Appendix E
Water Quality Technical Reports

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Ref: 60633505 M&C 4175

Craig Smith
Department of Chief Minister and Cabinet
Northern Territory Government

Dear Craig

Darwin Ship Lift Project - Water Sampling Data Report

1.0 Project Details

The Northern Territory Government (NTG) intends to construct a new ship lift and vessel servicing facility at East Arm in Darwin Harbour. The project will be known as the Darwin Ship Lift Project (hereafter the 'Project'). A key component of the Project will involve dredging of sediments within the project footprint to deepen the ship lift site and associated vessel berths to create safe all tide water depths for the size of the vessels which are proposed to utilise the facility.

To inform the environmental regulatory approvals for the marine construction aspects of the Project, including the assessment of potential impacts from dredging, water quality data were collected on behalf of the NTG by the Australian Institute of Marine Science (AIMS).

Water quality data were collected within the proposed Project footprint area and the wider East Arm; through the collection of water samples to test for potential contaminants including metals, nutrients and hydrocarbons. Furthermore, turbidity (NTU) and sub surface light (PAR) data were collected through the deployment of loggers at a location adjacent to South Shell Island.

This letter report presents the methodologies and results from the water quality sampling undertaken for the Project. Some comments are made based upon a preliminary analysis of the data; more detailed analysis of the data, and the data from future water quality monitoring, will be presented in an interpretive report for inclusion in the suite of environmental approvals documents for the Project.

2.0 Methodology

2.1 Water Sampling

2.1.1 Sampling dates

Sampling was conducted on two occasions with the aim of capturing any effects of temporal variation in the contaminants. Samples were collected on 21 October 2020 and 3 November 2020.

2.1.2 Sampling locations

Samples were collected at six locations as shown in Figure 1 and per co-ordinates listed in Table 1. Samples were collected from near seabed (L), mid water column (M) and surface (S) at each of the six locations shown in Figure 1.

Table 1 Water sampling location co-ordinates.

Site ID	Latitude	Latitude Decimal Degrees	Longitude	Longitude Decimal Degrees
WQ-1	12º 29' 29.439" S	-12.49151	130º 53' 56.030" E	130.89890
WQ-2	12º 29' 43.144" S	-12.49531	130º 53' 41.660" E	130.89491
WQ-3	12º 29' 29.057" S	-12.49140	130º 54' 6.677" E	130.90185
WQ-4	12º 29' 51.059" S	-12.49752	130º 53' 9.600" E	130.88600
WQ-5	12º 29' 31.162" S	-12.49199	130º 54' 28.163" E	130.90782
WQ-REF	12º 30' 5.402" S	-12.50150	130º 52' 27.360" E	130.87427

PROJECT ID 60633505
CREATED BY PJY
APPROVED BY PYoung
LAST MODIFIED 07 SEP 2021

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1:26,387 when printed at A4
DATUM GDA 1994, PROJECTION MGA ZONE 52
0 270 540 810 1,080
Meters

Data sources:
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

LEGEND
- Water Quality Sampling Locations
- Shiplift
- Project site footprint
- Dredging footprint
- Reclamaiton and landside area

Darwin Ship Lift Project
Water Quality Locations

NORTHERN TERRITORY GOVERNMENT OF AUSTRALIA
DARWIN SHIP LIFT PROJECT

Figure
1

Map Document: X:\606x\60633505\900_CAD_GIS\920_GIS\MXD\20200925_Water_Quality\60633505_FigX_WQ locations_v2_A4P_20210907.mxd (peter.young)

A4 size

2.2 Turbidity and light data

From 12 October 2020 to 26 November 2020, one NTU sensor and one PAR sensor were deployed on a mooring frame approximately 1 m above the seabed, at a location adjacent to South Shell Island (Latitude -12.49752 and Longitude 130.88600 [in decimal degrees]). This is the same location where data were collected for the long term baseline turbidity dataset upon which the trigger levels for the Marine Supply Base and Multi User Barge Ramp Facility dredging campaigns were set. The data collected during the current survey have been used to provide a snapshot of contemporary data relating to background turbidity and benthic light availability.

3.0 Analysis

3.1 Water Chemistry

Samples were tested for the analytes listed in Table 2 and compared against default guideline values (DGVs) for water quality as listed in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).

Table 2 List of contaminants tested for in water samples

Analyte	
Metals	Aluminium, Arsenic, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Nickel, Vanadium and Zinc
Nutrients	Total Kjeldahl Nitrogen, Total Nitrogen, Total Phosphorus, Total Organic Carbon, Total Inorganic Carbon and Total Carbon
Polynuclear Aromatic Hydrocarbons (PAH)	
Total Petroleum Hydrocarbons	
Total Recoverable Hydrocarbons	

3.2 NTU and PAR data

Following the final retrieval of the sensors all data were downloaded and checked for any erroneous trends due to fouling or voltage spikes. Once checked, total and daily averages were calculated for each respective month and for the whole data set. Calculating averages for each month was done as October is typically part of the dry season while November is considered the beginning of the wet season.

From the long term NTU dataset previously collected from South Shell Island (URS 2011), suspended sediment concentrations (SSC) from NTU were calculated assuming a linear NTU/SSC relationship and the formula *SSC = 0.848 * NTU + 7.0477*. For further comparison with that data set, the same formula was used to calculate SSC from the current data set.

Both NTU and PAR data were also compared against rainfall data from East Arm as well as tidal data from depth data recorded by the sensors themselves.

4.0 Results and Discussion

4.1 Water Chemistry

The analytical results revealed there were no instances of contaminants exceeding ANZG (2018) DGVs for 95% and 99% species level protection levels where applicable, in any of the samples collected. The reported concentrations of PAHs and hydrocarbons were all below the limit of reporting (LOR) across all samples. Only in the results for metals and nutrients were concentrations detected above the LOR, therefore Table 1 and Table 2 only present the results for metals and nutrients, respectively. All analytical results for all analytes across all samples are appended in Appendix A.

Table 3 Analytical results for all metals

Analyte		Aluminium	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Vanadium	Zinc
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		5	0.5	0.2	0.5	0.2	1	5	0.2	0.5	0.00004	0.5	0.5	5
ANZG 99% or 95% SPL*		-	-	0.7	4.4	1	1.3	-	2.2	-	0.0001	7	50	7
Sample date:	**Sample ID**													
12/10/2020	WQ-1-L	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	4.8	<0.00004	<0.5	2.4	<5
3/11/2020	WQ-1-L	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	1.2	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-1-M	<5	1.9	<0.2	<0.5	<0.2	<1	<5	<0.2	3.6	<0.00004	<0.5	2.1	<5
3/11/2020	WQ-1-M	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	1.4	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-1-S	<5	1.5	<0.2	<0.5	<0.2	<1	<5	<0.2	2.7	<0.00004	<0.5	2	<5
3/11/2020	WQ-1-S	<5	1.5	<0.2	<0.5	<0.2	<1	<5	<0.2	1.2	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-2-L-1	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	3	<0.00004	<0.5	1.8	<5
3/11/2020	WQ-2-L-1	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	1.1	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-2-M-1	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	2.4	<0.00004	<0.5	1.9	<5
3/11/2020	WQ-2-M-1	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	0.7	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-2-S-1	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.8	<0.00004	<0.5	1.8	<5
3/11/2020	WQ-2-S-1	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	0.6	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-3-L	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	4.7	<0.00004	<0.5	2	<5
3/11/2020	WQ-3-L	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	1.1	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-3-M	<5	1.8	<0.2	<0.5	<0.2	<1	<5	<0.2	4	<0.00004	<0.5	2	<5
3/11/2020	WQ-3-M	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	0.9	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-3-S	<5	1.8	<0.2	<0.5	<0.2	<1	<5	<0.2	2.8	<0.00004	<0.5	2.2	<5
3/11/2020	WQ-3-S	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	0.8	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-4-L	<5	1.8	<0.2	<0.5	<0.2	<1	<5	<0.2	3.1	<0.00004	<0.5	2	<5
3/11/2020	WQ-4-L	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	1.1	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-4-M	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.5	<0.00004	<0.5	1.8	<5
3/11/2020	WQ-4-M	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	0.9	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-4-S	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	1.9	<0.00004	<0.5	2.2	<5
3/11/2020	WQ-4-S	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	1	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-5-L	<5	1.5	<0.2	<0.5	<0.2	<1	<5	<0.2	5.3	<0.00004	<0.5	2.1	<5
3/11/2020	WQ-5-L	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.4	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-5-M	<5	1.5	<0.2	<0.5	<0.2	<1	<5	<0.2	3.5	<0.00004	<0.5	2	<5
3/11/2020	WQ-5-M	<5	1.5	<0.2	<0.5	<0.2	1	<5	<0.2	2.2	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-5-S	<5	1.8	<0.2	<0.5	<0.2	<1	<5	<0.2	3.1	<0.00004	<0.5	2.1	<5
3/11/2020	WQ-5-S	<5	1.6	<0.2	<0.5	<0.2	1	<5	<0.2	2.1	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-REF-L	<5	1.5	<0.2	<0.5	<0.2	<1	<5	<0.2	3	<0.00004	<0.5	2.3	<5
3/11/2020	WQ-REF-L	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	0.9	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-REF-M	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.5	<0.00004	<0.5	2.2	<5
3/11/2020	WQ-REF-M	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	1	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-REF-S	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.4	<0.00004	<0.5	1.9	<5
3/11/2020	WQ-REF-S	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	0.9	<0.00004	<0.5	1.8	<5
12/10/2020	WQ-2-L-2	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	3.4	<0.00004	<0.5	2.3	<5
3/11/2020	WQ-2-L-2	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	1.2	<0.00004	<0.5	1.1	<5
12/10/2020	WQ-2-L-3	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.5	<0.00004	<0.5	2.1	<5

Analyte		Aluminium	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Nickel	Vanadium	Zinc
Units		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
LOR		5	0.5	0.2	0.5	0.2	1	5	0.2	0.5	0.00004	0.5	0.5	5
ANZG 99% or 95% SPL*		-	-	0.7	4.4	1	1.3	-	2.2	-	0.0001	7	50	7
Sample date:	Sample ID													
3/11/2020	WQ-2-L-3	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	1.1	<0.00004	<0.5	<0.5	<5
12/10/2020	WQ-2-M-2	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.6	<0.00004	<0.5	2	<5
3/11/2020	WQ-2-M-2	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	0.7	<0.00004	<0.5	0.6	<5
12/10/2020	WQ-2-M-3	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.9	<0.00004	<0.5	2.3	<5
3/11/2020	WQ-2-M-3	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	0.6	<0.00004	<0.5	0.6	<5
12/10/2020	WQ-2-S-2	<5	1.6	<0.2	<0.5	<0.2	<1	<5	<0.2	3.2	<0.00004	<0.5	2.6	<5
3/11/2020	WQ-2-S-2	<5	1.8	<0.2	<0.5	<0.2	<1	<5	<0.2	0.6	<0.00004	<0.5	1.1	<5
12/10/2020	WQ-2-S-3	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	2.3	<0.00004	<0.5	2.1	<5
3/11/2020	WQ-2-S-3	<5	1.7	<0.2	<0.5	<0.2	<1	<5	<0.2	0.6	<0.00004	<0.5	0.6	<5

* Species Protection Level (%) per ANZG (2018)

Table 4 Analytical results for suspended solids, nutrients and carbon

Analyte		Suspended Solids	Total Kjeldahl Nitrogen as N	Total Nitrogen as N	Total Phosphorus as P	Total Organic Carbon	Total Inorganic Carbon	Total Carbon
Units		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
LOR		5	0.025	0.05	0.005	1	1	1
Sample date	Sample ID							
12/10/2020	WQ-1-L	<5	0.077	0.081	<0.005	1	29	30
3/11/2020	WQ-1-L	6	0.083	0.089	<0.005	1	29	30
12/10/2020	WQ-1-M	<5	0.065	0.065	<0.005	1	29	29
3/11/2020	WQ-1-M	16	0.103	0.108	<0.005	2	28	30
12/10/2020	WQ-1-S	<5	0.067	0.069	<0.005	<1	29	29
3/11/2020	WQ-1-S	20	0.067	0.073	<0.005	2	28	29
12/10/2020	WQ-2-L-1	<5	0.066	0.07	<0.005	<1	29	29
3/11/2020	WQ-2-L-1	10	0.074	0.08	<0.005	2	27	28
12/10/2020	WQ-2-M-1	<5	0.07	0.07	<0.005	<1	28	28
3/11/2020	WQ-2-M-1	6	0.062	0.068	<0.005	1	27	27
12/10/2020	WQ-2-S-1	<5	0.068	0.068	<0.005	<1	28	28
3/11/2020	WQ-2-S-1	<5	0.072	0.077	<0.005	<1	27	28
12/10/2020	WQ-3-L	<5	0.078	0.081	<0.005	<1	28	28
3/11/2020	WQ-3-L	10	0.088	0.093	<0.005	1	27	28
12/10/2020	WQ-3-M	<5	0.077	0.08	<0.005	<1	28	28
3/11/2020	WQ-3-M	11	0.075	0.08	<0.005	<1	27	28
12/10/2020	WQ-3-S	<5	0.067	0.067	<0.005	<1	28	28
3/11/2020	WQ-3-S	7	0.094	0.099	<0.005	2	27	28
12/10/2020	WQ-4-L	<5	0.068	0.07	<0.005	9	21	28
3/11/2020	WQ-4-L	8	0.135	0.138	<0.005	1	27	28
12/10/2020	WQ-4-M	<5	0.059	0.059	<0.005	1	28	28
3/11/2020	WQ-4-M	12	0.089	0.092	<0.005	1	27	27
12/10/2020	WQ-4-S	<5	0.071	0.071	<0.005	<1	28	28
3/11/2020	WQ-4-S	<5	0.092	0.095	<0.005	<1	27	28
12/10/2020	WQ-5-L	<5	0.064	0.064	<0.005	<1	29	30
3/11/2020	WQ-5-L	12	0.121	0.121	<0.005	<1	28	29
12/10/2020	WQ-5-M	<5	0.07	0.07	<0.005	<1	28	29
3/11/2020	WQ-5-M	<5	0.154	0.156	<0.005	2	28	28
12/10/2020	WQ-5-S	<5	0.065	0.068	<0.005	<1	28	28
3/11/2020	WQ-5-S	<5	0.074	0.076	<0.005	<1	28	28
12/10/2020	WQ-REF-L	<5	0.067	0.076	<0.005	<1	28	28
3/11/2020	WQ-REF-L	<5	0.074	0.078	<0.005	<1	26	27
12/10/2020	WQ-REF-M	<5	0.066	0.069	<0.005	<1	28	28
3/11/2020	WQ-REF-M	<5	0.079	0.082	<0.005	1	26	27
12/10/2020	WQ-REF-S	<5	0.066	0.066	<0.005	<1	28	29
3/11/2020	WQ-REF-S	8	0.075	0.078	<0.005	<1	26	27
12/10/2020	WQ-2-L-2	<5	0.071	0.075	<0.005	<1	28	28
3/11/2020	WQ-2-L-2	<5	0.118	0.121	<0.005	2	26	27
12/10/2020	WQ-2-L-3	<5	0.052	0.056	<0.005	<1	28	28
3/11/2020	WQ-2-L-3	<5	0.121	0.124	<0.005	2	26	28
12/10/2020	WQ-2-M-2	<5	0.083	0.083	<0.005	1	26	28
3/11/2020	WQ-2-M-2	<5	0.118	0.121	<0.005	1	26	27
12/10/2020	WQ-2-M-3	<5	0.057	0.06	<0.005	3	28	28
3/11/2020	WQ-2-M-3	8	0.081	0.085	<0.005	2	26	28
12/10/2020	WQ-2-S-2	<5	0.072	0.074	<0.005	<1	27	27
3/11/2020	WQ-2-S-2	<5	0.085	0.089	<0.005	<1	26	28
12/10/2020	WQ-2-S-3	<5	0.066	0.066	<0.005	<1	28	28
3/11/2020	WQ-2-S-3	8	0.086	0.089	<0.005	<1	26	28

* Species Protection Level (%) per ANZG (2018)

4.2 NTU and PAR data

Total and daily averages, and maximum and minimum NTU values, for each month and across the whole deployment are presented in Table 5. Calculated SSCs are also presented. Figure 2 presents a graph of NTU values throughout the deployment along with depth and rainfall data. Figure 3 presents the PAR data recorded during the deployment period along with depth and rainfall data.

Table 5 NTU Statistics

Statistic	October	November	Whole deployment	Long term data set #	
				Dry Season	Wet Season
Total Mean	7.8	6.0	6.8	4.4	8.3
Total Max	52.0	49.9	52.0	46.4	68.0
Total Min	1.1	1.2	1.1	0.1	0.2
Mean of Daily Means	7.2	6.1	6.7	-	-
Max of Daily Means	19.5	14.1	19.5	-	-
Min of Daily Means	1.7	2.0	1.7	-	-
Total SSC Mean (mg/L)*	13.6	12.2	12.8	10.8	14.1
Total SSC Max (mg/L)*	51.2	49.3	51.2	46.4	64.7
Total SSC Min (mg/L)*	8.0**	8.1**	8.0**	7.1**	7.2**
SSC Daily Means(mg/L)*	13.2	12.2	12.7	-	-
SSC Daily Max(mg/L)*	23.6	19.0	23.6	-	-
SSC Daily Min(mg/L)*	8.5**	8.7**	8.7**	-	-

* Calculated from NTU using relationship in URS (2011a): SSC = 0.848 * NTU + 7.0477

** These values are an artefact of applying a linear equation to the SSC/NTU relationship and the actual SSCs are likely to have been considerably lower.

Long term data set (URS 2011)

Average daily turbidity value ranged between 2 and 19.5 NTU across the whole deployment. NTU and SSC were highest during spring tidal periods when water movements were greatest (Figure 2). Notably daily PAR readings were highest during spring tides despite turbidity levels being at their greatest (Figure 3). This is as a result of the large tidal range and the very shallow water depths during low spring tide (as low as 1.9 m depth). Low water depth results in reduced light attenuation whereas, conversely, during high spring tide PAR readings dropped to near night time values. Minimal rainfall was recorded at East Arm during the deployment period and this did not seem to influence NTU or PAR values.

Mean, maximum and minimum NTU and calculated SCC values were comparable to the long term NTU dataset previously collected from South Shell Island (URS 2011) (Table 5). During that study mean NTU level during the dry season was slightly lower than the mean NTU recorded during October in this snapshot study. Similarly, the mean NTU recorded in the long term data set for the Wet season was slightly higher that recorded during November during the current study. These slight differences in values would most likely be a reflection of the shorter timeframe of data collection during the current study and thus is not an accurate reflection of the full Dry and Wet season turbidity variation. Rather, it may well reflect typical water quality within the transition period between the Dry and Wet seasons.

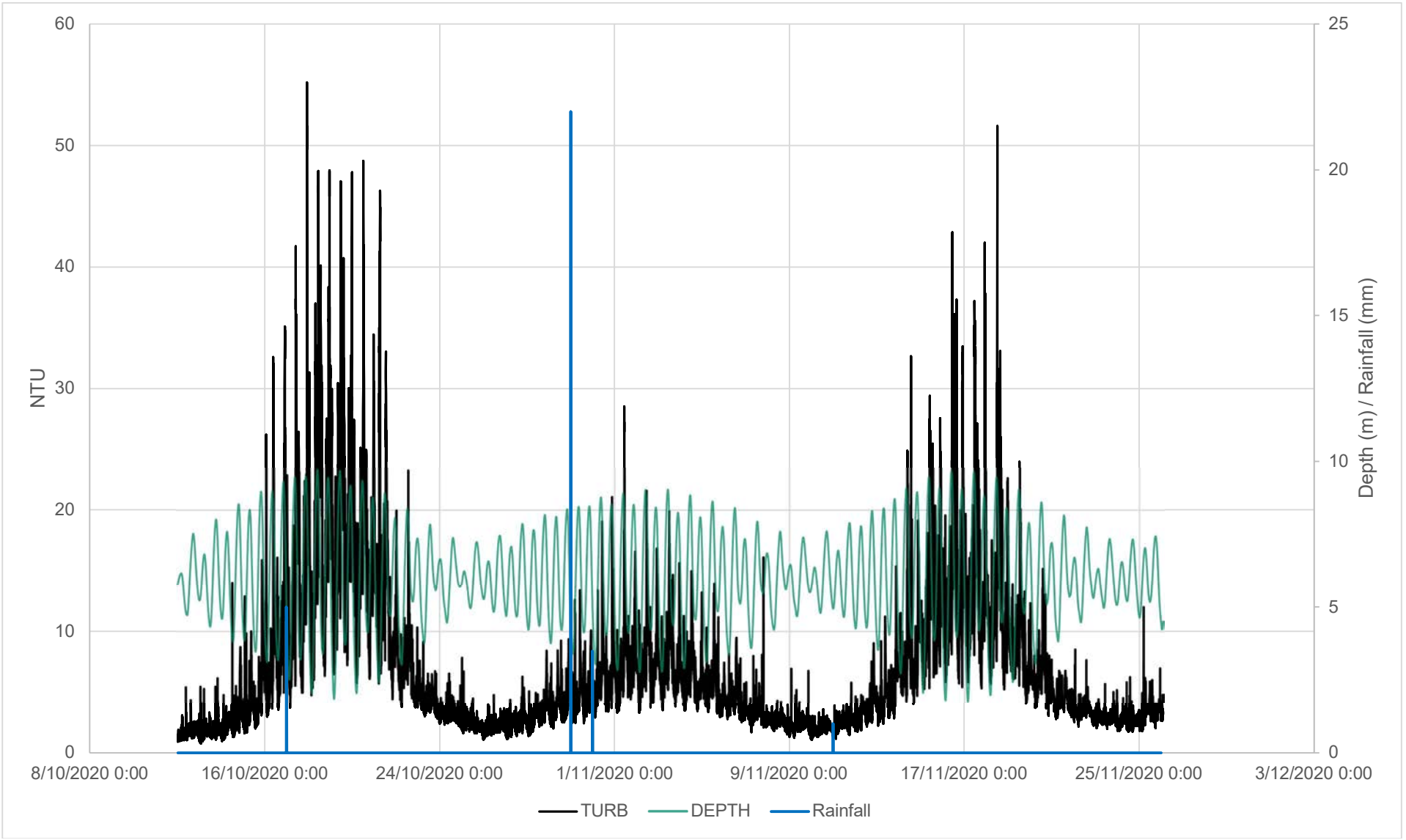

Figure 2 Graph of NTU and depth data

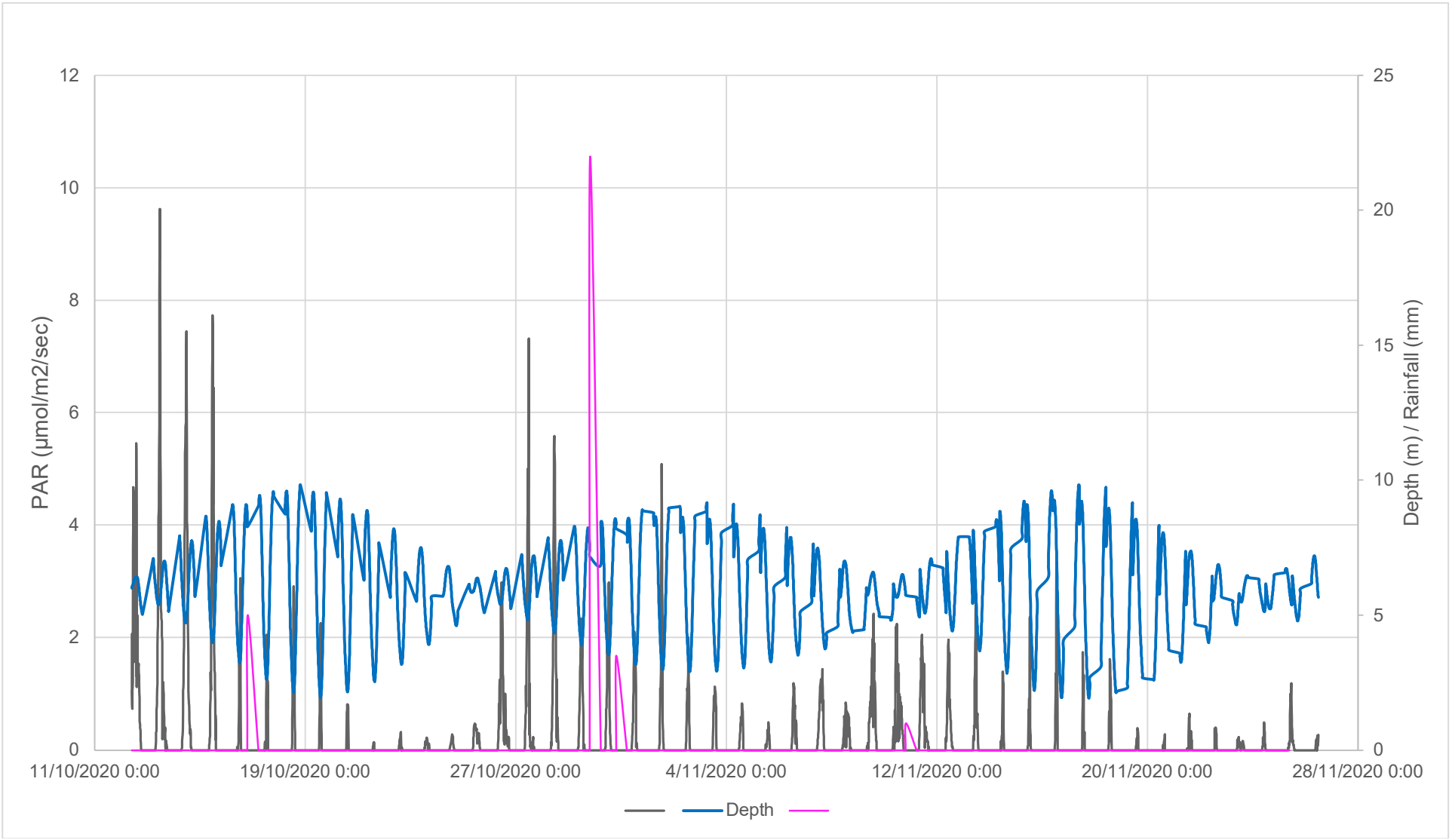

Figure 3 Graph of PAR, Depth and Rainfall data

5.0 References

ANZG 2018. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

URS 2011. *Ichthys Gas Field Development Project: summary of the long-term water-quality and program for Darwin Harbour*. Report prepared for INPEX Browse, Ltd, R1589, March 2011. Technical appendix S9 to INPEX (2011).

We trust that the information presented in this letter report meets your current requirements. However, if you need any clarification of, or discussion on, any aspects of the letter, then please do not hesitate to contact the undersigned.

Yours faithfully

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Appendix A

Laboratory Analytical Reports

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2038827**	Page	: 1 of 21
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: PETER YOUNG	Contact	: Brenda Hong
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 6432 2000	Telephone	: +61 2 8784 8555
Project	: 60566025	Date Samples Received	: 05-Nov-2020 07:30
Order number	: 60566025	Date Analysis Commenced	: 05-Nov-2020
C-O-C number	: ----	Issue Date	: 12-Nov-2020 14:33
Sampler	: ----		
Site	: ----		
Quote number	: SY/182/20		
No. of samples received	: 27		
No. of samples analysed	: 27		

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG093: Samples containing high levels of sulfate may precipitate barium under the acidic conditions of this method and may therefore bias results low.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-1-L	WQ-1-M	WQ-1-S	WQ-2-L-1	WQ-2-M-1
				Client sampling date / time	03-Nov-2020 08:26	03-Nov-2020 08:33	03-Nov-2020 08:39	03-Nov-2020 09:20	03-Nov-2020 09:38
Compound	CAS Number	LOR	Unit		ES2038827-001	ES2038827-002	ES2038827-003	ES2038827-004	ES2038827-005
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**6**	**16**	**20**	**10**	**6**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		**1.6**	**1.7**	**1.5**	**1.6**	**1.6**
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	<1
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		**1.2**	**1.4**	**1.2**	**1.1**	**0.7**
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		**0.083**	**0.103**	**0.067**	**0.074**	**0.062**
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		**0.089**	**0.108**	**0.073**	**0.080**	**0.068**
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**1**	**2**	**2**	**2**	**1**
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		**29**	**28**	**28**	**27**	**27**
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		**30**	**30**	**29**	**28**	**27**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-1-L	WQ-1-M	WQ-1-S	WQ-2-L-1	WQ-2-M-1
				Client sampling date / time	03-Nov-2020 08:26	03-Nov-2020 08:33	03-Nov-2020 08:39	03-Nov-2020 09:20	03-Nov-2020 09:38
Compound	CAS Number	LOR	Unit		ES2038827-001	ES2038827-002	ES2038827-003	ES2038827-004	ES2038827-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-1-L	WQ-1-M	WQ-1-S	WQ-2-L-1	WQ-2-M-1
				Client sampling date / time	03-Nov-2020 08:26	03-Nov-2020 08:33	03-Nov-2020 08:39	03-Nov-2020 09:20	03-Nov-2020 09:38
Compound	CAS Number	LOR	Unit		ES2038827-001	ES2038827-002	ES2038827-003	ES2038827-004	ES2038827-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		22.5	28.6	27.8	27.8	17.7
2-Chlorophenol-D4	93951-73-6	1.0	%		42.4	56.0	54.1	51.5	34.6
2.4.6-Tribromophenol	118-79-6	1.0	%		50.4	53.7	52.2	50.8	41.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		60.2	72.0	70.2	69.2	54.0
Anthracene-d10	1719-06-8	1.0	%		68.5	70.1	68.8	69.2	64.2
4-Terphenyl-d14	1718-51-0	1.0	%		72.9	73.4	77.5	72.4	63.0
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		131	131	92.2	132	93.4
Toluene-D8	2037-26-5	2	%		127	126	99.6	129	101
4-Bromofluorobenzene	460-00-4	2	%		122	124	96.5	126	95.4

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-S-1	WQ-3-L	WQ-3-M	WQ-3-S	WQ-4-L
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 08:51	03-Nov-2020 08:59	03-Nov-2020 09:07	03-Nov-2020 10:41
Compound	CAS Number	LOR	Unit		ES2038827-006	ES2038827-007	ES2038827-008	ES2038827-009	ES2038827-010
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	10	11	7	8
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		1.6	1.7	1.6	1.6	1.6
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	<1
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		0.6	1.1	0.9	0.8	1.1
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		0.072	0.088	0.075	0.094	0.135
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		0.077	0.093	0.080	0.099	0.138
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		<1	1	<1	2	1
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		27	27	27	27	27
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		28	28	28	28	28
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-S-1	WQ-3-L	WQ-3-M	WQ-3-S	WQ-4-L
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 08:51	03-Nov-2020 08:59	03-Nov-2020 09:07	03-Nov-2020 10:41
Compound	CAS Number	LOR	Unit		ES2038827-006	ES2038827-007	ES2038827-008	ES2038827-009	ES2038827-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-S-1	WQ-3-L	WQ-3-M	WQ-3-S	WQ-4-L
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 08:51	03-Nov-2020 08:59	03-Nov-2020 09:07	03-Nov-2020 10:41
Compound	CAS Number	LOR	Unit		ES2038827-006	ES2038827-007	ES2038827-008	ES2038827-009	ES2038827-010
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		28.3	24.4	24.7	23.7	18.0
2-Chlorophenol-D4	93951-73-6	1.0	%		54.1	46.6	46.6	44.6	36.1
2.4.6-Tribromophenol	118-79-6	1.0	%		50.7	45.6	43.0	47.2	47.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		73.1	65.3	63.3	63.7	55.2
Anthracene-d10	1719-06-8	1.0	%		72.2	64.8	64.6	65.3	63.1
4-Terphenyl-d14	1718-51-0	1.0	%		74.6	67.1	67.4	67.2	64.3
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		94.1	135	88.8	92.1	132
Toluene-D8	2037-26-5	2	%		97.6	129	94.9	100.0	122
4-Bromofluorobenzene	460-00-4	2	%		97.0	125	89.6	99.0	122

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-4-M	WQ-4-S	WQ-5-L	WQ-5-M	WQ-5-S
				Client sampling date / time	03-Nov-2020 10:46	03-Nov-2020 10:54	03-Nov-2020 10:13	03-Nov-2020 10:20	03-Nov-2020 10:25
Compound	CAS Number	LOR	Unit		ES2038827-011	ES2038827-012	ES2038827-013	ES2038827-014	ES2038827-015
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**12**	<5	**12**	<5	<5
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		**1.6**	**1.6**	**1.7**	**1.5**	**1.6**
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	**1**	**1**
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		**0.9**	**1.0**	**2.4**	**2.2**	**2.1**
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		**0.089**	**0.092**	**0.121**	**0.154**	**0.074**
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		**0.092**	**0.095**	**0.121**	**0.156**	**0.076**
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**1**	<1	<1	**2**	<1
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		**27**	**27**	**28**	**28**	**28**
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		**27**	**28**	**29**	**28**	**28**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-4-M	WQ-4-S	WQ-5-L	WQ-5-M	WQ-5-S
				Client sampling date / time	03-Nov-2020 10:46	03-Nov-2020 10:54	03-Nov-2020 10:13	03-Nov-2020 10:20	03-Nov-2020 10:25
Compound	CAS Number	LOR	Unit		ES2038827-011	ES2038827-012	ES2038827-013	ES2038827-014	ES2038827-015
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-4-M	WQ-4-S	WQ-5-L	WQ-5-M	WQ-5-S
				Client sampling date / time	03-Nov-2020 10:46	03-Nov-2020 10:54	03-Nov-2020 10:13	03-Nov-2020 10:20	03-Nov-2020 10:25
Compound	CAS Number	LOR	Unit		ES2038827-011	ES2038827-012	ES2038827-013	ES2038827-014	ES2038827-015
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		25.4	22.6	22.6	20.2	25.6
2-Chlorophenol-D4	93951-73-6	1.0	%		48.5	43.9	45.1	40.2	49.9
2.4.6-Tribromophenol	118-79-6	1.0	%		48.6	49.5	55.2	49.8	48.9
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		65.9	65.0	62.8	60.9	68.6
Anthracene-d10	1719-06-8	1.0	%		67.9	68.4	72.3	67.2	69.3
4-Terphenyl-d14	1718-51-0	1.0	%		70.0	71.7	75.6	74.1	70.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		91.1	89.2	91.2	95.1	96.6
Toluene-D8	2037-26-5	2	%		102	101	103	96.3	100
4-Bromofluorobenzene	460-00-4	2	%		105	94.7	94.7	95.0	96.7

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-REF-L	WQ-REF-M	WQ-REF-S	WQ-2-L-2	WQ-2-L-3
				Client sampling date / time	03-Nov-2020 11:10	03-Nov-2020 11:15	03-Nov-2020 11:18	03-Nov-2020 09:23	03-Nov-2020 09:44
Compound	CAS Number	LOR	Unit		ES2038827-016	ES2038827-017	ES2038827-018	ES2038827-019	ES2038827-020
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	<5	8	<5	<5
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		1.7	1.7	1.7	1.7	1.7
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	<1
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		0.9	1.0	0.9	1.2	1.1
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	1.8	1.1	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		0.074	0.079	0.075	0.118	0.121
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		0.078	0.082	0.078	0.121	0.124
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		<1	1	<1	2	2
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		26	26	26	26	26
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		27	27	27	27	28
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-REF-L	WQ-REF-M	WQ-REF-S	WQ-2-L-2	WQ-2-L-3
				Client sampling date / time	03-Nov-2020 11:10	03-Nov-2020 11:15	03-Nov-2020 11:18	03-Nov-2020 09:23	03-Nov-2020 09:44
Compound	CAS Number	LOR	Unit		ES2038827-016	ES2038827-017	ES2038827-018	ES2038827-019	ES2038827-020
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-REF-L	WQ-REF-M	WQ-REF-S	WQ-2-L-2	WQ-2-L-3
				Client sampling date / time	03-Nov-2020 11:10	03-Nov-2020 11:15	03-Nov-2020 11:18	03-Nov-2020 09:23	03-Nov-2020 09:44
Compound	CAS Number	LOR	Unit		ES2038827-016	ES2038827-017	ES2038827-018	ES2038827-019	ES2038827-020
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		25.2	27.9	23.9	25.1	29.0
2-Chlorophenol-D4	93951-73-6	1.0	%		57.6	54.0	45.7	63.2	55.2
2.4.6-Tribromophenol	118-79-6	1.0	%		57.5	53.7	50.4	62.1	52.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		77.9	75.7	64.2	81.9	71.3
Anthracene-d10	1719-06-8	1.0	%		78.3	74.2	67.5	85.1	73.4
4-Terphenyl-d14	1718-51-0	1.0	%		79.4	76.3	69.7	87.8	77.7
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		86.0	91.7	91.2	92.8	91.8
Toluene-D8	2037-26-5	2	%		90.9	107	105	103	103
4-Bromofluorobenzene	460-00-4	2	%		95.4	97.9	95.9	95.7	96.8

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-M-2	WQ-2-M-3	WQ-2-S-2	WQ-2-S-3	FB1
				Client sampling date / time	03-Nov-2020 09:53	03-Nov-2020 09:28	03-Nov-2020 09:47	03-Nov-2020 09:57	03-Nov-2020 08:14
Compound	CAS Number	LOR	Unit		ES2038827-021	ES2038827-022	ES2038827-023	ES2038827-024	ES2038827-025
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	8	<5	8	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	----
Arsenic	7440-38-2	0.5	µg/L		1.7	1.7	1.8	1.7	----
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	----
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	----
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	----
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	----
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	----
Manganese	7439-96-5	0.5	µg/L		0.7	0.6	0.6	0.6	----
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Vanadium	7440-62-2	0.5	µg/L		0.6	0.6	1.1	0.6	----
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	----
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		0.118	0.081	0.085	0.086	----
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		0.121	0.085	0.089	0.089	----
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		1	2	<1	<1	----
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		26	26	26	26	----
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		27	28	28	28	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-M-2	WQ-2-M-3	WQ-2-S-2	WQ-2-S-3	FB1
				Client sampling date / time	03-Nov-2020 09:53	03-Nov-2020 09:28	03-Nov-2020 09:47	03-Nov-2020 09:57	03-Nov-2020 08:14
Compound	CAS Number	LOR	Unit		ES2038827-021	ES2038827-022	ES2038827-023	ES2038827-024	ES2038827-025
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-M-2	WQ-2-M-3	WQ-2-S-2	WQ-2-S-3	FB1
				Client sampling date / time	03-Nov-2020 09:53	03-Nov-2020 09:28	03-Nov-2020 09:47	03-Nov-2020 09:57	03-Nov-2020 08:14
Compound	CAS Number	LOR	Unit		ES2038827-021	ES2038827-022	ES2038827-023	ES2038827-024	ES2038827-025
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		28.9	24.5	27.0	26.1	19.3
2-Chlorophenol-D4	93951-73-6	1.0	%		55.9	65.7	52.4	52.9	44.8
2.4.6-Tribromophenol	118-79-6	1.0	%		54.2	65.0	52.5	43.5	55.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		72.7	88.6	70.4	67.9	60.1
Anthracene-d10	1719-06-8	1.0	%		75.4	90.3	73.5	70.1	70.8
4-Terphenyl-d14	1718-51-0	1.0	%		78.2	93.6	80.4	73.8	78.1
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		110	111	117	111	107
Toluene-D8	2037-26-5	2	%		115	112	118	115	110
4-Bromofluorobenzene	460-00-4	2	%		122	118	122	120	117

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	R1	TB1	----	----	----
				Client sampling date / time	03-Nov-2020 08:18	03-Nov-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2038827-026	ES2038827-027	--------	--------	--------
					Result	Result	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L		<0.5	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L		<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L		<0.5	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L		<0.2	----	----	----	----
Copper	7440-50-8	1	µg/L		<1	----	----	----	----
Iron	7439-89-6	5	µg/L		<5	----	----	----	----
Lead	7439-92-1	0.2	µg/L		<0.2	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		<0.5	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		<0.5	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L		<0.5	----	----	----	----
Zinc	7440-66-6	5	µg/L		<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	R1	TB1	----	----	----
				Client sampling date / time	03-Nov-2020 08:18	03-Nov-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2038827-026	ES2038827-027	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
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	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**25.7**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**55.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**75.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**76.0**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**79.4**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**85.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**103**	**108**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	R1	TB1	----	----	----
				Client sampling date / time	03-Nov-2020 08:18	03-Nov-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2038827-026	ES2038827-027	--------	--------	--------
					Result	Result	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	2	%		**112**	**110**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**116**	**117**	**----**	**----**	**----**

Surrogate Control Limits

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

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6 September 2021

Ref: 60633505 M&C 4175

Craig Smith
Department of Chief Minister and Cabinet
Northern Territory Government

Dear Craig

Darwin Ship Lift Project - Water Sampling Data Report, Second Deployment

1.0 Project Details

The Northern Territory Government (NTG) intends to construct a new ship lift and vessel servicing facility at East Arm in Darwin Harbour. The project is known as the Darwin Ship Lift Project (hereafter the 'Project'). A key component of the Project will involve dredging of sediments within the project footprint to deepen the ship lift site and associated vessel berths to create safe all tide water depths for the size of the vessels which are proposed to utilise the facility.

To inform the environmental regulatory approvals for the marine construction aspects of the Project, including the assessment of potential impacts from dredging, water quality data were collected on behalf of the NTG by the Australian Institute of Marine Science (AIMS).

Water quality data were collected within the proposed Project footprint area and the wider East Arm; through the collection of water samples to test for potential contaminants (metals and hydrocarbons) and for nutrients. Furthermore, turbidity (NTU) and sub surface light (PAR) data were collected through the deployment of loggers at a location adjacent to South Shell Island.

This letter report presents the methodologies and results from the second deployment of water quality sampling undertaken for the Project during March to May 2021. It is supplementary to the report provided on 25th January 2021 which detailed the data acquired during the initial deployment; October to November 2020. The data from the two water quality monitoring periods will be presented in the EIS and other environmental approvals documents for the Project as required.

2.0 Methodology

2.1 Water Sampling

2.1.1 Sampling dates

Sampling was conducted on two occasions with the aim of capturing any effects of temporal variation in the contaminants. Samples were collected on 2nd March 2021 and 8th April 2021.

2.1.2 Sampling locations

Samples were collected at six locations as per the co-ordinates listed in Table 1, and as shown in Figure 1. Samples were collected from near seabed (L), mid water column (M) and surface (S) at each of the six locations shown in Figure 1.

Table 1 Water sampling location co-ordinates.

Site ID	Latitude	Latitude Decimal Degrees	Longitude	Longitude Decimal Degrees
WQ-1	12º 29' 29.439" S	-12.49151	130º 53' 56.030" E	130.89890
WQ-2	12º 29' 43.144" S	-12.49531	130º 53' 41.660" E	130.89491
WQ-3	12º 29' 29.057" S	-12.49140	130º 54' 6.677" E	130.90185
WQ-4	12º 29' 51.059" S	-12.49752	130º 53' 9.600" E	130.88600
WQ-5	12º 29' 31.162" S	-12.49199	130º 54' 28.163" E	130.90782
WQ-REF	12º 30' 5.402" S	-12.50150	130º 52' 27.360" E	130.87427

PROJECT ID 60633505
CREATED BY PJY
APPROVED BY PYoung
LAST MODIFIED 07 SEP 2021

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1:26,387 when printed at A4
DATUM GDA 1994, PROJECTION MGA ZONE 52
0 270 540 810 1,080
Meters

Data sources:
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Base Data: (c) Based on information provided by and with the permission of the Western Australian Land Information Authority trading as Landgate (2010).

LEGEND
- Water Quality Sampling Locations
- Shiplift
- Project site footprint
- Dredging footprint
- Reclamaiton and landside area

Darwin Ship Lift Project
Water Quality Locations

NORTHERN TERRITORY GOVERNMENT OF AUSTRALIA
DARWIN SHIP LIFT PROJECT

Figure
1

Map Document: X:\606x\60633505\900_CAD_GIS\920_GIS\MXD\20200925_Water_Quality\60633505_FigX_WQ locations_v2_A4P_20210907.mxd (peter.young)

A4 size

2.2 Turbidity and light data

From 1st March to 5th May 2021, one NTU sensor and one PAR sensor were deployed on a mooring frame approximately 1 m above the seabed, at a location adjacent to South Shell Island (Latitude -12.49752 and Longitude 130.88600 [in decimal degrees]). This is the same location where data were collected for the long term baseline turbidity dataset upon which the trigger levels for the Marine Supply Base and Multi User Barge Ramp Facility dredging campaigns were set. The data collected during the current survey have been used to provide a snapshot of contemporary data relating to background turbidity and benthic light availability.

3.0 Analysis

3.1 Water Chemistry

Samples were tested for the analytes listed in Table 2 and compared against default guideline values (DGVs) for water quality as listed in the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZG 2018).

Table 2 List of contaminants and nutrients tested for in water samples

Analyte	
Metals	Aluminium, Arsenic, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Nickel, Vanadium and Zinc
Hydrocarbons	Polynuclear Aromatic Hydrocarbons (PAH), Total Petroleum Hydrocarbons (TPH)
Nutrients	Total Kjeldahl Nitrogen, Total Nitrogen, Total Phosphorus, Total Organic Carbon, Total Inorganic Carbon and Total Carbon

3.2 NTU and PAR data

Following the final retrieval of the sensors all data were downloaded and checked for any erroneous trends due to fouling or voltage spikes. Once checked, total and daily averages were calculated for each respective month and for the whole data set. Calculating averages for each month was done as March and April represent a transitional period between from the wet to the dry seasons.

From the long term NTU dataset previously collected from South Shell Island (URS 2011), suspended sediment concentrations (SSC) from NTU were calculated assuming a linear NTU/SSC relationship and the formula *SSC = 0.848 * NTU + 7.0477*. For further comparison with that dataset, the same formula was used to calculate SSC from the current dataset.

Both NTU and PAR data were presented with reference to concurrent tidal data recorded by the PAR and NTU loggers. Daily records of rainfall at East Arm from BOM were presented alongside daily PAR, NTU and tidal data. Monthly total rainfall values from Darwin Airport are presented for the logger deployment period and for the 2010 reference data period.

4.0 Results and Discussion

4.1 Water Chemistry

The analytical results revealed there were no instances of contaminants exceeding ANZG (2018) DGVs for 95% and 99% species protection levels where applicable, in any of the samples collected. The reported concentrations of PAHs and hydrocarbons were all below the limit of reporting (LOR) across all samples. Only in the results for metals and nutrients were concentrations detected above the LOR, therefore Table 1 and Table 2 only present the results for metals and nutrients, respectively. All analytical results for all analytes across all samples are appended in Appendix A.

AECOM

Table 3 Analytical results for all metals in seawater

	Analyte	Aluminium	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Vanadium	Zinc
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	LOR	5	0.5	0.2	0.5	0.2	1	5	0.2	0.5	0.5	0.5	5
ANZG 99% or 95% SPL		-	-	**0.7**	**4.4**	**1**	**1.3**	-	**2.2**	-	**7**	**50**	**7**
Sample date:	Sample name												
2/03/2021	WQ-1-L	<5	1.2	<0.2	<0.5	<0.2	<1	<5	<0.2	1.9	<0.5	1.6	<5
8/04/2021	WQ-1-L	<5	1.4	<0.2	<0.5	<0.2	<1	6	<0.2	3.1	<0.5	2	<5
2/03/2021	WQ-1-M	<5	1.2	<0.2	<0.5	<0.2	<1	<5	<0.2	0.9	<0.5	1.7	<5
8/04/2021	WQ-1-M	<5	1.6	<0.2	<0.5	<0.2	<1	8	<0.2	3.1	<0.5	1.7	<5
2/03/2021	WQ-1-S	<5	1.2	<0.2	<0.5	<0.2	<1	<5	<0.2	1.1	<0.5	1.6	<5
8/04/2021	WQ-1-S	<5	1.5	<0.2	<0.5	<0.2	<1	10	<0.2	2.6	<0.5	2	<5
2/03/2021	WQ-2-L-1	<5	1.2	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.8	<5
8/04/2021	WQ-2-L-1	<5	1.8	<0.2	<0.5	<0.2	<1	8	<0.2	2.3	<0.5	1.9	<5
2/03/2021	WQ-2-L-2	<5	1.1	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.6	<5
8/04/2021	WQ-2-L-2	<5	1.8	<0.2	<0.5	<0.2	<1	11	<0.2	2	0.8	1.7	<5
2/03/2021	WQ-2-L-3	<5	1.2	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.6	<5
8/04/2021	WQ-2-L-3	<5	1.8	<0.2	<0.5	<0.2	<1	10	<0.2	2.2	0.6	1.8	<5
2/03/2021	WQ-2-M-1	<5	1.1	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.4	<5
8/04/2021	WQ-2-M-1	<5	1.6	<0.2	<0.5	<0.2	<1	9	<0.2	2.3	<0.5	1.8	<5
2/03/2021	WQ-2-M-2	<5	1.1	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	2	<5
8/04/2021	WQ-2-M-2	<5	1.8	<0.2	<0.5	<0.2	<1	9	<0.2	2.5	0.6	2.1	<5
2/03/2021	WQ-2-M-3	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.6	<5
8/04/2021	WQ-2-M-3	<5	1.8	<0.2	<0.5	<0.2	<1	15	<0.2	2.5	0.7	0.8	<5
2/03/2021	WQ-2-S-1	<5	0.9	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.6	<5
8/04/2021	WQ-2-S-1	<5	1.7	<0.2	<0.5	<0.2	<1	10	<0.2	1.9	<0.5	1.7	<5
2/03/2021	WQ-2-S-2	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.8	<5
8/04/2021	WQ-2-S-2	<5	2	<0.2	<0.5	<0.2	<1	10	<0.2	2.2	0.5	0.9	<5
2/03/2021	WQ-2-S-3	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	0.7	<0.5	1.2	<5
8/04/2021	WQ-2-S-3	<5	1.7	<0.2	<0.5	<0.2	<1	10	<0.2	2.1	1	0.7	<5
2/03/2021	WQ-3-L	<5	0.9	<0.2	<0.5	<0.2	<1	<5	<0.2	0.8	<0.5	2	<5
8/04/2021	WQ-3-L	<5	1.7	<0.2	<0.5	<0.2	<1	9	<0.2	2.9	<0.5	2.1	<5
2/03/2021	WQ-3-M	<5	1.1	<0.2	<0.5	<0.2	<1	<5	<0.2	0.9	<0.5	1.8	<5
8/04/2021	WQ-3-M	<5	1.7	<0.2	<0.5	<0.2	<1	10	<0.2	2.9	<0.5	1.9	<5
2/03/2021	WQ-3-S	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	0.8	<0.5	1.6	<5

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	Analyte	Aluminium	Arsenic	Cadmium	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Nickel	Vanadium	Zinc
	Units	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
	LOR	5	0.5	0.2	0.5	0.2	1	5	0.2	0.5	0.5	0.5	5
ANZG 99% or 95% SPL		-	-	**0.7**	**4.4**	**1**	**1.3**	-	**2.2**	-	**7**	**50**	**7**
Sample date:	Sample name												
8/04/2021	WQ-3-S	<5	1.4	<0.2	<0.5	<0.2	<1	11	<0.2	3.3	<0.5	1.8	<5
2/03/2021	WQ-4-L	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	0.7	<0.5	1.6	<5
8/04/2021	WQ-4-L	<5	1.7	<0.2	<0.5	<0.2	<1	9	<0.2	2	<0.5	2.2	<5
2/03/2021	WQ-4-M	<5	1.1	<0.2	<0.5	<0.2	<1	<5	<0.2	0.5	<0.5	1.5	<5
8/04/2021	WQ-4-M	<5	1.6	<0.2	<0.5	<0.2	<1	10	<0.2	2.3	0.7	1.8	<5
2/03/2021	WQ-4-S	5	0.9	<0.2	<0.5	<0.2	<1	<5	<0.2	0.8	<0.5	1.7	<5
8/04/2021	WQ-4-S	<5	1.9	<0.2	<0.5	<0.2	<1	10	<0.2	2.5	<0.5	1.7	<5
2/03/2021	WQ-5-L	<5	0.9	<0.2	<0.5	<0.2	<1	<5	<0.2	2.5	<0.5	1.4	<5
8/04/2021	WQ-5-L	<5	1.6	<0.2	<0.5	<0.2	<1	8	<0.2	2.7	0.5	1.8	<5
2/03/2021	WQ-5-M	<5	1.3	<0.2	<0.5	<0.2	<1	<5	<0.2	2.2	<0.5	1.8	<5
8/04/2021	WQ-5-M	<5	1.8	<0.2	<0.5	<0.2	<1	10	<0.2	2.9	0.7	2	<5
2/03/2021	WQ-5-S	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	2.1	<0.5	1.2	<5
8/04/2021	WQ-5-S	<5	1.7	<0.2	<0.5	<0.2	<1	10	<0.2	2.6	0.6	1.9	<5
2/03/2021	WQ-REF-L	<5	1.2	<0.2	<0.5	<0.2	<1	<5	<0.2	0.6	<0.5	2	<5
8/04/2021	WQ-REF-L	<5	1.8	<0.2	<0.5	<0.2	<1	10	<0.2	1.5	<0.5	1.9	<5
2/03/2021	WQ-REF-M	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	<0.5	<0.5	1.3	<5
8/04/2021	WQ-REF-M	<5	1.8	<0.2	<0.5	<0.2	<1	10	<0.2	1.5	0.6	1.7	<5
2/03/2021	WQ-REF-S	<5	1	<0.2	<0.5	<0.2	<1	<5	<0.2	0.5	<0.5	1.5	<5
8/04/2021	WQ-REF-S	<5	1.8	<0.2	<0.5	<0.2	<1	10	<0.2	1.8	<0.5	1.8	<5

* Species Protection Level (%) per ANZG (2018)

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Table 4 Analytical results for suspended solids, nutrients and carbon

	Analyte	Suspended Solids (SS)	Total Kjeldahl Nitrogen as N	Total Nitrogen as N	Total Phosphorus as P	Total Organic Carbon	Total Inorganic Carbon	Total Carbon
	Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	LOR	5	0.025	0.05	0.005	1	1	1
Sample date:	Sample name							
2/03/2021	WQ-1-L	18	0.081	0.094	0.007	2	25	25
8/04/2021	WQ-1-L	<5	0.109	0.114	<0.005	1	26	26
2/03/2021	WQ-1-M	11	0.11	0.124	<0.005	2	26	26
8/04/2021	WQ-1-M	<5	0.118	0.124	<0.005	<1	26	26
2/03/2021	WQ-1-S	8	0.104	0.117	<0.005	<1	24	24
8/04/2021	WQ-1-S	<5	0.1	0.106	<0.005	<1	26	26
2/03/2021	WQ-2-L-1	25	0.111	0.127	<0.005	1	25	24
8/04/2021	WQ-2-L-1	<5	0.106	0.113	<0.005	<1	27	25
2/03/2021	WQ-2-L-2	20	0.096	0.114	<0.005	1	25	23
8/04/2021	WQ-2-L-2	<5	0.117	0.127	<0.005	<1	27	25
2/03/2021	WQ-2-L-3	18	0.096	0.113	<0.005	<1	25	23
8/04/2021	WQ-2-L-3	<5	0.113	0.121	<0.005	<1	27	26
2/03/2021	WQ-2-M-1	9	0.125	0.141	<0.005	2	25	24
8/04/2021	WQ-2-M-1	<5	0.117	0.123	<0.005	2	26	25
2/03/2021	WQ-2-M-2	19	0.096	0.113	0.01	2	25	24
8/04/2021	WQ-2-M-2	<5	0.104	0.109	<0.005	<1	27	26
2/03/2021	WQ-2-M-3	16	0.117	0.133	0.009	2	25	24
8/04/2021	WQ-2-M-3	<5	0.096	0.1	<0.005	<1	27	26
2/03/2021	WQ-2-S-1	5	0.103	0.121	<0.005	1	25	23
8/04/2021	WQ-2-S-1	<5	0.111	0.114	<0.005	<1	27	26
2/03/2021	WQ-2-S-2	12	0.103	0.12	<0.005	<1	25	24
8/04/2021	WQ-2-S-2	<5	0.105	0.105	<0.005	<1	27	26
2/03/2021	WQ-2-S-3	12	0.176	0.19	<0.005	<1	25	25
8/04/2021	WQ-2-S-3	<5	0.11	0.112	<0.005	<1	27	26
2/03/2021	WQ-3-L	82	0.193	0.209	0.04	1	25	24
8/04/2021	WQ-3-L	<5	0.107	0.111	<0.005	<1	26	26
2/03/2021	WQ-3-M	65	0.183	0.198	0.027	<1	24	24
8/04/2021	WQ-3-M	<5	0.125	0.129	<0.005	<1	26	25
2/03/2021	WQ-3-S	41	0.166	0.183	0.007	<1	23	24
8/04/2021	WQ-3-S	<5	0.113	0.116	<0.005	<1	26	25

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	Analyte	Suspended Solids (SS)	Total Kjeldahl Nitrogen as N	Total Nitrogen as N	Total Phosphorus as P	Total Organic Carbon	Total Inorganic Carbon	Total Carbon
	Units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	LOR	5	0.025	0.05	0.005	1	1	1
Sample date:	Sample name							
2/03/2021	WQ-4-L	21	0.091	0.108	<0.005	1	25	24
8/04/2021	WQ-4-L	<5	0.147	0.154	<0.005	<1	26	26
2/03/2021	WQ-4-M	13	0.094	0.11	<0.005	<1	25	23
8/04/2021	WQ-4-M	<5	0.09	0.098	<0.005	<1	26	25
2/03/2021	WQ-4-S	16	0.092	0.107	<0.005	1	25	23
8/04/2021	WQ-4-S	<5	0.117	0.117	<0.005	<1	28	25
2/03/2021	WQ-5-L	18	0.117	0.125	<0.005	2	24	24
8/04/2021	WQ-5-L	<5	0.114	0.123	<0.005	<1	29	25
2/03/2021	WQ-5-M	16	0.118	0.126	<0.005	1	24	24
8/04/2021	WQ-5-M	<5	0.111	0.111	<0.005	<1	27	26
2/03/2021	WQ-5-S	9	0.113	0.119	<0.005	1	25	24
8/04/2021	WQ-5-S	8	0.133	0.133	<0.005	<1	27	25
2/03/2021	WQ-REF-L	39	0.113	0.128	0.022	1	24	23
8/04/2021	WQ-REF-L	<5	0.116	0.124	<0.005	<1	26	25
2/03/2021	WQ-REF-M	32	0.11	0.128	<0.005	5	25	23
8/04/2021	WQ-REF-M	<5	0.125	0.125	<0.005	<1	28	25
2/03/2021	WQ-REF-S	26	0.111	0.125	<0.005	<1	24	24
8/04/2021	WQ-REF-S	<5	0.112	0.112	<0.005	<1	26	25

4.2 NTU and PAR data

Total and daily averages, maximum and minimum NTU values and calculated SSCs for each month and across the whole deployment are presented in

Table 5, with concurrent monthly rainfall levels are shown in Figure 2. NTU values are graphed in Figure 3 for the duration of the deployment along with depth and daily rainfall data. Figure 4 presents the PAR data recorded during the deployment period along with depth and rainfall data.

Table 5 NTU Statistics

Statistic	March	April	Whole deployment	reference 2010 data set #	
				Dry Season	Wet Season
Total Mean NTU	5.8	4.6	5.0	4.4	8.3
Total Max NTU	26.4	23.3	26.4	46.4	68.0
Total Min NTU	0.2	0.5	0.2	0.1	0.2
Mean of Daily NTU Means	6.6	4.9	5.7	-	-
Max of Daily NTU Means	16.3	13.9	16.3	-	-
Min of Daily NTU Means	1.6	1.5	1.5	-	-
Total SSC Mean (mg/L)*	11.9	11.0	11.3	10.8	14.1
Total SSC Max (mg/L)*	29.2	26.8	29.2	46.4	64.7
Total SSC Min (mg/L)*	7.2**	7.5**	7.2**	7.1**	7.2**
SSC Daily Means(mg/L)*	12.2	10.9	11.6	-	-
SSC Daily Max(mg/L)*	20.9	26.8	29.2	-	-
SSC Daily Min(mg/L)*	7.0**	7.5**	7.2**	-	-

* Calculated from NTU using relationship in URS (2011): SSC = 0.848 * NTU + 7.0477

** These values are an artefact of applying a linear equation to the SSC/NTU relationship and the actual SSCs are likely to have been considerably lower.

Long term data set (URS 2011)

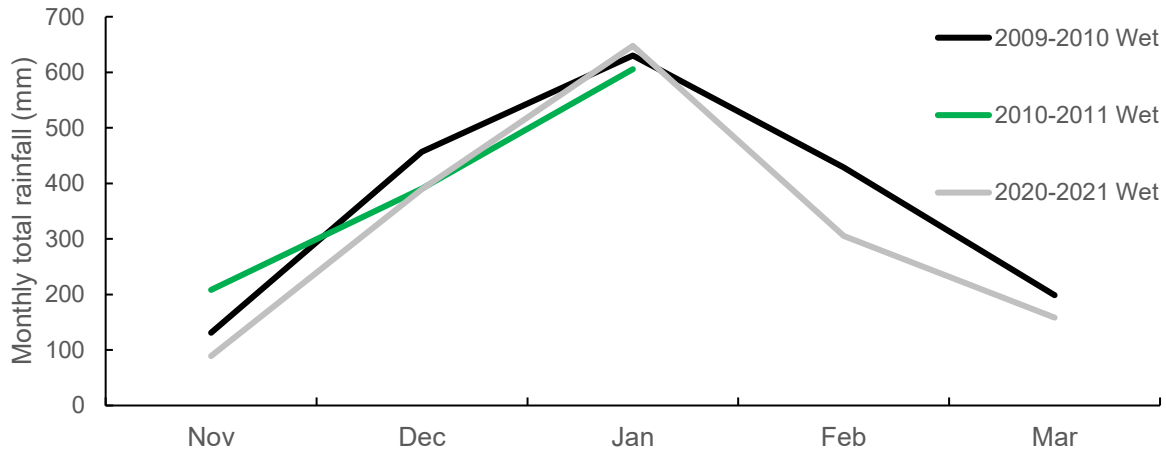

Figure 2 Monthly total rainfall data Darwin, Airport (BOM)

Average daily turbidity values ranged between 1.6 and 16.3 NTU across the whole deployment. NTU and SSC were highest during spring tidal periods when water movements were greatest (Figure 3). Notably daily PAR readings were highest during spring tides despite turbidity levels being at their greatest (Figure 4). This is as a result of the large tidal range and the very shallow water depths during

low spring tide minimising light attenuation. Low water depths resulted in reduced light attenuation whereas, conversely, during high spring tide PAR readings dropped to near night-time values.

Mean, maximum and minimum NTU and SCC values were calculated and presented alongside the reference NTU dataset previously collected from South Shell Island (URS 2011) (Table 5). During that study, maximum NTU levels during the dry season were approximately double the maximum NTU recorded during the March-April snapshot in this study. Similarly, the maximum NTU recorded in the long term data set for the Wet season was roughly three times greater than values recorded during March and April during the current study. Mean NTU values were similar to dry season long-term averages and roughly half those recorded during the long-term wet season data. These differences are most likely due to short term perturbations in turbidity identified during this two-month snap-shot whereas the dry and wet season means were derived from data collected over greater time extents.

The current study represents data from the 2021 Dry to Wet transition period.

Although several rainfall events were recorded during the deployment period, no qualitative correlation between rainfall and turbidity of PAR are apparent. Turbidity and PAR appear to be predominantly influenced by tidal phase. This is typical of macrotidal coastal soft-sediment environments where tidal range and phase as wave action determine current velocity and subsequently effect sediment entrainment and ultimately turbidity and PAR. Although rainfall has a significant effect on turbidity the relationship is often more complex and is affected by catchment flow rates and small-scale coastal geomorphology. As monthly rainfall in the 2020-2021 clearly lower than 2010/2011 wet season, this may explain why reference turbidity levels from 2011 were significantly greater than those recorded during the current deployment period.

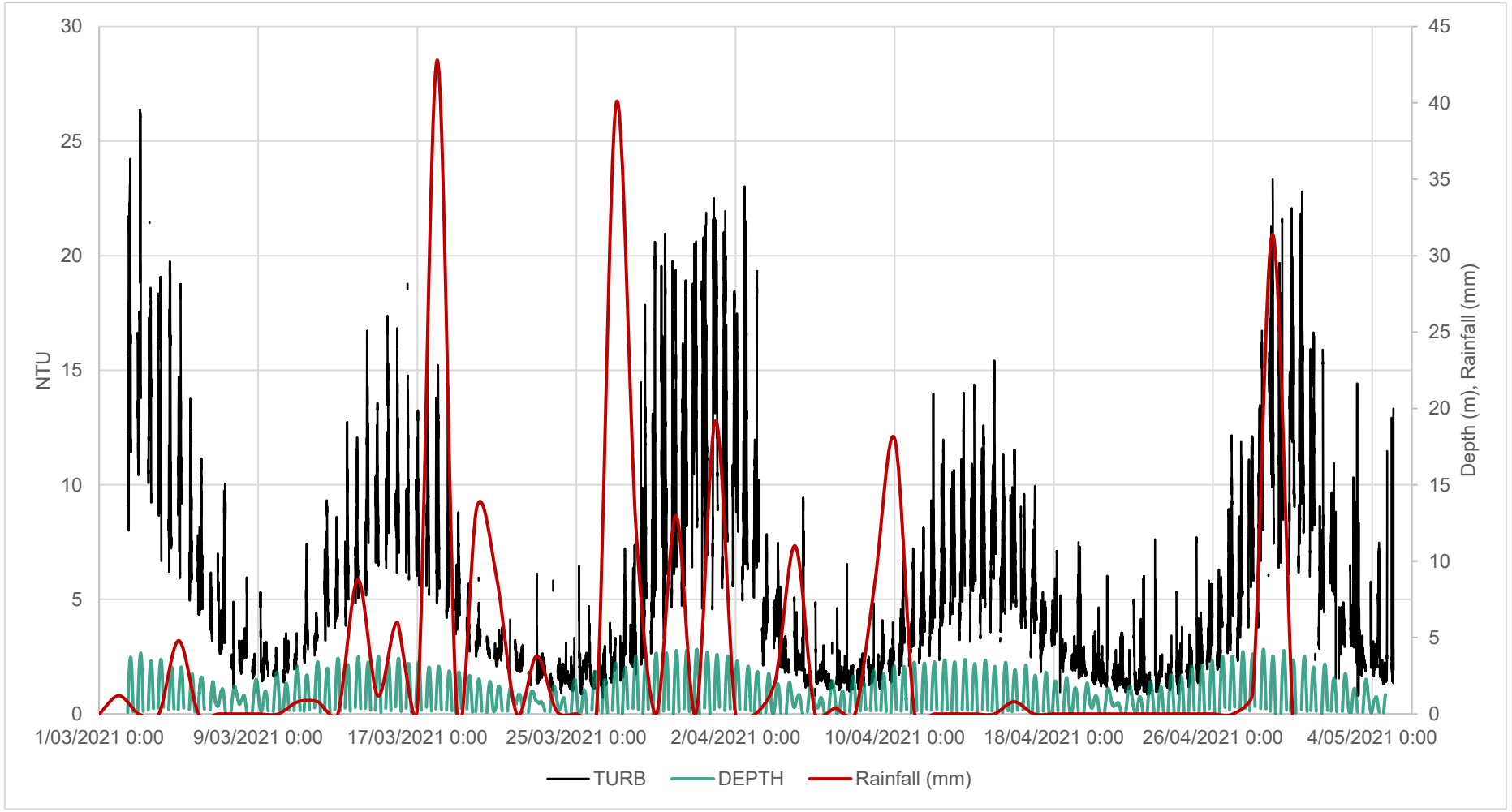

Figure 3 NTU, depth and daily rainfall data

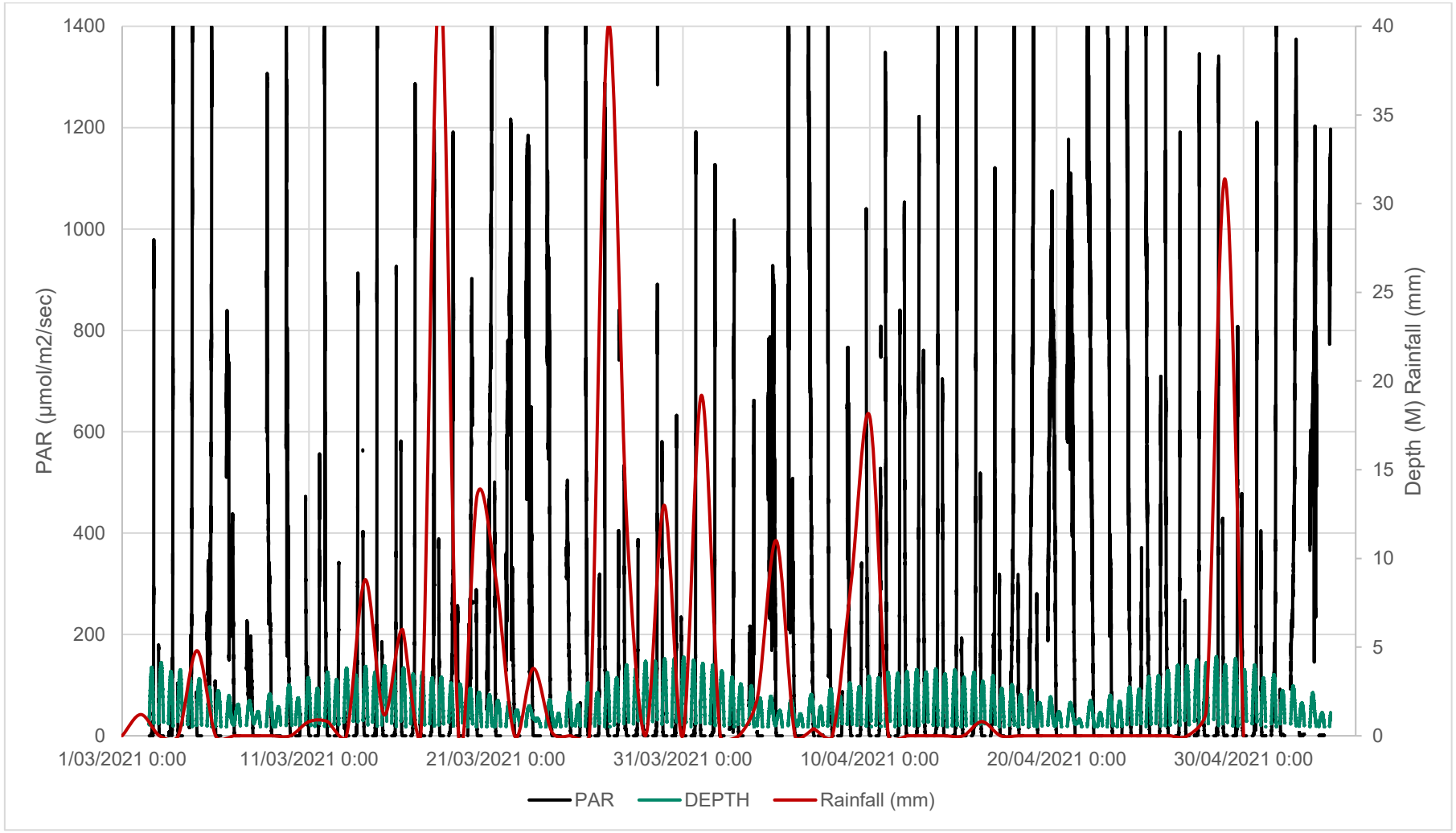

Figure 4 PAR, Depth and daily rainfall data

5.0 References

ANZG 2018. ANZG 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra ACT, Australia. Available at www.waterquality.gov.au/anz-guidelines

URS 2011. Ichth ys Gas Field Development Project: summary of the long-term water-quality and program for Darwin Harbour. Report prepared for INPEX Browse, Ltd, R1589, March 2011. Technical appendix S9 to INPEX (2011).

We trust that the information presented in this letter report meets your current requirements. However, if you need any clarification of, or discussion on, any aspects of the letter, then please do not hesitate to contact the undersigned.

Yours faithfully

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Appendix A

Laboratory Analytical Reports

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **ES2038827**	Page	: 1 of 21
Client	: **AECOM Australia Pty Ltd**	Laboratory	: Environmental Division Sydney
Contact	: PETER YOUNG	Contact	: Brenda Hong
Address	: GPO BOX 3175 DARWIN NT, AUSTRALIA 0801	Address	: 277-289 Woodpark Road Smithfield NSW Australia 2164
Telephone	: 6432 2000	Telephone	: +61 2 8784 8555
Project	: 60566025	Date Samples Received	: 05-Nov-2020 07:30
Order number	: 60566025	Date Analysis Commenced	: 05-Nov-2020
C-O-C number	: ----	Issue Date	: 12-Nov-2020 14:33
Sampler	: ----		
Site	: ----		
Quote number	: SY/182/20		
No. of samples received	: 27		
No. of samples analysed	: 27		

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*
Ankit Joshi	Inorganic Chemist	Sydney Inorganics, Smithfield, NSW
Celine Conceicao	Senior Spectroscopist	Sydney Inorganics, Smithfield, NSW
Edwandy Fadjar	Organic Coordinator	Sydney Organics, Smithfield, NSW
Ivan Taylor	Analyst	Sydney Inorganics, Smithfield, NSW

General Comments

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the 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.

- EP075 (SIM): Where reported, Benzo(a)pyrene Toxicity Equivalent Quotient (TEQ) per the NEPM (2013) 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.
- EP080: Where reported, Total Xylenes is the sum of the reported concentrations of m&p-Xylene and o-Xylene at or above the LOR.
- EP075(SIM): Where reported, Total Cresol is the sum of the reported concentrations of 2-Methylphenol and 3- & 4-Methylphenol at or above the LOR.
- EG093: Samples containing high levels of sulfate may precipitate barium under the acidic conditions of this method and may therefore bias results low.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-1-L	WQ-1-M	WQ-1-S	WQ-2-L-1	WQ-2-M-1
				Client sampling date / time	03-Nov-2020 08:26	03-Nov-2020 08:33	03-Nov-2020 08:39	03-Nov-2020 09:20	03-Nov-2020 09:38
Compound	CAS Number	LOR	Unit		ES2038827-001	ES2038827-002	ES2038827-003	ES2038827-004	ES2038827-005
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**6**	**16**	**20**	**10**	**6**
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		**1.6**	**1.7**	**1.5**	**1.6**	**1.6**
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	<1
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		**1.2**	**1.4**	**1.2**	**1.1**	**0.7**
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		**0.083**	**0.103**	**0.067**	**0.074**	**0.062**
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		**0.089**	**0.108**	**0.073**	**0.080**	**0.068**
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**1**	**2**	**2**	**2**	**1**
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		**29**	**28**	**28**	**27**	**27**
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		**30**	**30**	**29**	**28**	**27**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-1-L	WQ-1-M	WQ-1-S	WQ-2-L-1	WQ-2-M-1
				Client sampling date / time	03-Nov-2020 08:26	03-Nov-2020 08:33	03-Nov-2020 08:39	03-Nov-2020 09:20	03-Nov-2020 09:38
Compound	CAS Number	LOR	Unit		ES2038827-001	ES2038827-002	ES2038827-003	ES2038827-004	ES2038827-005
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-1-L	WQ-1-M	WQ-1-S	WQ-2-L-1	WQ-2-M-1
				Client sampling date / time	03-Nov-2020 08:26	03-Nov-2020 08:33	03-Nov-2020 08:39	03-Nov-2020 09:20	03-Nov-2020 09:38
Compound	CAS Number	LOR	Unit		ES2038827-001	ES2038827-002	ES2038827-003	ES2038827-004	ES2038827-005
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		22.5	28.6	27.8	27.8	17.7
2-Chlorophenol-D4	93951-73-6	1.0	%		42.4	56.0	54.1	51.5	34.6
2.4.6-Tribromophenol	118-79-6	1.0	%		50.4	53.7	52.2	50.8	41.4
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		60.2	72.0	70.2	69.2	54.0
Anthracene-d10	1719-06-8	1.0	%		68.5	70.1	68.8	69.2	64.2
4-Terphenyl-d14	1718-51-0	1.0	%		72.9	73.4	77.5	72.4	63.0
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		131	131	92.2	132	93.4
Toluene-D8	2037-26-5	2	%		127	126	99.6	129	101
4-Bromofluorobenzene	460-00-4	2	%		122	124	96.5	126	95.4

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-S-1	WQ-3-L	WQ-3-M	WQ-3-S	WQ-4-L
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 08:51	03-Nov-2020 08:59	03-Nov-2020 09:07	03-Nov-2020 10:41
Compound	CAS Number	LOR	Unit		ES2038827-006	ES2038827-007	ES2038827-008	ES2038827-009	ES2038827-010
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	10	11	7	8
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		1.6	1.7	1.6	1.6	1.6
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	<1
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		0.6	1.1	0.9	0.8	1.1
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		0.072	0.088	0.075	0.094	0.135
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		0.077	0.093	0.080	0.099	0.138
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		<1	1	<1	2	1
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		27	27	27	27	27
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		28	28	28	28	28
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-S-1	WQ-3-L	WQ-3-M	WQ-3-S	WQ-4-L
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 08:51	03-Nov-2020 08:59	03-Nov-2020 09:07	03-Nov-2020 10:41
Compound	CAS Number	LOR	Unit		ES2038827-006	ES2038827-007	ES2038827-008	ES2038827-009	ES2038827-010
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-S-1	WQ-3-L	WQ-3-M	WQ-3-S	WQ-4-L
				Client sampling date / time	03-Nov-2020 09:50	03-Nov-2020 08:51	03-Nov-2020 08:59	03-Nov-2020 09:07	03-Nov-2020 10:41
Compound	CAS Number	LOR	Unit		ES2038827-006	ES2038827-007	ES2038827-008	ES2038827-009	ES2038827-010
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		28.3	24.4	24.7	23.7	18.0
2-Chlorophenol-D4	93951-73-6	1.0	%		54.1	46.6	46.6	44.6	36.1
2.4.6-Tribromophenol	118-79-6	1.0	%		50.7	45.6	43.0	47.2	47.6
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		73.1	65.3	63.3	63.7	55.2
Anthracene-d10	1719-06-8	1.0	%		72.2	64.8	64.6	65.3	63.1
4-Terphenyl-d14	1718-51-0	1.0	%		74.6	67.1	67.4	67.2	64.3
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		94.1	135	88.8	92.1	132
Toluene-D8	2037-26-5	2	%		97.6	129	94.9	100.0	122
4-Bromofluorobenzene	460-00-4	2	%		97.0	125	89.6	99.0	122

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-4-M	WQ-4-S	WQ-5-L	WQ-5-M	WQ-5-S
				Client sampling date / time	03-Nov-2020 10:46	03-Nov-2020 10:54	03-Nov-2020 10:13	03-Nov-2020 10:20	03-Nov-2020 10:25
Compound	CAS Number	LOR	Unit		ES2038827-011	ES2038827-012	ES2038827-013	ES2038827-014	ES2038827-015
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		**12**	<5	**12**	<5	<5
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		**1.6**	**1.6**	**1.7**	**1.5**	**1.6**
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	**1**	**1**
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		**0.9**	**1.0**	**2.4**	**2.2**	**2.1**
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		**0.089**	**0.092**	**0.121**	**0.154**	**0.074**
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		**0.092**	**0.095**	**0.121**	**0.156**	**0.076**
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		**1**	<1	<1	**2**	<1
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		**27**	**27**	**28**	**28**	**28**
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		**27**	**28**	**29**	**28**	**28**
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-4-M	WQ-4-S	WQ-5-L	WQ-5-M	WQ-5-S
				Client sampling date / time	03-Nov-2020 10:46	03-Nov-2020 10:54	03-Nov-2020 10:13	03-Nov-2020 10:20	03-Nov-2020 10:25
Compound	CAS Number	LOR	Unit		ES2038827-011	ES2038827-012	ES2038827-013	ES2038827-014	ES2038827-015
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-4-M	WQ-4-S	WQ-5-L	WQ-5-M	WQ-5-S
				Client sampling date / time	03-Nov-2020 10:46	03-Nov-2020 10:54	03-Nov-2020 10:13	03-Nov-2020 10:20	03-Nov-2020 10:25
Compound	CAS Number	LOR	Unit		ES2038827-011	ES2038827-012	ES2038827-013	ES2038827-014	ES2038827-015
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		25.4	22.6	22.6	20.2	25.6
2-Chlorophenol-D4	93951-73-6	1.0	%		48.5	43.9	45.1	40.2	49.9
2.4.6-Tribromophenol	118-79-6	1.0	%		48.6	49.5	55.2	49.8	48.9
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		65.9	65.0	62.8	60.9	68.6
Anthracene-d10	1719-06-8	1.0	%		67.9	68.4	72.3	67.2	69.3
4-Terphenyl-d14	1718-51-0	1.0	%		70.0	71.7	75.6	74.1	70.8
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		91.1	89.2	91.2	95.1	96.6
Toluene-D8	2037-26-5	2	%		102	101	103	96.3	100
4-Bromofluorobenzene	460-00-4	2	%		105	94.7	94.7	95.0	96.7

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-REF-L	WQ-REF-M	WQ-REF-S	WQ-2-L-2	WQ-2-L-3
				Client sampling date / time	03-Nov-2020 11:10	03-Nov-2020 11:15	03-Nov-2020 11:18	03-Nov-2020 09:23	03-Nov-2020 09:44
Compound	CAS Number	LOR	Unit		ES2038827-016	ES2038827-017	ES2038827-018	ES2038827-019	ES2038827-020
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	<5	8	<5	<5
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	<0.00004
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	<5
Arsenic	7440-38-2	0.5	µg/L		1.7	1.7	1.7	1.7	1.7
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	<1
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	<5
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	<0.2
Manganese	7439-96-5	0.5	µg/L		0.9	1.0	0.9	1.2	1.1
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	<0.5
Vanadium	7440-62-2	0.5	µg/L		<0.5	<0.5	1.8	1.1	<0.5
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	<5
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		0.074	0.079	0.075	0.118	0.121
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		0.078	0.082	0.078	0.121	0.124
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		<1	1	<1	2	2
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		26	26	26	26	26
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		27	27	27	27	28
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-REF-L	WQ-REF-M	WQ-REF-S	WQ-2-L-2	WQ-2-L-3
				Client sampling date / time	03-Nov-2020 11:10	03-Nov-2020 11:15	03-Nov-2020 11:18	03-Nov-2020 09:23	03-Nov-2020 09:44
Compound	CAS Number	LOR	Unit		ES2038827-016	ES2038827-017	ES2038827-018	ES2038827-019	ES2038827-020
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-REF-L	WQ-REF-M	WQ-REF-S	WQ-2-L-2	WQ-2-L-3
				Client sampling date / time	03-Nov-2020 11:10	03-Nov-2020 11:15	03-Nov-2020 11:18	03-Nov-2020 09:23	03-Nov-2020 09:44
Compound	CAS Number	LOR	Unit		ES2038827-016	ES2038827-017	ES2038827-018	ES2038827-019	ES2038827-020
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		25.2	27.9	23.9	25.1	29.0
2-Chlorophenol-D4	93951-73-6	1.0	%		57.6	54.0	45.7	63.2	55.2
2.4.6-Tribromophenol	118-79-6	1.0	%		57.5	53.7	50.4	62.1	52.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		77.9	75.7	64.2	81.9	71.3
Anthracene-d10	1719-06-8	1.0	%		78.3	74.2	67.5	85.1	73.4
4-Terphenyl-d14	1718-51-0	1.0	%		79.4	76.3	69.7	87.8	77.7
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		86.0	91.7	91.2	92.8	91.8
Toluene-D8	2037-26-5	2	%		90.9	107	105	103	103
4-Bromofluorobenzene	460-00-4	2	%		95.4	97.9	95.9	95.7	96.8

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-M-2	WQ-2-M-3	WQ-2-S-2	WQ-2-S-3	FB1
				Client sampling date / time	03-Nov-2020 09:53	03-Nov-2020 09:28	03-Nov-2020 09:47	03-Nov-2020 09:57	03-Nov-2020 08:14
Compound	CAS Number	LOR	Unit		ES2038827-021	ES2038827-022	ES2038827-023	ES2038827-024	ES2038827-025
					Result	Result	Result	Result	Result
EA025: Total Suspended Solids dried at 104 ± 2°C									
Suspended Solids (SS)	----	5	mg/L		<5	8	<5	8	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	<0.00004	<0.00004	<0.00004	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	<5	<5	<5	----
Arsenic	7440-38-2	0.5	µg/L		1.7	1.7	1.8	1.7	----
Cadmium	7440-43-9	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	----
Chromium	7440-47-3	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Cobalt	7440-48-4	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	----
Copper	7440-50-8	1	µg/L		<1	<1	<1	<1	----
Iron	7439-89-6	5	µg/L		<5	<5	<5	<5	----
Lead	7439-92-1	0.2	µg/L		<0.2	<0.2	<0.2	<0.2	----
Manganese	7439-96-5	0.5	µg/L		0.7	0.6	0.6	0.6	----
Nickel	7440-02-0	0.5	µg/L		<0.5	<0.5	<0.5	<0.5	----
Vanadium	7440-62-2	0.5	µg/L		0.6	0.6	1.1	0.6	----
Zinc	7440-66-6	5	µg/L		<5	<5	<5	<5	----
EK261A: Total Kjeldahl Nitrogen									
Total Kjeldahl Nitrogen as N	----	0.025	mg/L		0.118	0.081	0.085	0.086	----
EK262A: Total Nitrogen									
Total Nitrogen as N	----	0.050	mg/L		0.121	0.085	0.089	0.089	----
EK267A: Total Phosphorus (Persulfate Digestion)									
Total Phosphorus as P	----	0.005	mg/L		<0.005	<0.005	<0.005	<0.005	----
EP005: Total Organic Carbon (TOC)									
Total Organic Carbon	----	1	mg/L		1	2	<1	<1	----
EP006 Total Inorganic Carbon									
Total Inorganic Carbon	----	1	mg/L		26	26	26	26	----
EP007 Total Carbon									
Total Carbon	TC	1	mg/L		27	28	28	28	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	83-32-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	86-73-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	85-01-8	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-M-2	WQ-2-M-3	WQ-2-S-2	WQ-2-S-3	FB1
				Client sampling date / time	03-Nov-2020 09:53	03-Nov-2020 09:28	03-Nov-2020 09:47	03-Nov-2020 09:57	03-Nov-2020 08:14
Compound	CAS Number	LOR	Unit		ES2038827-021	ES2038827-022	ES2038827-023	ES2038827-024	ES2038827-025
					Result	Result	Result	Result	Result
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons - Continued									
Anthracene	120-12-7	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	206-44-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	129-00-0	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	218-01-9	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	207-08-9	1.0	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	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g.h.i)perylene	191-24-2	1.0	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
EP080/071: Total Petroleum Hydrocarbons									
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
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
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
EP080: BTEXN									
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

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	WQ-2-M-2	WQ-2-M-3	WQ-2-S-2	WQ-2-S-3	FB1
				Client sampling date / time	03-Nov-2020 09:53	03-Nov-2020 09:28	03-Nov-2020 09:47	03-Nov-2020 09:57	03-Nov-2020 08:14
Compound	CAS Number	LOR	Unit		ES2038827-021	ES2038827-022	ES2038827-023	ES2038827-024	ES2038827-025
					Result	Result	Result	Result	Result
EP080: BTEXN - Continued									
^ Total Xylenes	----	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
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		28.9	24.5	27.0	26.1	19.3
2-Chlorophenol-D4	93951-73-6	1.0	%		55.9	65.7	52.4	52.9	44.8
2.4.6-Tribromophenol	118-79-6	1.0	%		54.2	65.0	52.5	43.5	55.0
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		72.7	88.6	70.4	67.9	60.1
Anthracene-d10	1719-06-8	1.0	%		75.4	90.3	73.5	70.1	70.8
4-Terphenyl-d14	1718-51-0	1.0	%		78.2	93.6	80.4	73.8	78.1
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		110	111	117	111	107
Toluene-D8	2037-26-5	2	%		115	112	118	115	110
4-Bromofluorobenzene	460-00-4	2	%		122	118	122	120	117

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	R1	TB1	----	----	----
				Client sampling date / time	03-Nov-2020 08:18	03-Nov-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2038827-026	ES2038827-027	--------	--------	--------
					Result	Result	----	----	----
EG035F: Dissolved Mercury by FIMS									
Mercury	7439-97-6	0.00004	mg/L		<0.00004	----	----	----	----
EG093F: Dissolved Metals in Saline Water by ORC-ICPMS									
Aluminium	7429-90-5	5	µg/L		<5	----	----	----	----
Arsenic	7440-38-2	0.5	µg/L		<0.5	----	----	----	----
Cadmium	7440-43-9	0.2	µg/L		<0.2	----	----	----	----
Chromium	7440-47-3	0.5	µg/L		<0.5	----	----	----	----
Cobalt	7440-48-4	0.2	µg/L		<0.2	----	----	----	----
Copper	7440-50-8	1	µg/L		<1	----	----	----	----
Iron	7439-89-6	5	µg/L		<5	----	----	----	----
Lead	7439-92-1	0.2	µg/L		<0.2	----	----	----	----
Manganese	7439-96-5	0.5	µg/L		<0.5	----	----	----	----
Nickel	7440-02-0	0.5	µg/L		<0.5	----	----	----	----
Vanadium	7440-62-2	0.5	µg/L		<0.5	----	----	----	----
Zinc	7440-66-6	5	µg/L		<5	----	----	----	----
EP075(SIM)B: Polynuclear Aromatic Hydrocarbons									
Naphthalene	91-20-3	1.0	µg/L		<1.0	----	----	----	----
Acenaphthylene	208-96-8	1.0	µg/L		<1.0	----	----	----	----
Acenaphthene	83-32-9	1.0	µg/L		<1.0	----	----	----	----
Fluorene	86-73-7	1.0	µg/L		<1.0	----	----	----	----
Phenanthrene	85-01-8	1.0	µg/L		<1.0	----	----	----	----
Anthracene	120-12-7	1.0	µg/L		<1.0	----	----	----	----
Fluoranthene	206-44-0	1.0	µg/L		<1.0	----	----	----	----
Pyrene	129-00-0	1.0	µg/L		<1.0	----	----	----	----
Benz(a)anthracene	56-55-3	1.0	µg/L		<1.0	----	----	----	----
Chrysene	218-01-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(b+j)fluoranthene	205-99-2 205-82-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(k)fluoranthene	207-08-9	1.0	µg/L		<1.0	----	----	----	----
Benzo(a)pyrene	50-32-8	0.5	µg/L		<0.5	----	----	----	----
Indeno(1.2.3.cd)pyrene	193-39-5	1.0	µg/L		<1.0	----	----	----	----
Dibenz(a.h)anthracene	53-70-3	1.0	µg/L		<1.0	----	----	----	----
Benzo(g.h.i)perylene	191-24-2	1.0	µg/L		<1.0	----	----	----	----
^ Sum of polycyclic aromatic hydrocarbons	----	0.5	µg/L		<0.5	----	----	----	----
^ Benzo(a)pyrene TEQ (zero)	----	0.5	µg/L		<0.5	----	----	----	----
EP080/071: Total Petroleum Hydrocarbons									

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	R1	TB1	----	----	----
				Client sampling date / time	03-Nov-2020 08:18	03-Nov-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2038827-026	ES2038827-027	--------	--------	--------
					Result	Result	----	----	----
EP080/071: Total Petroleum Hydrocarbons - Continued									
C6 - C9 Fraction	----	20	µg/L		<20	<20	----	----	----
C10 - C14 Fraction	----	50	µg/L		<50	----	----	----	----
C15 - C28 Fraction	----	100	µg/L		<100	----	----	----	----
C29 - C36 Fraction	----	50	µg/L		<50	----	----	----	----
^ C10 - C36 Fraction (sum)	----	50	µg/L		<50	----	----	----	----
EP080/071: Total Recoverable Hydrocarbons - NEPM 2013 Fractions									
C6 - C10 Fraction	C6_C10	20	µg/L		<20	<20	----	----	----
^ C6 - C10 Fraction minus BTEX (F1)	C6_C10-BTEX	20	µg/L		<20	<20	----	----	----
>C10 - C16 Fraction	----	100	µg/L		<100	----	----	----	----
>C16 - C34 Fraction	----	100	µg/L		<100	----	----	----	----
>C34 - C40 Fraction	----	100	µg/L		<100	----	----	----	----
^ >C10 - C40 Fraction (sum)	----	100	µg/L		<100	----	----	----	----
^ >C10 - C16 Fraction minus Naphthalene (F2)	----	100	µg/L		<100	----	----	----	----
EP080: BTEXN									
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	----	2	µg/L		<2	<2	----	----	----
^ Sum of BTEX	----	1	µg/L		<1	<1	----	----	----
Naphthalene	91-20-3	5	µg/L		<5	<5	----	----	----
EP075(SIM)S: Phenolic Compound Surrogates									
Phenol-d6	13127-88-3	1.0	%		**25.7**	----	----	----	----
2-Chlorophenol-D4	93951-73-6	1.0	%		**55.8**	----	----	----	----
2.4.6-Tribromophenol	118-79-6	1.0	%		**75.7**	----	----	----	----
EP075(SIM)T: PAH Surrogates									
2-Fluorobiphenyl	321-60-8	1.0	%		**76.0**	----	----	----	----
Anthracene-d10	1719-06-8	1.0	%		**79.4**	----	----	----	----
4-Terphenyl-d14	1718-51-0	1.0	%		**85.5**	----	----	----	----
EP080S: TPH(V)/BTEX Surrogates									
1.2-Dichloroethane-D4	17060-07-0	2	%		**103**	**108**	----	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				Client sample ID	R1	TB1	----	----	----
				Client sampling date / time	03-Nov-2020 08:18	03-Nov-2020 00:00	----	----	----
Compound	CAS Number	LOR	Unit		ES2038827-026	ES2038827-027	--------	--------	--------
					Result	Result	----	----	----
EP080S: TPH(V)/BTEX Surrogates - Continued									
Toluene-D8	2037-26-5	2	%		**112**	**110**	**----**	**----**	**----**
4-Bromofluorobenzene	460-00-4	2	%		**116**	**117**	**----**	**----**	**----**

Surrogate Control Limits

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