

CAULMERT LIMITED

Engineering, Environmental & Planning
Consultancy Services

Bryn Posteg Landfill Site

Potters Waste Management

Quarterly Monitoring Review

April – June 2017

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2601. EMP.01 Environmental Monitoring Plan

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1.0 INTRODUCTION

1.1 Background

1.1.1 This report has been compiled in compliance with the Environmental Permit (EP) BU7766, Variation Notice Number EPR/BU7766IC/V004 for Bryn Posteg Landfill Site, which requires that the monitoring data collected at the site is reviewed quarterly. The data reviewed in this report was collected between the 1st of April and the 30th of June 2017.

1.1.2 This report records and reviews monitoring data for landfill gas, leachate, groundwater and surface water and discusses this data in relation to emission limits set in the latest EP variation. The data will also be included in an Annual Monitoring Review, as required by the EP. Third party information supplied by Potters Waste Management (Potters) has been used in good faith within this document. Caulmert Ltd has not attempted to verify the information.

1.2 Site Location and Surrounding Land-use

1.2.1 Bryn Posteg Landfill Site is located approximately 3 km south east of Llanidloes in Powys and is centered at National Grid Reference SN 971 822. The site is accessed via the B4518, Llanidloes to Tylwch road. The B4518 runs parallel with the western site boundary.

1.2.2 The landfill site was developed from the surface void of a former lead mine. Controlled landfilling has taken place since 1982.

1.2.3 Bryn Posteg is situated amongst predominantly agricultural land. There are four residential receptors located within approximately 325 m of the waste mass, these are:

- Valley View, 200 m to the north west;
- Rhoswen, 250 m to the east;
- Pant, 260 m to the east; and
- Penbryn Du, 325 m to the north.

2.0 LANDFILL GAS

2.1 Summary of Monitoring Results

- 2.1.1 Routine landfill gas (LFG) monitoring is required to be carried out on a weekly basis at 36 boreholes situated around the site perimeter. All boreholes have the prefix 'G' in the monitoring data. Concentrations of methane (CH₄) and carbon dioxide (CO₂) are measured alongside oxygen (O₂), relative pressure and atmospheric pressure on each visit.
- 2.1.2 Summary tables displaying all CH₄, CO₂ and O₂ monitoring data collected during this period are included in Appendix 1.
- 2.1.3 CH₄ concentrations exceeded the trigger level value of 1.0 %¹ on at least one occasion at 18 of the monitoring points (G01, G12, G19, G20, G21, G22, G23, G24, G25, G27, G29, G30, G31, G35, G38, G40 and G41). The maximum concentration was 75.2 %, detected at G22, on the 8th April 2017.
- 2.1.4 CO₂ concentrations exceeded the trigger level value of 1.5 % on at least one occasion at 24 monitoring locations – G01, G10, G11, G12, G13, G14, G18, G19, G20, G21, G22, G23, G25, G26, G27, G29, G30, G31, G35, G36, G38, G39, G40 and G41. The maximum detected concentration was 36.3 % in G20.

2.2 Gas Collection Compound Data

- 2.2.1 Daily gas collection data is included in Appendix 1.

¹ All gas concentrations are expressed as % v/v

3.0 GROUNDWATER

3.1 Summary of Monitoring Results

- 3.1.1 Groundwater is sampled at locations W1 – W11. W10 and W11 are located off site and weren't accessible during this review period. Samples were tested for a monthly suite of parameters and once, in June, for a larger quarterly suite. All monitoring data is included in Appendix 2.
- 3.1.2 Concentrations of all monthly parameters were below their respective trigger levels, except chloride at location W1 only. The maximum chloride concentration in W1 was 257 mg/l, which is similar to the maximum found in W1 during the last review period (252 mg/l).
- 3.1.3 None of the quarterly parameter trigger limits were exceeded at any of the nine locations during this review period. Concentrations were similar to those detected in the previous quarter.
- 3.1.4 The parameters included in the quarterly suite that do not have trigger limits were considered to be within acceptable concentrations, with the majority of parameters remaining undetected.

3.2 Groundwater Levels

- 3.2.1 Groundwater levels were recorded Monthly. The results indicated that groundwater elevation remained relatively stable over the review period.

4.0 LEACHATE

4.1 Summary of Monitoring Results

Monitoring of leachate sumps

- 4.1.1 Leachate levels are measured monthly in Sump 1, Sump 2, Sump 3, Sump 4, Sump 5, Sump 9c and Sump 9d. RLMP9A and RLMP9B are sealed to improve the gas management on site. The EP limit for the liquid level within the sumps is 1 m above base. All monitoring data can be found in Appendix 3.
- 4.1.2 Leachate levels remained below the 1 m trigger level in Sump 1, Sump 2, Sump 4, Sump 9C and Sump 9D.
- 4.1.3 The leachate level in Sump 3 exceeded the trigger limit at the start of the review at 1.5 m above base in April, but decreased to less than 1 m above base in May and June.
- 4.1.4 The leachate level in Sump 5 exceeded the trigger limit slightly at the start of the review at 1.05 m above base in April, but decreased to less than 1 m above base in May and June.
- 4.1.5 Leachate samples were analysed in April, May and June for pH and ammoniacal nitrogen.
- 4.1.6 pH ranged from slightly acidic to slightly alkaline throughout the review period, ranging between 5.2 and 8.5 while ammoniacal nitrogen ranged between 21 mg/l in Leachate 7 and 3630 mg/l in Leachate 2, with an average of 1241 mg/l.

Treated leachate

- 4.1.7 Treated leachate (final discharge) was tested during April, May and June for pH, ammoniacal nitrogen, suspended solids, COD, Total Petroleum Hydrocarbons (C6 – C40), sulphate and dissolved methane.
- 4.1.8 Ammoniacal nitrogen, sulphate and dissolved methane concentrations remained below their respective EP limit throughout the review period.
- 4.1.9 pH concentrations dropped below the trigger range of 6 – 10 to 5.2 pH units during May.
- 4.1.10 COD concentration were above the 1000 mg/l compliance limit on two occasions with concentrations of 1440 mg/l and 1910 mg/l in May and June respectively
- 4.1.11 TPH concentrations exceeded the compliance level of 'nil' throughout the review period with a maximum concentration of 6100 µg/l recorded in April. The average concentration across the review period was 3380 µg/l.

- 4.1.12 Potters Waste Management also undertakes daily in-situ testing of treated leachate in order to assess its suitability for discharge.
- 4.1.13 A total of 8974 m³ of treated leachate was discharged between the 1st of April and the 30th of June 2017.
- 4.1.14 Additionally, 2751.36 m³ leachate was removed from site by tanker for offsite treatment during this quarter. Based on the available data, the total extracted leachate volume was therefore 11725.36 m³.

5.0 SURFACE WATER

5.1 Summary of Monitoring Results

- 5.1.1 The permit requires monthly monitoring at monitoring points P1, P2 and SW3.
- 5.1.2 SW3 is the discharge point for the proposed reed bed which has not yet been commissioned, hence monitoring at this point has not commenced.
- 5.1.3 Surface water samples were collected at SW1 (P1) and SW2 (P2) during the review period. A summary table displaying surface water monitoring data is enclosed in Appendix 4.
- 5.1.4 No ammoniacal nitrogen was detected in SW1 during this review period. The ammoniacal nitrogen concentration in SW2 was slightly above the detection limit during April at 0.07 mg/l, but decreased to below the detection limit for the remainder of the review period.
- 5.1.5 Suspended solids concentration remained below the 50 mg/l trigger level at SW1 throughout the review period. Suspended solid concentration in SW2 was slightly above the trigger level in June with a concentration of 54 mg/l.
- 5.1.6 pH was relatively neutral in SW1 throughout the review period ranging from 6.9 to 7.2, concentrations in SW2 were slightly alkaline with concentrations ranging from 7.8 to 8.1.
- 5.1.7 Electrical conductivity ranged between 113 $\mu\text{S}/\text{cm}$ and 117 $\mu\text{S}/\text{cm}$ in SW1, and between 336 $\mu\text{S}/\text{cm}$ and 453 $\mu\text{S}/\text{cm}$ in SW2.
- 5.1.8 Chloride concentrations ranged between 11.8 mg/l and 12.7 mg/l in SW1, and between 42.4 mg/l and 50.0 mg/l in SW2.
- 5.1.9 BOD concentration was low with concentrations ranging from 2 mg/l to 5 mg/l in SW1, concentrations in SW2 ranged from 2 mg/l to 4 mg/l.
- 5.1.10 Petroleum hydrocarbons (PAHs) were detected in SW1 in April with total petroleum hydrocarbon (EH >C6-C40) concentrations of 27 $\mu\text{g}/\text{l}$. PAHs were detected in SW2 in May and June with concentrations of total petroleum hydrocarbon (EH >C6-C40) at 24 $\mu\text{g}/\text{l}$ and 71 $\mu\text{g}/\text{l}$ respectively.

6.0 DUST

6.1 Monitoring Results

6.1.1 Dust monitoring was undertaken between the 15th of May to the 30th of May 2017 at locations BP1, BP2 and BP3. The dust monitoring results, as supplied by the subcontracted laboratory, are summarised in Table 2 below. A Certificate of Analysis is enclosed in Appendix 5

Period	17/05/2017 – 30/05/2017		
Location	Mass of Undissolved Solids mg	Result mg/m ² /day	Trigger Level mg/m ² /day
BP 1	13.7	26	200
BP 2	21.8	41	200
BP 3	16.1	31	200

6.1.2 Dust concentrations remained below the trigger level at all locations during this review period.

7.0 SUMMARY

7.1 Landfill gas

7.1.1 The CH₄ trigger level was exceeded at 18 locations and the CO₂ trigger level was exceeded at 24 locations on a number of occasions during the monitoring period.

7.2 Groundwater

7.2.1 Groundwater levels remained relatively stable over the review period.

7.2.2 The concentrations of all parameters were below their respective trigger levels, except chloride in W1. Chloride concentrations have been detected above the EP compliance limit at this location since 2005. The trends in concentrations of ammoniacal nitrogen, chloride and sodium were compared in the correspondence referenced 3033-CAU-XX-XX-CO-V-9101-A0 C1 and submitted to NRW on the 24th April 2017. It is considered unlikely that the chloride concentrations at W1 are the result of contamination from landfill leachate. This location is potentially affected by road salt application. It is recommended that the EP compliance limit for chloride at W1 be removed as it is not reflective of any impact the landfill may have on the groundwater at this location.

7.3 Leachate

7.3.1 The reported leachate levels were below the trigger limit of 1.0 m above base in Sump 1, Sump 2, Sump 4, Sump 9C and Sump 9D throughout the review period. The trigger limit was exceeded once in April alone in Sump 3 and Sump 5. Overall, the monitoring data tentatively suggests a steadily decrease over this review period. The majority of the locations show an improvement in leachate extraction across the Site.

7.3.2 In the final discharge (treated leachate) quality data, exceedances of the compliance limits for pH, Suspended solids, COD and TPH were recorded.

7.4 Surface Water

7.4.1 Surface water samples were collected at SW1 and SW2 during the review period. Trigger level exceedances were recorded only for suspended solids in SW2.

7.5 Dust

7.5.1 Dust concentrations remained below the 200 mg/m₂/day trigger level at all locations during this review period.



- NOTES**
1. SURVEY INFORMATION PROVIDED BY POTTERS WASTE MANAGEMENT. SURVEY DATED 12.01.2016
 2. ALL LEVELS IN METRES ABOVE ORDNANCE DATUM.
 3. DO NOT SCALE FROM THIS DRAWING

- LEGEND**
- IN WASTE GAS WELL
 - GAS MONITORING BOREHOLE
 - GROUNDWATER MONITORING BOREHOLE
 - GAS MONITORING BOREHOLE WITH GROUNDWATER MONITORING BOREHOLE
 - EXISTING LEACHATE COLLECTION POINT
 - IN WASTE GAS WELL
 - APPROXIMATE POSITION OF SURFACE WATER MONITORING POINT
 - APPROXIMATE POSITION OF DUST MONITORING POINT
 - SURFACE WATER MONITORING POINTS
 - NAN1-Y-GRANDNANT
 - P2 ACON DULS
 - DUST MONITORING POINTS
 - DMP1 VALLEY VIEW
 - DMP2 RHOSWEN AND PANT
 - DMP3 PENYRNDU

REV	MODIFICATIONS	BY	RE	AP	DATE

POTTERS WASTE MANAGEMENT

BRYN POSTEG LANDFILL SITE

ENVIRONMENTAL MONITORING PLAN

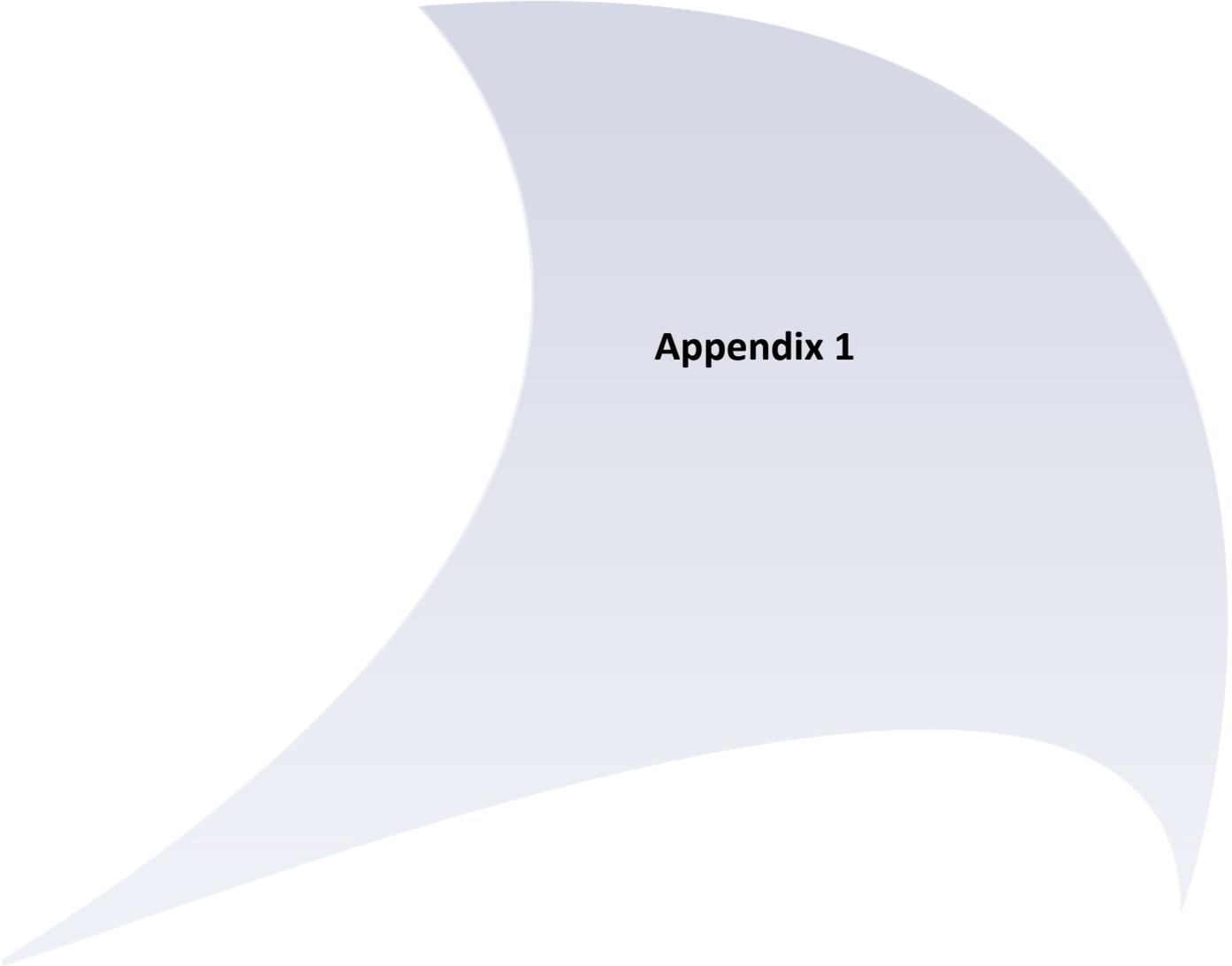
DRAWN BY	DATE
RWIG	12.02.2016

REVIEWED BY	SCALE @ A1
JMC	1:1250

AUTHORISED BY	ISSUE	REVISION
JMC	P	P1

DRAWING NUMBER
2601.EMP.01





Appendix 1

APPENDIX 1 – LANDFILL GAS

Table 1: Landfill Gas Monitoring Data (exceedances highlighted yellow)

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G01	08/04/2017	0.1	1.1	18.2
	16/04/2017	0.1	0.5	19.1
	22/04/2017	0.1	0.3	20.1
	08/05/2017	0.7	0.9	19.3
	14/05/2017	2.8	3.1	12.0
	22/05/2017	0.1	0.5	19.4
	04/06/2017	7.5	2.8	12.1
	19/06/2017	0.0	0.0	20.5
	25/06/2017	0.2	0.8	20.5
G02	08/04/2017	0.1	0.1	20.3
	16/04/2017	0.1	0.1	20.2
	22/04/2017	0.1	0.1	20.7
	08/05/2017	0.1	0.1	21.1
	14/05/2017	0.1	0.0	20.8
	22/05/2017	0.0	0.1	20.6
	04/06/2017	0.0	0.0	20.3
	19/06/2017	0.0	0.0	20.7
	25/06/2017	0.1	0.0	20.6
G03	08/04/2017	0.1	1.1	18.8
	16/04/2017	0.1	1.3	18.1
	22/04/2017	0.1	0.6	20.2
	08/05/2017	0.0	0.9	19.9
	14/05/2017	0.1	0.6	20.5
	22/05/2017	0.0	0.1	20.7
	04/06/2017	0.0	1.0	18.5
	19/06/2017	0.0	1.0	19.2
	25/06/2017	0.0	1.2	18.9
G07	08/04/2017	0.1	0.7	20.0
	16/04/2017	0.1	0.6	20.3
	22/04/2017	0.1	0.5	20.8
	08/05/2017	0.1	0.1	21.2
	14/05/2017	0.1	0.1	21.3
	22/05/2017	0.0	0.1	21.1
	04/06/2017	0.0	0.0	20.3
	19/06/2017	0.0	0.1	20.7
	25/06/2017	0.0	0.1	20.6

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G08	08/04/2017	0.1	0.0	20.6
	16/04/2017	0.1	0.0	20.9
	22/04/2017	0.1	0.0	21.1
	08/05/2017	0.1	0.1	21.2
	14/05/2017	0.1	0.0	21.4
	22/05/2017	0.0	0.1	21.2
	04/06/2017	0.0	0.0	20.4
	19/06/2017	0.0	0.0	20.9
	25/06/2017	0.0	0.0	20.8
G09	08/04/2017	0.1	0.0	20.7
	16/04/2017	0.1	0.0	20.9
	22/04/2017	0.1	0.0	21.1
	08/05/2017	0.1	0.1	21.3
	14/05/2017	0.1	0.0	21.6
	22/05/2017	0.0	0.1	21.1
	04/06/2017	0.0	0.0	20.5
	19/06/2017	0.0	0.0	20.9
	25/06/2017	0.0	0.0	20.8
G10	08/04/2017	0.1	0.6	20.1
	16/04/2017	0.1	2.7	17.9
	22/04/2017	0.1	0.4	20.6
	08/05/2017	0.1	3.3	18.3
	14/05/2017	0.1	7.8	13.1
	22/05/2017	0.0	1.5	19.7
	04/06/2017	0.0	3.2	18.2
	19/06/2017	0.3	3.7	17.5
	25/06/2017	0.4	4.9	16.8
G11	08/04/2017	0.1	0.3	20.5
	16/04/2017	0.1	0.5	20.7
	22/04/2017	0.1	1.1	20.3
	08/05/2017	0.1	1.1	19.6
	14/05/2017	0.1	0.7	20.6
	22/05/2017	0.0	1.0	19.1
	04/06/2017	0.0	0.4	20.6
	19/06/2017	0.0	1.7	19.7
	25/06/2017	0.0	1.7	19.7

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G12	08/04/2017	47.9	2.8	7.3
	16/04/2017	51.8	2.6	7.1
	22/04/2017	44.9	3.0	8.0
	08/05/2017	46.0	3.7	6.3
	14/05/2017	55.8	3.0	6.6
	22/05/2017	42.1	3.7	6.6
	04/06/2017	49.4	3.8	5.8
	19/06/2017	45.2	3.2	8.4
	25/06/2017	48.2	3.3	7.7
G13	08/04/2017	0.1	2.6	19.4
	16/04/2017	0.1	0.0	21.1
	22/04/2017	0.1	0.0	21.4
	08/05/2017	0.1	0.3	21.2
	14/05/2017	0.1	0.1	21.8
	22/05/2017	0.1	2.2	19.0
	04/06/2017	0.0	0.0	20.9
	19/06/2017	0.0	0.0	21.1
	25/06/2017	0.0	0.0	20.9
G14	08/04/2017	0.1	1.3	19.6
	16/04/2017	0.1	1.6	19.4
	22/04/2017	0.1	1.9	19.4
	08/05/2017	0.1	1.8	19.1
	14/05/2017	0.1	2.1	18.6
	22/05/2017	0.0	1.1	19.7
	04/06/2017	0.0	2.1	18.1
	19/06/2017	0.0	2.7	18.2
	25/06/2017	0.0	2.9	17.8
G15	08/04/2017	0.1	1.0	18.6
	16/04/2017	0.1	0.7	19.1
	22/04/2017	0.1	1.1	19.0
	08/05/2017	0.1	1.2	18.9
	14/05/2017	0.1	1.0	19.6
	22/05/2017	0.0	1.0	19.1
	04/06/2017	0.0	0.4	19.9
	19/06/2017	0.0	0.4	20.4
	25/06/2017	0.0	0.7	19.8

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G16	08/04/2017	0.1	0.0	21.0
	16/04/2017	0.1	0.0	21.1
	22/04/2017	0.1	0.0	21.4
	08/05/2017	0.1	0.1	21.2
	14/05/2017	0.1	0.1	21.8
	22/05/2017	0.0	0.1	21.1
	04/06/2017	0.0	0.0	20.8
	19/06/2017	0.0	0.0	21.2
	25/06/2017	0.0	0.0	21.0
G17	08/04/2017	0.1	0.1	21.0
	16/04/2017	0.1	0.2	21.1
	22/04/2017	0.1	0.1	21.4
	08/05/2017	0.1	0.3	21.2
	14/05/2017	0.1	0.1	21.8
	22/05/2017	0.0	0.1	21.3
	04/06/2017	0.0	0.0	20.9
	19/06/2017	0.0	0.0	21.2
	25/06/2017	0.0	0.0	21.0
G18	08/04/2017	0.1	0.0	21.1
	16/04/2017	0.1	0.0	21.1
	22/04/2017	0.1	0.0	21.4
	08/05/2017	0.1	0.1	21.2
	14/05/2017	0.1	0.1	21.8
	22/05/2017	0.0	1.8	20.4
	04/06/2017	0.0	0.0	20.9
	19/06/2017	0.0	0.0	21.3
	25/06/2017	0.0	0.0	21.0
G19	08/04/2017	73.0	27.6	0.2
	16/04/2017	72.1	28.4	0.2
	22/04/2017	72.8	27.7	0.2
	08/05/2017	74.1	27.3	0.2
	14/05/2017	72.8	29.0	0.2
	22/05/2017	67.6	34.3	0.3
	04/06/2017	68.1	33.4	0.3
	19/06/2017	70.8	31.1	0.2
	25/06/2017	66.8	35.7	0.2

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G20	08/04/2017	71.8	29.7	0.1
	16/04/2017	70.9	30.8	0.1
	22/04/2017	70.3	31.3	0.1
	08/05/2017	70.6	31.5	0.3
	14/05/2017	70.8	31.6	0.1
	22/05/2017	73.4	27.9	0.2
	04/06/2017	68.4	32.3	0.2
	19/06/2017	67.9	34.8	0.2
	25/06/2017	66.7	36.3	0.1
G21	08/04/2017	57.6	14.4	0.1
	16/04/2017	60.3	17.8	0.1
	22/04/2017	62.5	20.4	0.1
	08/05/2017	61.5	21.4	0.1
	14/05/2017	62.2	14.9	0.1
	22/05/2017	61.8	15.1	0.2
	04/06/2017	53.4	12.4	0.1
	19/06/2017	63.2	20.1	0.3
	25/06/2017	61.6	19.0	0.5
G22	08/04/2017	75.2	20.3	0.1
	16/04/2017	72.7	20.3	0.1
	22/04/2017	73.5	20.5	0.1
	08/05/2017	69.9	21.6	0.1
	14/05/2017	74.9	24.9	0.1
	22/05/2017	72.6	24.2	0.2
	04/06/2017	67.6	25.4	0.2
	19/06/2017	72.9	25.2	0.1
	25/06/2017	72.7	26.1	0.1
G23	08/04/2017	8.7	5.9	0.1
	16/04/2017	1.6	9.2	0.2
	22/04/2017	1.6	9.7	0.6
	08/05/2017	2.0	6.1	0.1
	14/05/2017	12.5	7.0	0.1
	22/05/2017	14.1	4.9	0.2
	04/06/2017	12.2	8.8	0.1
	19/06/2017	12.5	11.3	0.3
	25/06/2017	3.6	13.3	1.4

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G24	08/04/2017	0.1	0.6	20.0
	16/04/2017	0.1	0.4	20.3
	22/04/2017	0.1	0.3	20.8
	08/05/2017	0.1	1.4	17.7
	14/05/2017	0.1	1.4	18.5
	22/05/2017	3.5	1.5	19.5
	04/06/2017	0.0	0.0	20.6
	19/06/2017	0.0	0.1	21.3
	25/06/2017	0.0	0.3	20.6
G25	08/04/2017	28.6	10.8	0.3
	16/04/2017	21.9	6.8	0.2
	22/04/2017	19.0	6.8	0.2
	08/05/2017	26.4	16.1	0.7
	14/05/2017	32.9	15.3	2.3
	22/05/2017	14.7	9.9	11.7
	04/06/2017	43.1	18.9	0.5
	19/06/2017	48.4	13.5	0.3
	25/06/2017	46.9	13.2	0.2
G26	08/04/2017	0.1	1.1	19.5
	16/04/2017	0.1	1.4	19.4
	22/04/2017	0.1	1.8	19.4
	08/05/2017	0.1	2.4	19.5
	14/05/2017	0.1	1.9	20.0
	22/05/2017	0.0	0.6	20.2
	04/06/2017	0.0	1.9	18.1
	19/06/2017	0.0	1.9	19.9
	25/06/2017	0.0	1.7	19.6
G27	08/04/2017	17.6	19.7	4.2
	16/04/2017	64.5	31.6	1.0
	22/04/2017	64.5	31.3	1.3
	08/05/2017	47.5	26.6	4.5
	14/05/2017	34.0	21.0	7.0
	22/05/2017	0.2	7.0	15.5
	04/06/2017	1.3	3.6	17.9
	19/06/2017	0.0	0.5	21.1
	25/06/2017	0.0	0.4	20.5

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G29	08/04/2017	0.1	0.3	20.5
	16/04/2017	0.1	0.3	20.3
	22/04/2017	0.7	0.9	17.8
	08/05/2017	0.2	1.4	17.4
	14/05/2017	0.2	0.9	19.8
	22/05/2017	0.0	0.3	21.1
	04/06/2017	0.0	0.2	19.7
	19/06/2017	0.7	2.5	15.8
	25/06/2017	1.6	2.8	6.3
G30	08/04/2017	1.0	0.6	19.8
	16/04/2017	12.1	3.9	10.6
	22/04/2017	1.4	0.7	19.5
	08/05/2017	5.2	1.5	18.0
	14/05/2017	3.4	2.5	16.4
	22/05/2017	0.3	0.3	21.0
	04/06/2017	7.0	1.7	16.8
	19/06/2017	8.1	3.5	14.2
	25/06/2017	11.5	3.5	13.0
G31	08/04/2017	1.3	2.0	18.4
	16/04/2017	6.7	4.0	13.3
	22/04/2017	0.5	1.4	19.3
	08/05/2017	11.0	5.6	13.1
	14/05/2017	12.7	5.2	13.6
	22/05/2017	0.8	2.9	15.0
	04/06/2017	21.9	7.1	11.3
	19/06/2017	0.1	4.2	17.2
	25/06/2017	0.1	3.8	16.8
G32	08/04/2017	0.1	0.1	21.0
	16/04/2017	0.2	0.1	20.8
	22/04/2017	0.1	0.1	20.9
	08/05/2017	0.1	0.1	21.2
	14/05/2017	0.1	0.1	21.7
	22/05/2017	0.0	0.1	21.5
	04/06/2017	0.0	0.0	20.5
	19/06/2017	0.0	0.0	21.5
	25/06/2017	0.0	0.0	20.9

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G35	08/04/2017	1.2	3.0	17.9
	16/04/2017	62.2	26.1	0.1
	22/04/2017	69.9	25.9	0.2
	08/05/2017	74.3	18.4	0.1
	14/05/2017	71.3	23.5	0.2
	22/05/2017	65.1	35.8	0.8
	04/06/2017	65.3	34.9	0.2
	19/06/2017	72.7	28.5	0.2
	25/06/2017	0.0	0.0	20.3
	25/06/2017	70.1	32.1	0.2
G36	08/04/2017	0.1	0.5	20.1
	16/04/2017	0.1	0.5	20.0
	22/04/2017	0.1	0.5	20.3
	08/05/2017	0.1	6.8	10.9
	14/05/2017	0.1	2.3	17.7
	22/05/2017	0.0	0.5	20.6
	04/06/2017	0.0	0.2	20.2
	19/06/2017	0.0	0.2	21.1
	25/06/2017	0.0	0.2	20.8
G37	08/04/2017	0.1	1.4	19.7
	16/04/2017	0.1	1.1	20.0
	22/04/2017	0.1	0.8	20.4
	08/05/2017	0.1	0.7	20.9
	14/05/2017	0.1	0.5	21.4
	22/05/2017	0.0	0.7	20.9
	04/06/2017	0.0	0.3	20.3
	19/06/2017	0.0	0.2	21.3
	25/06/2017	0.0	0.2	20.8
G38	08/04/2017	64.8	27.9	0.1
	16/04/2017	65.2	29.1	0.1
	22/04/2017	23.8	24.7	0.1
	08/05/2017	58.0	30.1	0.1
	14/05/2017	61.4	29.1	0.1
	22/05/2017	66.1	32.1	0.2
	04/06/2017	55.5	29.5	0.2
	19/06/2017	67.3	33.2	0.2
	25/06/2017	53.7	33.4	0.1

APPENDIX 1 – LANDFILL GAS

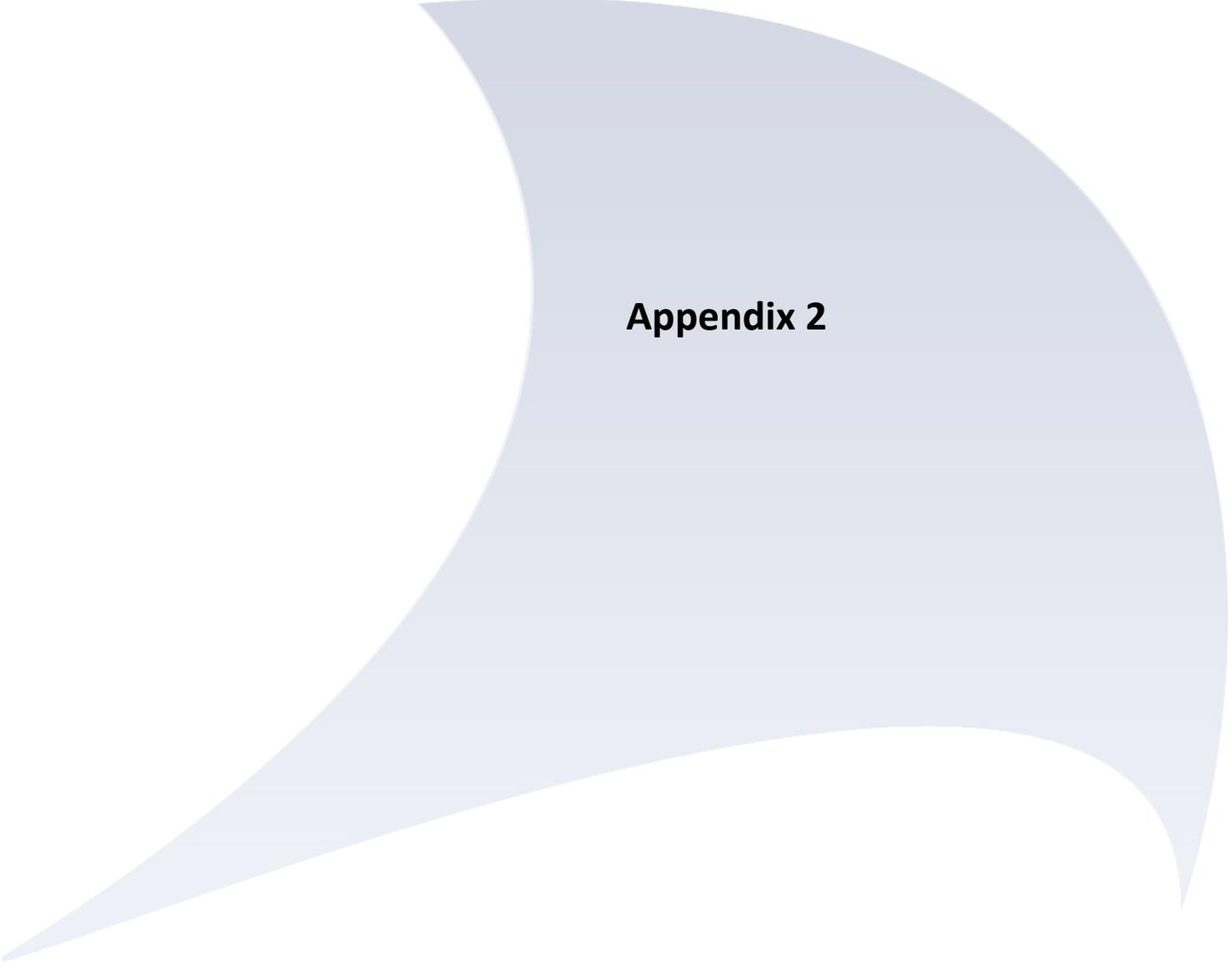
Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
G39	08/04/2017	0.1	0.9	20.1
	16/04/2017	0.1	1.1	18.9
	22/04/2017	0.1	1.0	20.1
	08/05/2017	0.1	0.6	20.5
	14/05/2017	0.1	1.9	19.2
	22/05/2017	0.7	5.4	14.8
	04/06/2017	0.0	0.2	20.3
	19/06/2017	0.0	0.2	21.6
	25/06/2017	0.0	0.0	20.9
G40	08/04/2017	68.6	30.1	0.4
	16/04/2017	68.4	31.2	0.2
	22/04/2017	58.5	29.4	0.3
	08/05/2017	46.6	28.5	0.7
	14/05/2017	69.5	31.9	0.1
	04/06/2017	37.6	28.2	2.9
	19/06/2017	0.0	0.0	21.5
	25/06/2017	0.2	0.1	20.8
G41	08/04/2017	0.5	8.7	1.8
	16/04/2017	0.4	4.8	11.4
	22/04/2017	0.2	5.9	13.7
	08/05/2017	0.1	6.3	6.8
	14/05/2017	0.1	5.7	8.7
	22/05/2017	1.1	5.5	9.1
	04/06/2017	5.2	6.9	0.9
	19/06/2017	0.9	8.8	9.0
	25/06/2017	0.2	6.1	14.1
G42	08/04/2017	0.1	0.0	20.8
	16/04/2017	0.1	0.0	20.8
	22/04/2017	0.1	0.0	21.0
	08/05/2017	0.1	0.1	21.4
	14/05/2017	0.1	0.1	21.7
	22/05/2017	0.0	1.4	20.3
	04/06/2017	0.0	0.0	20.6
	19/06/2017	0.0	0.0	21.5
	25/06/2017	0.1	0.0	21.0

APPENDIX 1 – LANDFILL GAS**Table 2: Daily gas collection monitoring data**

Date	HRS RUN	TEMP	CUBIC MTS	CH4=	O2=
03-Apr-17	32617	219	720	47.6%	1.18%
04-Apr-17	32593	185	670	49.7%	1.00%
05-Apr-17	32569	191	720	47.4%	1.56%
06-Apr-17	32545	198	730	47.2%	1.59%
07-Apr-17	32521	292	550	52.2%	0.88%
10-Apr-17	32449	185	700	48.9%	0.89%
11-Apr-17	32425	186	720	47.8%	0.87%
12-Apr-17	32402	123	720	48.5%	0.71%
13-Apr-17	32377	112	710	48.7%	0.66%
18-Apr-17	32257	71	690	44.8%	1.19%
19-Apr-17	32233	206	650	47.5%	1.29%
20-Apr-17	32209	221	640	48.8%	1.10%
21-Apr-17	32185	228	630	48.7%	1.18%
24-Apr-17	32112	194	610	52.0%	0.82%
25-Apr-17	32089	232	640	51.1%	1.27%
26-Apr-17	32065	274	660	50.6%	1.46%
27-Apr-17	32078	950	480	54.1%	0.84%
28-Apr-17	32096	984	94	52.2%	1.05%
02-Apr-17	32921	205	670	50.6%	1.07%
03-May-17	32897	231	710	48.3%	1.34%
04-May-17	32873	234	720	47.6%	1.30%
05-May-17	31849	956	0	46.5%	1.90%
08-May-17	31777	226	710	47.3.0%	1.62%
09-May-17	31753	213	680	49.7%	1.10%
10-May-17	31729	413	670	50.4%	0.97%
11-May-17	31705	277	730	52.0%	0.84%
12-May-17	31682	1045	980	52.4%	0.71%
15-May-17	31608	536	620	49.0%	1.11%
16-May-17	31586	530	620	49.2%	1.08%
17-May-17	31561	963	320	49.4%	1.15%
18-May-17	31537	532	570	50.4%	1.16%
19-May-17	31513	549	590	50.0%	1.35%
22-May-17	31441	960	780	50.5%	1.21%
23-May-17	31418	463	790	48.7%	1.43%
24-May-17	31394	864	670	48.2%	1.57%
26-May-17	31345	363	790	49.4%	1.36%
30-May-17	31249	378	810	49.6%	1.66%
31-May-17	31226	272	790	48.8%	1.60%
01-Jun-17	31201	285	790	48.5%	1.55%
02-Jun-17	31177	298	790	50.5%	1.51%
05-Jun-17	31105	220	790	49.5%	1.40%
06-Jun-17	31082	494	520	50.2%	1.36%
07-Jun-17	NR	NR	NR	NR	NR
08-Jun-17	31034	313	820	49.3%	1.64%
09-Jun-17	31009	355	810	49.2%	1.94%
12-Jun-17	30938	261	780	48.5%	2.17%
13-Jun-17	30913	265	820	47.9%	2.06%
14-Jun-17	30890	241	790	48.6%	1.89%
15-Jun-17	30865	259	780	49.9%	1.76%
16-Jun-17	30842	278	780	48.4%	2.06%
19-Jun-17	30770	336	750	49.8%	1.86%
20-Jun-17	30745	397	750	49.9%	1.84%
21-Jun-17	30721	428	700	51.7%	1.53%
22-Jun-17	30697	414	700	52.1%	1.34%

APPENDIX 1 – LANDFILL GAS

Date	HRS RUN	TEMP	CUBIC MTS	CH4=	O2=
23-Jun-17	30673	385	710	51.1%	1.56%
26-Jun-17	30601	370	750	50.1%	1.78%
27-Jun-17	30577	353	760	50.8%	1.67%
28-Jun-17	30554	318	730	50.4%	1.66%
29-Jun-17	30528	290	760	50.5%	1.79%
30-Jun-17	30505	275	740	49.0%	1.94%

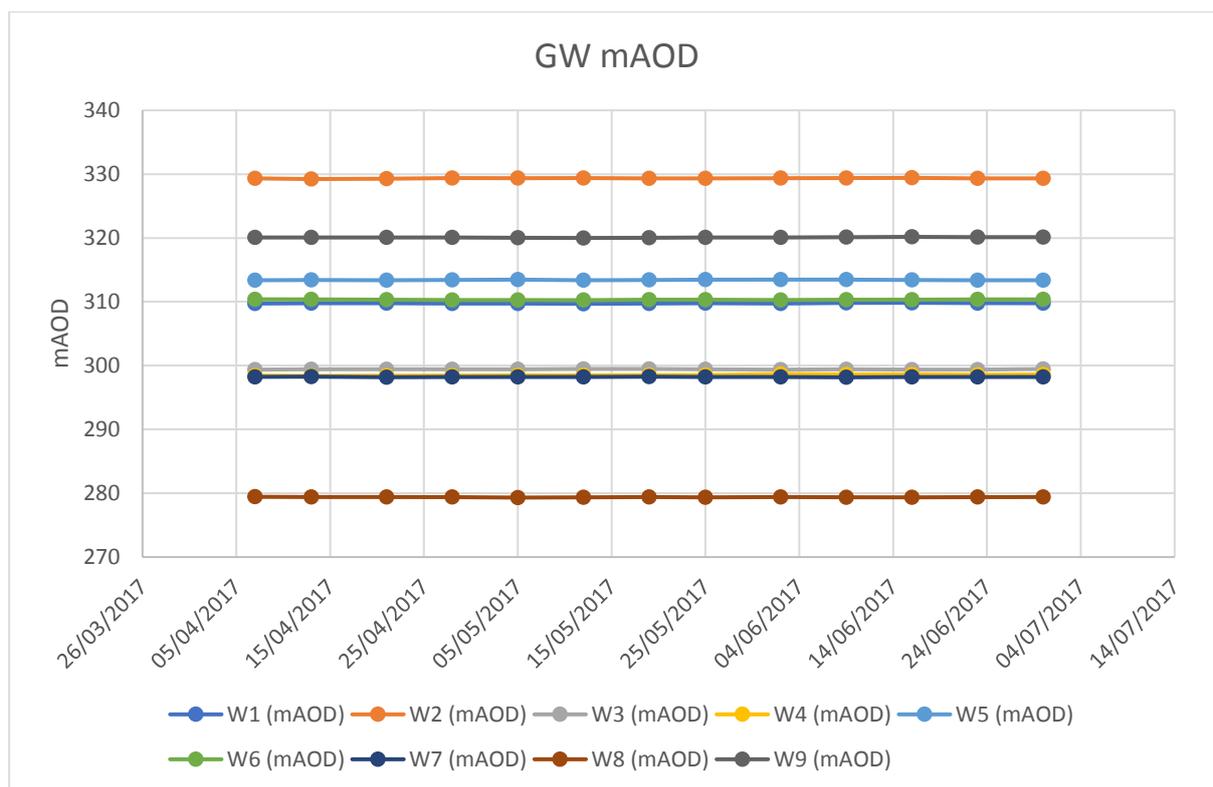


Appendix 2

APPENDIX 2 – GROUNDWATER

Table 1: Weekly level data (measured as metres above ordnance datum)

Date	W1 (mAOD)	W2 (mAOD)	W3 (mAOD)	W4 (mAOD)	W5 (mAOD)	W6 (mAOD)	W7 (mAOD)	W8 (mAOD)	W9 (mAOD)
07/04/2017	309.74	329.34	299.38	298.43	313.39	310.39	298.23	279.44	320.09
13/04/2017	309.78	329.23	299.42	298.38	313.41	310.37	298.25	279.4	320.06
21/04/2017	309.78	329.3	299.43	298.4	313.38	310.32	298.18	279.42	320.08
28/04/2017	309.74	329.38	299.42	298.43	313.42	310.28	298.21	279.39	320.1
05/05/2017	309.72	329.36	299.44	298.49	313.45	310.26	298.2	279.32	320.03
12/05/2017	309.68	329.37	299.48	298.47	313.38	310.25	298.2	279.38	320
19/05/2017	309.74	329.34	299.48	298.53	313.41	310.32	298.26	279.4	320.03
25/05/2017	309.78	329.34	299.41	298.52	313.46	310.33	298.24	279.35	320.1
02/06/2017	309.72	329.36	299.38	298.69	313.45	310.28	298.2	279.42	320.06
09/06/2017	309.83	329.4	299.42	298.62	313.45	310.31	298.19	279.37	320.12
16/06/2017	309.84	329.41	299.37	298.64	313.41	310.31	298.2	279.35	320.17
23/06/2017	309.79	329.33	299.38	298.58	313.37	310.36	298.24	279.39	320.13
30/06/2017	309.78	329.35	299.46	298.6	313.38	310.38	298.22	279.43	320.13



APPENDIX 2 – GROUNDWATER

Table 2: Groundwater Monthly monitoring data

Parameter	Trigger Limit	Date	W 1	W 2	W 3	W 4	W 5	W 6	W 7	W 8	W 9	W 10	W 11	
Ammoniacal Nitrogen (mg/l)	2	24/04/2017	<0.41	<0.41	<0.41	1.34	<0.41	<0.41	<0.41	<0.41	<0.41	N/S	N/S	
		30/05/2017	0.62	<0.41	<0.41	1.83	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	N/S	N/S
		27/06/2017	<0.41	<0.41	<0.41	1.21	<0.41	<0.41	<0.41	<0.41	<0.41	<0.41	N/S	N/S
Chloride (mg/l)	69	24/04/2017	251.0	31.7	13.7	21.8	14.8	12.6	15.6	17.0	17.9	N/S	N/S	
		30/05/2017	257.0	32.9	15.2	23.8	16.3	15.4	16.3	16.7	14.4	N/S	N/S	
		27/06/2017	248.0	30.3	10.9	20.2	14.6	14.2	12.7	13.1	11.1	N/S	N/S	
Electrical Conductivity (µS/cm)	-	24/04/2017	871	180	199	318	173	95	321	288	147	N/S	N/S	
		30/05/2017	864	177	276	317	177	103	316	281	156	N/S	N/S	
		27/06/2017	867	180	315	319	177	112	312	284	160	N/S	N/S	
Cyanide (mg/l)	-	24/04/2017	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	N/S	N/S	
		30/05/2017	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	N/S	N/S
		27/06/2017	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	N/S	N/S
pH	-	24/04/2017	6.0	7.8	6.5	6.6	5.8	6.1	7.4	6.9	6.2	N/S	N/S	
		30/05/2017	6.0	7.2	6.9	6.5	5.6	6.1	7.2	6.7	6.3	N/S	N/S	
		27/06/2017	6.3	7.4	7.4	6.9	6.0	6.4	7.6	7.1	6.6	N/S	N/S	
Sulphate (mg/l)	-	24/04/2017	19.4	<4.4	31.3	28.0	36.1	<4.4	28.6	31.4	26.8	N/S	N/S	
		30/05/2017	18.4	<4.4	24.2	31.5	36.7	6.3	31.1	25.5	27.6	N/S	N/S	
		27/06/2017	11.8	<4.4	11.9	30.1	36.0	<4.4	27.9	26.4	26.4	N/S	N/S	

APPENDIX 2 – GROUNDWATER**Table 3: Groundwater Quarterly monitoring data**

Reference	Unit	Trigger	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11
Ammoniacal Nitrogen	mg/l	2	<0.41	<0.41	<0.41	1.21	<0.41	<0.41	<0.41	<0.41	<0.41	N/S	N/S
Cadmium , Total as Cd	mg/l	0.0056	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	N/S	N/S
Nickel , Total as Ni	mg/l	0.12	0.004	<0.003	0.005	0.009	0.017	<0.003	<0.003	<0.003	<0.003	N/S	N/S
Toluene	µg/l	4	<0.10	0.13	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	N/S	N/S
Total Xylenes	µg/l	3	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	N/S	N/S
Zinc, Total as Zn	mg/l	0.85	0.03	<0.018	0.03	0.03	0.1	0.04	<0.018	0.03	0.02	N/S	N/S
Ethyl Benzene	µg/l	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	N/S	N/S
Mecoprop	µg/l	0.1	<0.04	<0.04	<0.04	<0.08	<0.04	<0.04	<0.04	<0.04	<0.04	N/S	N/S
2,4 - D	µg/l	0.1	<0.05	<0.05	<0.05	<0.10	<0.05	<0.05	<0.05	<0.05	<0.05	N/S	N/S

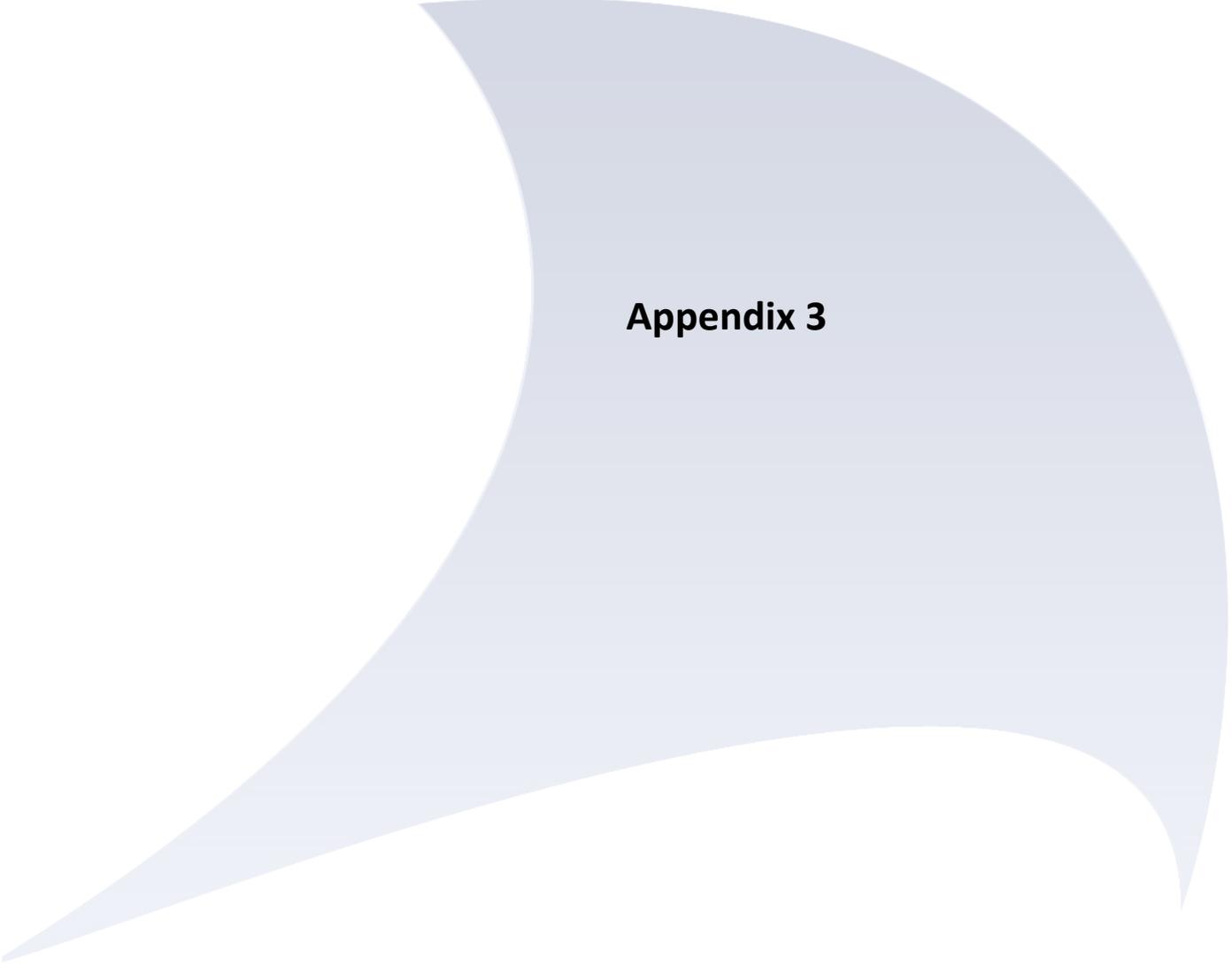
APPENDIX 2 – GROUNDWATER

Table 4: Groundwater Quarterly monitoring data (no EP trigger levels)

Reference	Unit	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11
Acenaphthene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Acenaphthylene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Alkalinity as CaCO3	mg/l	45.4	43.2	147	110	14.6	16.4	122	105	26.8	N/S	N/S
Anthracene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Antimony Ultra Low Total as Sb	mg/l	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	N/S	N/S
Arsenic, Ultra Low Total as As	mg/l	0.01	0.0011	0.013	0.016	0.0019	0.0019	0.011	0.002	<0.0010	N/S	N/S
Benzene	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	N/S	N/S
Benzo (a) anthracene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Benzo (a) pyrene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Benzo (b) fluoranthene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Benzo (g,h,i) perylene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Benzo (k) fluoranthene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Bicarbonate Alkalinity	mg/l	45.4	43.2	147	110	14.6	16.4	122	105	26.8	N/S	N/S
Calcium , Total as Ca	mg/l	13.3	9.74	39.2	36.6	12.8	9.41	39.7	36	11.6	N/S	N/S
Chromium , Total as Cr	mg/l	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	N/S	N/S
Chrysene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Copper, Total as Cu	mg/l	<0.009	<0.009	0.019	<0.009	0.041	<0.009	<0.009	<0.009	<0.009	N/S	N/S
Dibenz (a,h) anthracene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Dissolved Oxygen, Fixed	mg/l	<0.5	0.9	0.8	0.6	2.4	4.2	<0.5	3	2.5	N/S	N/S
Ethyl Benzene	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	N/S	N/S
Fluoranthene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Fluorene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Indeno (1,2,3) cd pyrene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Iron , Total as Fe	mg/l	2.58	0.33	3.76	8.82	0.76	0.71	4.1	0.73	<0.23	N/S	N/S
Lead , Total as Pb	mg/l	<0.006	<0.006	0.099	<0.006	<0.006	<0.006	0.146	0.009	<0.006	N/S	N/S
m&p Xylene	ug/l	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	N/S	N/S
Magnesium, Total as Mg	mg/l	4.5	1.1	9.3	8.4	3.4	2	6.2	8.9	3.4	N/S	N/S
Manganese , Total as Mn	mg/l	1.89	0.015	3.18	3.41	1.52	0.189	1.03	0.874	0.039	N/S	N/S
Mercury, Total as Hg	mg/l	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	N/S	N/S

APPENDIX 2 – GROUNDWATER

Reference	Unit	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11
Naphthalene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Nitrate as N	mg/l	<0.7	<0.7	<0.7	<0.7	2.6	1.4	<0.7	<0.7	1.2	N/S	N/S
o-Xylene	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	N/S	N/S
PAH, Total	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Phenanthrene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Phenols Mono (Phenol Index)	mg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	N/S	N/S
Potassium , Total as K	mg/l	1.47	2.33	2.1	2.19	2.03	0.56	2.9	1.21	0.94	N/S	N/S
Pyrene	ug/l	<0.04	<0.02	<0.02	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01	N/S	N/S
Selenium Ultra Low Total as Se	mg/l	<0.0008	<0.0008	0.0017	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	N/S	N/S
Silver , Total as Ag	mg/l	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	N/S	N/S
Sodium , Total as Na	mg/l	139	20	9.09	10.5	9.22	6.44	17.8	8.08	10.4	N/S	N/S



Appendix 3

APPENDIX 3 – LEACHATE**Table 1: Monthly leachate level data**

Location	Sump 1			Sump 2			Sump 3			Sump 4		
	Cover Level (mAOD)		318.86	Cover Level (mAOD)		350	Cover Level (mAOD)		348	Cover Level (mAOD)		325.8
	Base (mAOD)		313.4	Base (mAOD)		310.9	Base (mAOD)		311.5	Base (mAOD)		310.75
Date	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)
27/04/2017	4.75	314.11	0.71	38.2	311.8	0.9	35	313	1.5	14.2	311.6	0.85
11/05/2017	4.62	314.24	0.84	38.6	311.4	0.5	35.6	312.4	0.9	14.4	311.4	0.65
06/06/2017	4.58	314.28	0.88	38.6	311.4	0.5	35.6	312.4	0.9	14.6	311.2	0.45
EP Limit	1			1			1			1		

Location	Sump 5			Sump 9C			Sump 9D		
	Cover Level (mAOD)		323.5	Cover Level (mAOD)		323	Cover Level (mAOD)		323
	Base (mAOD)		310.75	Base (mAOD)		307	Base (mAOD)		307
Date	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)
27/04/2017	11.7	311.8	1.05	15.2	307.8	0.8	15.3	307.7	0.7
11/05/2017	11.8	311.7	0.95	15.4	307.6	0.6	15.5	307.5	0.5
06/06/2017	11.9	311.6	0.85	15.2	307.8	0.8	15.3	307.7	0.7
EP Limit	1			1			1		

APPENDIX 3 – LEACHATE**Table 2: Monthly leachate monitoring data**

LOCATION	DATE	pH	Ammoniacal Nitrogen as N
		pH units	mg/l
Leachate 1	24/04/2017	7.4	435
	30/05/2017	7.8	827
	27/06/2017	7.4	496
Leachate 2	24/04/2017	8.5	2950
	30/05/2017	8.5	3440
	27/06/2017	8.5	3630
Leachate 3	24/04/2017	-	-
	30/05/2017	-	-
	27/06/2017	-	-
Leachate 4	24/04/2017	7.5	1210
	30/05/2017	7.9	1200
	27/06/2017	7.5	1070
Leachate 5	24/04/2017	7.6	1210
	30/05/2017	7.9	1300
	27/06/2017	7.6	1490
Leachate 6	24/04/2017	8.0	391
	30/05/2017	-	-
	27/06/2017	-	-
Leachate 7	24/04/2017	6.2	21
	30/05/2017	5.2	38
	27/06/2017	6.3	146

APPENDIX 3 – LEACHATE**Table 3: Final discharge monthly monitoring data (EP exceedances highlighted)**

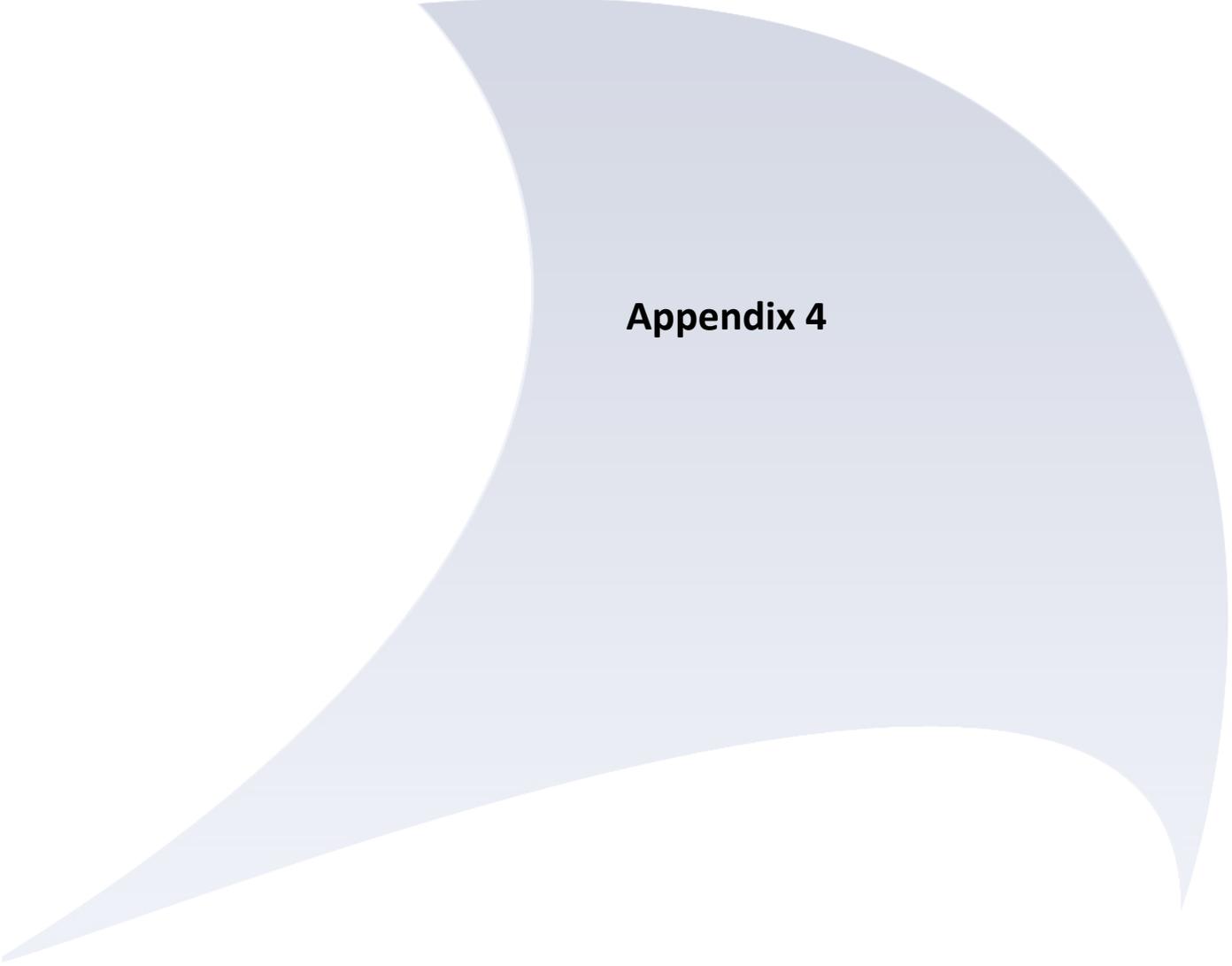
LOCATION	DATE	pH	Ammoniacal Nitrogen as N	Suspended Solids	COD (1 hr settled)	Total TPH (EH>C6 - C40)	Sulphate as SO4	Dissolved Methane
		pH units	mg/l	mg/l	mg/l	µg/l	mg/l	mg/l
Trigger Levels		6 - 10	150	500	1000	nil	1000	N/A
Treated Leachate	24/04/2017	6.2	21	90	613	6100	133	<0.010
	30/05/2017	5.2	38	1310	1440	1820	<4.4	<0.010
	27/06/2017	6.3	146	1400	1910	2220	128	<0.010

APPENDIX 3 – LEACHATE

Parameter	Units / Date	Treated Leachate		
		24/04/2017	30/05/2017	27/06/2017
2,3,6 - TBA	ug/l	-	-	<5.00
2,4 - D	ug/l	-	-	<5.00
2,4 - DB	ug/l	-	-	<5.00
2,4,5 - T	ug/l	-	-	<5.00
BOD + ATU (20 day)	mg/l	282	226	213
BOD + ATU (5 day)	mg/l	35	31	30
Bromoxynil	ug/l	-	-	<5.00
Cadmium , Total as Cd	mg/l	-	-	<0.0006
Chloride as Cl	mg/l	1520	76.7	-
Chromium , Total as Cr	mg/l	-	-	0.391
COD (Filtered)	mg/l	539	830	1340
COD (Total)	mg/l	755	1830	2220
Copper, Total as Cu	mg/l	-	-	0.131
Cyanide, Total as CN	mg/l	-	-	0.85
Dicamba	ug/l	-	-	<5.00
Dichlorprop	ug/l	-	-	<5.00
EH >C10 - C16	ug/l	-	-	2220
EH >C16 - C24	ug/l	-	-	<100
EH >C24 - C40	ug/l	-	-	<100
EH >C6 - C8	ug/l	-	-	<100
EH >C8 - C10	ug/l	-	-	<100
Fenthion	ug/l	-	-	<0.192
Ferric Iron	mg/l	<0.5	23.8	-
Ferrous Iron	mg/l	3.3	2.4	-
Hardness, Total as Ca (Calc)	mg/l	289	275	-
Hexachlorobenzene	ng/l	-	-	<155
Ioxynil	ug/l	-	-	<5.00
Iron, Total	mg/l	3.4	26.2	-
Lead , Total as Pb	mg/l	-	-	0.046
MCPA	ug/l	-	-	<5.00
MCPB	ug/l	-	-	<5.00
Mecoprop	ug/l	-	-	<4.00
Mercury, Total as Hg	mg/l	-	-	0.00019
Nickel, Total as Ni	mg/l	-	-	0.256
Nitrogen, Total as N	mg/l	559	964	-
SVOC with TICs	ug/l	-	-	-
TOC as C	mg/l	160	398	-

APPENDIX 3 – LEACHATE

Parameter	Units / Date	Treated Leachate		
		24/04/2017	30/05/2017	27/06/2017
Volatile Suspended Solids	mg/l	-	-	-
Zinc, Total as Zn	mg/l	-	-	0.418



Appendix 4

APPENDIX 4 – SURFACE WATER**Table 1: Monthly monitoring data**

LOCATION	DATE	pH	Conductivity- Electrical 20C	Ammoniacal Nitrogen as N (LL)	Chloride as Cl	Total Suspended Solids	BOD + ATU (5 day)	EH >C6 - C40	EH >C6 - C8	EH >C8 - C10	EH >C16 - C24	EH >C24 - C40	EH >C10 - C16
		pH	µS/cm	mg/l	mg/l	mg/l	mg/l	µg/l	µg/l	µg/l	µg/l	µg/l	µg/l
Trigger Level		6 - 9	N/A	0.25	N/A	50	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SW 1	24/04/2017	6.9	117	<0.06	12.7	4	3	27	<10	<10	<10	27	<10
	30/05/2017	7.1	113	<0.06	11.8	38	5	<10	<10	<10	<10	<10	<10
	27/06/2017	7.2	112	<0.06	12.6	8	2	<10	<10	<10	<10	<10	<10
SW 2	24/04/2017	7.8	336	0.07	45.2	21	3	<40	<40	<40	<40	<40	<40
	30/05/2017	8.1	397	<0.06	50.0	20	2	24	<10	<10	<10	24	<10
	27/06/2017	7.8	453	<0.06	42.4	54	4	71	<10	<10	49	23	<10

APPENDIX 4 – SURFACE WATER

Table 2: Annual monitoring data (SVOC)

Parameter	Units	SW 1	SW 2
SVOC			
Phenol	ug/l	N/S	<1.0
Bis(2-chloroethyl)ether	ug/l	N/S	<1.0
2-Chlorophenol	ug/l	N/S	<1.0
1,3-Dichlorobenzene	ug/l	N/S	<1.0
1,4-Dichlorobenzene	ug/l	N/S	<1.0
2-Methylphenol	ug/l	N/S	<1.0
3&4-Methylphenol	ug/l	N/S	<1.0
Dibenzofuran	ug/l	N/S	<1.0
1,2-Dichlorobenzene	ug/l	N/S	<1.0
Bis(2-chloroisopropyl)ether	ug/l	N/S	<1.0
n-Nitrosodi-n-propylamine	ug/l	N/S	<1.0
Hexachloroethane	ug/l	N/S	<1.0
Nitrobenzene	ug/l	N/S	<1.0
Isophorone	ug/l	N/S	<1.0
2,4-Dimethylphenol	ug/l	N/S	<1.0
2-Nitrophenol	ug/l	N/S	<1.0
Bis(2-chloroethoxy)methane	ug/l	N/S	<1.0
2,4-Dichlorophenol	ug/l	N/S	<1.0
1,2,4-Trichlorobenzene	ug/l	N/S	<1.0
Naphthalene	ug/l	N/S	<2.0
Hexachlorobutadiene	ug/l	N/S	<1.0
4-Chloro-3-methylphenol	ug/l	N/S	<1.0
2-Methylnaphthalene	ug/l	N/S	<1.0
2,4,6-Trichlorophenol	ug/l	N/S	<1.0
2,4,5-Trichlorophenol	ug/l	N/S	<1.0
2-Chloronaphthalene	ug/l	N/S	<1.0
Dimethylphthalate	ug/l	N/S	<1.0
2,6-Dinitrotoluene	ug/l	N/S	<1.0
Acenaphthylene	ug/l	N/S	<1.0
Acenaphthene	ug/l	N/S	<1.0
2,4-Dinitrotoluene	ug/l	N/S	<1.0
Diethylphthalate	ug/l	N/S	<1.0
4-Nitrophenol	ug/l	N/S	<5.0
4-Chlorophenyl phenyl ether	ug/l	N/S	<1.0
Fluorene	ug/l	N/S	<1.0
Diphenylamine	ug/l	N/S	<1.0
4-Bromophenyl Phenyl Ether	ug/l	N/S	<1.0

APPENDIX 4 – SURFACE WATER

Parameter	Units	SW 1	SW 2
SVOC			
Hexachlorobenzene	ug/l	N/S	<1.0
Pentachlorophenol	ug/l	N/S	<1.0
Phenanthrene	ug/l	N/S	<1.0
Anthracene	ug/l	N/S	<1.0
di-n-Butylphthalate	ug/l	N/S	<1.0
Fluoranthene	ug/l	N/S	<1.0
Pyrene	ug/l	N/S	<1.0
Benzyl Butyl Phthalate	ug/l	N/S	<1.0
Benzo(a)anthracene	ug/l	N/S	<1.0
Chrysene	ug/l	N/S	<1.0
Bis(2-ethylhexyl)phthalate	ug/l	N/S	<5.0
Di-n-octylphthalate	ug/l	N/S	<1.0
Benzo(b)fluoranthene	ug/l	N/S	<1.0
Benzo(k)fluoranthene	ug/l	N/S	<1.0
Benzo(a)pyrene	ug/l	N/S	<1.0
Indeno(1,2,3-c,d)pyrene	ug/l	N/S	<1.0
Dibenz(a,h)anthracene	ug/l	N/S	<1.0
Benzo(g,h,i)perylene	ug/l	N/S	<1.0

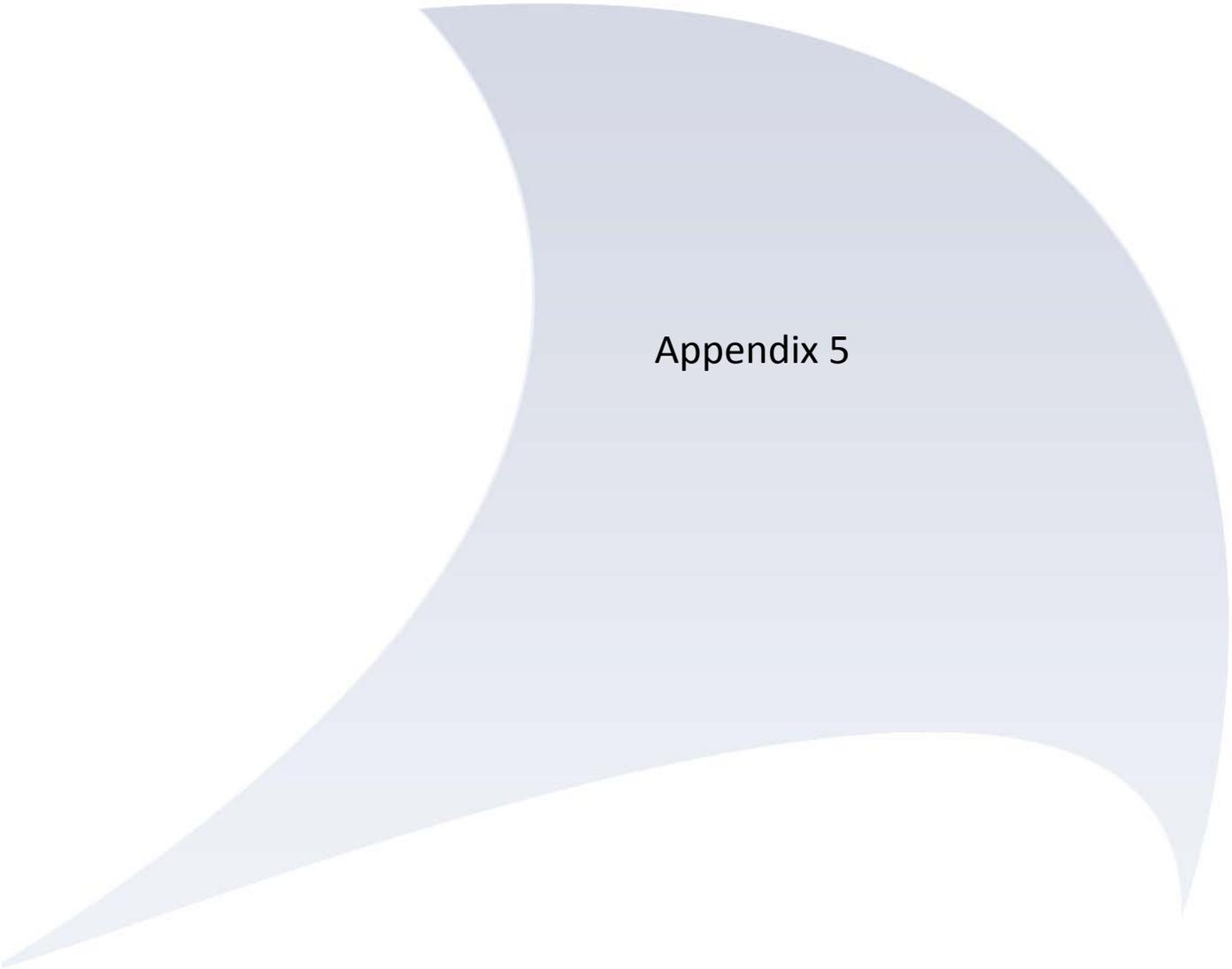
APPENDIX 4 – SURFACE WATER

Table 3: Annual monitoring data (VOC)

Parameter	Units	SW 1	SW 2
VOC			
Dichlorodifluoromethane	ug/l	<1.0	<1.0
Chloromethane	ug/l	<1.0	<1.0
Chloroethane	ug/l	<1.0	<1.0
Bromomethane	ug/l	<1.0	<1.0
Trichlorofluoromethane	ug/l	<1.0	<1.0
1,1-Dichloroethene	ug/l	<1.0	<1.0
Dichloromethane	ug/l	<1.0	<1.0
1,1-Dichloroethane	ug/l	<1.0	<1.0
cis-1,2-Dichloroethene	ug/l	<1.0	<1.0
2,2-Dichloropropane	ug/l	<1.0	<1.0
Chloroform	ug/l	<1.0	<1.0
Bromochloromethane	ug/l	<1.0	<1.0
1,1,1-Trichloroethane	ug/l	<1.0	<1.0
1,1-Dichloropropene	ug/l	<1.0	<1.0
1,2-Dichloroethane	ug/l	<1.0	<1.0
Benzene	ug/l	<1.0	<1.0
1,2-Dichloropropane	ug/l	<1.0	<1.0
Trichloroethene	ug/l	<1.0	<1.0
Bromodichloromethane	ug/l	<1.0	<1.0
Dibromomethane	ug/l	<1.0	<1.0
cis-1,3-Dichloropropene	ug/l	<1.0	<1.0
Toluene	ug/l	<1.0	<1.0
trans-1,3-Dichloropropene	ug/l	<1.0	<1.0
1,1,2-Trichloroethane	ug/l	<1.0	<1.0
Carbon Tetrachloride	ug/l	<1.0	<1.0
Vinyl Chloride	ug/l	<0.5	<0.5
1,3-Dichloropropane	ug/l	<1.0	<1.0
Tetrachloroethene	ug/l	<1.0	<1.0
Dibromochloromethane	ug/l	<1.0	<1.0
1,2-Dibromoethane	ug/l	<1.0	<1.0
Chlorobenzene	ug/l	<1.0	<1.0
1,1,1,2-Tetrachloroethane	ug/l	<1.0	<1.0
Ethyl Benzene	ug/l	<1.0	<1.0
m&p-Xylene	ug/l	<1.0	<1.0
o-Xylene	ug/l	<1.0	<1.0
Styrene	ug/l	<1.0	<1.0
Bromoform	ug/l	<1.0	<1.0

APPENDIX 4 – SURFACE WATER

Parameter	Units	SW 1	SW 2
VOC			
Isopropylbenzene	ug/l	<1.0	<1.0
trans-1,2-Dichloroethene	ug/l	<1.0	<1.0
1,1,2,2-Tetrachloroethane	ug/l	<1.0	<1.0
1,2,3-Trichloropropane	ug/l	<1.0	<1.0
n-Propylbenzene	ug/l	<1.0	<1.0
Bromobenzene	ug/l	<1.0	<1.0
2-Chlorotoluene	ug/l	<1.0	<1.0
1,3,5-Trimethylbenzene	ug/l	<1.0	<1.0
4-Chlorotoluene	ug/l	<1.0	<1.0
tert-Butylbenzene	ug/l	<1.0	<1.0
1,2,4-Trimethylbenzene	ug/l	<1.0	<1.0
sec-Butylbenzene	ug/l	<1.0	<1.0
p-Isopropyltoluene	ug/l	<1.0	<1.0
1,3-Dichlorobenzene	ug/l	<1.0	<1.0
1,4-Dichlorobenzene	ug/l	<1.0	<1.0
n-Butylbenzene	ug/l	<1.0	<1.0
1,2-Dichlorobenzene	ug/l	<1.0	<1.0
1,2-Dibromo-3-chloropropane	ug/l	<2.0	<2.0
1,2,4-Trichlorobenzene	ug/l	<1.0	<1.0
Hexachlorobutadiene	ug/l	<1.0	<1.0
Naphthalene	ug/l	<1.0	<1.0
1,2,3-Trichlorobenzene	ug/l	<1.0	<1.0
MTBE	ug/l	<1.0	<1.0



Appendix 5



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Mr Williams
Potters Waste Management
Potters Yard
Severn Road
Welshpool SY21 7BE
Powys

07 June 2017

Test Report: COV/1395032/2017

Dear Mr Williams

Analysis of your sample(s) submitted on 31 May 2017 is now complete and we have pleasure in enclosing the appropriate test report(s).

An invoice for the analysis carried out will be sent under separate cover.

Should you have any queries regarding this report(s) or any part of our service, please contact Customer Services on +44 (0)24 7642 1213 who will be happy to discuss your requirements.

If you would like to arrange any further analysis, please contact Customer Services. To arrange container delivery or sample collection, please call the Couriers Department directly on 024 7685 6562.

Thank you for using ALS Environmental Ltd and we look forward to receiving your next samples.

Yours Sincerely,

Signed: 

Name: P. Patel

Title: Inorganic Team Leader



Report Summary

Mr David Williams
Potters Waste Management
Potters Yard
Severn Road
Welshpool
Powys
SY21 7BE



Date of Issue : **07 June 2017**

Report Number : **COV/1395032/2017**

Issue **1**

This issue replaces all previous issues

Number of Samples
included in report: **3**

Number of Test
Results included in rep **21**

Site Name : **Waste Water Analysis**
Job Received : **31 May 2017**

Analysis Commenced : **06 June 2017**
Order Number : **B1772POT2**

Signed :

Name : **P. Patel**

Date : **07 June 2017**

Title : **Inorganic Team Leader**

ALS Environmental Ltd was not responsible for sampling unless otherwise stated.

Information on the methods of analysis and performance characteristics are available on request.

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. The results relate only to the items tested.

Tests marked 'Not UKAS Accredited' in this Report/Certificate are not included in the UKAS Accreditation Schedule for our laboratory.

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Certificate of Analysis



Report Number: **COV/1395032/2017 Issue 1**

Site Name: **Waste Water Analysis**

Determinand	Units	Method/ Analysis Site	Dust		
			1 16123927	2 16123928	3 16123929
Date In	dd/mm/yy	74 Cov	N 30/05/17	N 30/05/17	N 30/05/17
Date Out	dd/mm/yy	74 Cov	N 17/05/17	N 17/05/17	N 17/05/17
Deposited Dust, Total, Calc.	mg/m2/day	74 Cov	N 26	N 41	N 31
Description of Dust	Text	74 Cov	N {^}Light, brown deposition{^}	N {^}Medium, green deposition. Algae{^}	N {^}Medium, light green and brown deposition. Algae{^}
Frisbee Diameter	mm	74 Cov	N 227	N 227	N 227
Mass of Undissolved Solids	mg	74 Cov	N 13.7	N 21.8	N 16.1
Number of Days Exposed		74/77 Cov	N 13	N 13	N 13

Signed :

Name : **P. Patel**

Date : **07 June 2017**

Title : **Inorganic Team Leader**

This issue replaces all previous issues

Accreditation Codes: Y = UKAS / ISO17025 Accredited, N = Not UKAS / ISO17025 Accredited, M = MCERTS.

Analysed at: Cov = Coventry(CV4 9GU), Che = Chester(CH4 9EP), Ott = Otterbourne(SO21 2SW), S = Subcontracted, Trb = Subcontracted to Trowbridge(BA14 0XD), Wak = Wakefield(WF5 9TG).

For Microbiological determinands 0 or ND=Not Detected, For Legionella ND=Not Detected in volume of sample filtered. The LOD for the Legionella analysis will increase where the volume analysed is <1000g (1g is approximately equivalent to 1ml for

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ANALYST COMMENTS FOR REPORT

COV/1395032/2017

Issue 1

Date of Issue: **07 June 2017**

Sample No

Analyst Comments

16123927 DUST COMMENTS Light, brown deposition
16123928 DUST COMMENTS Medium, green deposition. Algae
16123929 DUST COMMENTS Medium, light green and brown deposition. Algae

Signed:

Name: **P. Patel**

Date: **07 June 2017**

Title: **Inorganic Team Leader**



Date of Issue : 07 June 2017

Sample No	Description	Determinand	Comments
16123927	1	Description of Dust	{*}Light, brown deposition{*/}
16123928	2	Description of Dust	{*}Medium, green deposition. Algae{*/}
16123929	3	Description of Dust	{*}Medium, light green and brown deposition. Algae{*/}

Signed: 	Name: P. Patel	Date: 07 June 2017
	Title: Inorganic Team Leader	



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