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Ref: ea/th/lf/1/1/07

19/02/07

Your ref: SEA/EP2/A10/EAWML30017

Environment Agency Wales,
Rivers House,
St. Mellons Business Park,
St. Mellons,
Cardiff,
CF3 0EY.
(Fao: S. Fernandez, Environment Officer)

Dear Sue,

Re: Landfill Completion and WML Surrender, Ael-y-Bryn, Merthyr.

As discussed please find enclosed the completion report for the above inert landfill site to take account of the monitoring performed at this site for the period 2004 to 2006.

Could you please review and where appropriate comment upon the results and conclusion presented within the report in order to determine this application for the WML surrender and thus a certificate of completion.

To keep you personally informed the following documents have been submitted since the application for the proposed landfill closure: -

- Landfill closure plan – dated July 2003 (Fao. H. Chapman)
- Monitoring results – dated August 2004 (Fao. D. Griffiths)
- Landfill closure plan – annual report – dated January 2006 (Fao. D. Griffiths)

As there were no adverse comments upon the submitted information at that time then the enclosed report is of a similar format and in general as that agreed within the Closure Plan and subsequent exchange of information.

I trust the enclosed is satisfactory but please do not hesitate to contact me of the contrary.

Yours faithfully,

P.L.Rees, CSci, C. Chem., MRSC, CMIOSH, RSP, CEnv, MCIWM, AIQA.
cc. Mr. A. Hurley
enc: Landfill completion report

**LANDFILL CLOSURE REPORT
FOR THE
AEL-Y-BRYN LANDFILL SITE,
METHYR TYDFIL.**

EAWML 30017
REFERENCE – HUR/1/1/07

February 2007



P.L.R.SERVICES

07703 470326

Report Type:		ENVIRONMENTAL	
Report Issue:		FACTUAL/INTERPRETIVE	
Contract:		HUR/1/03	
Reference:		HUR/1/1/07	
	Name	Signature	Date
Originator:	P REES	<i>P Rees</i>	FEBRUARY 2007
Title:	HSE CONSULTANT		
Checked & Approved:	P. REES	<i>P. Rees</i>	FEBRUARY 2007
Title:	HSE CONSULTANT		

The interpretation referenced within this report is based upon information, knowledge and results made available at the time of the report issue. Full reliance is placed upon the accuracy of such and thus any responsibility for incorrect information supplied from these sources cannot be accepted.

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 - 7. Environmental Advisors Report – HUR/1/8/04, August 2004

Environmental report for a completion certificate for the
Ael -Y-Bryn inert landfill site, Merthyr Tydfil
Assessment period – 2004 to 2006.

1.0 Introduction

The Ael-y-Bryn landfill site has been operated as an 'Inert' type waste management facility under the 'licence' (Ref.1) issued in 1993 until it's effective closure in 2002.

This report is therefore submitted to support the application for a landfill completion certificate in line with the Closure Plan (Ref. 2) and the references therein previously submitted for this location.

It presents the information required over a two year monitoring period and as that agreed with the Environment Agency Wales (Ref.3).

2.0 Monitoring objectives

2.1 These were previously agreed within the closure plan submitted prior to the start of environmental monitoring in 2003.

Information relating to the first period of assessment i.e. 2004/05 was submitted with an indication of the level of compliance during that time in January 2006 (Ref.4).

2.2 Thus during this two year assessment period a total of nine sampling sets have been performed as per the landfill completion sampling schedule (see appendices).

However it was not always possible to obtain a full set of data at each monitoring point due to lack of fluids available permeating from the base of the landfill site.

2.3 An interpretation of the results has been submitted via the comparison of data versus the most appropriate water quality standard/guidance as indicated upon the individual results for the sample points.

Gas monitoring results are also submitted for each sampling point and compared with the closure plan and guidance (Ref.5) as is an indication of any adverse environmental effect.

2.4 Thus presented below is an account of the sampling and analysis for each data set per monitoring point during this assessment period.

3.0 Techniques for sampling, analytical methodologies and laboratory accreditation

3.1 On-site analysis of landfill gas has been performed via the use of a calibrated and checked (via the use of test gases) hand held portable gas analyser.

Samples of water/fluids have been obtained as per the individual monitoring plans and as those submitted within the closure plan documentation.

The samples were transferred to a UKAS accredited test laboratory for analysis and subsequent reporting (see appendices for test result certification).

4.0 Environmental monitoring protocol

The following protocol was followed to obtain, wherever possible, representative samples from the monitoring points indicated upon the plan: -

4.1 Area of landfill undergoing closure

The enclosed plan indicates the number and position of the relative environmental monitoring points (Plan 1).

4.2 Site stability/settlement

No topographical survey has been performed to date to determine settlement although this is still being addressed with the site owner.

However it has been agreed with the EA at a local level that this report be submitted prior to any survey being performed whereupon the need for such a survey would then be determined/reviewed.

This approach was partly based upon the premise that the site only accepted solid, non-bio-degradable waste types and thus the potential for instability within the waste mass was of a low order.

4.3 Monitoring**a) Surface water monitoring points**

As presented within the closure plan the monitoring points were selected to take due account of the water/fluid sampling points in and around the site.

Thus with reference to the site plan (see appendices) the positioning and importance of these sampling points may be presented as follows: -

- A – water/fluid discharging from a concrete/stoned area which combines with other surface water run-off from the adjoining fields.
In general a small flow emanates from this area which has allowed a sample to be collected on each site visit.
- B – water/fluid discharging from within and beneath a concrete pipe (approx.0.3m diameter) installed as part of the herringbone collection system at the base of the landfill. This fluid then combines with that formed from point A and the field surface water run-off.
On three occasions it was not possible to obtain a representative sample of fluids from this sampling point.
- C – water/fluid discharging from within a blue plastic pipe (approx.0.1m diameter) which collects from beneath and towards the edge of the landfill site.
Again on four occasions there was no to insufficient flow from this outlet and this has resulted in a sample not able to be obtained.
- D – a small collection ditch (approx. 1m X 1m) which picks up surface water run-off from an area above the site and then passing beneath the road way adjacent to the entrance to the site and local authority restored old landfill workings.
This sampling point has been very weather dependant with little representative flow and/or even no flow observed on a number of site visits.
- E – more correctly indicated as E2 on the monitoring plan as access was not possible to point E as previously outlined.
This point represents where a sample has been obtained from the Nant Cwm Black surface water source on each site visit.

- b) Groundwater monitoring points
As indicated within the closure plan it has not been possible to obtain samples of groundwater within the area.
- c) Landfill Gas monitoring points
Gas monitoring boreholes (1, 2 & 3) are positioned around the perimeter of the landfilled area (Plan 1) whereupon access has sometimes been difficult due to overgrowth but nevertheless monitoring has been performed on all but one site visit. In addition, the outlet pipes passing beneath the site have also been monitored for landfill gas emissions on each site visit (A, B and C on Plan 1).
- d) Leachate monitoring points
As indicted within a) above, down stream sampling points have been monitored for the water/fluid discharge carried by the concrete pipes running beneath the site (A and B on Plan 1).
In addition a further sampling point (a blue pipe, C on Plan 1) has also been monitored as it carries site run-off which has the potential of eventually, after passing over open land, entering a controlled water i.e. the Nant Cwm Blacks.

4.4 Monitoring compliance

All monitoring points have been sampled and tested in compliance with WMP No.26A (see Table 3.2 attached). These have also been subject to review in comparison with appropriate standards/limits assigned for surface water and/or leachate completion criteria as agreed within the closure plan. These results have been assessed and are included within the appendices and further discussed below.

4.5 Reporting of significant effects

Monitoring has been performed and recorded upon the agreed monitoring form at each site visit and are presented within the appendices. In addition site photographs were taken and are included within the appendices.

N.B. All sampling points indicated upon the Plan 1 are approximate locations only.

5.0 Presentation/interpretation of monitoring results

5.1 Water monitoring

Sample point A – discharge from concrete pipe/stone wall area

From the table of results it can be observed that a sample was recoverable/obtained on each site visit albeit from a discharge of little flow, this may be observed upon the photographs taken at this point.

Elevated results have been obtained for the following determinands: -

- Conductivity – in the main these results exceed the surface water quality standard (sw/wqs) but does not exceed the leachate landfill completion criteria limit,
- COD – again for these results it can be observed that they exceed the sw/eqs almost on each occasion,
- Sulphate – elevated on a number of occasions compared with the surface water standard, where it's presence could be indicative of inert type materials within the landfill i.e. construction type wastes,
- Total Organic Carbon – slightly elevated compared to the landfill criteria limits on a number of occasions although the mean result is within completion criteria.
- Manganese – on a number of occasions this may be observed to be elevated and although the mean exceeds the completion criteria limit this may be attributable to the normal geology within this region.

Nevertheless in general all the other determinands are within control limits as can be observed upon the table of results.

Some explanation for the above could be due to residual matter e.g. naturally occurring organic matter, surface water run-off etc entering the sample at the discharge point, and thus there is the potential that this can contribute to the elevated results obtained.

Sample point B – discharge from concrete pipe area

From the table of results it can be observed that a sample was recoverable/obtained on most occasions albeit from a discharge of little flow whether it be from inside the concrete pipe or directly beneath. This may be observed upon the photographs taken from this sampling point.

From the table of results it can be observed that elevated results have been obtained for the following determinands: -

- Conductivity – exceeds the sw/eqs on a number of samples albeit only slightly but it may be observed the mean result is considerable below the landfill completion criteria limit.
- COD – exceeds the sw/eqs on each occasion and to a greater degree than in point A.

Nevertheless in general all the other determinands are within control limits as can be observed upon the table of results.

Similar difficulties in obtaining a representative sample were experienced at this point as that discussed above.

Sample point C – discharge from blue plastic pipe area

From the table of results it can be observed that a sample was recoverable/obtained on most occasions albeit from a discharge of little flow from inside of the plastic pipe. This again may be observed upon the photographs taken from this sampling point.

The only exceedence of the sw/eqs from this sampling point was that of COD where it may be observed occurred on most occasions.

Nevertheless in general all the other determinands are within control limits as can be observed upon the table of results.

Sample point D – surface water collection ditch up stream of landfill

From the table of results it can be observed that on most occasions a sample was not recoverable/obtained due to little or no flow from this area. Pondered water was evident but due to the high potential for contamination due to the natural environment i.e. detritus etc then it was not thought appropriate to obtain a sample. This again may be observed upon the photographs taken from this sampling point.

From the table of results it can be observed that elevated results have been obtained for the following determinands: -

- COD – exceeds the sw/eqs on each occasion that a sample was able to be obtained from this source.

Nevertheless in general all the other determinands are within control limits as can be observed upon the table of results.

Sample point E – surface water collection from Nant Cwm Black stream

From the table of results it can be observed that there were no elevated results obtained for this relatively fast flowing water source.

5.2 Landfill gas monitoring

Sample points A to C

Landfill gas monitoring has also been performed on the water sampling points via the insertion of a probe into the pipework at each location.

From the results it has been determined that no landfill gas has been found and that in general both carbon dioxide and oxygen levels within the landfill are approaching normal background levels.

Sample points 1, 2 and 3

Gas monitoring at these dedicated sample points have shown no adverse evidence of landfill gas emissions with results again approaching normal background levels.

Surface emission monitoring

A separate report (Ref.6 & 7) references and accompanies this overall landfill completion/closure submission and whilst performing the monitoring for landfill gas surface emissions none were detected.

In addition on this occasion and during the following site visits there was no evidence of vegetation dieback which is an indicator of landfill gas surface emissions.

5.3 Site inspection reports - significant effects

From the results, some accompanied by site photographs, it may be observed that there was no evidence to suggest the site has caused any adverse environmental effects.

Some areas worthy of comment include:

- the cap was found not to have eroded with strong growth present allowing livestock to graze,
- no adverse differential settlement was evident,
- no surface emissions/discharges observed,
- little to no flow from the water collection system beneath the site therefore supporting the impermeability of the cap.
- there was no evidence of slippage/differential settlement thus supporting the integrity of the slopes.

6.0 Conclusion

- 6.1 It is evident from the results presented, within the appendices and outlined above, that there is currently little indication to suggest that this landfill site is discharging and/or emitting leachate and/or landfill gas that could give rise to environmental disbenefit.
- 6.2 This may be supported by: -
- due to the low flow through the site this would suggest a satisfactory level of capping thus reducing infiltration and the potential for any subsequent leachate generation.
 - there is no evidence from the site inspection reports to demonstrate that the site has any adverse significant effects upon the local environment.
- 6.3 In addition the documents originally enclosed within the closure plan submission help support the above in:
- the EA site inspection reports not indicating adverse information,
 - the site waste returns indicating only inert type wastes being accepted as per the WML,
- and from this it may be deduced that there is a low potential for causing any risk to the environment.
- 6.4 As indicated within the text above there were a number of occasions where samples were unable to be taken due to no flow from the sampling points. Notwithstanding this the results obtained from the samples over the two year period of monitoring are in the main below the threshold limits assigned to the sample points/sources. This has also been recorded within the site photographs taken on the number of scheduled site visits.
- 6.5 If an assumption were made that the samples taken from the points of discharge were treated as leachate then all the sample points are within the guidance levels for landfill completion.

7.0 Summation

As this site has been in operation since 1993 and in post closure since 2002, and based upon the most recent waste returns dated late 2001, there is no evidence to suggest there has been any differential settlement during this period or indeed any uncontrolled emissions and/or discharges from the land filled area.

Thus based upon this and the above monitoring results the site does not currently exhibit any significant environmental impact and thus deemed to be of low environmental risk.

This is supported, based on the criteria for a low risk site as indicated within waste management guidance (Ref. 5) for the following reasons: -

- the isolated/remote location of the site,
- the likelihood that emissions and/or pollutants, if present, would be of insufficient quantity to cause harm,
- whether these pollutants could reach water courses and/or other sensitive targets,
- the nature of the wastes deposited,

then 'it is reasonable to assume the site is unlikely to cause pollution or harm due to leachate or gas'.

Therefore an application is made for the surrender of the waste management licence and the formal issue of a 'completion certificate'.

8.0 Appendices

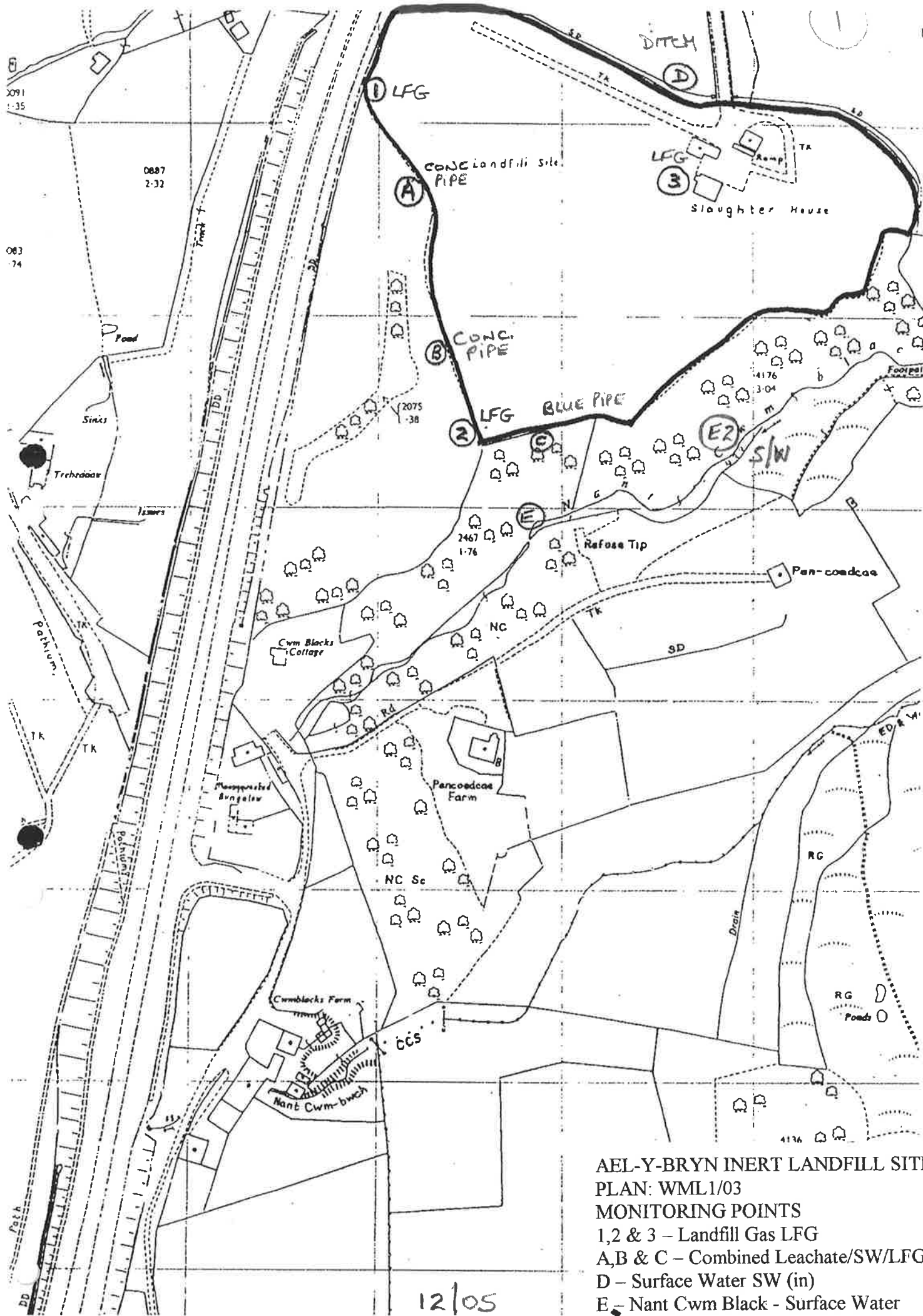
1. Monitoring point plan 1
2. Monitoring schedule
3. Sample point result tables
4. Site inspection reports – Significant effects
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6. Certificates of analysis
7. LFG surface emission monitoring report
8. Site photographs

9.0 References

1. Waste management/disposal licence 890056 (A)
2. Closure plan – ea/th/lf/4/5/03 – 4/5/03
3. EA Wales acceptance letter (reference to closure plan)
4. Interim report - Environmental Advisors Report – HUR/1/1/05, January 2006
5. Waste Management Paper (WMP) 26A – Landfill Completion
6. Landfill gas emission monitoring plan – March 2004
7. Environmental Advisors Report – HUR/1/8/04, August 2004

APPENDICES

**APPENDIX 1
MONITORING POINT PLAN 1**



**APPENDIX 2
MONITORING SCHEDULE**

MONITORING SCHEDULE - LANDFILL COMPLETION - AEL Y BRYN LANDFILL - 04/06

[illegible]

KEY(see sampling plans)

LFG - Landfill Gas sample points

SPL, L/S/G - combined leachate & surface water and LFG

SPL. S - external surface water

**APPENDIX 3
MONITORING POINT RESULT TABLES**

Units	Sampling Date	L/F Comp.	SW WQS	30/07/2004	24/09/2004	02/12/2004	31/03/2005	26/07/2005	27/09/2005	17/11/2005	08/06/2006	14/09/2006	MEAN
Determinands													
pH		6.5 - 8.5	5.5-9 G	7.8	8.3	7.2	7.3	7.6	7.8	7.9	7.5	7.3	7.6
Conductivity @ 20c		4000	1000 G	1780	730	1350	1200	1530	900	1230	1330	1920	1330.0
Oxygen (Dissolved) DO				8.4		9.7	NR	5.9	4	6.5	4	4.2	
BOD total+ATU				2		<1	<1	<1	4	1	4	3	
COD (Total)			30 G	50		34	27	190		40	86	178	86.4
Alkalinity total				292		486	402	480		473	497	579	458.4
Ammoniacal Nitrogen		5	4 <0.3			0.4	<0.3	<0.3		0.27	<0.3	<0.3	0.3
Total Oxidised Nitrogen				0.9		1.1	1.5	1.7		2.8	1.4	1.6	1.6
Chloride		2000	200 G	198		73	86	153		57	82	184	116.1
Sulphate		2500	250	335		249	215	302		233	247	332	273.4
Total Organic Carbon TOC		10		12.2		10.8	8.3	11.3		8.7	8.5	12.5	10.0
Cadmium		0.05	0.005 <0.0005					0.0007		<0.0005		0.001	<0.005
Chromium		0.5	0.05 <0.005					<0.005		<0.005		<0.005	<0.05
Lead		0.5	0.05	0.006				0.039		0.009		0.034	<0.05
Copper		1	1 G	0.018				0.028		0.008		0.02	<1
Nickel		0.5	<0.005					0.015		<0.005		0.009	<0.5
Zinc		1	5	0.18				0.185		0.077		0.13	0.2
Iron		2		0.67				6.4		0.86		6.37	<2
Manganese		0.5		0.33				1.31		0.34		1.88	0.7
Sodium		1500		132		63	74	108		46	62	110	85.0
Potassium		120		24		20	17	24		16	18	28	21.0
Calcium		1000		271		249	242	286		238	247	336	267.0
Magnesium		500		28		24	23	27		22	24	34	26.0
Temperature				12			10	14		6	10	11	
Metres													
Depth													

MEAN Average result based on actual figures (not less than <).

L/F Comp. Landfill Completion criteria (as WMP26A).

SW EQS Surface water quality standard - G-guidance value

Results in bold indicate result which exceeds at least one of the reference standards.

WQS EC Directive (75/440/EEC, G-guide)

() Sample points as sampling plan

NR No result

Water Analysis 2004/05/06- Ael-y-Bryn

SAMPLE POINT B - CONCRETE RING DOWNSTREAM OF LANDFILL SITE

Units	Sampling Date	L/F Comp.	SW WQS	30/07/2004	24/09/2004	02/12/2004	31/03/2005	26/07/2005	27/09/2005	17/11/2005	08/06/2006	14/09/2006	MEAN
Determinands													
pH		6.5 - 8.5	5.5-9 G	DRY	8.3	8	8	7.9	DRY	8.2	8	DRY	8.1
Conductivity @ 20c		4000	1000 G		627	1130	926	1230		1080	1150		1023.8
Oxygen (Dissolved) DO					NR		NR	5.3		5.9	4.4		5.2
BOD total+ATU						2	3	2		1	3		2.2
COD (Total)			30 G			278	540	608		159	205		358.0
Alkalinity total						468	381	470		408	449		435.2
Ammoniacal Nitrogen			5			0.4	<0.3	<0.3		0.25	<0.3		0.2
Total Oxidised Nitrogen						2	1.8	2.2		1.9	2.2		2.0
Chloride			2000			30	23	38		25	34		30.0
Sulphate			2500			265	208	281		230	255		247.8
Total Organic Carbon TOC			10			9.8	8.6	10.7		10.2	9.3		9.7
Cadmium			0.05					<0.0005		<0.0005			<0.005
Chromium			0.5					<0.005		<0.005			<0.05
Lead			0.5					0.022		0.008			<0.05
Copper			1					0.017		0.011			<1
Nickel			0.5					<0.005		<0.005			<0.5
Zinc			1					0.1		0.049			0.1
Iron			2					3.27		1.08			2.0
Manganese			0.5					0.582		0.16			0.4
Sodium			1500			33	25	39		34	36		33.4
Potassium			120			18	14	22		18	19		18.2
Calcium			1000			232	206	282		214	241		235.0
Magnesium			500			23	20	26		21	24		22.8
Temperature													
Metres						13	9	14		8	10	12	13.5
Depth													

MEAN Average result based on actual figures (not less than <).

L/F Comp. Landfill Completion criteria (as WMP26A).

S/W EQS Surface water quality standard - G-guidance value

Results in bold indicate result which exceeds at least one of the reference standards.

WQS EC Directive (75/440/EEC, G-guide)

() Sample points as sampling plan

NR No result

Water Analysis 2004/05/06 - Ael-y-Bryn

SAMPLE POINT C - BLUE PIPE - DOWNSTREAM OF LANDFILL SITE

Units	Determinands	Sampling Date	L/F Comp.	S/W WQS	30/07/2004	24/09/2004	02/12/2004	31/03/2005	26/07/2005	27/09/2005	17/11/2005	08/06/2006	14/09/2006	MEAN
pH			6.5 - 8.5	5.5-9 G	DRY		8.5	8	7.8	7.8	7.5	DRY		
uS/cm	Conductivity @ 20c		4000	1000 G		400	738	631	631	730	663			7.9
mg/l O	Oxygen (Dissolved) DO						NR	NR			NR			632.4
mg/l O	BOD total+ATU							1	5		5			0.0
mg/l O	COD (Total)			30 G				21	88		49			3.7
mg/l CaCO3	Alkalinity total							269	291		326			62.7
mg/l N	Ammoniacal Nitrogen		5	4			0.4	<0.3			0.53			295.3
mg/l N	Total Oxidised Nitrogen						0.6	1.6			3.4			0.3
mg/l	Chloride		2000	200 G			13	11			11			1.9
mg/l	Sulphate		2500	250			94	88			72			11.7
mg/l	Total Organic Carbon TOC		10				8.9	6			8.8			84.7
mg/l	Cadmium		0.05	0.005							0.001			7.9
mg/l	Chromium		0.5	0.05							<0.005			<0.005
mg/l	Lead		0.5	0.05							<0.005			<0.05
mg/l	Copper		1	1 G							0.005			<1
mg/l	Nickel		0.5								<0.005			<0.5
mg/l	Zinc		1	5							0.2			<1
mg/l	Iron		2								0.16			<2
mg/l	Manganese		0.5								0.041			<0.5
mg/l	Sodium		1500				14	12			9.5			11.8
mg/l	Potassium		120				9	7.6			7.5			8.0
mg/l	Calcium		1000				158	132			154			148.0
mg/l	Magnesium		500				12	11			10			11.0
Temperature	Degrees C					13		8			13			7.6
Metres	Depth													

MEAN Average result based on actual figures (not less than <).

L/F Comp. Landfill Completion criteria (as WMP26A).

S/W EQS Surface water quality standard - G-guidance value

Results in bold indicate result which exceeds at least one of the reference standards.

WQS EC Directive (75/440/EEC, G-guide)

() Sample points as sampling plan

NR No result

Water Analysis 2004/05/06 - Ael-y-Bryn

SAMPLE POINT D - OPEN DITCH UPSTREAM OF LANDFILL SITE

Units	Determinands	SW WQS	30/07/2004	24/09/2004	02/12/2004	31/03/2005	26/07/2005	27/09/2005	17/11/2005	08/06/2006	14/09/2006	MEAN
pH Units	pH	5.5-9 G	7.8	NA	8.2	8	DRY	DRY	DRY	DRY	DRY	
uS/cm	Conductivity @ 20c	1000 G	807		758	703						8.0
mg/l O	Oxygen (Dissolved) DO		6.4		7.5 NR							756.0
mg/l O	BOD total+ATU		2									4.6
mg/l O	COD (Total)	30 G	91		66	320						0.7
mg/l CaCO3	Alkalinity total		255									159.0
mg/l N	Ammoniacal Nitrogen	4 <0.3			0.4 <0.3							85.0
mg/l N	Total Oxidised Nitrogen	<0.3										0.1
mg/l	Chloride	200 G	39		16	26						0.0
mg/l	Sulphate	250	135									27.0
mg/l	Total Organic Carbon TOC		5.3									
mg/l	Cadmium	0.005 <0.0005										
mg/l	Chromium	0.05 <0.005										
mg/l	Lead	0.05	0.008									
mg/l	Copper	1 G	0.013									
mg/l	Nickel		<0.005									
mg/l	Zinc	5	0.11									
mg/l	Iron		2.34									
mg/l	Manganese		0.88									
mg/l	Sodium		25									
mg/l	Potassium		18									
mg/l	Calcium		117									
mg/l	Magnesium		33									
Temperature	Degrees C		16									
Metres	Depth											

MEAN Average result based on actual figures (not less than <).

SW EQS Surface water quality standard - G-guidance value

Results in bold indicate result exceeds standard.

WQS EC Directive (75/440/EEC, G-guide)

() Sample points as sampling plan

NR No result

Water Analysis 2004/05/06 - Ael-y-Bryn

SAMPLE POINT E - SURFACE WATER RECEPTOR - NANT CWM BLACK DOWNSTREAM OF LANDFILL SITE

Units	Determinands	Sampling Date	SW WQS	30/07/2004	24/09/2004	02/12/2004	31/03/2005	26/07/2005	27/09/2005	17/11/2005	08/06/2006	14/09/2006	MEAN
pH	pH			8.2		8.2	8.2	8.2	No spl reqd		8.4	8.4	8.3
uS/cm	Conductivity @ 20c			639		517	459	481			594	635	559.1
mg/l O	Oxygen (Dissolved) DO			12		NR	9.9	5			4.3	5.4	7.4
mg/l O	BOD total+ATU			3				<1			<1		1.0
mg/l O	COD (Total)		<20		<20			<20		<20	<20		<20
mg/l CaCO3	Alkalinity total			186				148				194	185.5
mg/l N	Ammoniacal Nitrogen		4 <0.3			0.4 <0.3		1.6			<0.3	0.5	0.5
mg/l N	Total Oxidised Nitrogen			1.2				1.5				1.3	1.1
mg/l	Chloride			20		11	25	12			9	24	16.3
mg/l	Sulphate		250	130				83			108	117	109.5
mg/l	Total Organic Carbon TOC			2.9				3.4			2.6	3.9	3.2
mg/l	Cadmium		0.005 <0.0005					0.001		<0.0005		<0.0005	
mg/l	Chromium		0.05 <0.005					0.005		<0.005		<0.005	
mg/l	Lead		0.05 <0.005					0.01		<0.005		0.007	
mg/l	Copper			0.008				0.009		<0.005		<0.005	
mg/l	Nickel		<0.005					0.005		<0.005		<0.005	
mg/l	Zinc		5	0.018				0.025		0.01		0.012	0.2
mg/l	Iron		<0.05					0.14		0.37		0.27	0.2
mg/l	Manganese			0.031				0.024		0.054		0.056	0.0
mg/l	Sodium			22				16		16		22	19.0
mg/l	Potassium			12				11		11		13	11.8
mg/l	Calcium			86				67		92		96	85.3
mg/l	Magnesium			26				19		24		28	24.3
Temperature	Degrees C			15				13		7		14	11.7
Metres	Depth												

MEAN Average result based on actual figures (not less than <).

SW EQS Surface water quality standard - G-guidance value

Results in bold indicate result exceeds standard.

WQS EC Directive (75/440/EEC, G-guide)

() Sample points as sampling plan

NR No result

**APPENDIX 4
SITE INSPECTION REPORTS – SIGNIFICANT EFFECTS**

PLR SERVICES

Phone/fax: 01792775404 Mobile: 07703 470326
E-mail: phl@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: AEZ-7-BRYN Temperature: 19°C
Date: 26-5-09 Barom. Press: 990 mbars
Time: 5.00 pm Weather: Sunny / Dry

Monitoring of:

Remarks:

Gates/Fences/Security	: Satisfactory/ un-satisfactory
Cap erosion	: Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	: Satisfactory/ un-satisfactory
Odour Level	: Strong/Weak /None
Leachate	: Tested/ Not Tested <u>NIL</u>
Gas Levels	: Tested/ Not Tested <u>'</u>
Water Monitoring	: Tested /Not Tested
Vegetation Die-back	: Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	: Satisfactory/ un-satisfactory
Review of monitoring results-	: Satisfactory/ un-satisfactory
Surface water	
Leachate	
Landfill gas	

Other Observations/Action required:

Note any CAR/PAR Issued

Photographs taken during surface gas emission testing

Signed:
Inspector:

Approved:
Consultant:

P. Lees

PLR SERVICES

Phone/fax: 01792775404 Mobile: 07703 470326
E-mail: phil@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: MURLEY - TEL-Y-BRYN Temperature: 12°C
Date: 2/12/04 Barom. Press: 991
Time: 10 - 12.00 Weather: Sunny, overnight frost

Monitoring of:

Remarks:

Gates/Fences/Security	: Satisfactory/ un-satisfactory
Cap erosion	: Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	: Satisfactory/ un-satisfactory
Odour Level	: Strong/ Weak /None
Leachate	: Tested/ Not Tested
Gas Levels	: Tested/ Not Tested
Water Monitoring	: Tested/ Not Tested
Vegetation Die-back	: Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	: Satisfactory/ un-satisfactory
Review of monitoring results-	: Satisfactory/ un-satisfactory
Surface water	: Samples taken, - clear
Leachate	: very low flows beneath site
Landfill gas	: Monitoring performed, - nil.

Other Observations/Action required:

Note any CAR/PAR Issued

Minor flow from blue pipe - Spl point C.
Photographs taken at monitoring points.

Signed: P. Rees
Inspector:

Approved: P. Rees
Consultant:

PLR SERVICES

Phone/Fax: 01792775404 Mobile: 07703 470326
E-mail: phil@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: HURLEY - AEL - Y - DRYN

Temperature: 15°C

Date: 31-3-05

Barom. Press: 993

Time: 10.00 am

Weather: OVERCAST

Monitoring of:

Remarks:

Gates/Fences/Security	Satisfactory/ un-satisfactory
Cap erosion	Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	Satisfactory/ un-satisfactory
Odour Level	Strong/ Weak //None
Leachate	Tested/ Not Tested
Gas Levels	Tested/ Not Tested
Water Monitoring	Tested/ Not Tested
Vegetation Die-back	Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	Satisfactory/ un-satisfactory
Review of monitoring results-	Satisfactory/ un-satisfactory
Surface water	} Low flows.
Leachate	
Landfill gas	
	Satisfactory

Other Observations/Action required:

Note any CAR/PAR Issued

- Low flows from all sampling points
- Samples contained some sediment on obtaining samples.

Signed:
Inspector:

P. Rees

Approved:
Consultant:

P. Rees

PLR SERVICES

Phone/fax: 01792775404 Mobile: 07703 470326
E-mail: phil@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: HURLEY - AEL - Y - BAYN Temperature: 20°C
Date: 26/07/05 Barom. Press: 982
Time: 3.00 pm Weather: Sunny, part cloud

Monitoring of:

Remarks:

Gates/Fences/Security	Satisfactory/ un-satisfactory
Cap erosion	Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	Satisfactory/ un-satisfactory
Odour Level	Strong/Weak/None
Leachate	Tested/ Not Tested
Gas Levels	Tested/ Not Tested
Water Monitoring	Tested/ Not Tested
Vegetation Die-back	Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	Satisfactory/ un-satisfactory
Review of monitoring results-	Satisfactory/ un-satisfactory
Surface water	
Leachate	} Low flow due to dry conditions
Landfill gas	
	Satisfactory

Other Observations/Action required:

Note any CAR/PAR Issued

- No sample obtained from blue pipe - Point C due to little to no flow.
- Photographs taken of monitoring points

Signed:
Inspector:

P. Rees

Approved:
Consultant:

P. Rees

PLR SERVICES

Phone/fax: 01792775404 Mobile: 07703 470326

E-mail: phil@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: MURLEY - AEL-7-BRYN Temperature: 20°C
Date: 27-9-05 Barom. Press: 985
Time: 11.00 am Weather: Overcast

Monitoring of:

Remarks:

Gates/Fences/Security	: Satisfactory/ un-satisfactory
Cap erosion	: Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	: Satisfactory/ un-satisfactory
Odour Level	: Strong /Weak/None
Leachate	: Tested/ Not Tested
Gas Levels	: Tested/ Not Tested
Water Monitoring	: Tested/ Not Tested
Vegetation Die-back	: Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	: Satisfactory/ un-satisfactory
Review of monitoring results-	: Satisfactory/ un-satisfactory
Surface water	
Leachate	} LOW TO LITTLE FLOW DUE TO DRY CONDITIONS
Landfill gas	: Satisfactory

Other Observations/Action required:

Note any CAR/PAR Issued

- Photographs taken of monitoring points
- No flow from blue pipe

Signed:
Inspector:

P. Rees

Approved:
Consultant:

P. Rees

PLR SERVICES

Phone/fax: 01792775404 Mobile: 07703 470326
E-mail: phil@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: AEL-Y-BRYN Temperature: 7°C
Date: 17-11-05 Barom. Press: 990
Time: 12.00 Weather: Sunny / Frosty

Monitoring of:	Remarks:
Gates/Fences/Security	Satisfactory/ un-satisfactory
Cap erosion	Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	Satisfactory/ un-satisfactory
Odour Level	Strong/Weak // None
Leachate	Tested/ Not Tested
Gas Levels	Tested/ Not Tested
Water Monitoring	Tested/ Not Tested
Vegetation Die-back	Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	Satisfactory/ un-satisfactory
Review of monitoring results-	Satisfactory/ un-satisfactory
Surface water	
Leachate	No flow from perimeter point I
Landfill gas	Low flows - samples obtained Satisfactory.

Other Observations/Action required:

Note any CAR/PAR Issued

Access to LFG monitoring points difficult due to
brambles.

Signed:
Inspector:

P. Rees

Approved:
Consultant:

P. Rees

PLR SERVICES

Phone/fax: 01792775404 Mobile: 07703 470326
E-mail: phil@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: HURLEY - AEL - Y-BRYN Temperature: 20°C
Date: 08-06-06 Barom. Press: 1004
Time: 10.00 am Weather: Very Hot, Sunny

Monitoring of:	Remarks:
Gates/Fences/Security	Satisfactory/ un-satisfactory
Cap erosion	Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	Satisfactory/ un-satisfactory
Odour Level	Strong/ Weak / None
Leachate	Tested/ Not Tested
Gas Levels	Tested / Not Tested
Water Monitoring	Tested/ Not Tested
Vegetation Die-back	Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	Satisfactory / un-satisfactory
Review of monitoring results-	Satisfactory/ un-satisfactory
Surface water	Satisfactory
Leachate	N/A
Landfill gas	No access to sampling points 1, 2+3

Other Observations/Action required:

Note any CAR/PAR Issued

LFG monitoring to be re-scheduled.
Sampling points B + E - no LFG detected.

Signed:
Inspector:

P. Rees

Approved:
Consultant:

P. Rees

PLR SERVICES

Phone/fax: 01792775404 Mobile: 07703 470326
E-mail: phil@plrservices.fsnet.co.uk

SITE INSPECTION REPORT SIGNIFICANT EFFECTS

Site: AEL-Y-BRYN Temperature: 15°C
Date: 14-9-06 Barom. Press: 976 mm
Time: 1.00pm Weather: Showers

Monitoring of:

Remarks:

Gates/Fences/Security	: Satisfactory/ un-satisfactory
Cap erosion	: Satisfactory/ un-satisfactory
Evidence of differential settlement e.g. ponding	: Satisfactory/ un-satisfactory
Odour Level	: Strong /Weak/None
Leachate	: Tested/ Not Tested
Gas Levels	: Tested/ Not Tested
Water Monitoring	: Tested/ Not Tested
Vegetation Die-back	: Satisfactory/ un-satisfactory
Condition of monitoring points e.g. damage/access	: Satisfactory/ un-satisfactory
Review of monitoring results-	: Satisfactory/ un-satisfactory
Surface water	: Satisfactory Temp: 14°C.
Leachate	: Nil
Landfill gas	: None Detected

Other Observations/Action required:

Note any CAR/PAR Issued

- Low flows from monitoring points (A) - 11°C (B) 12°C
- No flow from Blue pipe - spl point (C)
- No flow from slw point/ditch - spl point (D)

Signed:
Inspector:

P. Rees

Approved:
Consultant:

P. Rees

**APPENDIX 5
LANDFILL GAS RESULTS**

LFG ANALYSIS RESULTS - AEL-Y-BRYN LANDFILL - CLOSURE PLAN - 2004 TO 2006

Date	Sample point	CH4 %	CO2 %	O2 %	Atmos.Pres. mBar	Depth Metres	Air temp. C
26.5.04	LFG1	0	0	20	990	NA	19
	LFG2	0	0	20	990		
	LFG3	0	0	20	990		
	B	0	0	20	990		
	C	0	0	20	990		
2.12.04	LFG1	0	0	18	991	NA	12
	LFG2	0	0	18	991		
	LFG3	0	0	18	991		
	B	0	0	18	991		
	C	0	0	18	991		
31.3.05	LFG1	0	0	20.7	993	NA	15
	LFG2	0	0	21	993		
	LFG3	0	0	20.4	993		
	B	0	0	20.7	993		
	C	0	0	21	993		
26.7.05	LFG1	no access			982	NA	20
	LFG2	0	0	20	982		
	LFG3	0	0.1	20	982		
	B	0	0.1	19	982		
	C	0	0	19.2	982		
27.9.05	LFG1	no access			985	NA	20
	LFG2	0	0	20	985		
	LFG3	0	0	20	985		
	B	0	0	20	985		
	C	0	0	20	985		
17.11.05	LFG1	0	0	20	990	NA	7
	LFG2	0	0	20	990		
	LFG3	0	0	19.2	990		
	B	0	0	20.3	990		
	C	0	0	20.3	990		
8.6.06	LFG1	no access			1004	NA	19
	LFG2	no access			1004		
	LFG3	no access			1004		
	B	0	0	20	1004		
	C	0	0	20	1004		
14.9.06	LFG1	0	0	19.5	976	NA	15
	LFG2	0	0	19.2	976		
	LFG3	0	0	19.6	976		
	B	0	0	19.6	976		
	C	0	0	19.2	976		

FORM G1
GAS WELL OR BOREHOLE MONITORING

SITE AEL-Y-BRYN

DATE 26-5-04

OPERATIVE P. Rees

WEATHER Sunny, Dry

FLAMMABLE GAS INSTRUMENT Ser. No GA075

TEMPERATURE 19°C

CO₂ INSTRUMENT Ser. No —

WIND SPEED/DIRECTION NIL

O₂ INSTRUMENT Ser. No —

BAROMETRIC PRESSURE 990

B/H Ref.	Flammable Gas	CO ₂	O ₂	Water Level	Pressure +/- mm/H ₂ O	Sampled Yes/No	Comment
1.	0	0	20	NIL	N/A	N	
2.	0	0	20	NIL	N/A	N	
3.	0	0	20	NIL	N/A	N	
4.							
5.							
6.							

Signed

P. Rees

Date

26-5-04

FOR OFFICE USE:

SEEN BY:

ACTION PROPOSED

- ① - Blue Pipe outlet - no gas detected
② - Concrete pipe outlet - no gas detected

FORM G1
GAS WELL OR BOREHOLE MONITORING

SITE HURLEY
AEL-Y-BRYN LF.

DATE 2/12/04

OPERATIVE P. REES

WEATHER SUNNY OVERNIGHT FROST

FLAMMABLE GAS INSTRUMENT Ser. No GA075

TEMPERATURE 12°C

CO₂ INSTRUMENT Ser. No

WIND SPEED/DIRECTION N/A

O₂ INSTRUMENT Ser.No

BAROMETRIC PRESSURE 991

B/H Ref.	Flammable Gas	CO ₂	O ₂	Water Level	Pressure +/- mm/H ₂ O	Sampled Yes/No	Comment
1. LFG 1	0	0	18	N/A	N/A	N	See plan
2. LFG 2	0	0	18	N/A	N/A	N	"
3. LFG 3	0	0	18	N/A	N/A	N	"
4. CONCRETE RING - B	0	0	18	N/A	N/A	N	"
5. BLUE PIPE - C	0	0	18	N/A	N/A	N	"
6.							

Signed P. Rees

Date 2/12/04

FOR OFFICE USE:

SEEN BY:

ACTION PROPOSED

FORM G1
GAS WELL OR BOREHOLE MONITORING

SITE HURLEY
AEL-Y-BRYN

DATE 31-3-05

OPERATIVE P. REES

WEATHER OVERCAST (RAIN PREVIOUS WEEK)

FLAMMABLE GAS INSTRUMENT Ser. No GA075

TEMPERATURE 15°C

CO₂ INSTRUMENT Ser. No N/A

WIND SPEED/DIRECTION N/A

O₂ INSTRUMENT Ser. No N/A

BAROMETRIC PRESSURE 993

BH Ref.	Flammable Gas	CO ₂	O ₂	Water Level	Pressure +/- mm/H ₂ O	Sampled Yes/No	Comment
1 LFG 1	0	0	20.7	—	←	—	—
2 LFG 2	0	0	21	—	—	—	—
3 LFG 3	0	0	20.4	—	—	—	—
4 CONCRETE RING (B)	0	0	20.7	—	—	✓	—
5 BLUE PIPE (C)	0	0	21	—	—	✓	—
6							

Signed P. Rees

Date 31-3-05

FOR OFFICE USE:

SEEN BY:

ACTION PROPOSED

Waterlogged areas

FORM G1
GAS WELL OR BOREHOLE MONITORING

HURLEY

SITE AEL-Y-BAYN

DATE 26-7-05

OPERATIVE P. REES

WEATHER SUNNY, PART CLOUD, WARM

FLAMMABLE GAS INSTRUMENT Ser. No GAC 75

TEMPERATURE 20°C

CO₂ INSTRUMENT Ser. No N/A

WIND SPEED/DIRECTION N/A

O₂ INSTRUMENT Ser. No N/A

BAROMETRIC PRESSURE 982

B/H Ref.	Flammable Gas	CO ₂	O ₂	Water Level	Pressure +/- mm/H ₂ O	Sampled Yes/No	Comment
1 <u>LFG 2</u>	<u>0</u>	<u>0</u>	<u>20</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>See plan</u>
2 <u>3</u>	<u>0</u>	<u>0.1</u>	<u>20</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>
<u>CONCRETE RING</u>							
3 <u>B</u>	<u>0</u>	<u>0.1</u>	<u>19</u>	<u>—</u>	<u>—</u>	<u>X</u>	<u>—</u>
<u>BLUE PIPE</u>							
4 <u>C</u>	<u>0</u>	<u>0</u>	<u>19.2</u>	<u>—</u>	<u>—</u>	<u>N</u>	<u>—</u>
5							
6							

Signed P. Rees

Date 26-7-05

FOR OFFICE USE:

SEEN BY:

ACTION PROPOSED

NO access to LFG 1.

FORM G1
GAS WELL OR BOREHOLE MONITORING

SITE MURLEY
AEL-Y-BRYN

DATE 27-9-05

OPERATIVE P. REES

WEATHER OVERCAST

FLAMMABLE GAS INSTRUMENT Ser. No GA075

TEMPERATURE 20°C

CO² INSTRUMENT Ser. No N/A

WIND SPEED/DIRECTION N/A

O² INSTRUMENT Ser. No N/A

BAROMETRIC PRESSURE 985

B/H Ref.	Flammable Gas	CO ₂	O ₂	Water Level	Pressure +/- mm/H ₂ O	Sampled Yes/No	Comment
1 LFG 2	0	0	20	-	-	-	-
2 3	0	0	20	-	-	-	-
3 CONCRETE RING B	0	0	20	-	-	N	-
4 BLUE PIPE C	0	0	20	-	-	Y	-
5 STONE WALL A	0	0	20	-	-	Y	-
6							

Signed P. Rees

Date 27-9-05

FOR OFFICE USE:

SEEN BY:

ACTION PROPOSED

No access to LFG 1

Spl points A - pH = 7.8 - COND = 900 - TEMP = 13°C
C - pH = 7.8 - COND = 730 - TEMP = 13°C

PLR SERVICES

GAS WELL or BOREHOLE MONITORING

SITE: AEL-Y-BRYN

DATE: 17-11-05

OPERATIVE P REES

WEATHER: Sunny

AIR TEMP: 7°C

BAROMETRIC PRESS: 990

INSTRUMENTS. GA 75

REF: _____

Borehole/ Gaswell	Methane	Carbon dioxide	Oxygen	Water level	Pressure mbar	Sampled y/n
1	0	0	20	N/A	990	N
2	0	0	20	N/A	991	N
3	0	0	19.2	N/A	990	N
B (Concrete pipe)	0	0	20.3	N/A	990	N
C (Blue pipe)	0	0	20.3	N/A	990	Y

NOTES

ACTION REQUIRED:

SIGNED: *J. Keor*

DATE 12.11.05

APPROVED: *F. Kees*

DATE: 17-11-05

PLR SERVICES

GAS WELL or BOREHOLE MONITORING

SITE AEL-4-BRYN L/F

DATE 8-6-06

OPERATIVE P. Rees

WEATHER Hot / Sunny

AIR TEMP 19°C

BAROMETRIC PRESS 1004

INSTRUMENTS Geotechnical GA075 REF: _____

Borehole Gaswell	Methane	Carbon dioxide	Oxygen	Water level	Pressure mbar	Sampled y/n
1	No Access					
2	No access					
3	No access					
B	0	0	20	N/A	—	Y
E	0	0	20	N/A	—	X
C	0	0	20	N/A	—	N

NOTES

Site owner/operator informed of poor access to monitoring points

ACTION REQUIRED:

To cut back overgrown brambles etc to allow access to monitoring points

SIGNED:

P. Rees

DATE 8-6-06

APPROVED

P. Rees

DATE 8-6-06

PLR SERVICES

GAS WELL or BOREHOLE MONITORING

SITE AEL-Y-BRYN

DATE 14-9-06

OPERATIVE P. REES

WEATHER Showers

AIR TEMP 15°C

BAROMETRIC PRESS 976

INSTRUMENTS Geotechnical GATS REF: _____

Borehole Gaswell	Methane	Carbon dioxide	Oxygen	Water level	Pressure mbar	Sampled Y/N
<u>B-Concrete Pipe.</u>						
	<u>0</u>	<u>0</u>	<u>19.6</u>	<u>N/A</u>	<u>976</u>	<u>Y</u>
<u>C-Blue Pipe.</u>						
	<u>0</u>	<u>0</u>	<u>19.2</u>	<u>N/A</u>	<u>976</u>	<u>N</u>
<u>LFG 1</u>	<u>0</u>	<u>0</u>	<u>19.5</u>	<u>N/A</u>	<u>976</u>	<u>N/A</u>
<u>LFG 2</u>	<u>0</u>	<u>0</u>	<u>19.2</u>	<u>N/A</u>	<u>976</u>	<u>N/A</u>
<u>LFG 3</u>	<u>0</u>	<u>0</u>	<u>19.6</u>	<u>N/A</u>	<u>976</u>	<u>N/A</u>

NOTES

ACTION REQUIRED

SIGNED:

P. Rees

DATE 14-9-06

APPROVED

P. Rees

DATE 14-9-06

**APPENDIX 6
CERTIFICATES OF ANALYSIS**

Certificate of Analysis



1314
0897
1229
1510



STL

Sample **1** Laboratory Number : **677112**
of **3** Report Number : **TH /374153/2006** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **A - LEACH/SW**

Sample Date : **14 September 2006** Sample Received : **18 September 2006** Analysis Complete : **28 September 2006**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	0.0010	mg/l	C	WAS049
Calcium , Total as Ca	336	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.020	mg/l	C	WAS049
Iron , Total as Fe	6.37	mg/l	C	WAS049
Lead , Total as Pb	0.034	mg/l	C	WAS049
Magnesium, Total as Mg	34	mg/l	C	WAS049
Manganese , Total as Mn	1.88	mg/l	C	WAS049
Nickel , Total as Ni	0.009	mg/l	C	WAS049
Potassium , Total as K	28	mg/l	C	WAS049
Sodium , Total as Na	110	mg/l	C	WAS049
Zinc, Total as Zn	0.13	mg/l	C	WAS049
pH	7.3		C	WAS039
Conductivity- Electrical 20C	1920	uS/cm	C	WAS039
Alkalinity as CaCO3	579	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	164	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.6	mg/l	C	WAS036
Sulphate as SO4	332	mg/l	C	WAS036
D.O. concentration	4.2	mg/l	C	WAS052
BOD + ATU (5 day)	3	mg/l	C	WAS001
COD (Total)	178	mg/l	C	WAS040
TOC (Filtered)	12.5	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands S = Sub-contracted

Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

I/S = Insufficient sample

Certificate of Analysis



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STL

Sample **2** Laboratory Number : **677113**
of **3** Report Number : **TH /374153/2006** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **B - LEACH/SW**

Sample Date : **14 September 2006** Sample Received : **18 September 2006** Analysis Complete : **28 September 2006**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	0.0060	mg/l	C	WAS049
Calcium , Total as Ca	644	mg/l	C	WAS049
Chromium , Total as Cr	0.086	mg/l	C	WAS049
Copper, Total as Cu	0.61	mg/l	C	WAS049
Iron , Total as Fe	112	mg/l	C	WAS049
Lead , Total as Pb	0.45	mg/l	C	WAS049
Magnesium, Total as Mg	41	mg/l	C	WAS049
Manganese , Total as Mn	18.1	mg/l	C	WAS049
Nickel , Total as Ni	0.13	mg/l	C	WAS049
Potassium , Total as K	37	mg/l	C	WAS049
Sodium , Total as Na	68	mg/l	C	WAS049
Zinc, Total as Zn	2.69	mg/l	C	WAS049
pH	7.5		C	WAS039
Conductivity- Electrical 20C	1610	uS/cm	C	WAS039
Alkalinity as CaCO3	750	mg/l	C	WAS025
Ammoniacal Nitrogen as N	5.4	mg/l	C	WAS036
Chloride as Cl	60	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	0.7	mg/l	C	WAS036
Sulphate as SO4	269	mg/l	C	WAS036
Dissolved Oxygen, Unfixed	0.7	mg/l	*	WAS001
BOD + ATU (5 day)	97	mg/l	C	WAS001
COD (Total)	12100	mg/l	C	WAS040
TOC (Filtered)	19.2	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited. B = Analysed at STL Bridgend. C = Analysed at STL Coventry. R = Analysed at STL Runcorn. L = Analysed at STL Midlands. S = Sub-contracted

Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

I/S = Insufficient sample

NB Outgoing sample results are to be signed by the analyst and signed by the manager.

Certificate of Analysis



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STL

Sample **3** Laboratory Number : **677114**
of **3** Report Number : **TH /374153/2006** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **E - SW**

Sample Date : **14 September 2006** Sample Received : **18 September 2006** Analysis Complete : **28 September 2006**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Calcium , Total as Ca	96	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	<0.005	mg/l	C	WAS049
Iron , Total as Fe	0.27	mg/l	C	WAS049
Lead , Total as Pb	0.007	mg/l	C	WAS049
Magnesium, Total as Mg	28	mg/l	C	WAS049
Manganese , Total as Mn	0.056	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Potassium , Total as K	13	mg/l	C	WAS049
Sodium , Total as Na	22	mg/l	C	WAS049
Zinc, Total as Zn	0.012	mg/l	C	WAS049
pH	8.4		C	WAS039
Conductivity- Electrical 20C	635	uS/cm	C	WAS039
Alkalinity as CaCO3	194	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.5	mg/l	C	WAS036
Chloride as Cl	24	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.3	mg/l	C	WAS036
Sulphate as SO4	117	mg/l	C	WAS036
D.O. concentration	5.4	mg/l	C	WAS052
BOD + ATU (5 day)	<1	mg/l	C	WAS001
COD (Total)	<20	mg/l	C	WAS040
TOC (Filtered)	3.9	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted

Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

I/S = Insufficient sample

Signed :

Name : **J. Fell**

Date : **02 October 2006**

Title : **Production Manager**

Certificate of Analysis



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STL

Sample **3** Laboratory Number : **439484**
of **3** Report Number : **TH /351587/2006** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **E-SW**

Sample Date : **08 June 2006** Sample Received : **09 June 2006** Analysis Complete : **22 June 2006**

Test Description	Result	Units	Accreditation	Method
pH	8.4		C	WAS039
Conductivity- Electrical 20C	594	uS/cm	C	WAS039
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	13	mg/l	C	WAS036
D.O. concentration	4.3	mg/l	C	WAS052
COD (Total)	<20	mg/l	C	WAS040

Accreditation Codes: 1 = Not UKAS accredited, B = Analysed at STL Bingham, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted

For Microbiological determinands 0 or ND = Not Detected, DET = Detected. For Legionella ND=Not detected in volume of sample filtered.

INS = Insufficient sample

Signed :

Name : **J. Fell**

Date : **23 June 2006**

Title : **Production Manager**

Certificate of Analysis



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STL

Sample **2** Laboratory Number : **439483**
of **3** Report Number : **TH /351587/2006** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **B-LEACH/SW**

Sample Date : **08 June 2006** Sample Received : **09 June 2006** Analysis Complete : **22 June 2006**

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	241	mg/l	C	WAS049
Magnesium, Total as Mg	24	mg/l	C	WAS049
Potassium , Total as K	19	mg/l	C	WAS049
Sodium , Total as Na	36	mg/l	C	WAS049
pH	8.0		C	WAS039
Conductivity- Electrical 20C	1150	uS/cm	C	WAS039
Alkalinity as CaCO ₃	449	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	34	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	2.2	mg/l	C	WAS036
Sulphate as SO ₄	255	mg/l	C	WAS036
D.O. concentration	4.4	mg/l	C	WAS052
BOD + ATU (5 day)	3	mg/l	C	WAS001
COD (Total)	205	mg/l	C	WAS040
TOC (Filtered)	9.3	mg/l	C	WAS005

Accreditation Codes: * = Not UKAS accredited B = Analysed at STL Bridgend C = Analysed at STL Coventry R = Analysed at STL Runcorn L = Analysed at STL Midlands S = Sub-contracted

For Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

IS = Insufficient sample

Certificate of Analysis



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STL

Sample **1** Laboratory Number : **439482**
of **3** Report Number : **TH /351587/2006** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **A-LEACH/SW**

Sample Date : **08 June 2006** Sample Received : **09 June 2006** Analysis Complete : **22 June 2006**

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	247	mg/l	C	WAS049
Magnesium, Total as Mg	24	mg/l	C	WAS049
Potassium , Total as K	18	mg/l	C	WAS049
Sodium , Total as Na	62	mg/l	C	WAS049
pH	7.5		C	WAS039
Conductivity- Electrical 20C	1330	uS/cm	C	WAS039
Alkalinity as CaCO3	497	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	82	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.4	mg/l	C	WAS036
Sulphate as SO4	247	mg/l	C	WAS036
D.O. concentration	4.0	mg/l	C	WAS052
BOD + ATU (5 day)	4	mg/l	C	WAS001
COD (Total)	86	mg/l	C	WAS040
TOC (Filtered)	8.5	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Subcontracted

For Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

IS = Insufficient sample

Certificate of Analysis



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STL

Sample **4** Laboratory Number : **171651**
of **4** Report Number : **TH /313539/2005** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **E - S/W**

Sample Date : **17 November 2005** Sample Received : **21 November 2005** Analysis Complete : **05 December 2005**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Calcium , Total as Ca	92	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	<0.005	mg/l	C	WAS049
Iron , Total as Fe	0.37	mg/l	C	WAS049
Lead , Total as Pb	<0.005	mg/l	C	WAS049
Magnesium, Total as Mg	24	mg/l	C	WAS049
Manganese , Total as Mn	0.054	mg/l	C	WAS049
Nickel , Total as Ni	0.005	mg/l	C	WAS049
Potassium , Total as K	11	mg/l	C	WAS049
Sodium , Total as Na	16	mg/l	C	WAS049
Zinc, Total as Zn	0.010	mg/l	C	WAS049
pH	8.4		C	WAS039
Conductivity- Electrical 20C	589	uS/cm	C	WAS039
Alkalinity as CaCO3	214	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.26	mg/l	C	WAS036
Chloride as Cl	9	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	0.7	mg/l	C	WAS036
Sulphate as SO4	108	mg/l	C	WAS036
D.O. concentration	7.6	mg/l	C	WAS052
BOD + ATU (5 day)	2	mg/l	C	WAS001
COD (Total)	<20	mg/l	C	WAS040
TOC (Filtered)	2.6	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgend C = Analysed at STL Coventry R = Analysed at STL Runcorn L = Analysed at STL Midlands S = Sub-contracted

Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

I/S = Insufficient sample

Signed :

Name : **J. Fell**

Date : **07 December 2005**

Title : **Production Manager**

Certificate of Analysis



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STL

Sample **3** Laboratory Number : **171650**
of **4** Report Number : **TH /313539/2005** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **C - LEACH/SW**

Sample Date : **17 November 2005** Sample Received : **21 November 2005** Analysis Complete : **05 December 2005**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	0.0010	mg/l	C	WAS049
Calcium , Total as Ca	154	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.005	mg/l	C	WAS049
Iron , Total as Fe	0.16	mg/l	C	WAS049
Lead , Total as Pb	<0.005	mg/l	C	WAS049
Magnesium, Total as Mg	10	mg/l	C	WAS049
Manganese , Total as Mn	0.041	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Potassium , Total as K	7.5	mg/l	C	WAS049
Sodium , Total as Na	9.5	mg/l	C	WAS049
Zinc, Total as Zn	0.20	mg/l	C	WAS049
pH	8.2		C	WAS039
Conductivity- Electrical 20C	663	uS/cm	C	WAS039
Alkalinity as CaCO3	326	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.53	mg/l	C	WAS036
Chloride as Cl	11	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	3.4	mg/l	C	WAS036
Sulphate as SO4	72	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
BOD + ATU (5 day)	5	mg/l	C	WAS001
COD (Total)	49	mg/l	C	WAS040
TOC (Filtered)	8.8	mg/l	C	WAS005

Analyst Comment for 171650 : No Dissolved oxygen result due to sample interference.

Accreditation Codes : * = Not UKAS accredited. B = Analysed at STL Bridgend. C = Analysed at STL Coventry. R = Analysed at STL Runcorn. L = Analysed at STL Midlands. S = Sub-contracted

Microbiological determinands 0 or ND = Not Detected. DET = Detected. For Legionella ND=Not detected in volume of sample filtered.

I/S = Insufficient sample

Certificate of Analysis



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STL

Sample **2** Laboratory Number : **171649**
of **4** Report Number : **TH /313539/2005** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **B - LEACH/SW**

Sample Date : **17 November 2005** Sample Received : **21 November 2005** Analysis Complete : **05 December 2005**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Calcium , Total as Ca	214	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.011	mg/l	C	WAS049
Iron , Total as Fe	1.08	mg/l	C	WAS049
Lead , Total as Pb	0.008	mg/l	C	WAS049
Magnesium, Total as Mg	21	mg/l	C	WAS049
Manganese , Total as Mn	0.16	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Potassium , Total as K	18	mg/l	C	WAS049
Sodium , Total as Na	34	mg/l	C	WAS049
Zinc, Total as Zn	0.049	mg/l	C	WAS049
pH	8.2		C	WAS039
Conductivity- Electrical 20C	1080	uS/cm	C	WAS039
Alkalinity as CaCO3	408	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.25	mg/l	C	WAS036
Chloride as Cl	25	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.9	mg/l	C	WAS036
Sulphate as SO4	230	mg/l	C	WAS036
D.O. concentration	5.9	mg/l	C	WAS052
BOD + ATU (5 day)	1	mg/l	C	WAS001
COD (Total)	159	mg/l	C	WAS040
TOC (Filtered)	10.2	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgend C = Analysed at STL Coventry R = Analysed at STL Runcorn L = Analysed at STL Midlands S = Sub-contracted

Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

I/S = Insufficient sample

Certificate of Analysis



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STL

Sample **1** Laboratory Number : **171648**
of **4** Report Number : **TH /313539/2005** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **A - LEACH/SW**

Sample Date : **17 November 2005** Sample Received : **21 November 2005** Analysis Complete : **05 December 2005**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Calcium , Total as Ca	238	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.008	mg/l	C	WAS049
Iron , Total as Fe	0.86	mg/l	C	WAS049
Lead , Total as Pb	0.009	mg/l	C	WAS049
Magnesium, Total as Mg	22	mg/l	C	WAS049
Manganese , Total as Mn	0.34	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Potassium , Total as K	16	mg/l	C	WAS049
Sodium , Total as Na	46	mg/l	C	WAS049
Zinc, Total as Zn	0.077	mg/l	C	WAS049
pH	7.9		C	WAS039
Conductivity- Electrical 20C	1230	uS/cm	C	WAS039
Alkalinity as CaCO3	473	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.27	mg/l	C	WAS036
Chloride as Cl	57	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	2.8	mg/l	C	WAS036
Sulphate as SO4	233	mg/l	C	WAS036
D.O. concentration	6.5	mg/l	C	WAS052
BOD + ATU (5 day)	1	mg/l	C	WAS001
COD (Total)	40	mg/l	C	WAS040
TOC (Filtered)	8.7	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited, B = Analysed at STL Bridgend, C = Analysed at STL Coventry, R = Analysed at STL Runcorn, L = Analysed at STL Midlands, S = Sub-contracted

Microbiological determinands 0 or ND = Not Detected, DET = Detected, For Legionella ND=Not detected in volume of sample filtered.

I/S = Insufficient sample

Certificate of Analysis



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STL

Sample **3** Laboratory Number : **763868**
of **3** Report Number : **TH /293532/2005** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **E S/W**

Sample Date : **26 July 2005** Sample Received : **27 July 2005** Analysis Complete : **23 August 2005**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	0.0010	mg/l	C	WAS049
Calcium , Total as Ca	67	mg/l	C	WAS049
Chromium , Total as Cr	0.005	mg/l	C	WAS049
Copper , Total as Cu	0.009	mg/l	C	WAS049
Iron , Total as Fe	0.14	mg/l	C	WAS049
Lead , Total as Pb	0.010	mg/l	C	WAS049
Magnesium , Total as Mg	19	mg/l	C	WAS049
Manganese , Total as Mn	0.024	mg/l	C	WAS049
Nickel , Total as Ni	0.005	mg/l	C	WAS049
Potassium , Total as K	11	mg/l	C	WAS049
Sodium , Total as Na	16	mg/l	C	WAS049
Zinc , Total as Zn	0.025	mg/l	C	WAS049
pH	8.2		C	WAS039
Conductivity- Electrical 20C	481	uS/cm	C	WAS039
Alkalinity as CaCO3	148	mg/l	C	WAS025
Ammoniacal Nitrogen as N	1.6	mg/l	C	WAS036
Chloride as Cl	12	mg/l	C	WAS036
Nitrogen , Total Oxidised as N	1.5	mg/l	C	WAS036
Sulphate as SO4	83	mg/l	C	WAS036
D.O. concentration	5.0	mg/l	C	WAS052
BOD + ATU (5 day)	<1	mg/l	C	WAS001
COD (Total)	<20	mg/l	C	WAS040
TOC (Filtered)	3.4	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgend C = Analysed at STL Coventry R = Analysed at STL Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Signed : *A. Breckles*

Name : **A. Breckles** Date : **24 August 2005**

Title : **Production Supervisor**

Certificate of Analysis



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STL

Sample **2** Laboratory Number : **763867**
of **3** Report Number : **TH /293532/2005** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **B Leach/sw**

Sample Date : **26 July 2005**

Sample Received : **27 July 2005**

Analysis Complete : **23 August 2005**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Calcium , Total as Ca	282	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.017	mg/l	C	WAS049
Iron , Total as Fe	3.27	mg/l	C	WAS049
Lead , Total as Pb	0.022	mg/l	C	WAS049
Magnesium, Total as Mg	26	mg/l	C	WAS049
Manganese , Total as Mn	0.582	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Potassium , Total as K	22	mg/l	C	WAS049
Sodium , Total as Na	39	mg/l	C	WAS049
Zinc, Total as Zn	0.10	mg/l	C	WAS049
pH	7.9		C	WAS039
Conductivity- Electrical 20C	1230	uS/cm	C	WAS039
Alkalinity as CaCO3	470	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	38	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	2.2	mg/l	C	WAS036
Sulphate as SO4	281	mg/l	C	WAS036
D.O. concentration	5.3	mg/l	C	WAS052
BOD + ATU (5 day)	2	mg/l	C	WAS001
COD (Total)	608	mg/l	C	WAS040
TOC (Filtered)	10.7	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgend C = Analysed at STL Coventry R = Analysed at STL Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

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STL

Sample **1** Laboratory Number : **763866**
of **3** Report Number : **TH /293532/2005** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **A Leach/sw**

Sample Date : **26 July 2005** Sample Received : **27 July 2005** Analysis Complete : **23 August 2005**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	0.0007	mg/l	C	WAS049
Calcium , Total as Ca	286	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.028	mg/l	C	WAS049
Iron , Total as Fe	6.4	mg/l	C	WAS049
Lead , Total as Pb	0.039	mg/l	C	WAS049
Magnesium, Total as Mg	27	mg/l	C	WAS049
Manganese , Total as Mn	1.31	mg/l	C	WAS049
Nickel , Total as Ni	0.015	mg/l	C	WAS049
Potassium , Total as K	24	mg/l	C	WAS049
Sodium , Total as Na	108	mg/l	C	WAS049
Zinc, Total as Zn	0.185	mg/l	C	WAS049
pH	7.6		C	WAS039
Conductivity- Electrical 20C	1530	uS/cm	C	WAS039
Alkalinity as CaCO3	480	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	153	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.7	mg/l	C	WAS036
Sulphate as SO4	302	mg/l	C	WAS036
D.O. concentration	5.9	mg/l	C	WAS052
BOD + ATU (5 day)	<1	mg/l	C	WAS001
COD (Total)	190	mg/l	C	WAS040
TOC (Filtered)	11.3	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgend C = Analysed at STL Coventry R = Analysed at STL Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample **5** Laboratory Number : **655302**
of **5** Report Number : **TH /274289/2005** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **E-SW**

Sample Date : **31 March 2005** Sample Received : **31 March 2005** Analysis Complete : **07 April 2005**

Test Description	Result	Units	Accreditation	Method
pH	8.2		C	WAS039
Conductivity- Electrical 20C	459	uS/cm	C	WAS039
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	25	mg/l	C	WAS036
D.O. concentration	9.9	mg/l	C	WAS052
COD (Total)	<20	mg/l	C	WAS040

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgen C = Analysed at STL Coventry R = Analysed at STL Runcom S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Signed :

Name : **A. Breckles**

Date : **08 April 2005**

Title : **Production Supervisor**

Certificate of Analysis



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STL

Sample **4** Laboratory Number : **655301**
of **5** Report Number : **TH /274289/2005** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **D-SW**

Sample Date : **31 March 2005** Sample Received : **31 March 2005** Analysis Complete : **07 April 2005**

Test Description	Result	Units	Accreditation	Method
pH	8.0		C	WAS039
Conductivity- Electrical 20C	703	uS/cm	C	WAS039
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	26	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
COD (Total)	320	mg/l	C	WAS040

Analyst Comment for 655301 : No Dissolved oxygen result due to sample interference.

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgen C = Analysed at STL Coventry R = Analysed at STL Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample **3** Laboratory Number : **655300**
of **5** Report Number : **TH /274289/2005** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **C-Leach/SW**

Sample Date : **31 March 2005** Sample Received : **31 March 2005** Analysis Complete : **07 April 2005**

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	132	mg/l	C	WAS049
Magnesium, Total as Mg	11	mg/l	C	WAS049
Potassium , Total as K	7.6	mg/l	C	WAS049
Sodium , Total as Na	12	mg/l	C	WAS049
pH	7.8		C	WAS039
Conductivity- Electrical 20C	631	uS/cm	C	WAS039
Alkalinity as CaCO3	291	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	11	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.6	mg/l	C	WAS036
Sulphate as SO4	88	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
BOD + ATU (5 day)	5	mg/l	C	WAS001
COD (Total)	88	mg/l	C	WAS040
TOC (Filtered)	6.0	mg/l	C	WAS005

Analyst Comment for 655300 : No Dissolved oxygen result due to sample interference.

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgen C = Analysed at STL Coventry R = Analysed at STL Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample **2** Laboratory Number : **655299**
of **5** Report Number : **TH /274289/2005** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **B-Leach/SW**

Sample Date : **31 March 2005** Sample Received : **31 March 2005** Analysis Complete : **07 April 2005**

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	206	mg/l	C	WAS049
Magnesium, Total as Mg	20	mg/l	C	WAS049
Potassium , Total as K	14	mg/l	C	WAS049
Sodium , Total as Na	25	mg/l	C	WAS049
pH	8.0		C	WAS039
Conductivity- Electrical 20C	926	uS/cm	C	WAS039
Alkalinity as CaCO3	381	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	23	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.8	mg/l	C	WAS036
Sulphate as SO4	208	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
BOD + ATU (5 day)	3	mg/l	C	WAS001
COD (Total)	540	mg/l	C	WAS040
TOC (Filtered)	8.6	mg/l	C	WAS005

Analyst Comment for 655299 : No Dissolved oxygen result due to sample interference.

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgen C = Analysed at STL Coventry R = Analysed at STL Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample 1 Laboratory Number : 655298
of 5 Report Number : TH /274289/2005 Issue 1

Sample Source : PLR Services

Sample Point Description : PLR Services

Sample Description : A-Leach/SW

Sample Date : 31 March 2005 Sample Received : 31 March 2005 Analysis Complete : 07 April 2005

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	242	mg/l	C	WAS049
Magnesium, Total as Mg	23	mg/l	C	WAS049
Potassium , Total as K	17	mg/l	C	WAS049
Sodium , Total as Na	74	mg/l	C	WAS049
pH	7.3		C	WAS039
Conductivity- Electrical 20C	1200	uS/cm	C	WAS039
Alkalinity as CaCO3	402	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	86	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.5	mg/l	C	WAS036
Sulphate as SO4	216	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
BOD + ATU (5 day)	<1	mg/l	C	WAS001
COD (Total)	27	mg/l	C	WAS040
TOC (Filtered)	8.3	mg/l	C	WAS005

Analyst Comment for 655298 : No Dissolved oxygen result due to sample interference.

Accreditation Codes : * = Not UKAS accredited B = Analysed at STL Bridgen C = Analysed at STL Coventry R = Analysed at STL Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample **5** Laboratory Number : **558651**
of **5** Report Number : **TH /258735/2004** Issue **1**

Sample Source : **PLR Services**
Sample Point Description : **PLR Services**
Sample Description : **E - SW (Nant/Cwm)**

Sample Date : **02 December 2004** Sample Received : **02 December 2004** Analysis Complete : **16 December 2004**

Test Description	Result	Units	Accreditation	Method
pH	8.2		C	WAS039
Conductivity- Electrical 20C	517	uS/cm	C	WAS039
Ammoniacal Nitrogen as N	0.4	mg/l	C	WAS036
Chloride as Cl	11	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
COD (Total)	<20	mg/l	C	WAS040

Analyst Comment for 558651 : No DO result due to sample interference.

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Signed :

Name : **J. Fell**

Date : **14 January 2005**

Title : **Production Manager**

Certificate of Analysis



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STL

Sample **4** Laboratory Number : **558650**
of **5** Report Number : **TH /258735/2004** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **D - SW**

Sample Date : **02 December 2004** Sample Received : **02 December 2004** Analysis Complete : **16 December 2004**

Test Description	Result	Units	Accreditation	Method
pH	8.2		C	WAS039
Conductivity- Electrical 20C	758	uS/cm	C	WAS039
Ammoniacal Nitrogen as N	0.4	mg/l	C	WAS036
Chloride as Cl	16	mg/l	C	WAS036
D.O. concentration	7.5	mg/l	C	WAS052
COD (Total)	66	mg/l	C	WAS040

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample **3** Laboratory Number : **558649**
of **5** Report Number : **TH /258735/2004** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **C - Leach/SW**

Sample Date : **02 December 2004** Sample Received : **02 December 2004** Analysis Complete : **16 December 2004**

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	158	mg/l	C	WAS049
Magnesium, Total as Mg	12	mg/l	C	WAS049
Potassium , Total as K	9.0	mg/l	C	WAS049
Sodium , Total as Na	14	mg/l	C	WAS049
pH	8.0		C	WAS039
Conductivity- Electrical 20C	738	uS/cm	C	WAS039
Alkalinity as CaCO3	269	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.4	mg/l	C	WAS036
Chloride as Cl	13	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	0.6	mg/l	C	WAS036
Sulphate as SO4	94	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
BOD + ATU (5 day)		mg/l	C	WAS001
COD (Total)		mg/l	C	WAS040
TOC (Filtered)		mg/l	C	WAS005

Analyst Comment for 558649 : No DO result due to sample interference.

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL Midlands
For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample **2** Laboratory Number : **558648**
of **5** Report Number : **TH /258735/2004** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **B - Leach/SW**

Sample Date : **02 December 2004** Sample Received : **02 December 2004** Analysis Complete : **16 December 2004**

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	232	mg/l	C	WAS049
Magnesium, Total as Mg	23	mg/l	C	WAS049
Potassium , Total as K	18	mg/l	C	WAS049
Sodium , Total as Na	33	mg/l	C	WAS049
pH	8.0		C	WAS039
Conductivity- Electrical 20C	1130	uS/cm	C	WAS039
Alkalinity as CaCO ₃	468	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.4	mg/l	C	WAS036
Chloride as Cl	30	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	2.0	mg/l	C	WAS036
Sulphate as SO ₄	265	mg/l	C	WAS036
D.O. concentration	Analyst Comment	mg/l	C	WAS052
BOD + ATU (5 day)		mg/l	C	WAS001
COD (Total)		mg/l	C	WAS040
TOC (Filtered)		mg/l	C	WAS005

Analyst Comment for 558648 : No DO result due to sample interference.

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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STL

Sample **1** Laboratory Number : **558647**
of **5** Report Number : **TH /258735/2004** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **A - Leach/SW**

Sample Date : **02 December 2004** Sample Received : **02 December 2004** Analysis Complete : **16 December 2004**

Test Description	Result	Units	Accreditation	Method
Calcium , Total as Ca	249	mg/l	C	WAS049
Magnesium, Total as Mg	24	mg/l	C	WAS049
Potassium , Total as K	20	mg/l	C	WAS049
Sodium , Total as Na	63	mg/l	C	WAS049
pH	7.2		C	WAS039
Conductivity- Electrical 20C	1350	uS/cm	C	WAS039
Alkalinity as CaCO ₃	486	mg/l	C	WAS025
Ammoniacal Nitrogen as N	0.4	mg/l	C	WAS036
Chloride as Cl	73	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	1.1	mg/l	C	WAS036
Sulphate as SO ₄	249	mg/l	C	WAS036
D.O. concentration	9.7	mg/l	C	WAS052
BOD + ATU (5 day)	<1	mg/l	C	WAS001
COD (Total)	34	mg/l	C	WAS040
TOC (Filtered)	10.8	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL Midlands For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Certificate of Analysis



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SEVERN
TRENT

Environmental Leadership

STL

Sample **3** Laboratory Number : **370632**
of **3** Report Number : **TH /240992/2004** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **SAMPLE 3**

Sample Date : **30.07 July 2004** Sample Received : **02 August 2004** Analysis Complete : **09 August 2004**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Calcium , Total as Ca	117	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.013	mg/l	C	WAS049
Iron , Total as Fe	2.34	mg/l	C	WAS049
Lead , Total as Pb	0.008	mg/l	C	WAS049
Magnesium, Total as Mg	33	mg/l	C	WAS049
Manganese , Total as Mn	0.88	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Potassium , Total as K	18	mg/l	C	WAS049
Sodium , Total as Na	25	mg/l	C	WAS049
Zinc, Total as Zn	0.11	mg/l	C	WAS049
pH	7.8		C	WAS039
Conductivity- Electrical 20C	807	uS/cm	C	WAS039
Alkalinity as CaCO3	255	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	39	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	<0.3	mg/l	C	WAS036
Sulphate as SO4	135	mg/l	C	WAS036
D.O. concentration	6.4	mg/l	C	WAS052
BOD + ATU (5 day)	2	mg/l	C	WAS001
COD (Total)	91	mg/l	C	WAS040
TOC (Filtered)	5.3	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL CAS For Microbiological determinands 0 or ND = Not Detected, DET = Detected

Signed :

Name : **L. Roberts**

Date : **10 August 2004**

Title : **Senior Analyst**

Certificate of Analysis



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**SEVERN
TRENT**

Environmental Leadership

STL

Sample **1** Laboratory Number : **370630**
of **3** Report Number : **TH /240992/2004** Issue **1**

Sample Source : **PLR Services**

Sample Point Description : **PLR Services**

Sample Description : **SAMPLE 1**

Sample Date : **02 July 2004** Sample Received : **02 August 2004** Analysis Complete : **09 August 2004**

Test Description	Result	Units	Accreditation	Method
Cadmium , Total as Cd	<0.0005	mg/l	C	WAS049
Calcium , Total as Ca	271	mg/l	C	WAS049
Chromium , Total as Cr	<0.005	mg/l	C	WAS049
Copper, Total as Cu	0.018	mg/l	C	WAS049
Iron , Total as Fe	0.67	mg/l	C	WAS049
Lead , Total as Pb	0.006	mg/l	C	WAS049
Magnesium, Total as Mg	28	mg/l	C	WAS049
Manganese , Total as Mn	0.33	mg/l	C	WAS049
Nickel , Total as Ni	<0.005	mg/l	C	WAS049
Potassium , Total as K	24	mg/l	C	WAS049
Sodium , Total as Na	132	mg/l	C	WAS049
Zinc, Total as Zn	0.18	mg/l	C	WAS049
pH	7.8		C	WAS039
Conductivity- Electrical 20C	1780	uS/cm	C	WAS039
Alkalinity as CaCO3	292	mg/l	C	WAS025
Ammoniacal Nitrogen as N	<0.3	mg/l	C	WAS036
Chloride as Cl	198	mg/l	C	WAS036
Nitrogen, Total Oxidised as N	0.9	mg/l	C	WAS036
Sulphate as SO4	335	mg/l	C	WAS036
D.O. concentration	8.4	mg/l	C	WAS052
BOD + ATU (5 day)	2	mg/l	C	WAS001
COD (Total)	50	mg/l	C	WAS040
TOC (Filtered)	12.2	mg/l	C	WAS005

Accreditation Codes : * = Not UKAS accredited B = Analysed at Bridgend C = Analysed at STL Coventry R = Analysed at Runcorn S = Sub-contracted
L = Analysed at STL CAS For Microbiological determinands 0 or ND = Not Detected, DET = Detected

**APPENDIX 7
LFG SURFACE EMISSION MONITORING REPORT**

AEL-Y-BRYN
CLOSURE PLAN

Ael-Y-Bryn – Closed Inert Landfill Site
Landfill gas surface emission site monitoring record

WML Number: EAWML 30017

Monitoring date: 26/05/04

Report Number: HUR/1/5/04

Previous report: N/A

WEATHER CONDITIONS:

- Atmospheric pressure: 990 mbars
- Rising/falling: FALLING
- Temperature: 19 Degrees C
- Description:.....Wet/rain/windy/sunny/dry etc.

FEATURES:

- Side Slopes: WELL VEGETATED
- Fissures: NONE OBSERVED
- Vegetation dieback: NONE OBSERVED
- Ground conditions: DRY

MONITORING RESULTS:

Monitoring point:	Result: PPM	Monitoring point:	Result: PPM
1.	5	16.	5
2.	5	17.	5
3.	5	18.	5
4.	5	19.	5
5.	5	20.	5
6.	5	21.	5
7.	5	22.	5
8.	5	23.	5
9.	5	24.	5
10.	5	25.	5
11.	5	26.	5
12.	5	27.	5
13.	5	28.	5
14.	5	29.	5
15.	5	30.	5

Comments:

NO SURFACE EMISSION LANDFILL GAS DETECTED

NB - 1% CH₄ gas off scale

Performed by: *P. Rees*

Approved by: *P. Rees*

Date: *26-5-04*

Date: *26-5-04*

Copy to EA office: *22-8-04*

Date: *2*

NOV 21 1967



7 Lees

SITE RECORD



Station T. H. R. 1. 5
 Site ALLEY HIRYS LANDFILL SITE
 Date 11/1/94
 Date Photographed 11/1/94
 Reference EMBLIP gas emissions monitoring

No. 2

Comments

Monitoring point appears to be intact

SEM Soil instrument at use to determine concentration of VOC emissions through soil gas

The detector is not too far from the edge of the site adjacent to the corner building and
 photographs taken near surface gradient of soil used to determine

Soil gas detector calibration background region of 1000

P. Rees

Signed

SITE RECORD



Date: 11/18/13
 Site: ALABAMA LANDFILL SITE
 Proj: HERRING
 Org: Environmental
 Reference: Landfill gas emissions monitoring

Page 1

Comments

Observing point and but it has point

7 A few low-level dirt and debris - some minor building in background

Not a lot of vegetation above background level on 1 point

Notes

F. Leos

SITE RECORD



CNO: J. HURLEY
 SN: ALLEN-BRYN LANDING SITE
 CO: BURRILL
 Date Photographed: 2/20/04
 Remarks: 1. Mobile gas detector monitoring

Attachment

- Photographs depict use of SMI 500 surface ammonia monitoring instrument with the detector placed near to bypass from post bordering this site to the adjacent unleased closed Corral Top.

J. Rees

CHENNA

AEL-Y-BRYN
CLOSURE PLAN

PLR SERVICES
MANAGEMENT SYSTEMS

Ael-Y-Bryn – Landfill Site

Landfill gas surface emission monitoring plan

March 2004

INDEX

INTRODUCTION

1.0 LOCATION AND DETERMINANDS

2.0 METHOD

- 2.1 Landfill gas emission monitoring
- 2.2 Ground condition monitoring
- 2.3 Results
- 2.4 Interpretation of information

3.0 REFERENCES

4.0 APPENDICES

- a. Figure 1 - LFG emission monitoring location plan
- b. Monitoring/survey report form
- c. Monitoring instrument information

AEL-Y-BRYN CLOSURE PLAN

Introduction

This plan outlines the procedure to be followed to monitor for landfill gas LFG surface emission monitoring as indicated upon the plan and in line with EA guidance (Ref.1).

This surface emission monitoring will be initially performed, noting the barometric pressure, and depending upon the review of these results then an assessment for the need whether a repeat study may be required based upon changeable weather conditions.

1. Location and determinands

The landfill gas monitoring locations are indicated upon Figure 1 which is included within the appendices.

The number and location of surface monitoring points will be tested in conjunction with the EA guidance/draft consultation document.

This may be presented as zones (see Ref.1) for an area greater than 5,000 sqm and the number of monitoring locations and spacing presented as below:

The area of the landfilled area may be observed upon the site plan (Figure. 1).

- Zone size/area = 140m x 150m = 21,000sqm
- Number of points = $6 + 0.25 \sqrt{21,000}$ = 28
- Average monitoring spacing = $\sqrt{(21,000:28)}$ = $\sqrt{750}$ = 27metres

2. Method

The following procedure will be followed to obtain a sample of landfill gas from potential surface emissions from the monitoring points.

This is to achieved via a portable surface emissions gas monitor which consists of a specialized instrument which will determine the component gases potentially present.

The proposed instrumentation suitable for this monitoring is indicated within the appendices.

2.1 Landfill gas emission monitoring

- a. Each point will be monitored, by an appropriately competent person (i.e. inducted by an Environmental Consultant).
- b. At each location, as indicated upon the site plan, the monitoring point will be sampled by placing a appropriately sized (150mL) funnel/sampling probe onto the selected surface point and a record kept of the ground condition at the selected location/point i.e. surface cracking.
- c. The sampling equipment will consist of a calibrated gas sampling instrument which will determine the following parameters: -

- LFG (Methane) Range: 1 to 10,000 parts per million (ppm)

AEL-Y-BRYN
CLOSURE PLAN

- d. The trigger values which if exceeded will require further investigation has been recommended by the EA (Ref.1) to be of the order of:
- Less than 100 ppm immediately above the surface
 - Less than 1000 ppm close to any features e.g nearby slopes etc
- e. Further action will consist of the following:
- Confirmation of the analysis of monitoring results.
 - Repeat monitoring under differing environmental conditions e.g. barometric pressure
 - Inspection of ground conditions to detect any surface fissures/cracking.
- f. The result may be data logged for down loading later and/or recorded via a notebook while on site.
- e. Calibration certification will be obtained and held on file to accompany the results form the monitoring survey.

2.2 Ground condition monitoring

- a. A record will be kept upon observations made with respect to the following parameters:
- Surface fissures/cracks
 - Stressed vegetation (where applicable) e.g. die-back.
 - Landfill/capped edges/slopes
 - Adjacent areas to the capped landfill site e.g. lateral migration problems.
- b. Photographic evidence will be taken at the monitoring points to show areas/zones under determination.
- c. Weather conditions will be determined and recorded upon the test result forms.

2.3 Results

- a. The results will then be transferred to the appropriate record forms (appendix b) and a copy periodically submitted to the EA.

2.4 Interpretation of information

- a. Where it is determined that the trigger levels have not been exceeded then the site monitoring will be repeated at six monthly intervals.
- b. At regular intervals i.e. at the time of water monitoring the and site environmental conditions will be recorded i.e. vegetation die-back and any adverse effects investigated.

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3. References

- a. Guidance for monitoring landfill gas (LFG) surface emissions (draft for consultation) March 2003

4. Appendices

- a. Figure 1 – Landfill site area - zones for emission monitoring.
- b. Monitoring/survey report form.
- c. Monitoring instrument information.

Appendix a.

Figure 1 – Landfill site area – zones for emission monitoring

SCALE : 1:500

AEL-Y-BRYN

MERTHYR TYDFIL

SURFACE EMISSION
MONITORING PLAN
(MARCH 2004)

● SURFACE MONITORING
POINTS.

D
top soil final
cover stock pile

proposed access (phase 3)

Natural
CH₄ / CO₂
prior
to fill

PHASE 3 (P)

GAS VENTING CH
3
DIP FOR

Directing of filling
operations

PHASE 2 (P)

proposed access (phase 2)

GAS VENTING C

PHASE 1 (I)

24

23

26

25

A

28

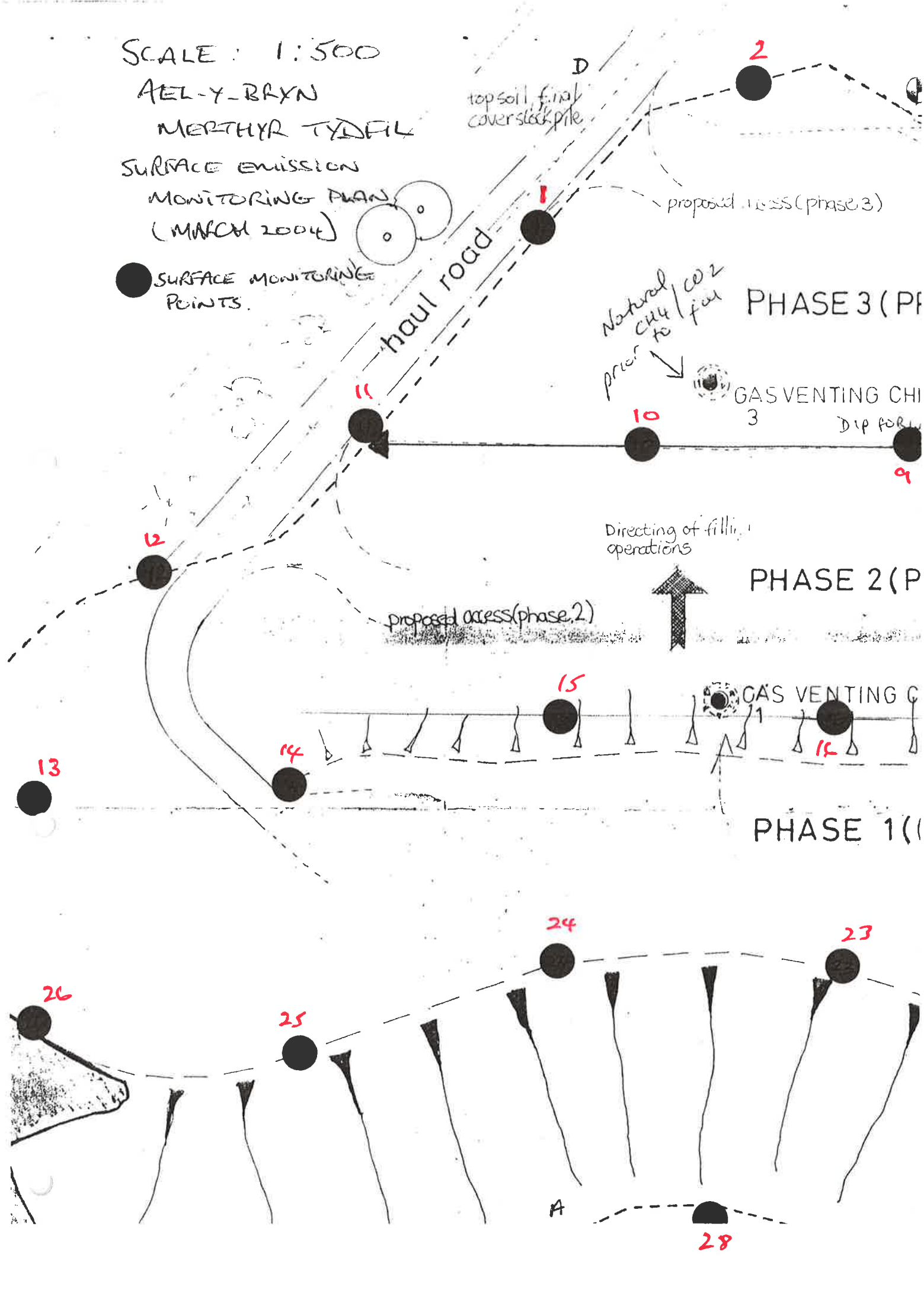
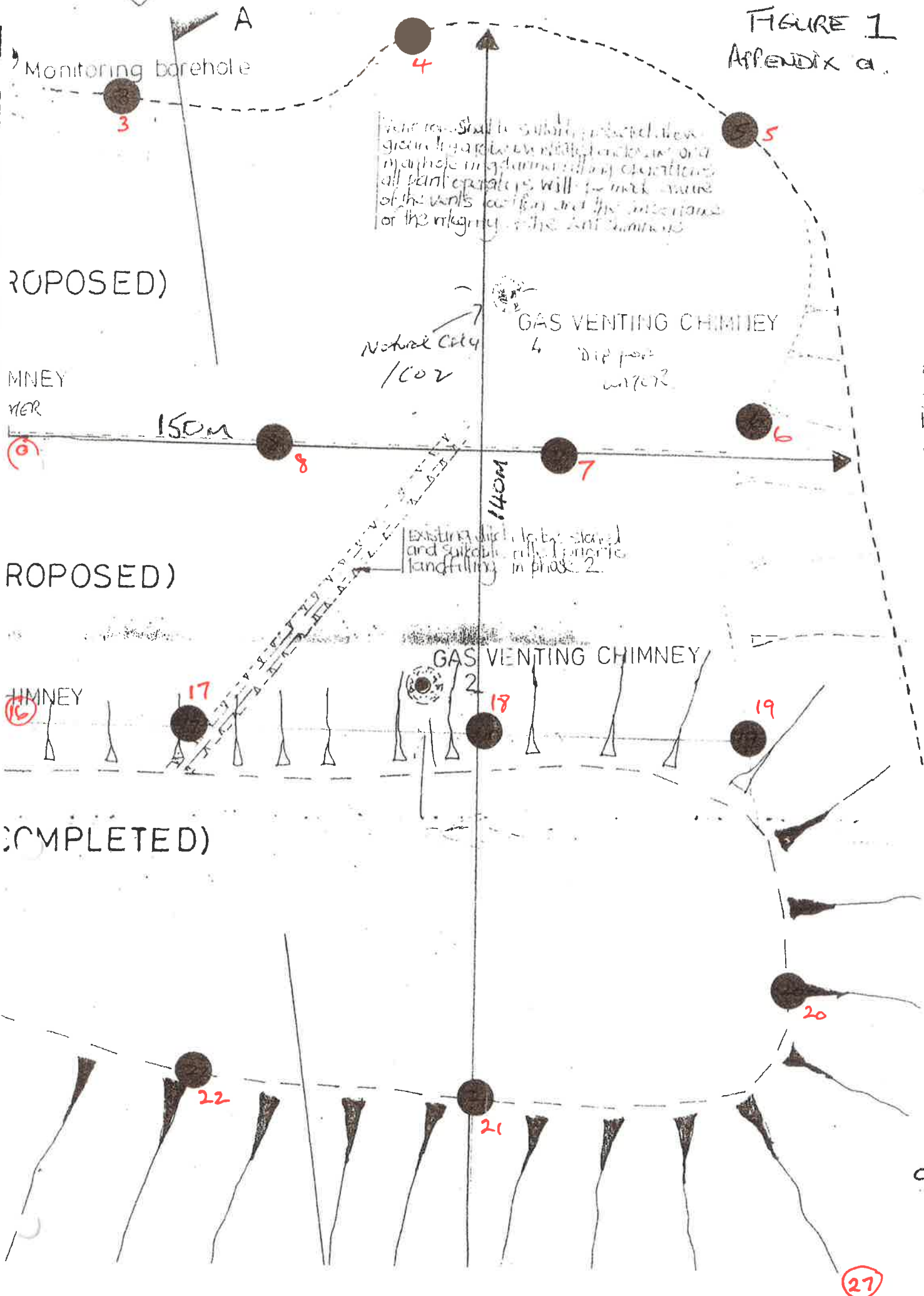


FIGURE 1
Appendix a.



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CLOSURE PLAN

Appendix b.

Monitoring/survey report form

Ael-Y-Bryn – Closed Inert Landfill Site
Landfill gas surface emission site monitoring record

WML Number: EAWML 30017

Monitoring date: 26/05/04

Report Number: HUR/1/5/04

Previous report: N/A

WEATHER CONDITIONS:

- Atmospheric pressure: 990 mbars
- Rising/falling: **FALLING**
- Temperature: 19 Degrees C
- Description:.....Wet/rain/windy/sunny/dry etc.

FEATURES:

- Side Slopes: **WELL VEGETATED**
- Fissures: **NONE OBSERVED**
- Vegetation dieback: **NONE OBSERVED**
- Ground conditions: **DRY**

MONITORING RESULTS:

Monitoring point:	Result: PPM	Monitoring point:	Result: PPM
1.	5	16.	5
2.	5	17.	5
3.	5	18.	5
4.	5	19.	5
5.	5	20.	5
6.	5	21.	5
7.	5	22.	5
8.	5	23.	5
9.	5	24.	5
10.	5	25.	5
11.	5	26.	5
12.	5	27.	5
13.	5	28.	5
14.	5	29.	5
15.	5	30.	5
Comments: NO SURFACE EMISSION LANDFILL GAS DETECTED			

Performed by:.....

Approved by:.....

Date:.....

Date:.....

Copy to EA office:.....

Date:.....

Appendix c.

Monitoring instrument information

SEM - 500
SURFACE EMISSION MONITOR
OPERATION, CONFIGURATION, AND
MAINTENANCE



**APPENDIX 8
SITE PHOTOGRAPHS**



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y - N
- SAMPLE MEDIA - WATER & GAS

DATE: 8/6/06



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y - N
- SAMPLE MEDIA - WATER & GAS

DATE: 8/6/06



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y - N
- SAMPLE MEDIA - WATER & GAS

DATE: 8/6/06



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y - N
- SAMPLE MEDIA - WATER & GAS

DATE: 8/6/06



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y - N
- SAMPLE MEDIA - WATER & GAS

- DATE: 14-9-06



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y - N
- SAMPLE MEDIA - WATER & GAS

- DATE: 14-9-06



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y - N
- SAMPLE MEDIA - WATER & GAS

- DATE: 14-9-06

CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - (X) N
- SAMPLE MEDIA - WATER & GAS

- DATE: 17-11-05



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - (Y) N
- SAMPLE MEDIA - WATER & GAS

- DATE: 17-11-05



SURE REPORT/PLAN
-Y-BRYN LANDFILL SITE

- IPLE POINT - A - B - C - D - E - 1-2-3
- PLE OBTAINED - (X) N
- PLE MEDIA - WATER & GAS

- DATE: 17-11-05



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - (Y) N
- SAMPLE MEDIA - WATER & GAS

- DATE: 17-11-05



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
 - SAMPLE POINT - A - B - C - D - E - 1-2-3
 - SAMPLE OBTAINED - Y - N
 - SAMPLE MEDIA - WATER & GAS
 - DATE: 27-9-05



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
 - SAMPLE POINT - A - B - C - D - E - 1-2-3
 - SAMPLE OBTAINED - Y - N
 - SAMPLE MEDIA - WATER & GAS
 - DATE: 27-9-05



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
 - SAMPLE POINT - A - B - C - D - E - 1-2-3
 - SAMPLE OBTAINED - Y - N
 - SAMPLE MEDIA - WATER & GAS
 - DATE: 27-9-05

CLOSURE REPORT/PLAN

AEI-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - ☒ - N
- SAMPLE MEDIA - WATER & GAS

- DATE: 26-7-05



CLOSURE REPORT/PLAN

AEI-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - ☒ - N
- SAMPLE MEDIA - WATER & GAS

- DATE: 26-7-05

CLOSURE REPORT/PLAN

AEI-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - ☒ - N
- SAMPLE MEDIA - WATER & GAS

- DATE: 26-7-05



CLOSURE REPORT/PLAN

AEI-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - ☒ - N
- SAMPLE MEDIA - WATER & GAS

- DATE: 26-7-05





CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED Y - N
- SAMPLE MEDIA - WATER & GAS
- DATE: 2-12-04



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED Y - N
- SAMPLE MEDIA - WATER & GAS
- DATE: 2-12-04



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED Y - N
- SAMPLE MEDIA - WATER & GAS
- DATE: 2-12-04



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE
- SAMPLE POINT A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED Y - N
- SAMPLE MEDIA - WATER & GAS
- DATE: 2-12-04



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A (B) C - D - E - 1-2-3
- SAMPLE OBTAINED (Y) N
- SAMPLE MEDIA - WATER & GAS

- DATE: 24-9-04

CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT (A) B - C - D - E - 1-2-3
- SAMPLE OBTAINED (Y) N
- SAMPLE MEDIA - WATER & GAS

- DATE: 24-9-04





CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y (N)
- SAMPLE MEDIA - WATER & GAS

- DATE: 30-7-04



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y (N)
- SAMPLE MEDIA - WATER & GAS

- DATE: 30-7-04



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y (N)
- SAMPLE MEDIA - WATER & GAS

- DATE: 30-7-04



CLOSURE REPORT/PLAN
AEL-Y-BRYN LANDFILL SITE

- SAMPLE POINT - A - B - C - D - E - 1-2-3
- SAMPLE OBTAINED - Y (N)
- SAMPLE MEDIA - WATER & GAS

- DATE: 30-7-04