0	21.9	24.2	21.3	
2-Chlorophenol-D4	93951-73-6	1	%	51.3	51.9	48.7	57.1	48.8	
2,4,6-Tribromophenol	118-79-6	1	%	45.8	45.0	37.0	47.5	38.0	
<b>EP075(SIM)T: PAH Surrogates</b>									
2-Fluorobiphenyl	321-60-8	1	%	60.6	65.8	63.2	69.8	63.5	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	BET-LB021	BET-LB019	BET-LB025	BET-MB002	BET-LB008
Client sampling date / time					11-Sep-2016 08:15	11-Sep-2016 08:45	11-Sep-2016 12:00	11-Sep-2016 12:20	11-Sep-2016 17:40
Compound	CAS Number	LOR	Unit	ES1620826-006	ES1620826-007	ES1620826-008	ES1620826-009	ES1620826-010	
				Result	Result	Result	Result	Result	
<b>EP075(SIM)T: PAH Surrogates - Continued</b>									
Anthracene-d10	1719-06-8	1	%	69.1	71.7	66.4	73.0	89.3	
4-Terphenyl-d14	1718-51-0	1	%	81.1	81.8	71.5	76.9	81.5	
<b>EP080S: TPH(V)/BTEX Surrogates</b>									
1,2-Dichloroethane-D4	17060-07-0	2	%	105	110	114	87.4	114	
Toluene-D8	2037-26-5	2	%	102	110	112	88.1	115	
4-Bromofluorobenzene	460-00-4	2	%	103	109	112	73.8	114	



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)		Client sample ID		BET-PW001_FR_INT BET-PW001_FE_INT	BET-LB052	---	---	---
Client sampling date / time		11-Sep-2016 20:45		13-Sep-2016 08:10		---	---	---
Compound	CAS Number	LOR	Unit	ES1620826-011 Result	ES1620826-012 Result	---	---	---
<b>EA005P: pH by PC Titrator</b>								
pH Value	---	0.01	pH Unit	8.05	7.61	---	---	---
<b>EA010P: Conductivity by PC Titrator</b>								
Electrical Conductivity @ 25°C	---	1	µS/cm	2050	1560	---	---	---
<b>EA015: Total Dissolved Solids dried at 180 ± 5 °C</b>								
Total Dissolved Solids @180°C	---	10	mg/L	1610	882	---	---	---
<b>EA016: Calculated TDS (from Electrical Conductivity)</b>								
Total Dissolved Solids (Calc.)	---	1	mg/L	1330	1010	---	---	---
<b>EA065: Total Hardness as CaCO3</b>								
Total Hardness as CaCO3	---	1	mg/L	425	463	---	---	---
<b>EA250: Gross Alpha and Beta Activity</b>								
Gross alpha	---	0.05	Bq/L	<0.05	---	---	---	---
Gross beta activity - 40K	---	0.1	Bq/L	<0.10	---	---	---	---
<b>ED037P: Alkalinity by PC Titrator</b>								
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	332	405	---	---	---
Total Alkalinity as CaCO3	---	1	mg/L	332	405	---	---	---
<b>ED041G: Sulfate (Turbidimetric) as SO4 2- by DA</b>								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	192	123	---	---	---
<b>ED045G: Chloride by Discrete Analyser</b>								
Chloride	16887-00-6	1	mg/L	377	189	---	---	---
<b>ED093F: Dissolved Major Cations</b>								
Calcium	7440-70-2	1	mg/L	86	98	---	---	---
Magnesium	7439-95-4	1	mg/L	51	53	---	---	---
Sodium	7440-23-5	1	mg/L	108	130	---	---	---
Potassium	7440-09-7	1	mg/L	11	19	---	---	---
<b>EG020F: Dissolved Metals by ICP-MS</b>								
Arsenic	7440-38-2	0.001	mg/L	0.019	<0.001	---	---	---
Boron	7440-42-8	0.05	mg/L	0.88	0.32	---	---	---
Barium	7440-39-3	0.001	mg/L	0.240	0.057	---	---	---
Beryllium	7440-41-7	0.001	mg/L	<0.001	<0.001	---	---	---
Cadmium	7440-43-9	0.0001	mg/L	0.0002	<0.0001	---	---	---
Cobalt	7440-48-4	0.001	mg/L	0.003	<0.001	---	---	---



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID		BET-PW001_FR_INT	BET-LB052	----	----	----
Client sampling date / time				11-Sep-2016 20:45	13-Sep-2016 08:10	----	----	----	----	----
Compound	CAS Number	LOR	Unit	ES1620826-011	ES1620826-012	-----	-----	-----	-----	-----
				Result	Result	---	---	---	---	---
<b>EG020F: Dissolved Metals by ICP-MS - Continued</b>										
Chromium	7440-47-3	0.001	mg/L	0.052	<0.001	----	----	----	----	----
Copper	7440-50-8	0.001	mg/L	0.117	0.028	----	----	----	----	----
Manganese	7439-96-5	0.001	mg/L	0.302	0.002	----	----	----	----	----
Nickel	7440-02-0	0.001	mg/L	0.031	<0.001	----	----	----	----	----
Lead	7439-92-1	0.001	mg/L	0.010	<0.001	----	----	----	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	----	----	----	----	----
Vanadium	7440-62-2	0.01	mg/L	<0.01	<0.01	----	----	----	----	----
Zinc	7440-66-6	0.005	mg/L	0.114	0.048	----	----	----	----	----
<b>EG035F: Dissolved Mercury by FIMS</b>										
Mercury	7439-97-6	0.0001	mg/L	0.0014	<0.0001	----	----	----	----	----
<b>EK040P: Fluoride by PC Titrator</b>										
Fluoride	16984-48-8	0.1	mg/L	0.4	0.8	----	----	----	----	----
<b>EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser</b>										
Nitrite + Nitrate as N	----	0.01	mg/L	1.28	----	----	----	----	----	----
<b>EK061G: Total Kjeldahl Nitrogen By Discrete Analyser</b>										
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	103	----	----	----	----	----	----
<b>EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser</b>										
^ Total Nitrogen as N	----	0.1	mg/L	104	----	----	----	----	----	----
<b>EK067G: Total Phosphorus as P by Discrete Analyser</b>										
Total Phosphorus as P	----	0.01	mg/L	0.17	----	----	----	----	----	----
<b>EN055: Ionic Balance</b>										
Total Anions	----	0.01	meq/L	21.4	----	----	----	----	----	----
Total Anions	----	0.01	meq/L	----	16.0	----	----	----	----	----
Total Cations	----	0.01	meq/L	20.9	----	----	----	----	----	----
Total Cations	----	0.01	meq/L	----	15.4	----	----	----	----	----
Ionic Balance	----	0.01	%	1.26	----	----	----	----	----	----
Ionic Balance	----	0.01	%	----	1.89	----	----	----	----	----
<b>EP033: C1 - C4 Hydrocarbon Gases</b>										
Methane	74-82-8	10	µg/L	<10	<10	----	----	----	----	----
Ethene	74-85-1	10	µg/L	<10	<10	----	----	----	----	----
Ethane	74-84-0	10	µg/L	<10	<10	----	----	----	----	----
Propene	115-07-1	10	µg/L	<10	<10	----	----	----	----	----
Propane	74-98-6	10	µg/L	<10	<10	----	----	----	----	----



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID		BET-PW001_FR_INT	BET-LB052	---	---	---
Client sampling date / time				11-Sep-2016 20:45		13-Sep-2016 08:10		---	---	---
Compound	CAS Number	LOR	Unit	ES1620826-011	ES1620826-012	-----	-----	-----		
				Result	Result	---	---	---		
<b>EP033: C1 - C4 Hydrocarbon Gases - Continued</b>										
Butene	25167-67-3	10	µg/L	<10	<10	---	---	---		
Butane	106-97-8	10	µg/L	<10	<10	---	---	---		
<b>EP041A: Nonionic Surfactants</b>										
Nonionic Surfactants as CTAS	---	5	mg/L	<5	---	---	---	---		
<b>EP050: Anionic Surfactants as MBAS</b>										
Anionic Surfactants as MBAS	---	0.1	mg/L	0.4	---	---	---	---		
<b>EP075(SIM)A: Phenolic Compounds</b>										
Phenol	108-95-2	1	µg/L	<1.0	<1.0	---	---	---		
2-Chlorophenol	95-57-8	1	µg/L	<1.0	<1.0	---	---	---		
2-Methylphenol	95-48-7	1	µg/L	<1.0	<1.0	---	---	---		
3- & 4-Methylphenol	1319-77-3	2	µg/L	<2.0	<2.0	---	---	---		
2-Nitrophenol	88-75-5	1	µg/L	<1.0	<1.0	---	---	---		
2,4-Dimethylphenol	105-67-9	1	µg/L	<1.0	<1.0	---	---	---		
2,4-Dichlorophenol	120-83-2	1	µg/L	<1.0	<1.0	---	---	---		
2,6-Dichlorophenol	87-65-0	1	µg/L	<1.0	<1.0	---	---	---		
4-Chloro-3-methylphenol	59-50-7	1	µg/L	<1.0	<1.0	---	---	---		
2,4,6-Trichlorophenol	88-06-2	1	µg/L	<1.0	<1.0	---	---	---		
2,4,5-Trichlorophenol	95-95-4	1	µg/L	<1.0	<1.0	---	---	---		
Pentachlorophenol	87-86-5	2	µg/L	<2.0	<2.0	---	---	---		
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons</b>										
Naphthalene	91-20-3	1	µg/L	<1.0	<1.0	---	---	---		
Acenaphthylene	208-96-8	1	µg/L	<1.0	<1.0	---	---	---		
Acenaphthene	83-32-9	1	µg/L	<1.0	<1.0	---	---	---		
Fluorene	86-73-7	1	µg/L	<1.0	<1.0	---	---	---		
Phenanthrene	85-01-8	1	µg/L	1.3	<1.0	---	---	---		
Anthracene	120-12-7	1	µg/L	<1.0	<1.0	---	---	---		
Fluoranthene	206-44-0	1	µg/L	<1.0	<1.0	---	---	---		
Pyrene	129-00-0	1	µg/L	<1.0	<1.0	---	---	---		
Benzo(a)anthracene	56-55-3	1	µg/L	<1.0	<1.0	---	---	---		
Chrysene	218-01-9	1	µg/L	<1.0	<1.0	---	---	---		
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1	µg/L	<1.0	<1.0	---	---	---		
Benzo(k)fluoranthene	207-08-9	1	µg/L	<1.0	<1.0	---	---	---		
Benzo(a)pyrene	50-32-8	0.5	µg/L	<0.5	<0.5	---	---	---		
Indeno(1.2.3.cd)pyrene	193-39-5	1	µg/L	<1.0	<1.0	---	---	---		



## Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID		BET-PW001_FR_INT	BET-LB052	---	---	---
Client sampling date / time				11-Sep-2016 20:45	13-Sep-2016 08:10	---	---	---	---	---
Compound	CAS Number	LOR	Unit	ES1620826-011	ES1620826-012	-----	-----	-----	-----	-----
				Result	Result	---	---	---	---	---
<b>EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued</b>										
Dibenz(a,h)anthracene	53-70-3	1	µg/L	<1.0	<1.0	---	---	---	---	---
Benzo(g,h,i)perylene	191-24-2	1	µg/L	<1.0	<1.0	---	---	---	---	---
^ Sum of polycyclic aromatic hydrocarbons	---	0.5	µg/L	1.3	<0.5	---	---	---	---	---
^ Benzo(a)pyrene TEQ (zero)	---	0.5	µg/L	<0.5	<0.5	---	---	---	---	---
<b>EP080/071: Total Petroleum Hydrocarbons</b>										
C6 - C9 Fraction	---	20	µg/L	20	<20	---	---	---	---	---
C10 - C14 Fraction	---	50	µg/L	460	<50	---	---	---	---	---
C15 - C28 Fraction	---	100	µg/L	4730	<100	---	---	---	---	---
C29 - C36 Fraction	---	50	µg/L	1580	<50	---	---	---	---	---
^ C10 - C36 Fraction (sum)	---	50	µg/L	6770	<50	---	---	---	---	---
<b>EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions</b>										
C6 - C10 Fraction	C6_C10	20	µg/L	50	<20	---	---	---	---	---
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L	50	<20	---	---	---	---	---
>C10 - C16 Fraction	---	100	µg/L	1240	<100	---	---	---	---	---
>C16 - C34 Fraction	---	100	µg/L	5030	<100	---	---	---	---	---
>C34 - C40 Fraction	---	100	µg/L	820	<100	---	---	---	---	---
^ >C10 - C40 Fraction (sum)	---	100	µg/L	7090	<100	---	---	---	---	---
^ >C10 - C16 Fraction minus Naphthalene (F2)	---	100	µg/L	1240	<100	---	---	---	---	---
<b>EP080: BTEXN</b>										
Benzene	71-43-2	1	µg/L	<1	<1	---	---	---	---	---
Toluene	108-88-3	2	µg/L	<2	<2	---	---	---	---	---
Ethylbenzene	100-41-4	2	µg/L	<2	<2	---	---	---	---	---
meta- & para-Xylene	108-38-3 106-42-3	2	µg/L	<2	<2	---	---	---	---	---
ortho-Xylene	95-47-6	2	µg/L	<2	<2	---	---	---	---	---
^ Total Xylenes	1330-20-7	2	µg/L	<2	<2	---	---	---	---	---
^ Sum of BTEX	---	1	µg/L	<1	<1	---	---	---	---	---
Naphthalene	91-20-3	5	µg/L	<5	<5	---	---	---	---	---
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>										
Phenol-d6	13127-88-3	1	%	20.6	24.0	---	---	---	---	---
2-Chlorophenol-D4	93951-73-6	1	%	42.8	57.3	---	---	---	---	---
2,4,6-Tribromophenol	118-79-6	1	%	63.0	73.6	---	---	---	---	---
<b>EP075(SIM)T: PAH Surrogates</b>										



### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID		BET-PW001_FR_INT	BET-LB052	----	----	----
Client sampling date / time				11-Sep-2016 20:45		13-Sep-2016 08:10		----	----	----
Compound	CAS Number	LOR	Unit	ES1620826-011	ES1620826-012	-----	-----	-----	-----	-----
				Result	Result	---	---	---	---	---
<b>EP075(SIM)T: PAH Surrogates - Continued</b>										
2-Fluorobiphenyl	321-60-8	1	%	56.2	74.1	----	----	----	----	----
Anthracene-d10	1719-06-8	1	%	69.7	74.1	----	----	----	----	----
4-Terphenyl-d14	1718-51-0	1	%	64.4	75.9	----	----	----	----	----
<b>EP080S: TPH(V)/BTEX Surrogates</b>										
1,2-Dichloroethane-D4	17060-07-0	2	%	107	103	----	----	----	----	----
Toluene-D8	2037-26-5	2	%	109	105	----	----	----	----	----
4-Bromofluorobenzene	460-00-4	2	%	97.2	102	----	----	----	----	----



### Surrogate Control Limits

Sub-Matrix: WATER		Recovery Limits (%)	
Compound	CAS Number	Low	High
<b>EP075(SIM)S: Phenolic Compound Surrogates</b>			
Phenol-d6	13127-88-3	10	44
2-Chlorophenol-D4	93951-73-6	14	94
2,4,6-Tribromophenol	118-79-6	17	125
<b>EP075(SIM)T: PAH Surrogates</b>			
2-Fluorobiphenyl	321-60-8	20	104
Anthracene-d10	1719-06-8	27	113
4-Terphenyl-d14	1718-51-0	32	112
<b>EP080S: TPH(V)/BTEX Surrogates</b>			
1,2-Dichloroethane-D4	17060-07-0	71	137
Toluene-D8	2037-26-5	79	131
4-Bromofluorobenzene	460-00-4	70	128