

Your ref: DP3733BK

Our ref: 14739/075/CBH/KR

12 December 2018

PPC Team
 Natural Resources Wales
 Rivers House
 Fortran Road
 St. Mellons Business Park
 Cardiff
 CF3 0EY

Attn: Mr David Willey

Dear David

RE: DP3733BK - Docksway Disposal Site. Latest Area 2 Groundwater and Leachate Quality Monitoring Report, Round 176, October 2018, including Annual Screen.

Please find enclosed the results of the groundwater and leachate quality monitoring undertaken at Area 2 of Docksway Disposal Site. Groundwater and leachate monitoring is required quarterly at the site in order to comply with Conditions 3.6.1 and 3.6.2 of the site PPC Permit. This report includes discussion on results obtained from monitoring during October 2018, and the results of the annual screen which was also carried out during this round. A groundwater sample was not obtained from GW06_14a during Round 176, and the liquid within the well has been reported as too viscous for the pump. The reason for this is unknown and is subject to ongoing investigation.

We enclose with this letter report, Figure A, a plan showing the locations of the available monitoring points. We also enclose the laboratory analytical certificates.

Field Observations

Details of the field testing of the Area 2 groundwater and leachate samples during Round 176 are presented in Table 1, together with depths to groundwater and leachate, recorded between August and November 2018.

Table 1 – Field Testing Results and Observations

Monitoring Point	Dates Monitored	Depth to Groundwater/Leachate (mbgl)	pH	Electrical Conductivity (µS/cm)	Temperature (°c)	Dissolved Oxygen (%)
GW06_39	02/08/2018	3.70	7.85	6594	12.57	0.4
	28/08/2018	4.50				
	29/10/2018	3.50				
	20/11/2018	3.95				

GW07_40	02/08/2018 28/08/2018 29/10/2018 20/11/2018	5.00 4.50 5.00 4.75	8.38	1980	12.35	20.3
GW12_30	02/08/2018 28/08/2018 29/10/2018 20/11/2018	4.90 4.90 4.60 4.70	7.50	2892	10.90	1.40
GW09_31	02/08/2018 28/08/2018 29/10/2018 20/11/2018	5.20 5.50 5.75 5.25	7.70	2276	11.85	0.0
GW03_09	02/08/2018 28/08/2018 29/10/2018 20/11/2018	8.30 8.40 8.20 8.40	7.93	6220	11.24	21.6
GW09_32	02/08/2018 28/08/2018 29/10/2018 20/11/2018	8.80 7.95 8.30 8.38	7.42	2209	10.44	5.60
GW12_33	02/08/2018 28/08/2018 29/10/2018 20/11/2018	8.10 8.65 8.15 8.43	7.64	4766	11.44	1.40
GW06_34	02/08/2018 28/08/2018 29/10/2018 20/11/2018	8.70 8.50 8.60 8.50	7.68	1601	11.64	3.20
GW09_35	02/08/2018 28/08/2018 29/10/2018 20/11/2018	7.60 9.01 4.80 8.28	7.80	13900	12.29	2.50
GW09_36	02/08/2018 28/08/2018 29/10/2018 20/11/2018	8.00 7.70 8.40 7.85	7.95	11170	12.19	5.50
GW06_37	02/08/2018 28/08/2018 29/10/2018 20/11/2018	7.70 6.20 7.60 6.85	8.05	496.4	11.38	66.20
GW06_13	02/08/2018 28/08/2018 29/10/2018 20/11/2018	7.20 7.30 7.45 7.15	8.21	8253	11.24	0.70
GW12_38	02/08/2018 28/08/2018 29/10/2018 20/11/2018	7.80 7.00 7.00 7.33	7.63	6542	11.78	44.0
GW06_14a	02/08/2018 28/08/2018 29/10/2018 20/11/2018	7.80 7.80 n/a 7.90	n/a	n/a	n/a	n/a
LF08_07	02/08/2018 28/08/2018 29/10/2018 20/11/2018	14.45 14.30 14.30 n/a	n/a	n/a	n/a	n/a
C2A	02/08/2018 28/08/2018 29/10/2018 20/11/2018	14.40 14.00 14.20 13.90	n/a	n/a	n/a	n/a
C2B	02/08/2018 28/08/2018 29/10/2018 20/11/2018	23.50 23.00 23.40 23.10	8.32	17470	19.70	74.80
C3B	02/08/2018 28/08/2018	10.13 10.00				

	29/10/2018 20/11/2018	n/a n/a	n/a	n/a	n/a	n/a
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n/a = no access

Laboratory Testing Results

Compliance Levels

The agreed Control levels and Compliance limits for Area 2 'priority contaminants' are reproduced in Tables 2 and 3.

Table 2 –PPC Permit Compliance Levels for Emissions to Groundwater (Hazardous Substances)

Monitoring Well	Benzene	Naphthalene	Xylene	EPH	Arsenic
	Compliance Limit	Compliance Limit	Compliance Limit	Compliance Limit	Compliance Limit
	ug/l	ug/l	ug/l	ug/l	ug/l
GW03_09	2	5	3	Not Required	35
GW06_13	2	5	3	Not Required	50
GW06_14a	2	5	3	Not Required	25
GW06_34	2	5	3	Not Required	65
GW06_36	2	5	3	Not Required	30
GW06_37	2	5	3	Not Required	60
GW06_39	2	5	3	Not Required	50
GW07_40	2	5	3	Not Required	35
GW09_31	13	5	3	Not Required	80
GW09_32	3	5	3	Not Required	30
GW09_35	2	5	3	Not Required	50
GW12_30	1	1	1	Not Required	160
GW12_33	1	1	1	Not Required	560
GW12_38	1	1	1	Not Required	26

Table 3 –PPC Permit Compliance Levels for Emissions to Groundwater (Non-Hazardous Substances)

Monitoring Well	Nickel		Potassium		Ammoniacal Nitrogen	
	Control Level	Compliance Limit	Control Level	Compliance Limit	Control Level	Compliance Limit
	ug/l	ug/l	mg/l	mg/l	mg/l	mg/l
GW03_09	8	10	160	180	30	35
GW06_13	12	14	100	110	30	35
GW06_14a	12	14	160	180	53	60
GW06_34	12	14	310	350	30	35
GW06_36	8	10	100	110	20	23
GW06_37	8	10	100	110	30	35
GW06_39	26.4	30	100	110	20	23
GW07_40	8	10	39.6	45	20	23
GW09_31	8	10	100	110	50	50
GW09_32	8	10	160	180	50	50
GW09_35	8	10	100	110	30	35

GW12_30	25	30	35	40	10	12
GW12_33	5	6	50	55	15	18
GW12_38	25	30	65	70	10	12

Hazardous Substances (formally List I substances)

All the hazardous substances, specified as “priority contaminants” in the Area 2 Hydrogeological Risk Assessment were monitored at the compliance wells in October 2018 and were recorded below the method detection limits.

Other Hazardous Substances (Annual Screen)

A full hazardous substance screen was carried out during October 2018 in accordance with Condition 3.6.1 of the PPC Permit. The majority of the hazardous substances tested for during this annual round at Area 2 are not designated Priority Contaminants for Docksway Disposal Site and therefore compliance limits are not required to be set. The results of the additional testing undertaken during October 2018 are presented in the enclosed analytical certificates, and summarised below.

The results indicate that with limited exceptions, volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs), mercury, phenols, pesticides and organotins were not detected above the laboratory method detection limits in the Area 2 groundwater samples during Round 176. The five exceptions are as follows;

Table 4 – Annual Screen Recorded Concentrations – October 2018

Component	Measured values	Borehole
Dichlobenil	0.208 ug/l	GW06_39
	0.0809 ug/l	GW07_07
Triallate	0.012 ug/l	GW09_31
	0.0136 ug/l	GW09_35
Atrazine	0.0147 ug/l	GW12_38

Non-hazardous Substances

None of the non-hazardous substances agreed as “priority contaminants” exceeded the well specific Compliance Limits at the wells sampled during Round 176.

Leachate Measurements and Laboratory Test Results

Leachate levels were recorded at C1A, C1B, C1D, C2A, C2B, C3B and LF08_07 in July, August, October and November 2018 and the leachate head levels are indicated to be as follows;

Table 5 – Leachate Head

Monitoring Location	Leachate Head (m) in July/Aug/Oct/Nov
C1A	no access
C1B	1.12/1.42/1.22/1.32
C1D	1.11/1.51/1.51/1.31
C2A	0.98/1.38/1.18/1.48
C2B	2.24/2.74/2.34/2.64
LF08_07 (Cell 1)	2.04/2.19/2.19/2.49
C3B	1.77/1.90/no access/no access

The leachate head levels recorded indicate a slight exceedance of the permitted level (2m) at C2B and LF08_07.

An annual hazardous substance screen of the Area 2 leachate was carried out during November 2018 in accordance with Condition 3.6.1 of the PPC Permit. Samples of leachate were obtained from the side riser closest to C2B in Cell 2 and in Cell 1 at a side riser called LF Cell_1_C on the lab certificate. The results of the annual screen testing undertaken during November 2018 are presented in the enclosed analytical certificates and are summarised below.

The results of the additional testing for the annual screen indicate that whilst Mercury was not detected above Method Detection Limit (MDL), total Phenols were recorded at concentrations of 0.18 and 0.05 mg/l respectively.

The majority of the remaining annual screen results were below the detection limits with the following exceptions;

Table 6 – Area 2 Annual Screen Leachate Data

Component	Measured Value (C2B)	Measured Value (LF Cell_1_C)
Naphthalene (ug/l)	1.07	1.58
Bis(2-Ethylhexyl) phthalate (SVOC) (ug/l)	48.20	9.5
Methyl tertiary butyl ether (MTBE)	-	3.98
Benzene	4.62	6.09
Chlorobenzene	-	2.62
Toluene	3.89	-
Ethylbenzene	4.54	5.07
m,p-Xylene	4.20	7.43
o-Xylene	3.06	5.89
1,2,4-Trimethylbenzene	1.40	2.75

Leachate Removed

The volume of leachate removed from Area 2 (Cells 1 to 3 combined) is summarised in Table 7 below:

Table 7 – Quarterly Leachate Data from Area 2

Monitoring Round	Leachate Removed (kg)
September 2018 R175	522800
October 2018 R176	1194380
November 2018 R177	820840

Concluding Remarks

All of the 'priority contaminants' were recorded at concentrations in the groundwater below the well specific Compliance Limits in Area 2 during October 2018.

The majority of annual screen results were recorded at concentrations in the groundwater below the MDL, however some components were detected at relatively low levels. There were detectable concentrations for three parameters at five monitoring locations as described above. The parameters detected are all pesticides and it is considered likely that these represent general background levels representative of the wide groundwater regime rather than resulting from the landfill site. It is considered that these do not indicate a significant risk to the groundwater from the landfill.

PBA will continue to monitor and comment on the groundwater quality within subsequent reports. If you have any questions regarding the data, then please do not hesitate to contact us.

Yours sincerely

A handwritten signature in black ink, appearing to read 'V Kate Riley'.

Kate Riley
Associate
For and on behalf of
PETER BRETT ASSOCIATES LLP

Cc. Jonathan Davey – NCC (Docksway Disposal Site)