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Aled Zachary
Natural Resources Wales

Our ref: 2306.2.POT.SDB.JDM.A0
10th August 2015

Dear Andi,

Re: Bryn Posteg Landfill Site, Permit Number BU7766IC (Variation Notice Number EPR/BU7766IC/V004) – Quarterly Monitoring Review (April - June 2015)

In respect of Permit condition 4.2.2, a report of the monitoring and assessment carried out between the 1st of April and the 30th of June 2015 is enclosed.

The monitoring data required by permit conditions 3.6.1, for leachate in tables S4.1 and S4.9, point source emissions specified in tables S4.2, S4.3 and S4.4, groundwater specified in tables S4.5 and S4.11, landfill gas specified in tables S4.6, S4.7 and S4.8 and particulate matter in table S4.10 is submitted. This data comprises:

- Daily data for treated leachate quality;
- Weekly data for landfill gas in peripheral monitoring boreholes and groundwater levels;
- Monthly data for landfill gas in collection wells, groundwater quality, leachate levels, leachate quality, leachate discharge quality and surface water;
- Quarterly data for groundwater quality and particulate matter;

Please do not hesitate to contact me should you require any further information.

Yours sincerely,

Jim McClymont
Principal Environmental Scientist
On behalf of Caulmert Ltd

CAULMERT LIMITED

Engineering, Environmental & Planning
Consultancy Services

Bryn Posteg Landfill Site

Potters Waste Management

Quarterly Monitoring Review

April – June 2015

Prepared by:

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August 2015

APPROVAL RECORD

Site: **Bryn Posteg Landfill**

Client: **Potters Waste Management**

Document Title: **Quarterly Monitoring Review, April – June 2015**

Document Ref: **2306.2.POT.SDB.JDM**

Report Status: **A0**

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Author	Sean O'Brien	**Date**	07/08/2015
Reviewer	Jim McClymont	**Date**	07/08/2015
Approved	Jim McClymont	**Date**	07/08/2015

DISCLAIMER

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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 by this report was collected between the 1st of April and the 30th of June 2015.

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.

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.

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

1.2.3 The site is accessed via the B4518, Llanidloes to Tylwch road. The B4518 runs parallel with the western site boundary.

1.2.4 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 BPW009 in the monitoring data. Concentrations of methane (CH_4) and carbon dioxide (CO_2) are measured alongside oxygen (O_2), relative pressure and atmospheric pressure on each visit.

2.1.2 CH_4 concentrations exceeded the trigger level value of 1.0 %[1] on at least one occasion at 16 monitoring locations – BPW009-01, 12, 19, 20, 21, 22, 23, 25, 27, 29, 30, 31, 35, 38, 40 and 41. The maximum concentration was 75.2 %, detected at BPW009-22.

2.1.3 CO_2 concentrations exceeded the trigger level value of 1.5 % on at least one occasion at 23 monitoring locations – BPW009-01, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 25, 26, 27, 29, 30, 31, 35, 36, 38, 39, 40 and 41. The maximum detected concentration was 34.9 % in BPW009-35.

2.1.4 Summary tables displaying all CH_4, CO_2 and O_2 monitoring data collected during this period are included in Appendix 1.

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 GW1 – GW11. GW10 cannot currently be sampled and location GW11 was dry throughout the 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 Chloride concentration at location GW1 was significantly above the trigger limit (69 mg/l). The maximum chloride concentration in GW1 was 392 mg/l, which is lower than the maximum found in GW1 during the last review period, which was 498 mg/l. Chloride concentration remained below the trigger limit at all other monitoring locations.

3.1.3 Ammoniacal nitrogen concentration exceeded the trigger limit on one occasion in GW7 only, with a concentration of 2.9 mg/l in May 2015. No ammoniacal nitrogen was detected at this location in April or June 2015.

3.1.4 A full quarterly suite was undertaken in June 2015. None of the quarterly parameter trigger limits were exceeded, with the exception of a low concentration of 0.18 µg/l mecoprop at W5, which slightly exceeded the 0.1 µg/l trigger limit.

3.1.5 Quarterly parameters without trigger limits also remained within acceptable low concentrations at all locations. No polycyclic aromatic hydrocarbons (PAHs) or phenols were detected.

3.2 Groundwater Levels

3.2.1 Groundwater levels were recorded weekly. 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 4, Sump 5, Sump 9c and Sump 9d. Sump 3, 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 at or below the 1 m trigger level throughout the review period in all of the sumps.

4.1.3 Sump 9C and Sump 9D leachate levels were calculated as being below the base of the landfill throughout the monitoring period. This is due to the extension of the sump heads with one and two concrete rings respectively. Cover levels have not been surveyed to account for this increase in well height.

4.1.4 Leachate samples were analysed in April, May and June for pH and ammoniacal nitrogen.

4.1.5 pH remained slightly alkaline throughout the review period, ranging between 7.4 and 8.4 while ammoniacal nitrogen ranged between 82.8 mg/l in LC1 and 3020 mg/l in LC2.

Treated leachate

4.1.6 Treated leachate (final discharge) was tested monthly for pH, ammoniacal nitrogen, suspended solids, COD, Total Petroleum Hydrocarbons (C6 – C40), sulphate and dissolved methane. Six monthly, hazardous substances suite was also carried out on samples collected in June, as required by the EP.

4.1.7 Ammoniacal nitrogen concentration exceeded the EP limit (150 mg/l) in April and May with concentrations of 643 mg/l and 689 mg/l respectively.

4.1.8 Suspended solids concentration increased throughout the review and was above the EP limit (500 mg/l) in May and June at concentrations of 552 mg/l and 1680 mg/l respectively. COD concentration was above the trigger level of 1000 mg/l in April, May and June at 1250 mg/l, 1630 mg/l and 1330 mg/l respectively.

4.1.9 TPH concentrations exceeded the trigger level of 'nil' in April, May and June at 495 µg/l, 834 µg/l and 1040 µg/l respectively.

4.1.10 Sulphate remained below the respective EP limits throughout the review period. pH remained within the trigger range of 6 – 10.

4.1.11 Low concentrations of dissolved methane were detected in May and June, at 0.1 mg/l and 0.021 mg/l respectively.

4.1.12 No volatile organic compounds (VOCs), semi volatile organic compounds (SVOCs) or mercury was detected as part of the six-monthly hazardous substances suite. Low concentrations of cyanide and mecoprop were detected at 0.35 mg/l and 3.14 µg/l respectively.

4.1.13 Potters Waste Management also undertakes daily in-situ testing of treated leachate in order to assess its suitability for discharge. Daily discharge volumes for this review period are included in Appendix 3. A total of 2110 m^3 of treated leachate was discharged between the 1st of April and the 30th of June 2015.

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 has not commenced.

5.1.3 Surface water samples were collected at SW1 (P1) in April and May and at SW2 (P2) in April, May and June. A summary table displaying surface water monitoring data is enclosed in Appendix 4.

5.1.4 Ammoniacal nitrogen was detected above the trigger level (0.25 mg/l) once in SW1 in May, at a concentration of 1.37 mg/l. Concentrations remained below the trigger limit in SW2 throughout the review.

5.1.5 Suspended solids concentration remained below the trigger level (50 mg/l) at SW2 during the review period. The trigger level was exceeded during May at SW1 with a concentration of 177 mg/l. .

5.1.6 pH ranged between 6.5 and 7.3 in SW1, and 6.9 and 7.7 in SW2. Electrical conductivity was similar in SW1 and SW2 with the exception of one higher concentration of 796 µS/cm in SW1 during May. The maximum recorded electrical conductivity in SW2 was 110 µS/cm also in May.

5.1.7 Chloride concentrations also peaked in SW1, with a maximum of 119 mg/l in May, compared to a maximum of 12.7 mg/l in SW2. BOD was <1 mg/l in SW1, and ranged between <1 mg/l and 1 mg/l in SW2.

5.1.8 Petroleum hydrocarbons were detected in SW1 during April and May, with a total petroleum hydrocarbons (EH >C6-C40) concentration of 20 µg/l and 26 µg/l respectively. Petroleum hydrocarbons were detected in SW2 during June at a concentration of 35 µg/l.

6.0 DUST

6.1 Monitoring Results

6.1.1 Dust monitoring was undertaken between the 7th of May 2015 and the 26th of May 2015 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.

Table 2: Dust Monitoring Results

Period	07/05/2015 – 26/05/2015		
Location	Mass of Undissolved Solids Mg	Result mg/m²/day	Trigger Level mg/m²/day
BP 1	45.8	61	200
BP 2	57.4	76	200
BP 3	33.1	44	200

6.1.2 Dust concentrations remained significantly below the trigger level outlined in the EP at all locations.

7.0 SUMMARY

7.1 Landfill gas

7.1.1 The CH_4 trigger level was exceeded at 16 locations and the CO_2 trigger level was exceeded at 23 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 Similar to the last quarterly review, the concentrations of all parameters were below their respective trigger levels, except chloride in GW1 and, on one occurrence, ammoniacal nitrogen in GW7.

7.3 Leachate

7.3.1 Leachate levels were below the trigger limit of 1.0 m in all sumps throughout the review period.

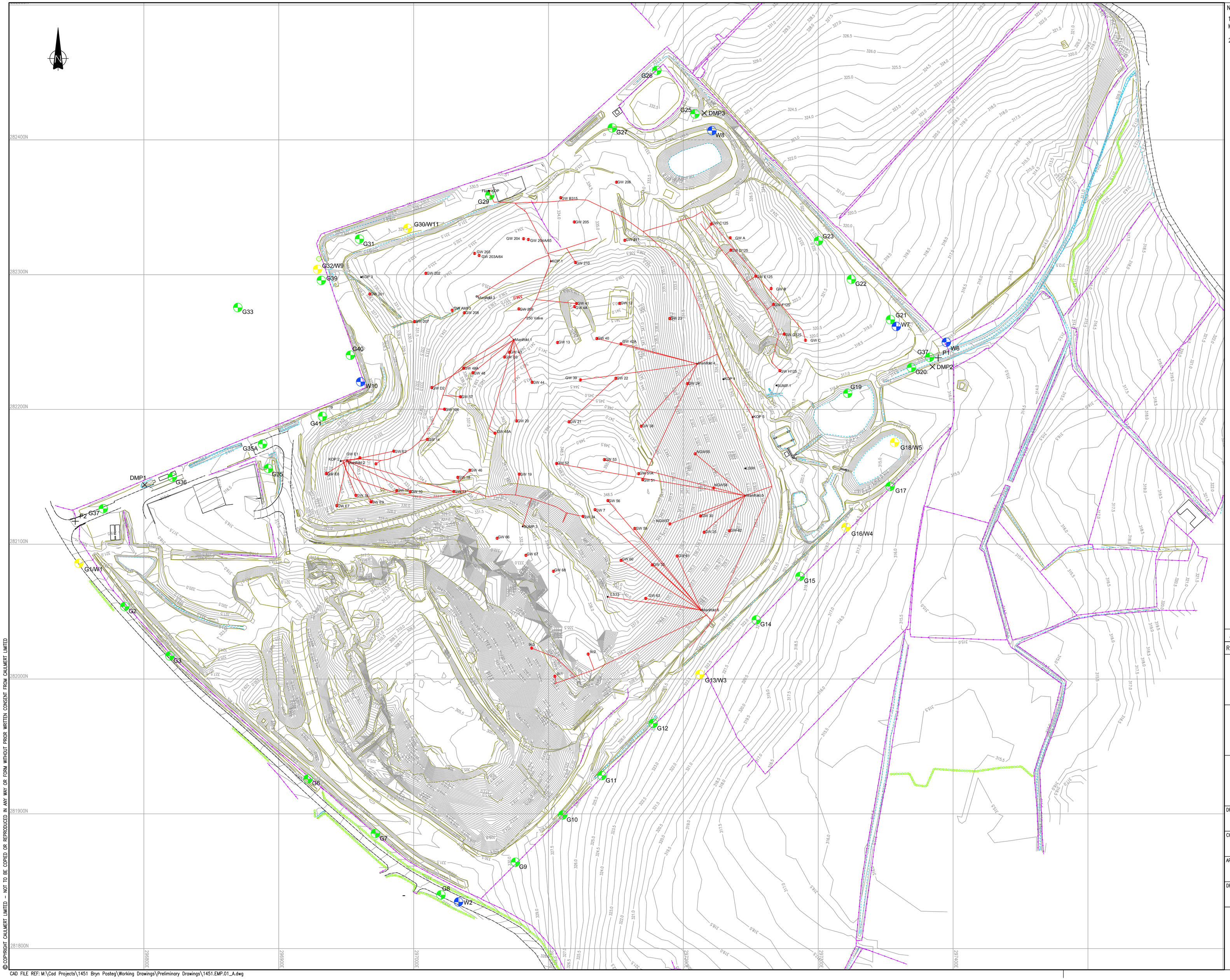
7.3.2 In the final discharge (treated leachate) quality data, exceedances of the trigger levels for ammoniacal nitrogen, suspended solids, COD and TPH were recorded.

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 for ammoniacal nitrogen and suspended solids in SW1.

7.5 Dust

7.5.1 Dust concentrations remained below the 200 mg/m^2/day trigger level at all locations.



NOTES

1. SURVEY INFORMATION PROVIDED BY POTTER'S WASTE MANAGEMENT, REF: TopoSurvey 161111A.dxf

2. LEGEND

- GAS MONITORING BOREHOLE
- GROUNDWATER MONITORING BOREHOLE
- GAS MONITORING BOREHOLE WITH GROUNDWATER MONITORING BOREHOLE
- PIPELINE
- APPROXIMATE POSITION OF SURFACE WATER MONITORING POINT
- APPROXIMATE POSITION OF DUST MONITORING POINT

SURFACE WATER MONITORING POINTS

- P1 NANT-Y-BRADNANT
- P2 AFON DULAS

DUST MONITORING POINTS

- DMP1 VALLEY VIEW
- DMP2 RHOSWEN AND PANT
- DMP3 PENBRYNDU

REV	MODIFICATIONS	BY	CH	AP	DATE
A	SURVEY UPDATED	EW	TC	XX	07.02.12

POTTERS WASTE MANAGEMENT

BRYN POSTEG LANDFILL SITE

ENVIRONMENTAL MONITORING PLAN

DRAWN BY: EW	DATE: 06.02.2012	
CHECKED BY: TC	SCALE @ A1: 1:1250	
APPROVED BY: JM	ISSUE: P	REVISION: A

DRAWING NUMBER: 1451.EMP.01

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CAD FILE REF: M:\Cad Projects\1451 Bryn Posteg\Working Drawings\Preliminary Drawings\1451.EMP.01_A.dwg

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
BPW00901	08/04/2015	0.1	1.1	18.2
	16/04/2015	0.1	0.5	19.1
	22/04/2015	0.1	0.3	20.1
	08/05/2015	0.7	0.9	19.3
	14/05/2015	2.8	3.1	12.0
	04/06/2015	7.5	2.8	12.1
	19/06/2015	0.0	0.0	20.5
	25/06/2015	0.2	0.8	20.5
BPW00902	08/04/2015	0.1	0.1	20.3
	16/04/2015	0.1	0.1	20.2
	22/04/2015	0.1	0.1	20.7
	08/05/2015	0.1	0.1	21.1
	14/05/2015	0.1	0.0	20.8
	04/06/2015	0.0	0.0	20.3
	19/06/2015	0.0	0.0	20.7
	25/06/2015	0.1	0.0	20.6
BPW00903	08/04/2015	0.1	1.1	18.8
	16/04/2015	0.1	1.3	18.1
	22/04/2015	0.1	0.6	20.2
	08/05/2015	0.0	0.9	19.9
	14/05/2015	0.1	0.6	20.5
	04/06/2015	0.0	1.0	18.5
	19/06/2015	0.0	1.0	19.2
	25/06/2015	0.0	1.2	18.9

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
BPW00907	08/04/2015	0.1	0.7	20.0
	16/04/2015	0.1	0.6	20.3
	22/04/2015	0.1	0.5	20.8
	08/05/2015	0.1	0.1	21.2
	14/05/2015	0.1	0.1	21.3
	04/06/2015	0.0	0.0	20.3
	19/06/2015	0.0	0.1	20.7
	25/06/2015	0.0	0.1	20.6
BPW00908	08/04/2015	0.1	0.0	20.6
	16/04/2015	0.1	0.0	20.9
	22/04/2015	0.1	0.0	21.1
	08/05/2015	0.1	0.1	21.2
	14/05/2015	0.1	0.0	21.4
	04/06/2015	0.0	0.0	20.4
	19/06/2015	0.0	0.0	20.9
	25/06/2015	0.0	0.0	20.8
BPW00909	08/04/2015	0.1	0.0	20.7
	16/04/2015	0.1	0.0	20.9
	22/04/2015	0.1	0.0	21.1
	08/05/2015	0.1	0.1	21.3
	14/05/2015	0.1	0.0	21.6
	04/06/2015	0.0	0.0	20.5
	19/06/2015	0.0	0.0	20.9
	25/06/2015	0.0	0.0	20.8

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
BPW00910	08/04/2015	0.1	0.6	20.1
	16/04/2015	0.1	2.7	17.9
	22/04/2015	0.1	0.4	20.6
	08/05/2015	0.1	3.3	18.3
	14/05/2015	0.1	7.8	13.1
	04/06/2015	0.0	3.2	18.2
	19/06/2015	0.3	3.7	17.5
	25/06/2015	0.4	4.9	16.8
BPW00911	08/04/2015	0.1	0.3	20.5
	16/04/2015	0.1	0.5	20.7
	22/04/2015	0.1	1.1	20.3
	08/05/2015	0.1	1.1	19.6
	14/05/2015	0.1	0.7	20.6
	04/06/2015	0.0	0.4	20.6
	19/06/2015	0.0	1.7	19.7
	25/06/2015	0.0	1.7	19.7
BPW00912	08/04/2015	47.9	2.8	7.3
	16/04/2015	51.8	2.6	7.1
	22/04/2015	44.9	3.0	8.0
	08/05/2015	46.0	3.7	6.3
	14/05/2015	55.8	3.0	6.6
	04/06/2015	49.4	3.8	5.8
	19/06/2015	45.2	3.2	8.4
	25/06/2015	48.2	3.3	7.7

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
BPW00913	08/04/2015	0.1	2.6	19.4
	16/04/2015	0.1	0.0	21.1
	22/04/2015	0.1	0.0	21.4
	08/05/2015	0.1	0.3	21.2
	14/05/2015	0.1	0.1	21.8
	04/06/2015	0.0	0.0	20.9
	19/06/2015	0.0	0.0	21.1
	25/06/2015	0.0	0.0	20.9
BPW00914	08/04/2015	0.1	1.3	19.6
	16/04/2015	0.1	1.6	19.4
	22/04/2015	0.1	1.9	19.4
	08/05/2015	0.1	1.8	19.1
	14/05/2015	0.1	2.1	18.6
	04/06/2015	0.0	2.1	18.1
	19/06/2015	0.0	2.7	18.2
	25/06/2015	0.0	2.9	17.8
BPW00915	08/04/2015	0.1	1.0	18.6
	16/04/2015	0.1	0.7	19.1
	22/04/2015	0.1	1.1	19.0
	08/05/2015	0.1	1.2	18.9
	14/05/2015	0.1	1.0	19.6
	04/06/2015	0.0	0.4	19.9
	19/06/2015	0.0	0.4	20.4
	25/06/2015	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
BPW00916	08/04/2015	0.1	0.0	21.0
	16/04/2015	0.1	0.0	21.1
	22/04/2015	0.1	0.0	21.4
	08/05/2015	0.1	0.1	21.2
	14/05/2015	0.1	0.1	21.8
	04/06/2015	0.0	0.0	20.8
	19/06/2015	0.0	0.0	21.2
	25/06/2015	0.0	0.0	21.0
BPW00917	08/04/2015	0.1	0.1	21.0
	16/04/2015	0.1	0.2	21.1
	22/04/2015	0.1	0.1	21.4
	08/05/2015	0.1	0.3	21.2
	14/05/2015	0.1	0.1	21.8
	04/06/2015	0.0	0.0	20.9
	19/06/2015	0.0	0.0	21.2
	25/06/2015	0.0	0.0	21.0
BPW00918	08/04/2015	0.1	0.0	21.1
	16/04/2015	0.1	0.0	21.1
	22/04/2015	0.1	0.0	21.4
	08/05/2015	0.1	0.1	21.2
	14/05/2015	0.1	0.1	21.8
	04/06/2015	0.0	0.0	20.9
	19/06/2015	0.0	0.0	21.3
	25/06/2015	0.0	0.0	21.0

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
BPW00919	08/04/2015	73.0	27.6	0.2
	16/04/2015	72.1	28.4	0.2
	22/04/2015	72.8	27.7	0.2
	08/05/2015	74.1	27.3	0.2
	14/05/2015	72.8	29.0	0.2
	04/06/2015	68.1	33.4	0.3
	19/06/2015	70.8	31.1	0.2
	25/06/2015	66.8	35.7	0.2
BPW00920	08/04/2015	71.8	29.7	0.1
	16/04/2015	70.9	30.8	0.1
	22/04/2015	70.3	31.3	0.1
	08/05/2015	70.6	31.5	0.3
	14/05/2015	70.8	31.6	0.1
	04/06/2015	68.4	32.3	0.2
	19/06/2015	67.9	34.8	0.2
	25/06/2015	66.7	36.3	0.1
BPW00921	08/04/2015	57.6	14.4	0.1
	16/04/2015	60.3	17.8	0.1
	22/04/2015	62.5	20.4	0.1
	08/05/2015	61.5	21.4	0.1
	14/05/2015	62.2	14.9	0.1
	04/06/2015	53.4	12.4	0.1
	19/06/2015	63.2	20.1	0.3
	25/06/2015	61.6	19.0	0.5

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
BPW00922	08/04/2015	75.2	20.3	0.1
	16/04/2015	72.7	20.3	0.1
	22/04/2015	73.5	20.5	0.1
	08/05/2015	69.9	21.6	0.1
	14/05/2015	74.9	24.9	0.1
	04/06/2015	67.6	25.4	0.2
	19/06/2015	72.9	25.2	0.1
	25/06/2015	72.7	26.1	0.1
BPW00923	08/04/2015	8.7	5.9	0.1
	16/04/2015	1.6	9.2	0.2
	22/04/2015	1.6	9.7	0.6
	08/05/2015	2.0	6.1	0.1
	14/05/2015	12.5	7.0	0.1
	04/06/2015	12.2	8.8	0.1
	19/06/2015	12.5	11.3	0.3
	25/06/2015	3.6	13.3	1.4
BPW00924	08/04/2015	0.1	0.6	20.0
	16/04/2015	0.1	0.4	20.3
	22/04/2015	0.1	0.3	20.8
	08/05/2015	0.1	1.4	17.7
	14/05/2015	0.1	1.4	18.5
	04/06/2015	0.0	0.0	20.6
	19/06/2015	0.0	0.1	21.3
	25/06/2015	0.0	0.3	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
BPW00925	08/04/2015	28.6	10.8	0.3
	16/04/2015	21.9	6.8	0.2
	22/04/2015	19.0	6.8	0.2
	08/05/2015	26.4	16.1	0.7
	14/05/2015	32.9	15.3	2.3
	04/06/2015	43.1	18.9	0.5
	19/06/2015	48.4	13.5	0.3
	25/06/2015	46.9	13.2	0.2
BPW00926	08/04/2015	0.1	1.1	19.5
	16/04/2015	0.1	1.4	19.4
	22/04/2015	0.1	1.8	19.4
	08/05/2015	0.1	2.4	19.5
	14/05/2015	0.1	1.9	20.0
	04/06/2015	0.0	1.9	18.1
	19/06/2015	0.0	1.9	19.9
	25/06/2015	0.0	1.7	19.6
BPW00927	08/04/2015	17.6	19.7	4.2
	16/04/2015	64.5	31.6	1.0
	22/04/2015	64.5	31.3	1.3
	08/05/2015	47.5	26.6	4.5
	14/05/2015	34.0	21.0	7.0
	04/06/2015	1.3	3.6	17.9
	19/06/2015	0.0	0.5	21.1
	25/06/2015	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
BPW00929	08/04/2015	0.1	0.3	20.5
	16/04/2015	0.1	0.3	20.3
	22/04/2015	0.7	0.9	17.8
	08/05/2015	0.2	1.4	17.4
	14/05/2015	0.2	0.9	19.8
	04/06/2015	0.0	0.2	19.7
	19/06/2015	0.7	2.5	15.8
	25/06/2015	1.6	2.8	6.3
BPW00930	08/04/2015	1.0	0.6	19.8
	16/04/2015	12.1	3.9	10.6
	22/04/2015	1.4	0.7	19.5
	08/05/2015	5.2	1.5	18.0
	14/05/2015	3.4	2.5	16.4
	04/06/2015	7.0	1.7	16.8
	19/06/2015	8.1	3.5	14.2
	25/06/2015	11.5	3.5	13.0
BPW00931	08/04/2015	1.3	2.0	18.4
	16/04/2015	6.7	4.0	13.3
	22/04/2015	0.5	1.4	19.3
	08/05/2015	11.0	5.6	13.1
	14/05/2015	12.7	5.2	13.6
	04/06/2015	21.9	7.1	11.3
	19/06/2015	0.1	4.2	17.2
	25/06/2015	0.1	3.8	16.8

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
BPW00932	08/04/2015	0.1	0.1	21.0
	16/04/2015	0.2	0.1	20.8
	22/04/2015	0.1	0.1	20.9
	08/05/2015	0.1	0.1	21.2
	14/05/2015	0.1	0.1	21.7
	04/06/2015	0.0	0.0	20.5
	19/06/2015	0.0	0.0	21.5
	25/06/2015	0.0	0.0	20.9
BPW00935	08/04/2015	1.2	3.0	17.9
	16/04/2015	62.2	26.1	0.1
	22/04/2015	69.9	25.9	0.2
	08/05/2015	74.3	18.4	0.1
	14/05/2015	71.3	23.5	0.2
	04/06/2015	65.3	34.9	0.2
	19/06/2015	72.7	28.5	0.2
	25/06/2015	70.1	32.1	0.2
BPW00936	08/04/2015	0.1	0.5	20.1
	16/04/2015	0.1	0.5	20.0
	22/04/2015	0.1	0.5	20.3
	08/05/2015	0.1	6.8	10.9
	14/05/2015	0.1	2.3	17.7
	04/06/2015	0.0	0.2	20.2
	19/06/2015	0.0	0.2	21.1
	25/06/2015	0.0	0.2	20.8

APPENDIX 1 – LANDFILL GAS

Borehole	Date	Methane	Carbon Dioxide	Oxygen
		% v/v	% v/v	% v/v
		Trigger - 1.0	Trigger - 1.5	N/A
BPW00937	08/04/2015	0.1	1.4	19.7
	16/04/2015	0.1	1.1	20.0
	22/04/2015	0.1	0.8	20.4
	08/05/2015	0.1	0.7	20.9
	14/05/2015	0.1	0.5	21.4
	04/06/2015	0.0	0.3	20.3
	19/06/2015	0.0	0.2	21.3
	25/06/2015	0.0	0.2	20.8
BPW00938	08/04/2015	64.8	27.9	0.1
	16/04/2015	65.2	29.1	0.1
	22/04/2015	23.8	24.7	0.1
	08/05/2015	58.0	30.1	0.1
	14/05/2015	61.4	29.1	0.1
	04/06/2015	55.5	29.5	0.2
	19/06/2015	67.3	33.2	0.2
	25/06/2015	53.7	33.4	0.1
BPW00939	08/04/2015	0.1	0.9	20.1
	16/04/2015	0.1	1.1	18.9
	22/04/2015	0.1	1.0	20.1
	08/05/2015	0.1	0.6	20.5
	14/05/2015	0.1	1.9	19.2
	04/06/2015	0.0	0.2	20.3
	19/06/2015	0.0	0.2	21.6
	25/06/2015	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
BPW00940	08/04/2015	68.6	30.1	0.4
	16/04/2015	68.4	31.2	0.2
	22/04/2015	58.5	29.4	0.3
	08/05/2015	46.6	28.5	0.7
	14/05/2015	69.5	31.9	0.1
	04/06/2015	37.6	28.2	2.9
	19/06/2015	0.0	0.0	21.5
	25/06/2015	0.2	0.1	20.8
BPW00941	08/04/2015	0.5	8.7	1.8
	16/04/2015	0.4	4.8	11.4
	22/04/2015	0.2	5.9	13.7
	08/05/2015	0.1	6.3	6.8
	14/05/2015	0.1	5.7	8.7
	04/06/2015	5.2	6.9	0.9
	19/06/2015	0.9	8.8	9.0
	25/06/2015	0.2	6.1	14.1
BPW00942	08/04/2015	0.1	0.0	20.8
	16/04/2015	0.1	0.0	20.8
	22/04/2015	0.1	0.0	21.0
	08/05/2015	0.1	0.1	21.4
	14/05/2015	0.1	0.1	21.7
	04/06/2015	0.0	0.0	20.6
	19/06/2015	0.0	0.0	21.5
	25/06/2015	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=
01-Apr-15	15433	206	630	57.2%	1.08%
02-Apr-15	15457	223	630	57.1%	0.98%
03-Apr-15	15481	366	630	57.3%	0.78%
06-Apr-15	15553	360	630	57.4%	0.99%
07-Apr-15	15553	360	630	57.4%	0.98%
08-Apr-15	15601	353	620	57.3%	0.96%
09-Apr-15	15625	367	620	57.1%	0.79%
10-Apr-15	15649	345	630	57.5%	0.67%
13-Apr-15	15721	256	590	57.7%	0.94%
14-Apr-15	15745	289	620	57.1%	0.91%
15-Apr-15	15769	334	630	n/a	n/a
16-Apr-15	15792	471	630	n/a	n/a
17-Apr-15	15817	439	620	N/A	N/A
20-Apr-15	15888	471	620	N/A	N/A
21-Apr-15	15912	464	620	N/A	N/A
22-Apr-15	15937	467	630	N/A	N/A
23-Apr-15	15960	482	620	N/A	N/A
24-Apr-15	15984	470	620	N/A	N/A
27-Apr-15	16057	282	630	N/A	N/A
28-Apr-15	16081	265	620	N/A	N/A
29-Apr-15	16105	409	620	N/A	N/A
30-Apr-05	16128	407	620	N/A	N/A
01-May-15	16152	404	620	N/A	N/A
04-May-15	16224	388	610	N/A	N/A
05-May-15	16248	415	610	N/A	N/A
06-May-15	16272	362	610	N/A	N/A
07-May-15	16297	360	600	N/A	N/A
08-May-15	16113	406	620	N/A	N/A
11-May-15	16393	386	620	N/A	N/A
12-May-15	16417	388	610	N/A	N/A
13-May-15	16440	427	620	N/A	N/A
14-May-15	16464	425	620	N/A	N/A
15-May-15	16489	314	600	N/A	N/A
18-May-15	16561	425	630	N/A	N/A
19-May-15	16504	295	600	N/A	N/A
20-Apr-15	16401	277	580	N/A	N/A
21-May-15	16425	319	620	N/A	N/A
22-May-15	16656	337	630	N/A	N/A
25-May-15	16730	325	620	N/A	N/A
26-May-15	16753	304	610	N/A	N/A
27-May-15	16777	320	620	N/A	N/A
28-May-15	16801	304	610	N/A	N/A
29-May-15	16824	303	610	N/A	N/A
01-Jun-15	16896	289	600	N/A	N/A
02-Jun-15	16713	319	620	N/A	N/A
03-Jun-15	16944	237	610	N/A	N/A
04-Jun-15	16968	347	640	N/A	N/A
05-Jun-15	16786	358	640	N/A	N/A
08-Jun-15	17810	365	650	N/A	N/A
09-Jun-15	17834	362	650	N/A	N/A
10-Jun-15	17858	370	640	N/A	N/A
11-Jun-15	17929	370	650	N/A	N/A
12-Jun-15	17160	376	660	N/A	N/A
15-Jun-15	17233	305	630	N/A	N/A
16-Jun-15	17257	308	640	N/A	N/A
17-Jun-15	17280	310	640	N/A	N/A
18-Jun-15	17305	311	640	N/A	N/A
19-Jun-15	17328	301	620	N/A	N/A
22-Jun-15	17401	304	630	N/A	N/A
23-Jun-15	17425	351	630	N/A	N/A
24-Jun-15	17449	330	630	N/A	N/A
25-Jun-15	17473	359	670	N/A	N/A
26-Jun-15	17496	372	680	N/A	N/A
29-Jun-15	17567	353	670	N/A	N/A
30-Jun-15	17591	398	690	N/A	N/A

Appendix 2

APPENDIX 2 – GROUNDWATER

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

Date	W1 (mAOD)	W2 (mAOD)	W3 (mAOD)	W4 (mAOD)	W5 (mAOD)	W6 (mAOD)	W7 (mAOD)	W8 (mAOD)	W9 (mAOD)
07/04/2015	308.43	328.12	299.40	298.03	311.99	309.67	298.71	277.55	319.30
16/04/2015	308.41	328.12	299.40	298.03	311.97	309.66	298.72	277.55	319.31
24/04/2015	308.38	328.11	299.38	298.00	311.95	309.63	298.71	277.50	319.29
06/05/2015	308.42	328.26	299.41	298.13	312.05	309.72	298.78	277.51	319.19
14/05/2015	308.39	328.33	299.46	298.29	312.18	309.70	298.79	277.57	319.08
22/05/2015	308.32	328.47	299.52	298.32	312.27	309.69	298.80	277.58	318.95
28/05/2015	308.30	328.63	299.62	298.37	312.34	310.64	298.76	277.51	318.80
05/06/2015	308.29	328.61	299.61	298.33	312.30	310.46	298.74	277.49	318.75
12/06/2015	308.32	328.61	299.49	298.38	312.32	310.42	298.77	277.57	318.88
18/06/2015	308.29	328.59	299.47	298.37	312.28	310.39	298.80	277.55	318.95
25/06/2015	308.33	328.54	299.53	298.32	312.25	310.49	298.75	277.51	318.95

APPENDIX 2 – GROUNDWATER

Table 2: Groundwater Monthly monitoring data

Parameter	Trigger Limit	Date	GW 1	GW 2	GW 3	GW 4	GW 5	GW 6	GW 7	GW 8	GW 9
Ammoniacal Nitrogen (mg/l)	2	Apr-15	<0.27	<0.27	<0.27	1.06	<0.27	<0.27	<0.27	<0.27	<0.27
		May-15	<0.27	<0.27	<0.27	1.06	<0.27	<0.27	2.9	1.1	0.5
		Jun-15	<0.27	<0.27	<0.27	0.89	<0.27	<0.27	<0.27	<0.27	<0.27
Chloride (mg/l)	69	Apr-15	392.0	41.5	12.9	18.8	21.4	10.8	13.7	15.7	15.8
		May-15	383.0	39.9	13.7	19.7	26.4	12.3	15.2	17.6	14.3
		Jun-15	355.0	41.9	14.0	18.9	30.2	15.8	15.4	17.5	13.4
Electrical Conductivity (µS/cm)	-	Apr-15	1230	206	328	309	211.0	116.0	320.0	325.0	182.0
		May-15	1220	203	321	311	211.0	121.0	315.0	332.0	191.0
		Jun-15	1110	202	315	298	228.0	126.0	302.0	304.0	180.0
Cyanide (mg/l)	-	Apr-15	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
		May-15	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
		Jun-15	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
pH	-	Apr-15	6.3	7.7	7.3	6.9	6.1	6.7	7.7	6.9	6.6
		May-15	6.1	8.3	7.3	7	6.0	6.6	7.6	6.8	6.8
		Jun-15	6.7	8.2	6.8	7.3	5.9	6.7	7.9	7.0	6.9
Sulphate (mg/l)	-	Apr-15	16	<1.3	23.2	30.5	35.0	8.2	29.8	22.2	26.9
		May-15	17.7	1.5	23.1	28.4	35.2	7.7	29.0	23.7	27.2
		Jun-15	8.5	<1.3	110	25.8	52.0	6.8	25.3	21.5	25.1

Key: Above Permit Limit

APPENDIX 2 – GROUNDWATER

Table 3: Groundwater Quarterly monitoring data

Reference	Unit	Trigger	W1	W2	W3	W4	W5	W6	W7	W8	W9
Ammoniacal Nitrogen	**mg/l**	**2**	<0.27	<0.27	<0.27	0.89	<0.27	<0.27	<0.27	<0.27	<0.27
Cadmium , Total as Cd	**mg/l**	**0.0056**	0.0008	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006	<0.0006
Nickel , Total as Ni	**mg/l**	**0.12**	0.012	<0.003	<0.003	0.006	0.021	<0.003	<0.003	<0.003	<0.003
Toluene	**µg/l**	**4**	0.93	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total Xylenes	**µg/l**	**3**	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Zinc, Total as Zn	**mg/l**	**0.85**	0.06	<0.018	<0.018	<0.018	0.11	<0.018	<0.018	<0.018	0.05
Ethyl Benzene	**µg/l**	**1**	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Mecoprop	**µg/l**	**0.1**	<0.04	<0.04	<0.04	0.07	0.18	<0.04	<0.04	<0.04	<0.04
2,4 - D	**µg/l**	**0.1**	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

APPENDIX 2 – GROUNDWATER

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

Reference	Unit	W1	W2	W3	W4	W5	W6	W7	W8	W9
Calcium , Total as Ca	mg/l	16.8	7.9	33.2	37.1	15.7	11.6	37.6	41.2	14.9
Chromium , Total as Cr	mg/l	0.005	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Copper, Total as Cu	mg/l	0.023	<0.009	<0.009	<0.009	0.047	<0.009	<0.009	<0.009	<0.009
Iron , Total as Fe	mg/l	12.80	<0.23	9.05	6.99	0.79	4.80	1.63	1.26	<0.23
Lead , Total as Pb	mg/l	0.018	<0.006	0.008	<0.006	0.01	<0.006	0.076	0.011	<0.006
Magnesium, Total as Mg	mg/l	5.90	1.00	11.20	8.40	4.10	2.70	5.90	9.90	4.20
Manganese , Total as Mn	mg/l	2.49	0.01	1.58	3.28	1.76	0.68	0.98	0.91	0.20
Mercury, Total as Hg	mg/l	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Potassium , Total as K	mg/l	2.27	2.11	1.35	2.09	2.16	0.55	2.78	1.5	0.85
Silver , Total as Ag	mg/l	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007	<0.0007
Sodium , Total as Na	mg/l	168.0	26.8	10.6	9.1	12.8	4.8	16.5	8.7	11.6
pH	-	6.7	8.2	6.8	7.3	5.9	6.7	7.9	7.0	6.9
Conductivity- Electrical 20C	uS/cm	1110	202	315	298	228	126	302	304	180
Alkalinity as CaCO3	mg/l	35	39.4	38.1	106	12.6	31.6	122	127	45.4
Bicarbonate Alkalinity	mg/l	35	39.4	38.1	106	12.6	31.6	122	127	45.4
Nitrate as N	mg/l	1.82	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42	<0.42
Sulphate as SO4	mg/l	8.5	<1.3	110	25.8	52	6.8	25.3	21.5	25.1
Dissolved Oxygen	mg/l	<0.5	1.5	4.3	1	2	2.6	1.3	0.5	1.7
Cyanide, Total as CN	mg/l	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
Phenols Mono (Phenol Index)	mg/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzene	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (a) anthracene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (g,h,i) perylene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (a) pyrene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (b) fluoranthene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo (k) fluoranthene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Dibenz (a,h) anthracene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01

APPENDIX 2 – GROUNDWATER

Reference	Unit	W1	W2	W3	W4	W5	W6	W7	W8	W9
Fluorene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno (1,2,3) cd pyrene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Naphthalene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
PAH, Total	ug/l	<0.10	<0.01	<0.01	<0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Antimony, Total as Sb	mg/l	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012	<0.0012
Arsenic, Total as As	mg/l	0.041	<0.0010	0.022	0.015	0.0023	0.012	0.0042	0.0015	<0.0010
m&p Xylene	ug/l	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
o-Xylene	ug/l	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Selenium, Total as Se	mg/l	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008	<0.0008

Appendix 3

APPENDIX 3 – LEACHATE

Table 1: Monthly leachate level data

Location	Sump 1			Sump 2			Sump 4			Sump 5		
	Cover Level (mAOD)		318.9	Cover Level (mAOD)		350	Cover Level (mAOD)		324.91	Cover Level (mAOD)		321.9
	Base (mAOD)		313.4	Base (mAOD)		310.9	Base (mAOD)		310.75	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)
Apr-15	4.63	314.3	0.9	DRY	-	0.0	13.55	311.4	0.6	10.35	311.6	0.8
May-15	4.60	314.3	0.9	DRY	-	0.0	13.65	311.3	0.5	10.38	311.5	0.8
Jun-15	4.62	314.3	0.9	DRY	-	0.0	13.45	311.5	0.7	10.40	311.5	0.8
Trigger Level			1			1			1			1

Location	Sump 9C			Sump 9D		
	Cover Level (mAOD)		310.88*	Cover Level (mAOD)		311.57*
	Base (mAOD)		307	Base (mAOD)		307
Date	Dip (mBGL)	Level (mAOD)	Leachate Head (m)	Dip (mBGL)	Level (mAOD)	Leachate Head (m)
Apr-15	4.20	306.7	-0.3	5.80	305.8	-1.2
May-15	4.30	306.6	-0.4	5.80	305.8	-1.2
Jun-15	4.30	306.6	-0.4	5.80	305.8	-1.2
EP Limit			1			1

* In March 2015 Sumps 9c and 9d received one and two concrete rings respectively. Cover levels have not yet been surveyed.

APPENDIX 3 – LEACHATE

Table 2: Monthly leachate monitoring data

LOCATION	DATE	pH	Ammoniacal Nitrogen as N
		pH units	mg/l
Leachate 1	Apr-15	7.5	82.8
	May-15	7.5	199
	Jun-15	7.7	405
Leachate 2	Apr-15	8.1	3020
	May-15	8.0	2770
	Jun-15	8.4	2520
Leachate 4	Apr-15	8.0	147
	May-15	8.0	122
	Jun-15	8.0	153
Leachate 5	Apr-15	7.9	381
	May-15	7.9	459
	Jun-15	8.0	505
Leachate 7	Apr-15	-	-
	May-15	-	-
	Jun-15	7.4	484

APPENDIX 3 – LEACHATE

Table 4: 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	**Apr-15**	8.4	643	350	1250	495	67	<0.010
	May-15	8.4	689	552	1630	834	125	0.1
	Jun-15	8.5	67.2	1680	1330	1040	73	0.021

APPENDIX 3 – LEACHATE

Table 5: Final discharge Six-Monthly monitoring data

Analyte	Units	Treated Leachate
Cadmium , Total as Cd	mg/l	<0.0006
Chromium , Total as Cr	mg/l	0.125
Copper, Total as Cu	mg/l	0.092
Lead , Total as Pb	mg/l	0.043
Mercury, Total as Hg	mg/l	<0.00010
Nickel, Total as Ni	mg/l	0.104
Zinc, Total as Zn	mg/l	0.353
Cyanide, Total as CN	mg/l	0.354
Hexachlorobenzene	ng/l	<78
Fenthion	ug/l	<0.097
2,3,6 - TBA	ug/l	<2.00
2,4 - D	ug/l	<2.00
2,4 - DB	ug/l	<2.00
2,4,5 - T	ug/l	<2.00
Bromoxynil	ug/l	<2.00
Dicamba	ug/l	<2.00
Dichlorprop	ug/l	<2.00
Ioxynil	ug/l	<2.00
MCPA	ug/l	<2.00
MCPB	ug/l	<2.00
Mecoprop	ug/l	3.14
EH >C6 - C40	ug/l	1040
EH >C6 - C8	ug/l	<100
EH >C8 - C10	ug/l	<100
EH >C16 - C24	ug/l	182
EH >C24 - C40	ug/l	686
EH >C10 - C16	ug/l	168

Analyte	Units	Treated Leachate
SVOC		
Phenol	ug/l	<20.0
Bis(2-chloroethyl)ether	ug/l	<20.0
2-Chlorophenol	ug/l	<20.0
1,3-Dichlorobenzene	ug/l	<20.0
1,4-Dichlorobenzene	ug/l	<20.0
2-Methylphenol	ug/l	<20.0
3&4-Methylphenol	ug/l	<20.0
Dibenzofuran	ug/l	<20.0
1,2-Dichlorobenzene	ug/l	<20.0
Bis(2-chloroisopropyl)ether	ug/l	<20.0
n-Nitrosodi-n-propylamine	ug/l	<20.0
Hexachloroethane	ug/l	<20.0
Nitrobenzene	ug/l	<20.0
Isophorone	ug/l	<20.0
2,4-Dimethylphenol	ug/l	<20.0
2-Nitrophenol	ug/l	<20.0
Bis(2-chloroethoxy)methane	ug/l	<20.0
2,4-Dichlorophenol	ug/l	<20.0
1,2,4-Trichlorobenzene	ug/l	<20.0
Naphthalene	ug/l	<40.0
4-Chloro-3-methylphenol	ug/l	<20.0
2-Methylnaphthalene	ug/l	<20.0
2,4,6-Trichlorophenol	ug/l	<20.0
2,4,5-Trichlorophenol	ug/l	<20.0
2-Chloronaphthalene	ug/l	<20.0
Dimethylphthalate	ug/l	<20.0
2,6-Dinitrotoluene	ug/l	<20.0

APPENDIX 3 – LEACHATE

Analyte	Units	Treated Leachate
SVOC		
Acenaphthylene	ug/l	<20.0
Acenaphthene	ug/l	<20.0
2,4-Dinitrotoluene	ug/l	<20.0
Diethylphthalate	ug/l	<20.0
4-Nitrophenol	ug/l	<100
4-Chlorophenyl phenyl ether	ug/l	<20.0
Fluorene	ug/l	<20.0
Diphenylamine	ug/l	<20.0
4-Bromophenyl Phenyl Ether	ug/l	<20.0
Hexachlorobenzene	ug/l	<20.0
Pentachlorophenol	ug/l	<20.0
Phenanthrene	ug/l	<20.0
Anthracene	ug/l	<20.0
di-n-Butylphthalate	ug/l	<20.0
Fluoranthene	ug/l	<20.0
Pyrene	ug/l	<20.0
Benzyl Butyl Phthalate	ug/l	<20.0
Benzo(a)anthracene	ug/l	<20.0
Chrysene	ug/l	<20.0
Bis(2-ethylhexyl)phthalate	ug/l	<100
Di-n-octylphthalate	ug/l	<20.0
Benzo(b)fluoranthene	ug/l	<20.0
Benzo(k)fluoranthene	ug/l	<20.0
Benzo(a)pyrene	ug/l	<20.0
Indeno(1,2,3-c,d)pyrene	ug/l	<20.0
Dibenz(a,h)anthracene	ug/l	<20.0
Benzo(g,h,i)perylene	ug/l	<20.0

Analyte	Units	Treated Leachate
VOC		
Dichlorodifluoromethane	ug/l	<20.0
Chloromethane	ug/l	<20.0
Chloroethane	ug/l	<20.0
Bromomethane	ug/l	<20.0
Trichlorofluoromethane	ug/l	<20.0
1,1-Dichloroethene	ug/l	<20.0
Dichloromethane	ug/l	<20.0
1,1-Dichloroethane	ug/l	<20.0
cis-1,2-Dichloroethene	ug/l	<20.0
2,2-Dichloropropane	ug/l	<20.0
Chloroform	ug/l	<20.0
Bromochloromethane	ug/l	<20.0
1,1,1-Trichloroethane	ug/l	<20.0
1,1-Dichloropropene	ug/l	<20.0
1,2-Dichloroethane	ug/l	<20.0
Benzene	ug/l	<20.0
1,2-Dichloropropane	ug/l	<20.0
Trichloroethene	ug/l	<20.0
Bromodichloromethane	ug/l	<20.0
Dibromomethane	ug/l	<20.0
cis-1,3-Dichloropropene	ug/l	<20.0
Toluene	ug/l	<20.0
trans-1,3-Dichloropropene	ug/l	<20.0
1,1,2-Trichloroethane	ug/l	<20.0
Carbon Tetrachloride	ug/l	<20.0
Vinyl Chloride	ug/l	<10.0

APPENDIX 3 – LEACHATE

Analyte	Units	Treated Leachate
VOC		
1,3-Dichloropropane	ug/l	<20.0
Tetrachloroethene	ug/l	<20.0
Dibromochloromethane	ug/l	<20.0
1,2-Dibromoethane	ug/l	<20.0
Chlorobenzene	ug/l	<20.0
1,1,1,2-Tetrachloroethane	ug/l	<20.0
Ethyl Benzene	ug/l	<20.0
m&p-Xylene	ug/l	<20.0
o-Xylene	ug/l	<20.0
Styrene	ug/l	<20.0
Bromoform	ug/l	<20.0
Isopropylbenzene	ug/l	<20.0
trans-1,2-Dichloroethene	ug/l	<20.0
1,1,2,2-Tetrachloroethane	ug/l	<20.0
1,2,3-Trichloropropane	ug/l	<20.0
n-Propylbenzene	ug/l	<20.0
Bromobenzene	ug/l	<20.0
2-Chlorotoluene	ug/l	<20.0
1,3,5-Trimethylbenzene	ug/l	<20.0
4-Chlorotoluene	ug/l	<20.0
tert-Butylbenzene	ug/l	<20.0
1,2,4-Trimethylbenzene	ug/l	<20.0
sec-Butylbenzene	ug/l	<20.0
p-Isopropyltoluene	ug/l	<20.0
1,3-Dichlorobenzene	ug/l	<20.0
1,4-Dichlorobenzene	ug/l	<20.0
n-Butylbenzene	ug/l	<20.0
1,2-Dichlorobenzene	ug/l	<20.0
1,2-Dibromo-3-chloropropane	ug/l	<40.0
1,2,4-Trichlorobenzene	ug/l	<20.0
Hexachlorobutadiene	ug/l	<20.0
Naphthalene	ug/l	<20.0
1,2,3-Trichlorobenzene	ug/l	<20.0
MTBE	ug/l	<20.0

APPENDIX 3 – LEACHATE

Table 6: Final discharge daily discharge data

DATE	Actual Discharge (m3)
01-Apr-15	98
02-Apr-15	68
03-Apr-15	184
06-Apr-15	76
07-Apr-15	1
08-Apr-15	10
09-Apr-15	1
10-Apr-15	0
13-Apr-15	1
14-Apr-15	0
15-Apr-15	0
16-Apr-15	0
17-Apr-15	0
20-Apr-15	0
21-Apr-15	0
22-Apr-15	0
23-Apr-15	0
24-Apr-15	0
27-Apr-15	6
28-Apr-15	1
29-Apr-15	13
30-Apr-15	0
01-May-15	13
04-May-15	0
05-May-15	23
06-May-15	14
07-May-15	18
08-May-15	9
11-May-15	0
12-May-15	15
13-May-15	16
14-May-15	18
15-May-15	0
18-May-15	24
19-May-15	19
20-May-15	19
21-May-15	28
22-May-15	11
25-May-15	29
26-May-15	22
27-May-15	13

APPENDIX 3 – LEACHATE

DATE	Actual Discharge (m3)
28-May-15	18
29-May-15	14
01-Jun-15	0
02-Jun-15	40
03-Jun-15	0
04-Jun-15	35
05-Jun-15	0
08-Jun-15	0
09-Jun-15	19
10-Jun-15	39
11-Jun-15	91
12-Jun-15	71
15-Jun-15	77
16-Jun-15	86
17-Jun-15	99
18-Jun-15	116
19-Jun-15	101
22-Jun-15	102
23-Jun-15	93
24-Jun-15	84
25-Jun-15	75
26-Jun-15	87
28-Jun-15	91
30-Jun-15	22

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 units	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	Apr-15	6.5	71.5	<0.06	5.7	6	<1	20	<10	<10	<10	20	<10
	May-15	7.3	796	1.37	119.0	177	<1	26	<10	<10	<10	26	<10
	Jun-15	-	-	-	-	-	-	-	-	-	-	-	-
SW 2	Apr-15	6.9	93.2	<0.06	10.9	28	<1	<40	<40	<40	<40	<40	<40
	May-15	7.3	110	<0.06	11.4	2	<1	<10	<10	<10	<10	<10	<10
	Jun-15	7.7	109	0.08	12.7	4	1	35	<10	<10	<10	35	<10

APPENDIX 4 – SURFACE WATER

Table 2: Six Monthly monitoring data

Parameters	Units	SW 2
2,3,6 - TBA	**ug/l**	<0.10
2,4 - D	**ug/l**	<0.10
2,4 - DB	**ug/l**	<0.10
2,4,5 - T	**ug/l**	<0.10
Ammoniacal Nitrogen as N (LL)	**mg/l**	0.08
Bromoxynil	**ug/l**	<0.10
Cadmium , Total as Cd	**mg/l**	<0.0006
COD (Total)	**mg/l**	47
Cyanide, Total as CN	**mg/l**	<0.009
Dicamba	**ug/l**	<0.10
Dichlorprop	**ug/l**	<0.10
Dissolved Oxygen, Fixed	**mg/l**	5.9
Ioxynil	**ug/l**	<0.10
MCPA	**ug/l**	<0.10
MCPB	**ug/l**	<0.10
Mecoprop	**ug/l**	<0.08

Parameter	Units	SW 2
SVOC		
Phenol	ug/l	<2.0
Bis(2-chloroethyl)ether	ug/l	<2.0
2-Chlorophenol	ug/l	<2.0
1,3-Dichlorobenzene	ug/l	<2.0
1,4-Dichlorobenzene	ug/l	<2.0
2-Methylphenol	ug/l	<2.0
3&4-Methylphenol	ug/l	<2.0
Dibenzofuran	ug/l	<2.0
1,2-Dichlorobenzene	ug/l	<2.0
Bis(2-chloroisopropyl)ether	ug/l	<2.0
n-Nitrosodi-n-propylamine	ug/l	<2.0
Hexachloroethane	ug/l	<2.0
Nitrobenzene	ug/l	<2.0
Isophorone	ug/l	<2.0
2,4-Dimethylphenol	ug/l	<2.0
2-Nitrophenol	ug/l	<2.0
Bis(2-chloroethoxy)methane	ug/l	<2.0
2,4-Dichlorophenol	ug/l	<2.0
1,2,4-Trichlorobenzene	ug/l	<2.0
Naphthalene	ug/l	<4.0
4-Chloro-3-methylphenol	ug/l	<2.0
2-Methylnaphthalene	ug/l	<2.0
2,4,6-Trichlorophenol	ug/l	<2.0
2,4,5-Trichlorophenol	ug/l	<2.0
2-Chloronaphthalene	ug/l	<2.0
Dimethylphthalate	ug/l	<2.0
2,6-Dinitrotoluene	ug/l	<2.0
Acenaphthylene	ug/l	<2.0
Acenaphthene	ug/l	<2.0
2,4-Dinitrotoluene	ug/l	<2.0
Diethylphthalate	ug/l	<2.0
4-Nitrophenol	ug/l	<10.0
4-Chlorophenyl phenyl ether	ug/l	<2.0
Fluorene	ug/l	<2.0

APPENDIX 4 – SURFACE WATER

Parameter	Units	SW 2
SVOC		
Diphenylamine	ug/l	<2.0
4-Bromophenyl Phenyl Ether	ug/l	<2.0
Hexachlorobenzene	ug/l	<2.0
Pentachlorophenol	ug/l	<2.0
Phenanthrene	ug/l	<2.0
Anthracene	ug/l	<2.0
di-n-Butylphthalate	ug/l	<2.0
Fluoranthene	ug/l	<2.0
Pyrene	ug/l	<2.0
Benzyl Butyl Phthalate	ug/l	<2.0
Benzo(a)anthracene	ug/l	<2.0
Chrysene	ug/l	<2.0
Bis(2-ethylhexyl)phthalate	ug/l	<10.0
Di-n-octylphthalate	ug/l	<2.0
Benzo(b)fluoranthene	ug/l	<2.0
Benzo(k)fluoranthene	ug/l	<2.0
Benzo(a)pyrene	ug/l	<2.0
Indeno(1,2,3-c,d)pyrene	ug/l	<2.0
Dibenz(a,h)anthracene	ug/l	<2.0
Benzo(g,h,i)perylene	ug/l	<2.0

Parameter	Units	SW 2
VOC		
Dichlorodifluoromethane	ug/l	<2.0
Chloromethane	ug/l	<2.0
Chloroethane	ug/l	<2.0
Bromomethane	ug/l	<2.0
Trichlorofluoromethane	ug/l	<2.0
1,1-Dichloroethene	ug/l	<2.0
Dichloromethane	ug/l	<2.0
1,1-Dichloroethane	ug/l	<2.0
cis-1,2-Dichloroethene	ug/l	<2.0
2,2-Dichloropropane	ug/l	<2.0
Chloroform	ug/l	<2.0
Bromochloromethane	ug/l	<2.0
1,1,1-Trichloroethane	ug/l	<2.0
1,1-Dichloropropene	ug/l	<2.0
1,2-Dichloroethane	ug/l	<2.0
Benzene	ug/l	<2.0
1,2-Dichloropropane	ug/l	<2.0
Trichloroethene	ug/l	<2.0
Bromodichloromethane	ug/l	<2.0
Dibromomethane	ug/l	<2.0
cis-1,3-Dichloropropene	ug/l	<2.0
Toluene	ug/l	<2.0
trans-1,3-Dichloropropene	ug/l	<2.0
1,1,2-Trichloroethane	ug/l	<2.0
Carbon Tetrachloride	ug/l	<2.0
Vinyl Chloride	ug/l	<1.0
1,3-Dichloropropane	ug/l	<2.0
Tetrachloroethene	ug/l	<2.0
Dibromochloromethane	ug/l	<2.0
1,2-Dibromoethane	ug/l	<2.0

APPENDIX 4 – SURFACE WATER

Parameter	Units	SW 2
VOC		
Chlorobenzene	ug/l	<2.0
1,1,1,2-Tetrachloroethane	ug/l	<2.0
Ethyl Benzene	ug/l	<2.0
m&p-Xylene	ug/l	<2.0
o-Xylene	ug/l	<2.0
Styrene	ug/l	<2.0
Bromoform	ug/l	<2.0
Isopropylbenzene	ug/l	<2.0
trans-1,2-Dichloroethene	ug/l	<2.0
1,1,2,2-Tetrachloroethane	ug/l	<2.0
1,2,3-Trichloropropane	ug/l	<2.0
n-Propylbenzene	ug/l	<2.0
Bromobenzene	ug/l	<2.0
2-Chlorotoluene	ug/l	<2.0
1,3,5-Trimethylbenzene	ug/l	<2.0
4-Chlorotoluene	ug/l	<2.0
tert-Butylbenzene	ug/l	<2.0
1,2,4-Trimethylbenzene	ug/l	<2.0
sec-Butylbenzene	ug/l	<2.0
p-Isopropyltoluene	ug/l	<2.0
1,3-Dichlorobenzene	ug/l	<2.0
1,4-Dichlorobenzene	ug/l	<2.0
n-Butylbenzene	ug/l	<2.0
1,2-Dichlorobenzene	ug/l	<2.0
1,2-Dibromo-3-chloropropane	ug/l	<4.0
1,2,4-Trichlorobenzene	ug/l	<2.0
Hexachlorobutadiene	ug/l	<2.0
Naphthalene	ug/l	<2.0
1,2,3-Trichlorobenzene	ug/l	<2.0
MTBE	ug/l	<2.0

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