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1 INTRODUCTION

1.1 BACKGROUND

Located on the La Colette peninsular south east of St Helier on Jersey, the La Collette waste management facility has been in operation since 1995. The current Waste Management Licence to operate the site (WML001), was issued in December 2013. The licence requires the operator to undertake monitoring on a quarterly basis. In addition, the licence requires the production of an annual report, which provides an overview of the data collected over the course of the year.

The site consists of lined cells that contain incinerator ash wastes that are underlain and surrounded by inert waste fill (mainly construction and excavated soil wastes). This area is then bounded by the armoured sea wall outside of which lies the open marine environment. The water quality monitoring programme was established in 2011[1] following an extensive baseline survey to characterise the site in terms of pollutant potential, pathways and sensitive receptors. The source, pathway, receptor concept is a widely recognised standard approach to assessing pollution potential.

In accordance with the baseline survey, the ash cells are considered the principle pollutant *source*. The inert waste fill material, in comparison, has a minor pollutant potential resulting from a low percentage of non-inert material. Passage of water from around the ash cells and from the inert fill through the armoured sea wall represents the *pathway* for any pollutants to reach the seawater on the outside. The most important *receptor* is the marine environment near to the La Collette peninsular, due to its designation as a RAMSAR site. Specifically, the South East Jersey Coast RAMSAR site (designated in recognition of a diverse and rare ecology and biodiversity) commences on the western edge of the La Collette site and continues east and south, extending from the peninsula.

Water samples have been collected at the site since 2011. Water samples are collected frequently from a number of locations across the La Collette site to enable any changes in the water quality to be determined. A strategic review of the water quality monitoring programme was conducted in 2015, and a revised programme devised. The changes involved reductions in the number of sites sampled and suite of analyses used. These changes have taken into account the extensive data already collected and ensures that the data collected still provides the evidence base to monitor the long term performance of the site, and the protection of the sensitive surrounding habitats.

[1] Capita Symonds (2011): States of Jersey Transport and Technical Services La Collette Waste Management Facility – Baseline water quality review. November 2011.

1.2 AIMS AND SCOPE OF REPORT

This report presents a review of the water quality data for 2016.

Section 2 *sets out the sampling, analysis and assessment methodology.*

Section 3 *sets out the results for the 2016 monitoring programme and subsequent trend Analysis*

Section 4 *provides conclusions based on the 2016 data*

Appendix A-E *provides the 2016 data for phenols, other organics, metals and inorganics*

Appendix F *provides descriptive statistics used for the data assessment*

2 METHODOLOGY

During the 2016 monitoring period, the sampling methodology was amended following a Strategic Review undertaken by Cascade in early 2015[2]. The result of this review was an updated Operational Water Quality Monitoring Plan[3], which came into effect from Quarter 3 (Q3) of 2015. As such, the monitoring strategy followed during 2016 was that of the update Operational Water Quality Monitoring Plan.

An overview of the changes has been presented in the Cascade consulting (2016). La Collette Water Quality – Annual Review 2016 report, which have not been repeated below.

2.1 2016 MONITORING LOCATIONS

As with the previous 2011 Monitoring Strategy, monitoring is continued at the three discrete areas (Northern Mound Area, Eastern Ash Cell Area and Inert Waste Fill Area) outlined in **Figure 2.1**.

Within each area, the number of monitoring sites was rationalised to ensure that duplication of data collection is avoided and samples taken are targeted at providing data which is relevant to protection of the environment. The post-2015 review monitoring locations are set out in **Table 2.1** below.

Table 2.1 Monitoring Locations Post 2015 Review

Area	Site Type	Locations for monitoring – post 2015 review
Northern Mound Area	Dip Tubes (DT)	DT3, DT6
	Surface Water (SW)	SW18, SW20
Eastern Ash Cell Area	Dip Tubes (DT)	DT25S, DT22, DT36N, DT16S, DT18, DT29N, DT32N
	Boreholes (BH)	BH5, BH6 (50mm), BH2R, BH7, Bh3R
	Surface Water (SW)	SW8, SW12, SW14
Inert Waste Fill Area	Boreholes (BH)	BH9, BH11, BH10, BH12
	Lagoon (LAG)	LAG 1
	Surface Water (SW)	SW1, SW2

Of these locations, of note is the extinguishment of BH3R after the 2016 Q1 round due to new ash cell construction

[2] Cascade (2015). Strategic Review of the water quality monitoring programme for La Collette waste facility. On behalf of The States of Jersey.
[3] Cascade (2015a). La Collette Waste Management Facility - Operational Water Quality Monitoring Plan 2015 On behalf of The States of Jersey.

2.2 DETERMINANDS

The updated monitoring strategy amended the list of determinands for which water quality samples are tested for, dividing the analyses into a **Long Suite** and a **Short Suite.** The determinands investigated in each suite are listed in **Table 2.2**. Of note is the 4 No. descriptions of analysis used for determination of Total Phenol Concentration (all of which are described as test Method TM259). The two descriptions which refer to analysis of fresh water are Phenol and Phenols, Total Detected Monohydric. The two descriptions referring to analysis of saline waters are; Saline Phenol by HPLC (w) and Sum of Detected Monohydric Phenols saline Matrix. The Limit Of Detection (LOD) for each of these analyses varies slightly.

At the time of sample collection, the following in-situ water quality parameters are also recorded. These form part of the **short suite** and are:

- pH (in pH units).
- Temperature (degrees centigrade, ^{o}C).
- Salinity (parts per thousand,).

In addition, at the time of collecting samples for the **long suite,** the following additional parameters are recorded:

- Redox potential (mV).
- Dissolved Oxygen (% saturation and mg/l O2).

Table 2.2 Determinands analysed a part of the Long and Short Suites

Suite	Determinants	Units	Limit of Detection (LoD)	Analytical Suite
Inorganic	Nitrate	mg/l	0.3	
	Ammoniacal Nitrogen as N	mg/l	0.0214	
	Chemical Oxygen Demand	mg/l	7	
	Total Suspended Solids (TSS)	mg/l	2	
	Total Dissolved Solids(TDS)	mg/l	5	
	Chloride	mg/l	2	
	Sodium	mg/l	1	
	Sulphate	mg/l	2	
	pH	pH units	1	

<table>
<tr><th>Suite</th><th>Determinants</th><th>Units</th><th>Limit of Detection (LoD)</th><th>Analytical Suite</th></tr>
<tr><td rowspan="11">Metals

(all samples to be filtered on site at point of sampling at 0.45 μm to give total dissolved analysis results)</td><td>Arsenic</td><td>μg/l</td><td>0.1</td><td rowspan="11">Short suite</td></tr>
<tr><td>Cadmium</td><td>μg/l</td><td>0.1</td></tr>
<tr><td>Chromium</td><td>μg/l</td><td>0.2</td></tr>
<tr><td>Copper</td><td>μg/l</td><td>0.9</td></tr>
<tr><td>Iron</td><td>mg/l</td><td>0.02</td></tr>
<tr><td>Manganese</td><td>mg/l</td><td>0.04</td></tr>
<tr><td>Lead</td><td>μg/l</td><td>0.02</td></tr>
<tr><td>Mercury</td><td>μg/l</td><td>0.01</td></tr>
<tr><td>Nickel</td><td>μg/l</td><td>0.15</td></tr>
<tr><td>Vanadium</td><td>μg/l</td><td>0.2</td></tr>
<tr><td>Zinc</td><td>μg/l</td><td>0.4</td></tr>
<tr><td rowspan="10">Organics</td><td>Total Phenols</td><td>μg/l</td><td>15</td><td rowspan="10">Long suite Only</td></tr>
<tr><td>Total Petroleum Hydrocarbons (TPH)</td><td>μg/l</td><td>10</td></tr>
<tr><td>BTEX (Benzene, Toluene, ethyl-benzene, xylene)</td><td>μg/l</td><td>0.1</td></tr>
<tr><td>Naphthalene</td><td rowspan="7">μg/l</td><td rowspan="7">0.1</td></tr>
<tr><td>Benzo(a)pyrene</td></tr>
<tr><td>Benzo(b)flouranthene</td></tr>
<tr><td>Benzo(k)fluoranthene</td></tr>
<tr><td>Benzo(g,h,i)perylene</td></tr>
<tr><td>Indeno(123-cd)pyrene</td></tr>
<tr><td>Anthracene</td></tr>
</table>

2.3 2016 MONITORING FREQUENCY

The amendment to monitoring frequency (as per the 2015 Strategic Review) divided monitoring effort within the three discrete areas across the four quarterly monitoring periods. Thus resulting in a change from the previous method (sampling for all parameters, at all sites at each quarter) to a more targeted approach. **Table 2.3** illustrates how this approach allows for certain site types (such as Dip Tubes) to be sampled at different frequencies, dependent on the risk and stage of operation of the area in which they are located (for example the Northern Mound Area).

Table 2.3 Annual Monitoring Programme

Area	Site Type	Annual Programme			
		Q1	Q2	Q3	Q4
Northern Mound Area	DT			Long	
	SW	Long	Short	Long	Short
Eastern Ash Cell Area	DT	Short		Long	
	BH	Long	Short	Long	Short
	SW	Long	Short	Long	Short
Inert Waste Fill Area	BH	Short		Long	
	LAG	Short		Long	
	SW	Long	Short	Long	Short

Notes: DT – Dip tube, SW- Surface water (sea water), BH – Borehole, LAG – lagoon

Q1, Q2, Q3 and Q4 – Quarters 1, 2, 3 and 4 of any year.

A **long suite** of analyses was undertaken at all locations aside from the Dip Tubes within the Northern Mound Area during Q1 in 2016, and at all locations during Q3 in 2016, as per **Table 2.3.**

During Q2 and Q4, as shown in **Table 2.3**, a **short suite** of analyses was undertaken at the following areas and sampling locations: Northern Mound (SW sites); Eastern Ash Cell Area (Boreholes and Surface Water sites only) and the Inert Waste Fill Area (Surface Water Sites only).

2.4 FILTRATION OF SAMPLE FOR METAL ANALYSIS

Filtration of water samples for metal analysis at 0.45 μm at the time of sampling has been introduced from Q1 2015 in line with the "La Collette Metal Data Analysis (filtered v unfiltered) June 2015 FINAL" technical note. This ensures analyses are not influenced by particulate matter and are a true reflection of water quality. As such, comparison with 2011-2014 meatal concentration data (which is unfiltered) must take this into account.

2.5 UNIONISED AMMONIA

Unionised ammonia is calculated from ammoniacal nitrogen values, and analysed a part of the "Inorganic" determinands group (in the short suite). It should be noted that the comparison of the 2015 unionised ammonia dataset with previous unionised ammonia data is the comparison of data calculated using two different approaches. The 2011-2014 data was calculated using in-situ salinity, temperature, and pH from the point at which the relevant sample was collected. Whilst the 2015 and 2016 unionised ammonia concentrations were calculated using temperature, salinity and pH data that represented typical La Collette bay sea water. This approach modelled the potential impact on sea water should borehole and dip tube waters migrate outside of the coastal defence wall. As such, the 2016 unionised ammonia data was compared to the 2015 dataset only.

Figure 2.1 La Collette Water Quality monitoring sites 2016

2.6 ASSESSMENT CRITERIA

Quarterly reports issued use **exceptions** and **Results of Note.** Exceptions are those values which exceed the 2011-2015 maximum recorded value (as shown in Appendix E) for that determinant, within that group of sites. Results of Note are defined as those values which do not exceed the 2011-2015 maximum recorded value, however are considered unusually high.

It is noted that that exceptions and Results of Note do not constitute failures of water quality standards. They are values which good governance dictates should be reviewed.

In addition, for the annual report, results have been compared against **Environmental Quality Standards**, as published in the Capita 2011 baseline water quality review (see **Table 2.4**, next page). These standards establish concentrations, against which analyses can be compared for management purposes.

They standards have been derived from a variety of sources (e.g. environmental protection and drinking water quality) and are aimed at protecting both biodiversity and human health. Some of these standards are maximum values, whilst others are longer term annual average values. These numerical standards are a useful guide to establish pollution source quantum for the ash cell and borehole data and as a comparison for surface water samples. The standard presented for Total Phenols does not differentiate between test types. The EQS for other organics are limited to: Napthalene, Benzo(a)pyrene, Anthracene and 'Total PAH' (defined as a sum of four individual species: Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, and Indeno(123-cd)pyrene).

The addition of trend monitoring (see Section 3.5) has allowed a more detailed analysis of Exceedances and Results of Note compared to previous monitoring periods and reports. Section 3.5 displays time series graphs (using all data from 2011-2016) of sites where consistent Exceptions and Results of Note have been identified for specific metal species. Linear regression analysis was used to model the relationship between the metal concentration (Y axis) and the independent variable of time (on the X axis). The result of linear regression analysis is an R-squared value (R^2). This is a statistical measure of how close the data are to the fitted regression line, with 0 representing a low level of fit to the data, and 1 representing a very good fit.

Table 2.4 La Collette Environmental Quality Standards (EQS) for data analysis and exception reporting

Determinant	Units	Quality Standard[a]
Inorganic contaminants		
Sulphate	mg/l	250[b]
Chloride	mg/l	250[b]
Nitrate as NO_3	mg/l	50[b]
un-ionised Ammonia (NH_3-N)	mg/l	0.021
Metals		
Arsenic	µg/l	25 (AA)
Cadmium	µg/l	2.5 (AA)
Chromium	µg/l	15 (AA)
Copper	µg/l	5 (AA)
Iron	mg/l	1 (AA)
Mercury	µg/l	0.3 (AA)
Manganese	mg/l	0.5[c]
Nickel	µg/l	30 (AA)
Lead	µg/l	25 (AA)
Zinc	µg/l	40 (AA)
Organic hydrocarbons		
Benzene	µg/l	30 (AA) 300 (MAC)
Toluene	µg/l	40 (AA) 400 (MAC)
Ethylbenzene	µg/l	30
Xylene	µg/l	30 (AA) 300 (MAC)
Mineral oils	µg/l	600[d]
Phenols (total)	µg/l	30
Napthalene	µg/l	5 (AA) 200 (MAC)
Benzo(a)pyrene	µg/l	0.03
Anthracene	µg/l	0.02
PAH (sum of 4 individual species)[e]	µg/l	0.1[b]

a) UK Environmental Quality Standards (marine) unless stated otherwise: AA = annual average; MAC = maximum admissible concentration
b) UK Drinking Water Standard
c) WHO drinking water standard
d) Groundwater intervention value. Annex A of 2009 Soil Remediation Circular: Target values, soil remediation intervention values and indicative levels for serious contamination.
e) Sum of Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, and Indeno(1,2,3-cd)pyrene

3 RESULTS

This annual reports includes the raw data for 2016 in the appendices (Appendix A-D). The appendices include the complete list of determinands which continue to be monitored as per the Strategic Review (See **Table 2.1**). This is in line with the 2015 Operational Water Quality Monitoring Plan. Appendix E displays the 2011-2015 mean and maximum values for each group of sites (Dip Tubes, Boreholes, Surface Waters and the Lagoon) and each group of determinands.

The following sections analyses the exceptions and Results of Note for each determinant group (phenols, other organics, metals and inorganics) across each quarter.

Tables 3.1 to **3.4** below display the occurrences of exceptions (shaded red) and Results of Note (shaded orange). This allows for rapid summary of the variations in these sites and parameters combinations, providing for an assessment of potential trends in concentration to be made. Green shading represents site and parameter combinations where no exception, nor result of note, has been observed.

3.1 PHENOLS

The following Results of Note and exceedances are described according to determinands group and monitoring area (as per **Table 2.1**). The Results of Note and exceptions observed in the phenol determinands group during the 2016 monitoring period are shown in **Table 3.1**.

3.1.1 Overview

The measurements undertaken in the 2016 monitoring period analysed the concentration of Total Phenols (through use of four test variations, depending on salinity of the water sample). This was the first year where these total phenol concentrations have been measured, and as such no previous data exist by which to compare the observed values. Values detected above the respective LOD for the tests were only observed at DT16S, DT18, DT22, DT25, DT 36, DT32N during the Q3 sampling round.

Table 3.1 Showing exceptions and Results of Note for phenol determinands in 2016 (red = exception, orange = result of note)

Phenol Test	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Phenol				
Phenols, Total Detected monohydric				
Saline Phenol by HPLC (W)			**DT22 - 7.45 µg/l**	
Sum of Detected MONOHYDRIC PHENOLS saline matrix			**DT22 - 8.22 µg/l**	

3.1.2 Description of results

Of the values detected above the LOD, the highest values were observed at DT22 - 7.45 µg/l (Saline Phenol by HPLC) and 8.22 µg/l (Sum of Detected Monohydric Phenols, Saline Matrix). These values represent less than 50% of the EQS concentration stated for the Total Phenols parameter (15 µg/l) and, as such, they have been designated as Results of Note, for review during the next DT sampling round in 2017.

3.2 OTHER ORGANICS

3.2.1 Overview

The following Results of Note and exceedances are described according to determinands group and monitoring area (as per **Table 2.1**). The Results of Note and exceptions observed in the other organics determinands group during the 2016 monitoring period are shown in **Table 3.2**

Northern Mound Area

The following Results of Note for the other organics determinant group (PAH) were all recorded in Q3. No exceptions were recorded

- Measurements of the BH1 sample for the Acenapthene species show a value of 0.250 µg/l, which was noteworthy as it was higher than the mean (2011-2015) value.
- Notable values, exceeding their previous means (2011-2015) are observed in five (5 No.) parameters at SW20. These are:
    - Benzo(a)pyrene (0.0187 µg/l)
    - Benzo(b)Fluoranthene (0.0274 µg/l)
    - Chrysene (0.0154 µg/l)
    - Fluoranthene (0.0274 µg/l)
    - Pyrene (0.0247 µg/l)
- Concentrations of Acenapthene (0.0253 µg/l) were noteworthy at SW18.

Eastern Ash Cell Area

No exceptions or Results of Note were observed from any sampling sites within the Eastern Ash Cell Area.

Inert Waste Fill Area

No exceptions or Results of Note were observed from any sampling sites within the Inert Waste Fill Area.

Table 3.2 Showing exceptions and Results of Note for other organic determinands in 2016 (red = exception, orange = result of note)

Determinant	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Acenaphthene (aq)			BH1 - 0.250 µg/l	
Acenaphthylene (aq)			SW18 - 0.0253 µg/l	
Anthracene (aq)				
Benzo(a)anthracene (aq)				
Benzo(a)pyrene (aq)			SW20 - 0.0187 µg/l	
Benzo(b)fluoranthene (aq)			SW20 - 0.0274 µg/l	
Benzo(g,h,i)perylene (aq)				
Benzo(k)fluoranthene (aq)				
Chrysene (aq)			SW20 - 0.0154 µg/l	
Dibenzo(a,h)anthracene (aq)				
Fluoranthene (aq)			SW20 - 0.0274 µg/l	
Fluorene (aq)				
Indeno(1,2,3-cd)pyrene (aq)				
Naphthalene (aq)				
PAH, Total Detected USEPA 16 (aq)				
Phenanthrene (aq)				
Pyrene (aq)			SW20 - 0.0247 µg/l	

3.2.2 Description of results

The value for acenaphthene at SW18 was above the 2011-2015 mean value, however this did not constitute an exceedance as no EQS are developed for this substance.

A suite of PAH concentrations from SW20 were recorded during Q3 that were higher than previous mean values. The concentrations for the determinands; benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, and pyrene were all recorded as Results of Note, as these values did not exceed 2011-2015 maxima. None of the above results constitute an exceedance of their respective EQS values, however all determinands were recorded as exceptions during Q3 of 2015 at the SW20 site.

3.3 METALS

3.3.1 Overview

The following Results of Note and exceedances are described according to determinands group and monitoring area (as per **Table 2.1**). The Results of Note and exceptions observed in the metals determinands group during the 2016 monitoring period are shown in **Table 3.3.**

Northern Mound Area

Within the Northern Mound Area, a single exception was recored during the 2016 monitoring period, this was for the measured concentration of Arsenic (9.06 µg/l) and was recorded at SW20 during Q3;

Results of Note, signifying metal concentrations which were recorded as being above the mean 2011-2015 value, were recorded at the following two surface water sites.

- Notable values, exceeding their previous means (2011-2015) are observed in three (3No.) parameters at SW18, as follows:
  - Copper concentration of 12.1 µg/l was recorded during Q1
  - Manganese concentration of 25.1 µg/l was recorded during Q4
  - Zinc concentration of 31.3 µg/l was recorded during Q4
- Notable values, exceeding their previous means (2011-2015) were observed in seven (7No.) parameters at SW20, as follows:
  - Arsenic concentration of 4.73 µg/l recorded during Q1

- Arsenic concentration of 3.16 µg/l recorded during Q4
- Iron concentration of 61.9 µg/l recorded during Q2
- Iron concentration of 81.1 µg/l recorded during Q3
- Iron concentration of 69.2 µg/l recorded during Q4
- Manganese concentration of 6.35 µg/l recorded during Q3
- Manganese concentration of 13.5 µg/l recorded during Q4
- Nickel concentration of 32.0 µg/l recorded during Q4

Eastern Ash Cell Area

No exceptions for metal concentrations were observed at the Eastern Ash Cell Area during 2016. A number of Results of Note were measured at several sites, and these are described here.

- At the Dip Tube sampling locations, the following concentrations were deemed to be Results of Note:
  - Concentrations of Copper – (79.9 µg/l Q1), and (Iron 268 µg/l Q3) at DT25S
  - The Nickel concentration of 295 µg/l recorded at DT 22 during Q3.
  - An elevated mercury concentration of 3.130 µg/l was recorded at DT 36N during Q3
  - At DT16S a cadmium concentration of 7.6 µg/ (Q3)
  - Two concentrations of Chromium observed in DT18 (29.1 µg/l in Q1 and 36.1 µg/l during Q3) are Results of Note
  - Manganese concentrations at DT29N were found to be elevated on two occasions, with a value of 1,200 µg/l recorded during Q1 and 1,100 µg/l recorded during Q3.

- At the Borehole sampling locations within the Eastern Ash Cell Area, the following concentrations were deemed to be Results of Note:

- A noteworthy concentration of Iron (3,490 µg/l) was recorded at BH5 were recorded during Q4, alongside three incidences of elevated Arsenic values (none of which are higher than previously observed maxima) as follows; 32.1 µg/l in Q2, 43.3 µg/l in Q3 and 36.7 µg/l during Q4.
- An elevated chromium concentration of 17.3 µg/l in was recorded at BH5 during Q3, and manganese concentrations of 2,760 µg/l and 3,570 µg/l recorded during Q3 and Q4 respectively.
- BH6 showed a noteworthy mercury concentration of 0.391 µg/l recorded during Q4, alongside a value of 28.2 µg/l for zinc.
- A manganese concentration of 1,690 µg/l was recorded at BH7 during Q1, which was higher than the 2011-2015 mean value.
- Elevated Chromium values (27.2 µg/l - above 2011-2015 mean value) were recorded at BH3R during Q1, prior to its extinction due to further ash cell development.

- The following Results of Note are reported from the Surface Water sampling locations within the Eastern Ash Cell Area:
  - An elevated mercury concentration of 0.354 µg/l was recorded at SW12 during Q4.

Inert Waste Fill Area

- The following results are the exceptions recorded for metals determinands:
  - LAG1 recorded a value of 20.4 µg/l for Chromium in Q1.
  - An Arsenic value of 5.31 µg/l recorded at LAG1 during Q3 was also an exception.
  - An elevated concentration of Cadmium was recorded at SW4 during Q4. This value, 1.38 µg/l, was an exception.

- The following results are considered as Results of Note for concentrations of metals determinands within the Inert Waste Fill Area during 2016;
  - A single Result of Note was recorded for the concentration of Zinc (44.1 µg/l) at SW2 during Q2.

Table 3.3 Showing exceptions and Results of Note for other metal determinands in 2016 (red = exception, orange = result of note)

Metal species	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Arsenic	**SW20 - 4.73 µg/l**	**BH5 - 32.1 µg/l** **SW2- 2.89 µg/l**	**SW20 - 9.06 µg/l** **LAG1 - 5.31 µg/l** **BH 5 - 43.3 µg/l**	**BH5 - 36.7 µg/l** **SW20 -3.16 µg/l**
Cadmium			**DT16S - 7.6 µg/l**	**SW4 - 1.38 µg/l**
Chromium	**LAG 1 - 29.4 µg/l** **DT18 - 29.1 µg/l** **BH3R - 27.2 µg/l**		**BH 5 - 17.3 µg/l** **DT18 - 36.1 µg/l**	
Copper	**DT25S - 79.9 µg/l** **SW18 - 12.1 µg/l**			
Iron		**SW20- 61.9 µg/l**	**SW20 - 81.1 µg/l** **DT25S - 268 µg/l**	**BH5 - 3,490 µg/l** **SW20 - 69.2 µg/l**
Lead				
Manganese	**DT29N - 1200 µg/l** **BH7 - 1690 µg/l**		**BH5 - 2760 µg/l** **SW20 – 6.35 µg/l** **DT29N - 1100 µg/l** **LAG1 - 2.64 µg/l**	**BH5 - 3,570 µg/l** **SW18 - 25.1 µg/l** **SW20 -13.5**
Mercury			**DT36N - 3.130 µg/l**	**BH6 - 0.391 µg/l** * **SW12 - 0.354 µg/l**
Nickel			**DT22 - 295 µg/l**	**SW20 - 32.0 µg/l**
Zinc	**LAG 1 - 20.1 µg/l**	**BH2R – 31.7 µg/l** **SW2 - 44.1 µg/l**		**BH6 - 28.3 µg/l** **SW18 - 31.3 µg/l** **

*Mercury values were notably higher across four BH sites (BH5, BH6, BH2R and BH 7) sampled (0.239 – 0.391 µg/l) in Q4

**Zinc concentrations at SW sites was generally found to have increased in Q4

3.3.2 Description of results

No exceptional concentration of metal determinands were encountered within the Dip Tubes sites during 2016, and the overall number of exceptions has reduced from 6 in 2015, to 3 during this monitoring period.

Elevated values were encountered for Arsenic (As) at SW20 in Q1, Q3 (exception result) and Q4. However, although these values were elevated in comparison with previous years, they did not constitute an exceedance of the EQS value (annual average of 25 µg/l). Arsenic values were also of note at BH5 (with a maximum value of 43.3 µg/l observed during Q3). These values were appreciable higher than those at other BH sites throughout the year, and did constitute an exceedance of the EQS. Elevated concentrations of As are also seen at BH7, resulting in an annual average of 25.175 µg/l, which was also a very minor exceedance.

A single exception concentration of Cadmium (Cd) was recorded at SW 4, with a value of 1.34 µg/l. This does not constitute an exceedance of the EQS annual average value of 2.5 µg/l.

It is to be noted that the apparent elevated values recorded for Chromium (Cr) at the LAG1 site during Q1 (29.40 µg/l) constitutes an exception and also an exceedance of the annual average EQS value of 15 µg/l. An exceptional concentration of Chromium was recorded at BH3R prior to its extinction, however as no further values were recorded, no statement of exceedance can be made.

Copper (Cu) concentrations were shown to be highest at DT25S (following on from a similar result seen in 2015), with a result of note value observed in Q1 of 79.9µg/l (against a mean copper concentration of 33.6µg/l for all DT sites in 2011-2015). The data shown in Appendix C shows that this annual average value for copper at DT25S was based upon the following two values: Q1: 79.9 µg/l and Q3: 1 µg/l. No data were recorded during the Q2 and Q4 monitoring rounds, however the fluctuation demonstrated above indicates a periodic spike in the concentration. This determinant should be monitored closely at DT25S throughout the forthcoming 2017 monitoring period.

The noteworthy metal concentrations highlighted in section 3.3 show an Iron (Fe) concentration value of 3,490 µg/l at BH5 reported in Q4. In contrast with the 2015 monitoring period, this was the only BH result of note for Iron, and is considerably lower than the 2015 maximum observed at BH5 during Q4. However the elevated values seen BH5 during 2016 resulted in the annual average exceeding the EQS value of 1,000 µg/l. Results of Note for Iron concentrations were recorded during sampling at SW20 on three occasions (Q2, Q3 and Q4), however the values fall far short of the EQS. A spike in Iron concentration was recorded at DT25S (268 µg/l), again not exceeding the EQS.

No exceptions or Results of Note were recorded for Lead (Pb) during the 2016 monitoring period.

Manganese (Mn) concentrations were monitored at DT29N, owing to noteworthy concentrations observed during Q1 (1,200 µg/l); Q2 (1,110 µg/l). These are Results of Note, not exceptions as values were significantly lower than those values recorded during the 2015 monitoring period (the 2011-2015 maximum values observed at DT sites did not exceed 8,460 µg/l). Consistently elevated values of Mn recorded at sites BH2R, Bh5, BH7 and BH9 have resulted in the EQS (500 µg/l) being exceeded at these sites, however these values are not exceptions, nor in most cases have they exceeded the mean 2011-2015 BH concentration value of 1319.5 µg/l. An exception of 25 µg/l was recorded at SW18 during Q4, this value is still and order of magnitude below the EQS value. Noteworthy concentrations of Mn were also encountered at SW20 and LAG1- all of which were considerably below the EQS.

A result of note for Mercury (Hg) concentration was recorded at SW12 during Q4, with a reported value of 0.354 µg/l. This value is greater than the previously recorded (2011-2015) mean for mercury at SW sites, 0.180µg/l. A further noteworthy value of mercury was noted at BH6 during Q4 (0.391 µg/l). These values appear to be spikes, as further noteworthy concentrations of mercury were not recorded at any SW site. As such, these values do not lead to an exceedance of the EQS value for Mercury (annual average of 0.3 µg/l). An elevated mercury concentrations was recorded at DT 36N during Q3 (a value of 3.130 µg/l). It is recommended that this site be reviewed for Mercury concentration during Q1 2017, as no sample was taken during Q4 2016.

The concentration of Nickel (Ni) was noteworthy at DT22 during Q3, with a value of 295 µg/l recorded. This value is substantially lower than the concentration of Ni recorded at this site during Q1 2015 (533.00 µg/l). This value was not an exception (as the 2011-2014 maximum recorded value was 1430 µg/l). A slightly elevated concentration of Ni was recorded at SW20 during Q4 (32.0 µg/l). This result of note does not constitute an exceedance of EQS.

Results of Note for Zinc (Zn) concentrations were observed at a single surface water site during 2016, this was at SW18 (31.3 µg/l during Q4). This value was higher than the 2011-2015 mean value for SW sites and significantly lower than the maximum value previously recorded (122 µg/l). Of note is the consistency with the value observed at this site during the 2015 monitoring period, which were of comparable concentrations. The elevated Zn concentration observed at LAG1 during Q1 (20.1 µg/l) was found to much reduced during the Q4 sampling round. These results did not constitute exceptions nor Results of Note. Bh2R and BH6 demonstrated elevated concentrations of Zn during Q2 (BH2r – 31.7 µg/l) and Q4 (Bh6 - 28.3 µg/l). Neither of these concentrations have led to an exceedance of the EQS for Zinc (40 µg/l annual average).

3.4 INORGANICS

3.4.1 Overview

Four exceptions in Q4 and one result of note in Q2 were observed in the inorganics determinands group during the 2016 monitoring period, as shown in **Table 3.3.**

Exceptions:

- Nitrate concentrations at **BH6** (118 mg/l) and **SW18** (12.60 mg/l) were exceptionally high in Q4 when compared to the 2011-2015 baseline maxima.

- The observed values for total dissolved solids at **SW1** (4500 mg/l) and **SW8** (40600 mg/l) were greater than the 2011-2015 maximum value of 40,400 mg/l.

Table 3.3 Showing exceptions and Results of Note for other inorganic determinands in 2016

Inorganics	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Ammoniacal Nitrogen as N				
Chloride				
COD, unfiltered				
Dissolved solids, Total (gravimetric)				**SW1 – 40,500 mg/l SW8 – 40,600 mg/l**
Saline Nitrate as NO3				**BH6 - 118 mg/l SW18 - 12.60 mg/l**
Sodium (diss.filt)				
Sulphate				
Suspended solids, Total				
Unionised ammonia		**SW12 -13.899 µg/l**		
pH				

3.4.2 Description of results

Exceptions in Dissolved Solid concentration were observed at SW1 and SW8 during Q4, these values were 40,500 and 40,600 mg/l respectively. These values to not constitute an exceedance, as no EQS have been developed for this parameter.

Exceptions in Saline Nitrate as NO3 were observed at SW18 and BH6 during Q4, the values were recorded as 12.60 and 118 mg/l respectively. These values to not constitute an exceedance, as the EQS for this parameter is 50 mg/l.

The most important parameter with respect to the marine environment receptor is un-ionised ammonia. No exceptions or Results of Note were observed for this determinant, other than the anomalous result identified at SW14 during Q3, which is discussed below.

Ammonia is a very important parameter as it is toxic to a broad range of biodiversity, and has an established environmental quality standard of 21 µg/l. Concentrations were highest in the ash cells (DT sites, averaging 22,013 µg/l due to the high values recorded at DT36), with borehole concentrations considerably lower (averaging 124 µg/l), and concentrations in the seawater a further order or magnitude lower (averaging 10.951 µg/l for 2016). This is slightly lower when compared with the 2015 average of 10 µg/l and does not cause concern.

The values at seven of the nine BH sites represented exceedances of the EQS for ammonium (in keeping with the results from 2015), as well as the annual average value recorded at SW14 (30.164 µg/l). The ammonium concentration at this surface water site is due to an anomalous value arising during Q3, which has been associated with an unusually high sea water temperature. The concentrations unionised ammonia calculated at SW14 during Q1, Q2 and Q4 are significantly less than the EQS value.

The values observed for unionised ammonia show exceedances from the EQS, (21 µg/l annual average) in nine of the nine DT sites, as would be expected from the concentrations within the environmentally sealed ash cells.

An elevated Nitrate as NO3 value was recorded at BH6 during Q4 (118 mg/l), which has resulted in an exceedance of EQS at this site. This EQS has been developed form the UK Drinking Water Standard, and as such is highly precautionary in the context of groundwater and surface waters at the La Collette Site.

The concentrations of the inorganic determinants Sulphate and Chloride were found to exceed the EQS for both substances at all BH and SW sites. This is to be expected, given the saline nature of the surface water and groundwater at the La Collette Site, and the stringent UK Drinking Water Standard basis for the developed EQS.

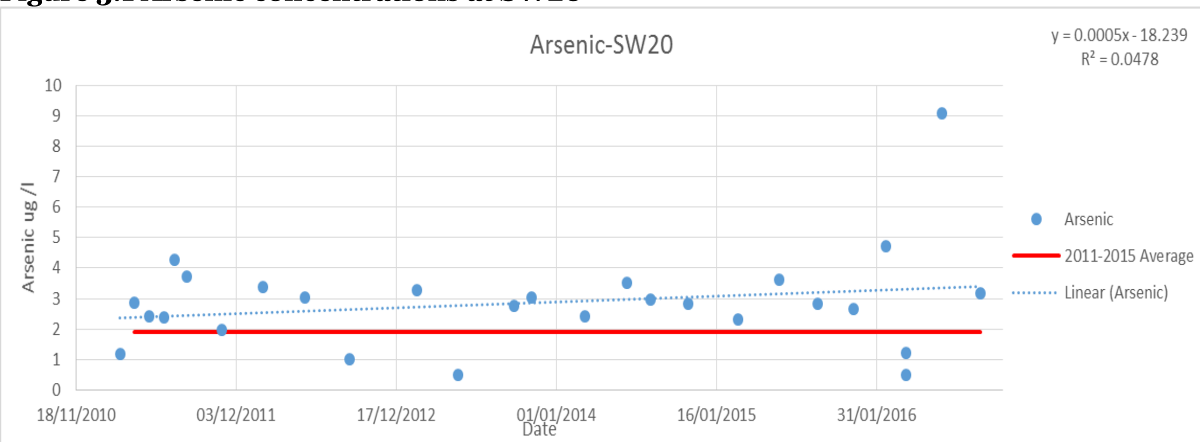
3.5 TREND ANALYSIS

As requested during July 2016, time series analyses of metal determinant/sites pairs associated with Results of Note and exceptions were undertaken in Q3 and Q4. These analyses presented time series graphs with regression analysis for specific determinants at specific sites (using all data from 2011-2016), allowing for the monitoring of possible long term trends. Where these analyses have shown increase in concentration against time, the graphs are presented below.

As discussed in Section 2.6 (Methodology; Assessment Criteria), linear regression analysis was used to model the relationship between the metal concentration (Y axis) and the independent variable of time (on the X axis). The result of linear regression analysis is an R-squared value (R^2). This is a statistical measure of how close the data are to the fitted regression line, with 0 representing a low level of fit to the data, and 1 representing a very good fit. As the following section demonstrates, all R^2 values calculated for the trend monitoring were not statistically significant, with all values reported being under 0.5 (which is the minium level considered significant).

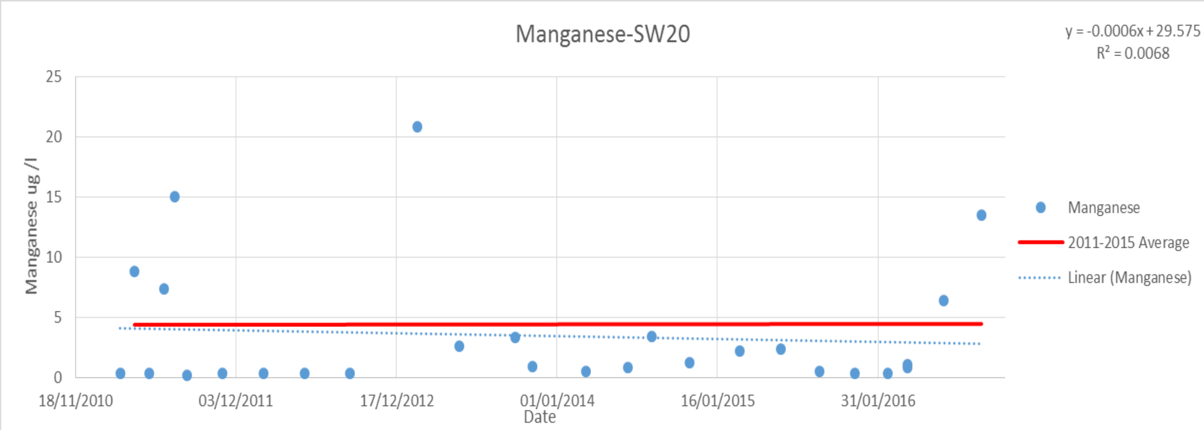
3.5.1 Northern Mound Area

Figure 3.1 Arsenic concentrations at SW20



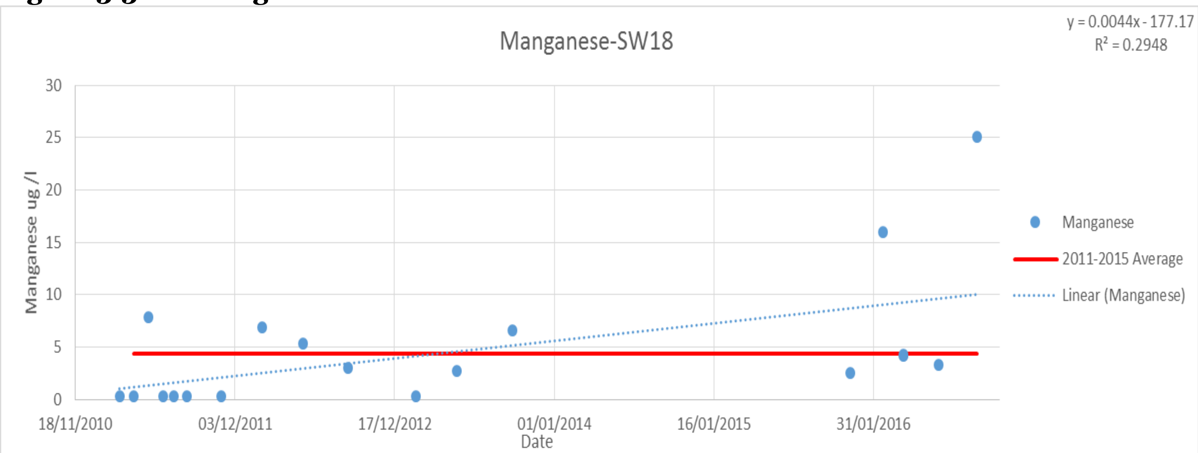
The concentration of arsenic at SW20 has fluctuated during the 2016 monitoring period, with an exceptional value recorded during Q3 (9.06 µg/l). This decreased to 3.19 µg/l in 2016 Q4, and although **Figure 3.1** indicates a very slight increasing trend, however a very low R^2 value of 0.0478 indicates that this trend is not significant. The increase is most likely associated with the anomalous exception in Q3.

Figure 3.2 Manganese concentrations at SW20



Manganese concentrations at notably SW20 was found to be of note during Q3 and Q4 of 2016, with a value of 13.5 µg/l observed in Q4. These two data points constitute an increase in 2016, however the linear regression analysis shows a very small R^2 value of 0.0068 (see **Figure 3.2)** from the entire data set, thus indicating no significant trend.

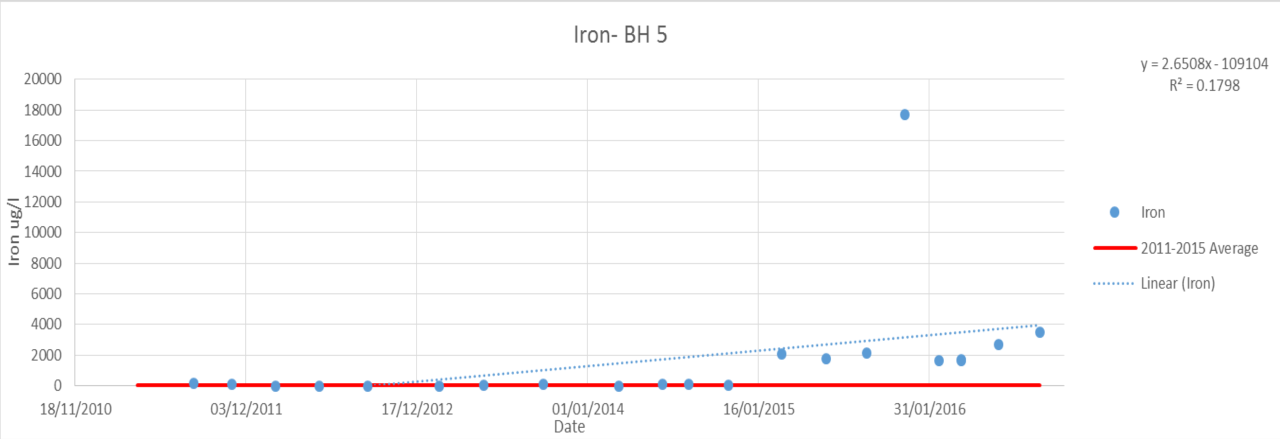
Figure 3.3 Manganese Concentrations at SW18



Manganese concentrations at SW18 (with an exception of 25.1 µg/l recorded during Q4), have also increased during 2016. **Figure 3.3** displays the linear regression analysis for Mn at SW18, with an R^2 value of 0.1798), which is not significant and therefore does not indicate an increasing trend, especially in light of the fluctuating nature of the values observed throughout 2016.

3.5.2 Eastern Ash Cell Area

Figure 3.4 Iron concentrations at BH5



The Iron concentration measured at BH5 during Q4 2016 was 3,490 µg/l, with the time series (**Figure 3.**4) showing an increase in Q3 and Q4 of 2016. The Q4 value, however-still significantly lower than Q4 2015. The rising nature of the trend line may be partially associated with the anomalous value recorded during Q4 2015. However, the R^2 value of 0.1798 is insignificant and therefore not conclusive of a rising trend in concentration.

Figure 3.5 Showing the Mercury concentrations at all SW sites over time

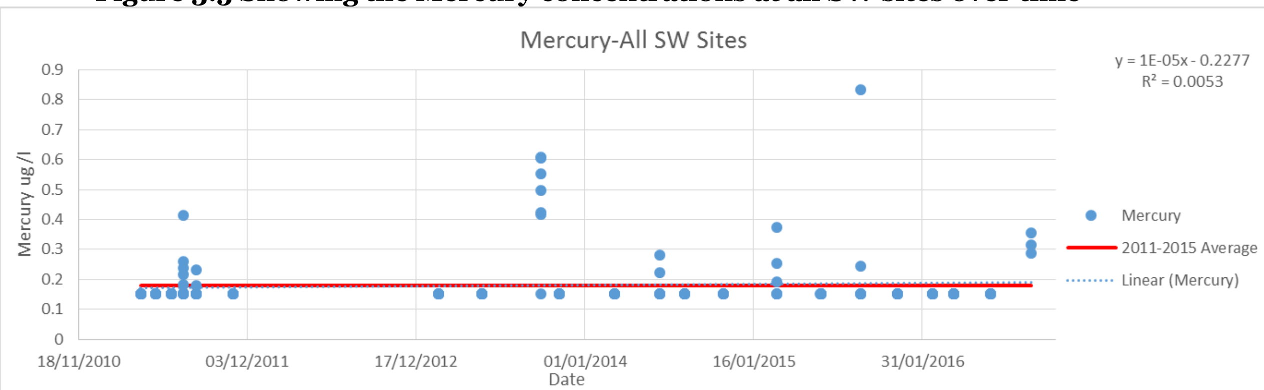
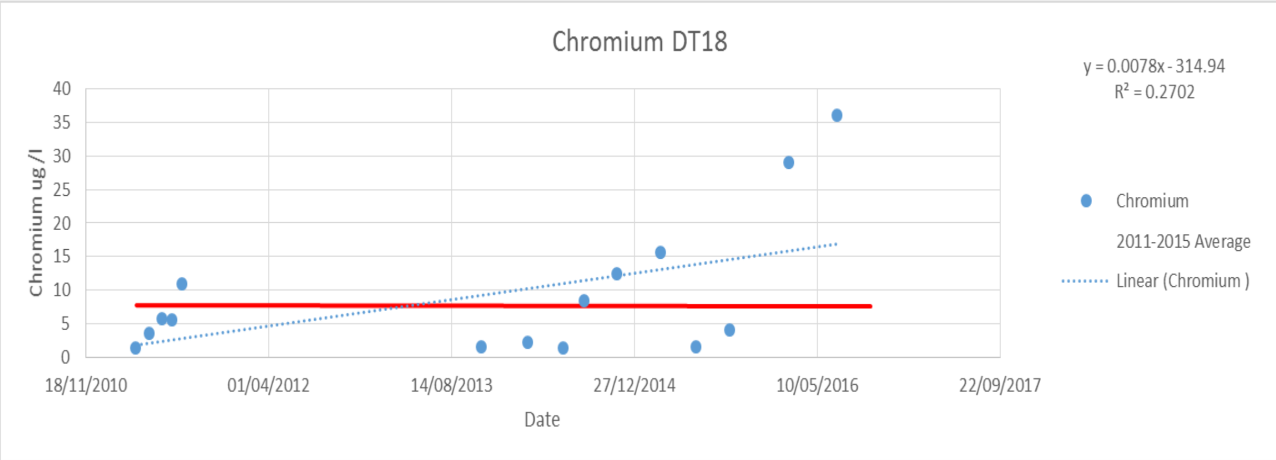


Figure 3.5 shows no obvious increasing trend in Mercury concentrations over time, (with an insignificant R^2 value of 0.005) at the SW sites. However, the elevated values recorded during Q4 2016 are noticeable, and indicate a requirement to monitor this determinant at the SW sites throughout 2017.

Figure 3.6 Showing the Chromium concentration at DT18 over time



Chromium values were measured as 36.1 µg/l during Q3, with **Figure 3.6** indicating elevated value in 2016 compared with 2015. The R^2 value of 0.2702 is not significant enough to conclude the presence of an increasing trend. No Q4 value has been acquired, and as such further trend monitoring is recommended in the Q1 2017 review.

3.5.3 Inert Waste Fill Area

Figure 3.7 Showing Manganese concentrations at SW2 over time

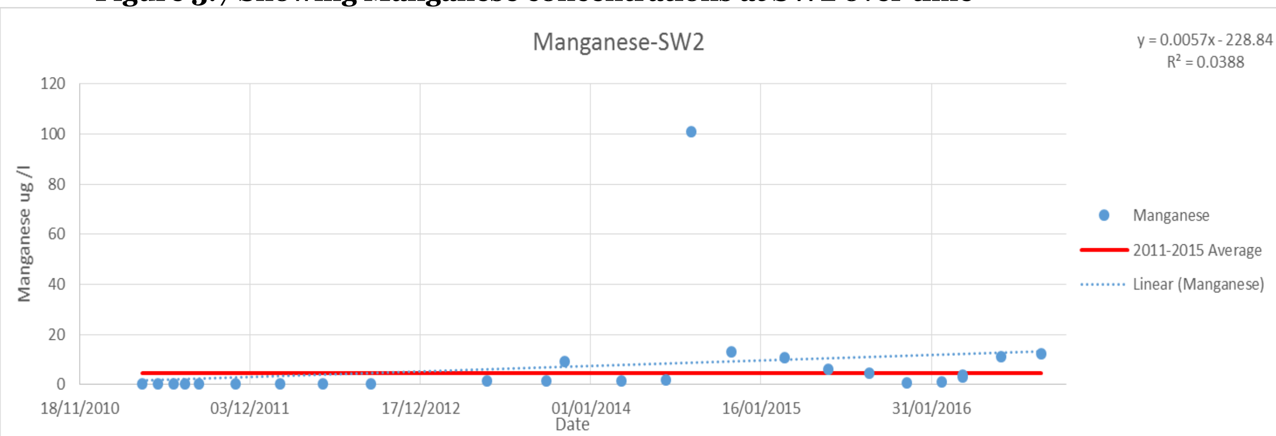
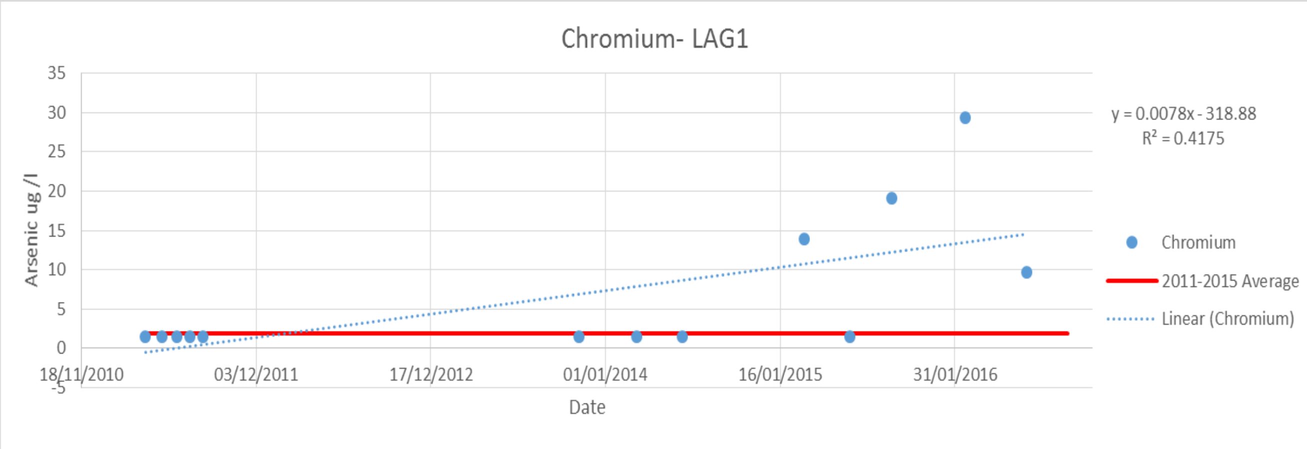


Figure 3.7 indicates no real increasing trend in Mn concentrations at SW2, as the insignificantly low R^2 value of 0.0388 µg/l is likely to have been influenced by the anomalous value observed during Q2 2015. No recorded concentrations have led to an exceedance of the EQS.

Figure 3.8 Showing concentration of Chromium values at LAG1 over time



Chromium values were measured as 29.4 µg/l at LAG1 during Q1, with a far lower value of 9.71 µg/l recorded during Q4. These values, as shown in **Figure 3.8** demonstrate large fluctuations in the concentrations observed in 2015 and 2016, however these are higher than recorded in the 2011-2014 dataset. The R^2 value of 0.415 is again too low to be statistically significant. As two measurements were made during 2016, the elevated nature of these values has led to an exceedance of the annual EQS value for Chromium at this site. No Q4 value has been acquired, and as such further trend monitoring is recommended in the Q1 2017 review.

Figure 3.9 Showing concentration of Arsenic values at LAG1 over time

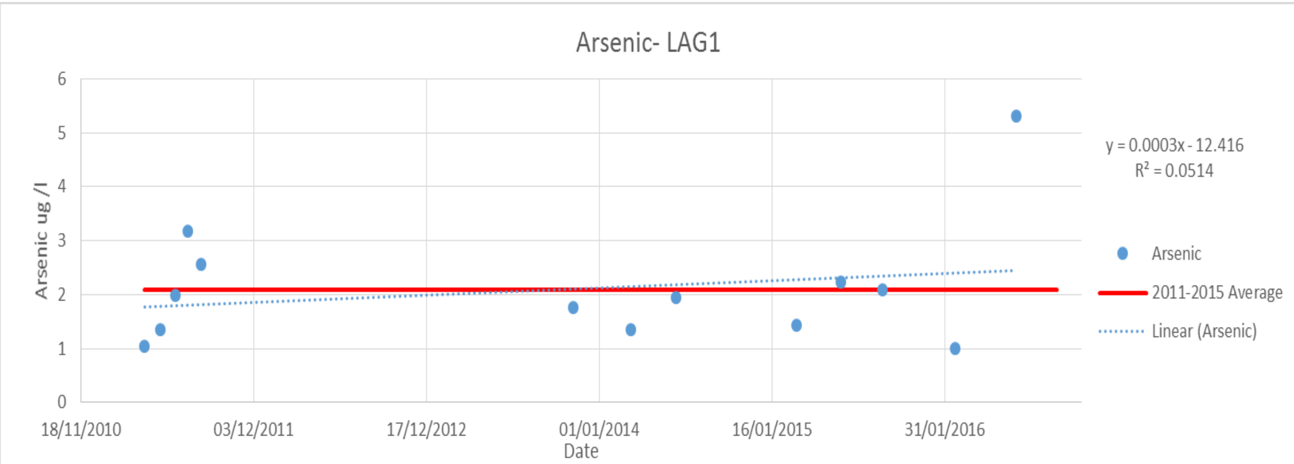


Figure 3.9 shows that no true trend is observable in the concentrations of Arsenic at LAG1. The very low R^2 value (0.0514) is not statistically significant, and is likely to be influenced by the outlying value of 5.31 µg/l recorded at the site during Q4 2016. This determinant therefore required close monitoring during 2017 at the LAG1 site.

4 CONCLUSION

In summary, a review of the data analysed during the 2016 quarterly reviews has enabled the following conclusions to be made.

- The marked differences between the ash cell (Dip Tube) concentrations of all determinands, and those concentrations observed in the groundwater borehole (BH) data indicate that the ash cells are hydraulically isolated.

- The ash cells (DT sites) concentrations remain static when compared broadly with 2012-15 indicating stable conditions. However, fluctuations in concentrations of the metal species Chromium, Manganese and Iron, which have been identified as Results of Note (specifically at DT18, Dt25S and DT29N) and require further monitoring during 2017 so as to ensure that no increasing trends are present (none have been identified to date).

- The concentrations of determinands within the groundwater (BH) sites remain broadly similar to those monitored in 2015, with no exceptional values recorded. Iron concentrations of note were recorded at BH5, and trend analysis shows a possible increasing trend. Manganese concentrations at BH5 are also shown to be increasing throughout 2016, however no long term trend is present.

- Un-ionised ammonia concentrations in marine waters remain below the Environmental Quality Standard (EQS) at all sites other than SW14, with the annual average of un-ionised ammonia between 10.21 µg/l (EQS = 21 µg/l). The possible exceedance at SW14 can be attributed to an outlier value calculated during Q3, and as such is not of concern (however, close observation is recommended during 2017).

- No failures of quality standards for Phenols or Other Organics (Poly Aromatic Hydrocarbon species) were observed, although very slightly elevated values of PAH species were observed at SW20, as seen in 2015 also and thus further close monitoring is advised.

- No exceedances of metal EQS concentrations were recorded at the surface water sites during 2016. A potential increasing trend (which is not statically significant) has been identified in Mn concentration at SW 18 and SW20, concentrations of this metal should be monitored closely during the 2017 monitoring period.

- Elevated Mercury values were recorded at the surface water (SW) sites during Q4, however at this time these cannot be linked directly to activities on the site, owing to the single exceptional results resulting in higher than expected annual mean concentrations. These outlier values must be closely observed during 2017, and do not constitute an exceedance of the EQS.

- Concentrations in Chromium at the Lagoon Site (LAG1) are indicated to be subject to a possible increasing trend, however linear regression analysis indicates that this trend is not statistically significant. No exceedance of the EQS value for this parameter has been recorded. Further close monitoring of metal concentrations at this site is recommended.

- Overall, the key sensitive receptor (marine water) remains of a quality that does not cause concern.

APPENDICES

Where certain determinands were not analysed (as per the proposed 2015 Operational Water Quality Monitoring Plan) the term "NA" has been inserted.

APPENDIX A – PHENOL DATA

BOREHOLE OTHER ORGANICS REVIEW

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Phenol Test	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Phenol	NA	NA	NA	NA	0.002	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	NA	NA	0.016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Phenol by HPLC (W)	0.004	0.004	0.004	0.004	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	0.019	0.019	0.019	0.019	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Quarter 3 (Q3)									Quarter 4 (Q4)								
Phenol Test	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Phenol by HPLC (W)	0.004	NA	NA	NA	NA	0.004	0.004	0.004	0.004	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	0.019	NA	0.019	0.019	0.019	0.019	0.019	0.019	0.019	NA	NA	NA	NA	NA	NA	NA	NA	NA

SURFACE WATERS PHENOL REVIEW

	Quarter 1 (Q1)							Quarter 2 (Q2)						
Phenol Test	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Phenol by HPLC (W)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	NA	NA	NA	NA	NA	NA	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	0.019	0.019	0.019	0.019	0.019	0.019	0.019	NA	NA	NA	NA	NA	NA	NA

	Quarter 3 (Q3)							Quarter 4 (Q4)						
Phenol Test	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Phenol by HPLC (W)	0.004	0.004	0.004	0.004	0.004	0.004	0.004	NA	NA	NA	NA	NA	NA	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	0.019	0.019	0.019	0.019	0.019	0.019	0.019	NA	NA	NA	NA	NA	NA	NA

DIP TUBES PHENOL REVIEW

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Phenol Test	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT 29N	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT 29N
Phenol	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Phenol by HPLC (W)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Quarter 3 (Q3)									Quarter 4 (Q4)								
Phenol Test	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT 29N	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT 29N
Phenol	NA	NA	0.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	0.22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Phenol by HPLC (W)	0.004	0.004	NA	0.15	7.45	0.25	2.56	2.36	0.01	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	0.019	0.019	NA	0.15	8.22	0.25	2.61	2.44	0.019	NA	NA	NA	NA	NA	NA	NA	NA	NA

LAGOON PHENOL REVIEW

	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Phenol Test	LAG 1	LAG 1	LAG 1	LAG 1
Phenol	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	NA	NA
Saline Phenol by HPLC (W)	NA	NA	0.004	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	NA	NA	0.019	NA

APPENDIX B – OTHER ORGANICS DATA

BOREHOLE OTHER ORGANICS REVIEW

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Organic Compound	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Acenaphthene	0.015	0.015	0.015	0.015	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	0.011	0.011	0.011	0.011	0.011	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	0.015	0.015	0.015	0.015	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.017	0.017	0.017	0.017	0.023	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.009	0.009	0.009	0.009	0.036	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.023	0.023	0.023	0.023	0.040	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.016	0.016	0.016	0.016	0.035	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.027	0.027	0.027	0.027	0.027	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.013	0.013	0.013	0.013	0.026	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.016	0.016	0.016	0.016	0.016	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	0.017	0.017	0.017	0.017	0.057	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	0.014	0.014	0.014	0.014	0.014	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.014	0.014	0.014	0.014	0.034	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	0.100	0.100	0.100	0.100	0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH, Total Detected USEPA 16	0.344	0.344	0.344	0.344	0.346	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	0.022	0.022	0.022	0.022	0.022	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	0.040	0.015	0.069	0.015	0.096	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Quarter 3 (Q3)										Quarter 4 (Q4)							
Organic Compound	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Acenaphthene	0.015	NA	0.015	0.015	0.015	0.015	0.250	0.021	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	0.011	NA	0.011	0.011	0.011	0.017	0.011	0.011	0.011	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	0.015	NA	0.015	0.015	0.015	0.015	0.015	0.015	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.017	NA	0.017	0.017	0.017	0.017	0.017	0.017	0.017	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.009	NA	0.009	0.009	0.009	0.009	0.009	0.009	0.009	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.023	NA	0.023	0.023	0.023	0.023	0.023	0.023	0.023	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.016	NA	0.016	0.016	0.016	0.016	0.016	0.016	0.016	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.027	NA	0.027	0.027	0.027	0.027	0.027	0.027	0.027	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.013	NA	0.013	0.013	0.013	0.013	0.013	0.013	0.013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.016	NA	0.016	0.016	0.016	0.016	0.016	0.016	0.016	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	0.017	NA	0.017	0.017	0.017	0.035	0.017	0.030	0.017	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	0.014	NA	0.014	0.014	0.014	0.014	0.029	0.014	0.014	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.014	NA	0.014	0.014	0.014	0.014	0.014	0.014	0.014	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	0.100	NA	0.100	0.100	0.100	0.100	0.100	0.100	0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH, Total Detected USEPA 16	0.344	NA	0.344	0.344	0.344	0.344	0.344	0.344	0.344	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	0.022	NA	0.022	0.022	0.022	0.022	0.022	0.022	0.022	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	0.039	NA	0.060	0.015	0.049	0.048	0.015	0.039	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA

SURFACE WATERS OTHER ORGANICS REVIEW

	Quarter 1 (Q1)							Quarter 2 (Q2)						
Organic Compound	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Acenaphthene	0.015	0.015	0.015	0.015	0.015	0.015	0.015	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	0.011	0.011	0.011	0.011	0.011	0.011	0.011	NA	NA	NA	NA	NA	NA	NA
Anthracene	0.015	0.015	0.015	0.015	0.015	0.015	0.015	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.017	0.017	0.017	0.017	0.017	0.017	0.017	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.009	0.009	0.009	0.009	0.009	0.009	0.009	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.023	0.023	0.023	0.023	0.023	0.023	0.023	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.016	0.016	0.016	0.016	0.016	0.016	0.016	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.027	0.027	0.027	0.027	0.027	0.027	0.027	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.013	0.013	0.013	0.013	0.013	0.013	0.013	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.016	0.016	0.016	0.016	0.016	0.016	0.016	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	0.017	0.017	0.017	0.017	0.017	0.017	0.017	NA	NA	NA	NA	NA	NA	NA
Fluorene	0.014	0.014	0.014	0.014	0.014	0.014	0.014	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.014	0.014	0.014	0.014	0.014	0.014	0.014	NA	NA	NA	NA	NA	NA	NA
Naphthalene	0.100	0.100	0.100	0.100	0.100	0.100	0.100	NA	NA	NA	NA	NA	NA	NA
PAH, Total Detected USEPA 16	0.344	0.344	0.344	0.344	0.344	0.344	0.344	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	0.022	0.022	0.022	0.022	0.022	0.022	0.022	NA	NA	NA	NA	NA	NA	NA
Pyrene	0.015	0.015	0.015	0.015	0.015	0.015	0.015	NA	NA	NA	NA	NA	NA	NA

	Quarter 3 (Q3)							Quarter 4 (Q4)						
Organic Compound	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Acenaphthene	0.015	0.015	0.015	0.015	0.015	0.0253	0.015	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	0.011	0.011	0.011	0.011	0.011	0.011	0.011	NA	NA	NA	NA	NA	NA	NA
Anthracene	0.015	0.015	0.015	0.015	0.015	0.015	0.015	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.017	0.017	0.017	0.017	0.017	0.017	0.017	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.009	0.009	0.009	0.009	0.009	0.009	0.0187	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.023	0.023	0.023	0.023	0.023	0.023	0.0274	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.016	0.016	0.016	0.016	0.016	0.016	0.016	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.027	0.027	0.027	0.027	0.027	0.027	0.027	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.013	0.013	0.013	0.013	0.013	0.013	0.0154	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.016	0.016	0.016	0.016	0.016	0.016	0.016	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	0.017	0.017	0.017	0.017	0.017	0.017	0.0274	NA	NA	NA	NA	NA	NA	NA
Fluorene	0.014	0.014	0.014	0.014	0.014	0.014	0.014	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.014	0.014	0.014	0.014	0.014	0.014	0.014	NA	NA	NA	NA	NA	NA	NA
Naphthalene	0.100	0.100	0.100	0.100	0.100	0.100	0.100	NA	NA	NA	NA	NA	NA	NA
PAH, Total Detected USEPA 16	0.344	0.344	0.344	0.344	0.344	0.344	0.344	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	0.022	0.022	0.022	0.022	0.022	0.022	0.022	NA	NA	NA	NA	NA	NA	NA
Pyrene	0.015	0.015	0.015	0.015	0.015	0.015	0.0247	NA	NA	NA	NA	NA	NA	NA

DIP TUBES ORGANICS REVIEW

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Organic Compound	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N
Acenaphthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH, Total Detected USEPA 16	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Quarter 3 (Q3)									Quarter 4 (Q4)								
Organic Compound	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N
Acenaphthene	0.015	0.015	0.015	0.016	0.015	0.015	0.091	0.030	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA
Acenaphthylene	0.011	0.011	0.011	0.011	0.011	0.011	0.016	0.022	0.011	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anthracene	0.015	0.015	0.015	0.015	0.015	0.015	0.017	0.030	0.015	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	0.017	0.017	0.017	0.017	0.057	0.017	0.019	0.034	0.017	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	0.009	0.009	0.030	0.009	0.055	0.009	0.009	0.018	0.011	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	0.023	0.023	0.045	0.023	0.084	0.023	0.023	0.046	0.023	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	0.016	0.016	0.031	0.016	0.040	0.016	0.016	0.032	0.016	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(k)fluoranthene	0.027	0.027	0.027	0.027	0.027	0.027	0.027	0.054	0.027	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	0.013	0.013	0.027	0.013	0.039	0.013	0.013	0.026	0.013	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dibenzo(a,h)anthracene	0.016	0.016	0.016	0.016	0.016	0.016	0.016	0.032	0.016	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	0.017	0.017	0.070	0.020	0.114	0.017	0.070	0.042	0.026	NA	NA	NA	NA	NA	NA	NA	NA	NA
Fluorene	0.014	0.014	0.014	0.014	0.014	0.014	0.052	0.028	0.014	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	0.014	0.014	0.025	0.014	0.041	0.014	0.014	0.028	0.014	NA	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	0.100	0.100	0.100	0.100	0.100	0.100	0.141	0.200	0.100	NA	NA	NA	NA	NA	NA	NA	NA	NA
PAH, Total Detected USEPA 16	0.344	0.344	0.344	0.344	0.616	0.344	0.627	0.688	0.344	NA	NA	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	0.022	0.022	0.022	0.022	0.054	0.022	0.170	0.084	0.022	NA	NA	NA	NA	NA	NA	NA	NA	NA
Pyrene	0.015	0.015	0.062	0.018	0.105	0.015	0.052	0.035	0.023	NA	NA	NA	NA	NA	NA	NA	NA	NA

LAGOON OTHER ORGANICS REVIEW

	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Organic Compound	LAG 1	LAG 1	LAG 1	LAG 1
Acenaphthene	NA	NA	0.02	NA
Acenaphthylene	NA	NA	0.01	NA
Anthracene	NA	NA	0.02	NA
Benzo(a)anthracene	NA	NA	0.02	NA
Benzo(a)pyrene	NA	NA	0.01	NA
Benzo(b)fluoranthene	NA	NA	0.02	NA
Benzo(g,h,i)perylene	NA	NA	0.02	NA
Benzo(k)fluoranthene	NA	NA	0.03	NA
Chrysene	NA	NA	0.01	NA
Dibenzo(a,h)anthracene	NA	NA	0.02	NA
Fluoranthene	NA	NA	0.02	NA
Fluorene	NA	NA	0.01	NA
Indeno(1,2,3-cd)pyrene	NA	NA	0.01	NA
Naphthalene	NA	NA	0.10	NA
PAH, Total Detected USEPA 16	NA	NA	0.34	NA
Phenanthrene	NA	NA	0.02	NA
Pyrene	NA	NA	0.02	NA

APPENDIX C – METALS DATA

BOREHOLE METALS DATA

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Metal	BH2R	BH3R	BH5	BH6	BH7 (Diss Filt)	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Arsenic	15.90	2.90	32.70	2.69	36.20	13.90	7.15	NA	6.15	7.80	NA	31.10	0.50	18.00	NA	NA	NA	NA
Cadmium	0.15	1.34	0.39	0.15	0.10	0.15	0.15	NA	0.15	0.15	NA	0.15	0.15	0.15	NA	NA	NA	NA
Chromium	1.50	27.20	25.80	26.80	12.20	1.50	1.50	NA	1.50	1.50	NA	1.50	1.50	1.50	NA	NA	NA	NA
Copper	7.62	1.00	1.00	1.00	2.29	12.20	4.51	NA	4.69	1.00	NA	1.35	1.00	1.00	NA	NA	NA	NA
Iron	4.00	4.00	1,630.00	54.00	0.84	28.10	65.10	NA	19.10	11.54	NA	1,660.00	12.05	1,145.00	NA	NA	NA	NA
Lead	0.20	0.20	0.20	0.23	0.16	0.20	0.20	NA	0.20	0.20	NA	0.20	0.20	0.20	NA	NA	NA	NA
Manganese	1,110.00	4.01	1,390.00	0.30	1,690.00	767.00	150.00	NA	78.10	1,110.00	NA	1,840.00	1.22	1,995.00	NA	NA	NA	NA
Mercury	0.15	0.15	0.15	0.15	0.01	0.15	0.15	NA	0.15	0.15	NA	0.15	0.15	0.15	NA	NA	NA	NA
Nickel	5.04	4.51	9.07	1.10	6.37	2.69	3.81	NA	1.10	1.10	NA	1.10	1.10	1.64	NA	NA	NA	NA
Zinc	3.88	58.60	2.10	16.70	8.99	37.10	13.80	NA	44.30	16.90	NA	15.30	22.10	9.12	NA	NA	NA	NA

	Quarter 3 (Q3)										Quarter 4 (Q4)							
Metal	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Arsenic	11.00	NA	43.30	6.76	25.20	19.60	9.48	15.00	8.82	10.20	NA	36.70	1.88	21.30	NA	NA	NA	NA
Cadmium	0.15	NA	0.46	0.20	0.15	0.15	0.15	0.15	0.15	0.15	NA	0.15	0.15	0.15	NA	NA	NA	NA
Chromium	12.90	NA	13.30	12.50	1.50	1.50	11.40	1.50	1.50	1.79	NA	1.69	1.76	2.40	NA	NA	NA	NA
Copper	1.32	NA	1.00	1.00	1.00	1.59	1.00	1.00	1.00	1.00	NA	1.00	1.00	1.00	NA	NA	NA	NA
Iron	37.40	NA	2,690.00	33.20	1,190.00	86.50	97.70	105.00	54.20	34.50	NA	3,490.00	16.30	1,400.00	NA	NA	NA	NA
Lead	0.20	NA	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	NA	0.20	0.20	0.20	NA	NA	NA	NA
Manganese	1,100.00	NA	2,760.00	6.15	2,020.00	816.00	115.00	472.00	69.40	1,100.00	NA	3,520.00	8.14	2,270.00	NA	NA	NA	NA
Mercury	0.19	NA	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.24	NA	0.37	0.39	0.33	NA	NA	NA	NA
Nickel	6.71	NA	5.41	3.18	1.43	1.10	5.76	1.10	1.10	2.82	NA	9.33	4.92	5.95	NA	NA	NA	NA
Zinc	2.10	NA	2.10	2.10	2.10	2.10	2.10	2.10	2.10	2.30	NA	4.66	28.30	3.82	NA	NA	NA	NA

SURFACE WATERS METALS DATA

	Quarter 1 (Q1)							Quarter 2 (Q2)						
Metal	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Arsenic	3.23	1.11	2.80	1.25	2.38	3.25	4.73	NA	1.70	0.95	1.34	1.81	1.71	0.86
Cadmium	0.15	0.84	0.15	0.15	0.15	0.15	0.15	NA	0.15	0.15	0.15	0.15	0.15	0.15
Chromium	24.30	29.60	1.50	26.80	1.50	1.50	1.50	NA	1.50	1.50	1.50	1.50	1.50	1.50
Copper	1.00	1.00	6.09	1.00	6.03	12.10	11.60	NA	1.00	1.00	1.00	1.00	1.00	1.00
Iron	4.00	7.33	4.00	4.00	20.60	12.00	60.50	NA	4.76	4.00	4.70	4.00	11.70	43.15
Lead	0.20	0.20	0.20	0.20	0.20	0.20	0.20	NA	0.20	0.20	0.20	0.20	0.20	0.20
Manganese	0.30	0.89	0.30	0.30	5.42	16.00	0.30	NA	3.36	0.79	0.62	0.39	4.21	0.92
Mercury	0.15	0.15	0.15	0.15	0.15	0.15	0.15	NA	0.15	0.15	0.15	0.15	0.15	0.15
Nickel	1.10	14.80	3.04	4.00	5.35	5.37	7.12	NA	1.10	1.10	1.10	1.10	1.10	1.10
Zinc	14.20	21.30	15.70	2.47	26.20	25.00	13.20	NA	23.10	2.10	11.10	4.04	4.70	3.56

	Quarter 3 (Q3)							Quarter 4 (Q4)						
Metal	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Arsenic	7.13	6.11	7.57	4.80	7.42	5.51	9.06	1.84	2.06	2.72	2.55	1.00	2.19	3.16
Cadmium	0.15	0.15	0.15	0.15	0.15	0.21	0.15	0.15	0.15	0.15	0.20	1.38	0.15	0.15
Chromium	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.60	1.50	1.50	1.50	1.76	1.50	2.57
Copper	1.00	1.00	1.00	1.00	1.00	1.00	1.55	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Iron	38.40	32.50	28.70	37.00	30.50	27.90	81.10	30.70	31.60	29.10	39.00	57.60	58.40	69.20
Lead	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Manganese	5.25	11.10	1.76	4.34	0.81	3.30	6.35	2.05	12.30	0.89	1.97	0.92	25.10	13.50
Mercury	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.21	0.32	0.35	0.29	0.28	0.31
Nickel	1.10	1.10	1.10	1.10	1.10	1.10	1.10	4.04	6.06	1.10	2.82	1.10	6.27	32.00
Zinc	2.10	2.10	2.10	2.10	2.10	2.10	2.10	19.70	11.90	9.57	16.70	8.11	31.30	5.32

DIP TUBES METALS DATA

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Metal	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N
Arsenic	NA	NA	6.55	8.90	NA	6.31	18.20	NA	4.25	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	0.10	0.15	NA	2.94	0.75	NA	2.74	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	2.96	29.10	NA	1.50	28.30	NA	27.40	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	18.80	1.00	NA	79.90	1.00	NA	1.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	0.04	107.00	NA	NA	4.00	NA	82.20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	2.30	2.00	NA	0.83	0.53	NA	32.80	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	18.20	143.00	NA	NA	0.30	NA	1,200.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	0.01	0.15	NA	0.15	0.24	NA	0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	2.69	32.50	NA	23.50	147.00	NA	37.40	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	10.80	6.36	NA	153.00	3.12	NA	59.30	NA	NA	NA	NA	NA	NA	NA	NA	NA

	Quarter 3 (Q3)									Quarter 4 (Q4)								
Metal	**DT3**	**DT6**	**DT16S**	**DT18**	**DT22**	**DT25S**	**DT36**	**DT32N**	**DT29N**	**DT3**	**DT6**	**DT16S**	**DT18**	**DT22**	**DT25S**	**DT36**	**DT32N**	**DT29N**
Arsenic	17.70	20.20	29.10	16.50	12.60	7.37	11.20	11.40	7.98	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cadmium	0.15	0.23	7.58	0.15	0.15	0.15	0.15	0.15	6.33	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chromium	12.90	9.23	0.92	36.10	12.40	11.60	6.37	8.54	6.46	NA	NA	NA	NA	NA	NA	NA	NA	NA
Copper	1.00	4.28	5.18	1.00	1.00	1.00	1.00	1.00	5.12	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron	179.00	197.00	0.19	143.00	78.50	268.00	24.20	29.20	170.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.30	3.67	3.69	2.21	0.20	0.20	0.20	0.20	0.35	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese	200.00	891.00	8.56	157.00	43.40	597.00	0.82	6.32	1,110.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Mercury	0.28	0.15	0.01	0.38	1.38	0.15	3.13	1.94	0.15	NA	NA	NA	NA	NA	NA	NA	NA	NA
Nickel	48.00	94.10	41.60	30.90	295.00	43.10	175.00	276.00	28.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Zinc	2.10	6.00	2.87	2.10	2.10	2.10	2.10	2.10	18.00	NA	NA	NA	NA	NA	NA	NA	NA	NA

LAGOON METALS DATA

	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Metal	LAG 1	LAG 1	LAG 1	LAG 1
Arsenic	1.00	NA	5.31	NA
Cadmium	0.15	NA	0.15	NA
Chromium	29.40	NA	9.71	NA
Copper	1.00	NA	1.00	NA
Iron	4.00	NA	46.90	NA
Lead	0.20	NA	0.20	NA
Manganese	0.30	NA	2.64	NA
Mercury	0.15	NA	0.15	NA
Nickel	2.14	NA	3.14	NA
Zinc	20.10	NA	2.10	NA

APPENDIX D – INORGANICS DATA

BOREHOLE INORGANIC DATA

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Determinant	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Ammoniacal Nitrogen as N	3.88	0.20	8.82	0.20	13.10	7.35	0.98	NA	1.05	4.01	NA	11.65	0.20	15.65	NA	NA	NA	NA
Chloride	17,000.00	18,800.00	4,800.00	18,800.00	4,810.00	14,900.00	19,600.00	NA	19,200.00	15,100.00	NA	6,340.00	18,850.00	6,270.00	NA	NA	NA	NA
COD, unfiltered	438.00	488.00	267.00	825.00	283.00	665.00	660.00	NA	855.00	652.00	NA	334.00	682.00	435.00	NA	NA	NA	NA
Dissolved solids, Total (gravimetric)	32,900.00	36,600.00	9,680.00	34,600.00	8,640.00	25,800.00	35,300.00	NA	36,400.00	28,100.00	NA	11,400.00	36,200.00	11,250.00	NA	NA	NA	NA
pH	7.97	7.59	7.93	7.75	8.00	8.09	7.88	NA	7.78	7.93	NA	7.84	7.46	7.97	NA	NA	NA	NA
Saline Nitrate as NO3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium (diss.filt)	8,480.00	9,420.00	2,270.00	8,980.00	2,500.00	6,880.00	9,710.00	NA	9,790.00	7,455.00	NA	3,180.00	9,990.00	3,305.00	NA	NA	NA	NA
Sulphate	2,350.00	2,560.00	603.00	2,330.00	746.00	1,560.00	2,570.00	NA	2,570.00	1,955.00	NA	682.00	2,830.00	764.00	NA	NA	NA	NA
Suspended solids, Total	23.00	23.00	12.50	22.00	58.00	21.50	23.50	NA	26.00	15.00	NA	12.00	22.00	8.50	NA	NA	NA	NA
Unionised ammonia	117.13	2.39	116.33	2.67	85.18	280.98	29.10	NA	56.46	106.76	NA	141.48	2.32	101.17	NA	NA	NA	NA

	Quarter 3 (Q3)									Quarter 4 (Q4)								
Determinant	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12	BH2R	BH3R	BH5	BH6	BH7	BH9	BH10	BH11	BH12
Ammoniacal Nitrogen as N	3.77	NA	13.80	0.20	15.90	7.85	0.83	7.41	0.50	4.10	NA	14.00	0.20	16.50	NA	NA	NA	NA
Chloride	14,800.00	NA	9,130.00	19,700.00	6,070.00	15,300.00	19,600.00	5,770.00	19,300.00	16,300.00	NA	13,400.00	20,700.00	7,630.00	NA	NA	NA	NA
COD, unfiltered	533.00	NA	470.00	688.00	322.00	630.00	11,400.00	209.00	1,920.00	350.00	NA	314.00	350.00	208.00	NA	NA	NA	NA
Dissolved solids, Total (gravimetric)	30,800.00	NA	20,600.00	39,900.00	13,300.00	31,000.00	39,600.00	13,300.00	41,000.00	30,000.00	NA	25,100.00	37,600.00	14,400.00	NA	NA	NA	NA
pH	7.97	NA	7.87	7.71	8.11	8.10	8.00	8.04	7.93	8.03	NA	7.66	7.70	7.98	NA	NA	NA	NA
Saline Nitrate as NO3	0.30	NA	0.74	1.48	0.30	0.30	1.99	0.30	2.93	0.30	NA	0.30	118.00	0.30	NA	NA	NA	NA
Sodium (diss.filt)	8,800.00	NA	4,520.00	10,600.00	2,810.00	6,800.00	10,300.00	2,630.00	9,370.00	8,230.00	NA	6,230.00	10,100.00	3,690.00	NA	NA	NA	NA
Sulphate	2,140.00	NA	1,030.00	2,800.00	758.00	1,680.00	2,580.00	1,380.00	2,520.00	2,170.00	NA	1,350.00	2,600.00	770.00	NA	NA	NA	NA
Suspended solids, Total	29.00	NA	23.00	36.00	11.50	21.50	60.50	16.50	29.50	18.50	NA	39.50	16.50	12.50	NA	NA	NA	NA
Unionised ammonia	157.92	NA	243.56	3.80	284.25	363.43	14.91	300.57	13.90	122.67	NA	81.97	1.76	193.03	NA	NA	NA	NA

SURFACE WATERS INORGANIC DATA

	Quarter 1 (Q1)							Quarter 2 (Q2)						
Determinant	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Ammoniacal Nitrogen as N	0.20	0.20	0.20	0.20	0.20	0.20	0.20	NA	0.20	0.20	0.20	0.20	0.20	0.20
Chloride	21,000.00	19,400.00	20,500.00	19,100.00	20,900.00	18,800.00	17,700.00	NA	19,850.00	19,900.00	19,250.00	19,150.00	19,300.00	17,300.00
COD, unfiltered	790.00	760.00	1,070.00	443.00	790.00	970.00	675.00	NA	516.50	810.00	483.00	541.50	566.50	602.50
Dissolved solids, Total (gravimetric)	36,400.00	36,300.00	37,100.00	38,000.00	36,800.00	36,200.00	30,500.00	NA	36,800.00	36,500.00	37,000.00	36,000.00	32,700.00	33,700.00
pH	8.01	8.28	7.99	8.15	7.99	7.69	7.72	NA	8.21	8.00	8.42	8.43	8.28	7.80
Saline Nitrate as NO3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium (diss.filt)	10,200.00	10,100.00	10,700.00	9,740.00	10,700.00	9,170.00	8,470.00	NA	8,785.00	8,305.00	9,185.00	9,015.00	9,590.00	4,335.60
Sulphate	2,710.00	2,440.00	2,470.00	2,800.00	2,450.00	2,650.00	2,220.00	NA	2,760.00	2,815.00	2,735.00	2,590.00	2,590.00	2,400.00
Suspended solids, Total	26.00	24.00	53.00	30.00	61.50	34.00	42.00	NA	132.00	42.25	39.50	45.50	50.75	29.50
Unionised ammonia	5.54	7.13	4.64	6.97	3.42	2.02	3.61	NA	6.97	5.25	13.90	10.37	6.66	1.72

	Quarter 3 (Q3)							Quarter 4 (Q4)						
Determinant	SW1	SW2	SW8	SW12	SW14	SW18	SW20	SW1	SW2	SW8	SW12	SW14	SW18	SW20
Ammoniacal Nitrogen as N	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.53	0.20
Chloride	20,000.00	19,500.00	19,500.00	19,800.00	19,700.00	19,700.00	18,300.00	19,900.00	20,900.00	19,500.00	21,200.00	21,100.00	20,000.00	18,900.00
COD, unfiltered	578.00	584.00	562.00	684.00	630.00	504.00	606.00	610.00	444.00	536.00	554.00	496.00	404.00	350.00
Dissolved solids, Total (gravimetric)	39,200.00	38,400.00	40,300.00	39,600.00	40,000.00	40,300.00	38,000.00	40,500.00	40,000.00	40,600.00	40,400.00	42,200.00	38,600.00	36,400.00
pH	8.09	8.10	8.06	8.02	9.08	8.06	7.66	8.18	7.83	8.09	8.67	8.45	7.63	7.78
Saline Nitrate as NO3	0.35	0.84	0.45	0.51	0.30	0.30	1.71	0.42	0.70	0.86	0.31	0.30	12.60	3.37
Sodium (diss.filt)	9,900.00	9,960.00	10,000.00	10,100.00	9,650.00	10,500.00	11,100.00	10,200.00	10,700.00	9,980.00	10,400.00	10,200.00	11,100.00	9,510.00
Sulphate	2,600.00	2,610.00	2,570.00	2,600.00	2,590.00	2,600.00	2,500.00	2,800.00	2,630.00	2,790.00	2,610.00	2,640.00	2,700.00	2,520.00
Suspended solids, Total	30.00	27.00	46.00	56.00	19.50	79.00	433.00	24.50	17.50	20.50	18.50	18.00	102.00	87.50
Unionised ammonia	10.85	11.76	11.14	11.64	92.37	9.86	6.84	6.79	3.25	6.12	24.17	14.49	7.62	3.79

DIP TUBES INORGANIC DATA

	Quarter 1 (Q1)									Quarter 2 (Q2)								
Determinant	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N
Ammoniacal Nitrogen as N	NA	NA	0.20	80.40	NA	8.13	99.10	NA	84.10	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloride	NA	NA	136.00	23,000.00	NA	1,630.00	5,970.00	NA	20,600.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
COD, unfiltered	NA	NA	88.50	960.00	NA	159.00	771.00	NA	738.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved solids, Total (gravimetric)	NA	NA	530.00	42,400.00	NA	6,660.00	12,400.00	NA	37,600.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	NA	NA	7.82	7.40	NA	7.68	11.00	NA	6.99	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Nitrate as NO3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium (diss.filt)	NA	NA	78.00	8,850.00	NA	684.00	2,930.00	NA	5,810.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulphate	NA	NA	121.00	190.00	NA	1,310.00	1,340.00	NA	880.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Suspended solids, Total	NA	NA	149.00	73.50	NA	11.50	12.00	NA	26.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unionised ammonia	NA	NA	4.58	502.54	NA	189.46	124,641.69	NA	283.93	NA	NA	NA	NA	NA	NA	NA	NA	NA

Determinant	Quarter 3 (Q3)									Quarter 4 (Q4)								
	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N	DT3	DT6	DT16S	DT18	DT22	DT25S	DT36	DT32N	DT29N
Ammoniacal Nitrogen as N	82.60	177.00	16.90	80.30	117.00	57.80	100.00	74.40	61.60	NA	NA	NA	NA	NA	NA	NA	NA	NA
Chloride	4,980.00	20,600.00	1,300.00	24,000.00	10,600.00	7,860.00	5,840.00	5,240.00	16,800.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
COD, unfiltered	660.00	2,060.00	146.00	974.00	1,460.00	376.00	980.00	1,390.00	738.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved solids, Total (gravimetric)	10,200.00	40,100.00	4,120.00	47,000.00	20,800.00	16,700.00	13,400.00	10,600.00	36,100.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
pH	7.87	7.68	9.22	6.80	8.05	7.31	11.40	9.19	6.86	NA	NA	NA	NA	NA	NA	NA	NA	NA
Saline Nitrate as NO3	2.41	117.00	NA	43.50	0.30	0.30	0.30	0.30	26.20	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sodium (diss.filt)	1,930.00	8,150.00	692.00	9,770.00	4,450.00	2,580.00	3,130.00	2,480.00	6,790.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulphate	496.00	193.00	1,010.00	175.00	164.00	143.00	957.00	95.50	795.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Suspended solids, Total	15.00	50.00	38.50	34.00	71.00	15.00	38.00	26.50	248.00	NA	NA	NA	NA	NA	NA	NA	NA	NA
Unionised ammonia	1,333.97	6,859.18	15,051.82	57.19	4,291.43	1,066.99	127,687.23	50,727.06	342.00	NA	NA	NA	NA	NA	NA	NA	NA	NA

LAGOON INORGANIC DATA

	Quarter 1 (Q1)	Quarter 2 (Q2)	Quarter 3 (Q3)	Quarter 4 (Q4)
Determinant	LAG 1	LAG 1	LAG 1	LAG 1
Ammoniacal Nitrogen as N	0.20	NA	0.20	NA
Chloride	20,100.00	NA	19,600.00	NA
COD, unfiltered	748.00	NA	965.00	NA
Dissolved solids, Total (gravimetric)	36,000.00	NA	40,100.00	NA
Saline Nitrate as N	8.03	NA	8.02	NA
Saline Nitrate as NO3	NA	NA	0.30	NA
Sodium (diss.filt)	NA	NA	0.35	NA
Sulphate	9,760.00	NA	10,800.00	NA
Suspended solids, Total	2,530.00	NA	2,550.00	NA
Unionised ammonia	41.50	NA	30.00	NA
pH	6.25	NA	8.58	NA

APPENDIX E- 2011-2015 STATISTICS

PHENOLS

No previous (2011-2015) statistics are available for the following total phenol tests, as these were conducted for the first time

Determinant	BH 2011-2015 Statistics		SW 2011-2015 Statistics		DT 2011-2015 Statistics		Lagoon 2011-2015 Statistics	
	Max	Mean	Max	Mean	Max	Mean	Max	Mean
Phenol	NA	NA	NA	NA	NA	NA	NA	NA
Phenols, Total Detected monohydric	NA	NA	NA	NA	NA	NA	NA	NA
Saline Phenol by HPLC (W)	NA	NA	NA	NA	NA	NA	NA	NA
Sum of Detected MONOHYDRIC PHENOLS saline matrix	NA	NA	NA	NA	NA	NA	NA	NA

OTHER ORGANICS

Determinant	BH 2011-2015 Statistics		SW 2011-2015 Statistics		DT 2011-2015 Statistics		Lagoon 2011-2015 Statistics	
	Max	Mean	Max	Mean	Max	Mean	Max	Mean
Acenaphthene	0.736	0.074	0.015	0.082	1.500	0.098	0.015	0.015
Acenaphthylene	0.797	0.025	0.011	0.019	1.100	0.062	0.011	0.015
Anthracene	1.81	0.051	0.015	0.022	1.500	0.088	0.015	0.015
Benzo(a)anthracene	6.86	0.168	0.017	0.074	1.700	0.105	0.017	0.017
Benzo(a)pyrene	10.6	0.229	0.009	0.069	0.900	0.061	0.009	0.009
Benzo(b)fluoranthene	8.25	0.186	0.023	0.093	2.300	0.137	0.023	0.023
Benzo(g,h,i)perylene	7.95	0.162	0.016	0.054	1.600	0.096	0.022	0.016
Benzo(k)fluoranthene	8.00	0.209	0.027	0.039	2.700	0.156	0.027	0.027
Chrysene	7.02	0.190	0.013	0.080	1.300	0.088	0.013	0.013
Dibenzo(a,h)anthracene	1.30	0.043	0.016	0.035	1.600	0.091	0.020	0.016
Fluoranthene	10.2	0.283	0.017	0.122	1.700	0.128	0.024	0.018
Fluorene	0.638	0.036	0.014	0.031	1.400	0.086	0.014	0.014
Indeno(1,2,3-cd)pyrene	6.97	0.132	0.014	0.037	1.400	0.084	0.017	0.014
Naphthalene	1.00	0.152	0.1	1.640	10.000	0.613	0.173	0.108
PAH, Total Detected USEPA 16	79.2	2.31	0.344	1.780	2.200	0.149	0.344	0.271
Phenanthrene	7.16	0.159	0.022	0.083	1.500	0.015	0.022	0.022
Pyrene	8.85	0.275	0.015	0.107	34.400	1.877	0.020	0.015

METALS

Determinant	BH 2011-2015 Statistics		SW 2011-2015 Statistics		DT 2011-2015 Statistics		Lagoon 2011-2015 Statistics	
	Max	Mean	Max	Mean	Max	Mean	Max	Mean
Arsenic	125	22.9	7.39	1.92	477	42.9	3.2	1.90
Cadmium	21.1	0.675	1.34	0.205	219	2.55	1.62	0.335
Chromium	56.5	7.87	285	4.48	97	7.78	19.1	4.23
Copper	59.0	5.55	21.2	2.29	1800	33.6	4.1	1.76
Iron	17700	484.1	4230	58.0	707	43.8	12300.00	1255.97
Lead	25.1	1.041	6.98	0.460	1970	12.6	1.47	0.401
Manganese	4830	1319.5	116	4.45	8460	307.5	5	2.5
Mercury	0.634	0.142	0.834	0.180	4.23	0.36	36.5	3.489
Nickel	34.3	7.96	251	3.99	1430	122.1	10.6	3.32
Zinc	175	14.3	122	12.8	842	22.5	72.00	12.3

INORGANICS

Determinant	BH 2011-2015 Statistics		SW 2011-2015 Statistics		DT 2011-2015 Statistics		Lagoon 2011-2015 Statistics	
	Max	**Mean**	**Max**	**Mean**	**Max**	**Mean**	**Max**	**Mean**
Ammoniacal Nitrogen as N	28.0	8.82	4.3	0.43	340	76.80	4.42	0.80
Chloride	20,900	14,216	22,300.00	20,028.45	44,800.00	15,649.83	21,000.00	18,343.95
COD, unfiltered	1,810	423.81	978	387.05	4,920	1,022.76	938	370.87
Dissolved solids, Total (gravimetric)	37,900	23,487	40,400.00	37,446.94	38,000	25,072	40,500	35,950.00
pH	8.70	7.95	8.93	7.98	11.70	8.33	8.35	7.96
Saline Nitrate as NO3	5.15	0.77	12	1.19	693	34.06	3.42	0.96
Sodium (diss.filt)	11,500	5,774.60	13,600	11,496.11	20,500	7,394.72	12,400	12,000
Sulphate	2,800	1,810	2,920.00	2,684.31	1,810.00	586.64	3,150.00	2,472.12
Suspended solids, Total	22,700	736.61	1,750	86.16	804	96.95	12,300	429.77
Unionised ammonia (2015 Data Only)	406.2	147.75	43.66	10.26	144,240.32	13,739.56	10.27	8.22