



Ground Investigation Report (Phase 1 and 2)
A110489-4-1

Caerphilly County Borough Council
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Prepared by WYG Environment Planning Transport Limited.



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CONTENTS

EXE	CUTI	VE SUMMARY	. 1
1.	INT	RODUCTION	. 3
	1.1	Instruction	. 3
	1.2	Brief	. 3
	1.3	Report Scope	. 4
	1.4	Limitations	. 5
2.	SIT	E INFORMATION	. 6
	2.1	Location	. 6
	2.2	Site Description	. 6
3.	SIT	E SETTING	. 7
	3.1	Site Walkover	. 7
	3.2	Geology, hydrogeology and hydrology	. 7
		3.2.1 Geology	. 7
		3.2.2 Hydrogeology	. 8
		3.2.3 Hydrology	. 8
	3.3	Historical Mining	. 8
		3.3.1 Summary	. 9
	3.4	Radon	. 9
	3.5	Unexploded Ordnance	10
	3.6	Site History	10
	3.7	Preliminary Ground Contamination Risk Assessment	10
	3.8	Recommendations	11
4.	SIT	E INVESTIGATION	12
	4.1	Phase 1	12
		4.1.1 Scope	12



	4.2	Phase 2	13
		4.2.1 Scope	13
5.	GRO	OUND CONDITIONS ENCOUNTERED	15
	5.1	Strata encountered	15
		5.1.1 Topsoil	17
		5.1.2 Made Ground	17
		5.1.3 Alluvium	18
	5.2	Groundwater	19
	5.3	In Situ Testing	19
		5.3.1 Standard Penetration Testing	19
		5.3.2 Soil Infiltration Testing	19
	5.4	Visual or Olfactory Evidence of Contamination	20
	5.5	Foundations	20
6.	LAB	ORATORY TESTING	21
	6.1	Geotechnical Testing	21
	6.2	Environmental Testing	22
7.	GRO	DUNDWATER AND GAS MONITORING	24
	7.1	Groundwater Monitoring	24
	7.2	Ground Gas Monitoring	25
8.	GEC	TECHNICAL ASSESSMENT	27
	8.1	Ground Conditions	27
	8.2	Soil Properties	27
		8.2.1 Made Ground	28
		8.2.2 Shallow fine-grained alluvium	28
		8.2.3 Coarse-grained alluvium	29
		8.2.4 Fine-grained (Deeper) Alluvium	29



9.	GEO	TECHNICAL DESIGN CONSIDERATIONS	31
	9.1	Proposed Development	31
	9.2	Earthworks	31
	9.3	Foundations	31
	9.4	Floor Slabs	32
	9.5	Chemical Attack on Buried Concrete	32
	9.6	Temporary Works	32
	9.7	Pavements	33
	9.8	Drainage	33
10.	GRO	OUND CONTAMINATION ASSESSMENT – HUMAN HEALTH	34
	10.1	Introduction	34
	10.2	Assessment Criteria	34
		10.2.1Generic Assessment Criteria	34
		10.2.2Proposed End Use	35
		10.2.3Soil Organic Matter	36
		10.2.4Sampling Rationale	36
	10.3	Tier 1 – Soil Screening – General Ground Conditions	36
	10.4	Asbestos – General Ground Conditions	37
	10.5	Asbestos – Post Demolition Survey	37
11.	GRO	OUND CONTAMINATION ASSESSMENT – WIDER ENVIRONMENT	39
	11.1	Introduction	39
	11.2	Assessment Criteria	39
	11.3	Tier 1 Screening Assessment – Soil Derived Leachate	39
	11.4	Tier 1 Screening Assessment – Groundwater	41
12.	PRE	LIMINARY GROUND GAS ASSESSMENT	43
	12.1	Introduction	43
	12.2	Land Gas Risk Assessment Methodology	43



	12.3	Preliminary Ground Gas Risk Assessment	43
		12.3.1Source potential	43
		12.3.2Risk Assessment	43
	12.4	Summary and Discussion	44
13.	STTE	CONCEPTUAL MODEL AND GROUND CONTAMINATION RISK	
13.		ESSMENT	45
	13.1	Introduction	45
	13.2	Site Conceptual Model	45
		13.2.1Sources	45
		13.2.2Pathways	46
		13.2.3Receptors	46
	13.3	Ground Contamination Risk Assessment Table	47
14.	CON	CLUSIONS AND RECOMMENDATIONS	53
	14.1	Ground Contamination	53
		14.1.1Summary	53
		14.1.2Asbestos	53
		14.1.3Ground Gas	54
	14.2	Geotechnical	54
	14.3	Recommendations	54
15.	NOT	ES	56
16.	GLO	SSARY	57
	D	FRENCES	
1/.	KEF	ERENCES	58

FIGURES

Figure 1 – Site Location Plan

Figure 2 – Site Investigation Layout Plan

Figure 3 – SPT v Depth Plot

Figure 4 – Geological Sections



TABLES

Table 1 – Summary of Coal Authority Report	8
Table 2 - Summary of strata depths (m bgl) for exploratory hole (Phase 1)	15
Table 3 - Summary of strata depths (m bgl) for exploratory hole (Phase 2)	16
Table 4 – Soil Infiltration Testing Results Summary	19
Table 5 - Summary of Geotechnical Testing	21
Table 6 - Summary of environmental testing	22
Table 7- Summary of Phase 1 groundwater levels monitoring	24
Table 8- Summary of Phase 2 groundwater levels monitoring	24
Table 9 – Summary of phase 1 Ground Gas monitoring	25
Table 10 – Summary of phase 2 Ground Gas monitoring	25
Table 11 - Summary of test results within the fine-grained alluvial deposits	28
Table 12 - Summary of in-situ test results within the coarse-grained alluvial deposits	29
Table 13 - Summary of in-situ SPT N test results within the deeper fine-grained Alluvium	30
Table 14 – Summary of pH exceedances	36
Table 15 – Summary of Asbestos Quantification	37
Table 16 – Summary of Exceedances within Soil Derived Leachate Samples	40
Table 17 – M-BAT adjusted Screening Values for Heavy Metals – Soil Derived Leachate	41
Table 18 – Summary of Exceedances within groundwater samples	42
Table 19 – M-BAT adjusted Screening Values for Heavy Metals – Groundwater	42
Table 20 – Initial GSV Calculations	44
Table 21 - Ground Contamination Assessment Risk Table	48

APPENDICES

Appendix A – Report Conditions

Appendix B - Exploratory Hole Logs and photographic plates

Appendix C – Soil Infiltration Testing Results

Appendix D -TRL DCP results

Appendix E – Geotechnical laboratory test results

Appendix F – Environmental laboratory test results

Appendix G – Groundwater and Groundgas monitoring results

Appendix H – CIRIA C552 Risk Methodology



EXECUTIVE SUMMARY

The Site	The site is a the former Cwmcarn High School consisting of a single remaining building surrounded by sports fields and hardstanding areas occupying an area of approximately 5.87 hectares. It is located off Chapel Farm Terrace near the A467 in the village of Cwmcarn. The proposed development comprises the construction of a new primary school with associated parking.
Summary of DTS	The site is underlain by River Terrace Deposits in the east and Alluvium in the west. The bedrock is recorded to be the Rhonda Member composed of sandstone. The superficial deposits and bedrock are both classified as Secondary A Aquifers. The nearest watercourse is the Ebbw River located adjacent to the western boundary of the site. There are no surface water or groundwater abstractions near to the site and the site is not located within a groundwater source protection zone. A site-specific radon report for the site indicates no radon protection measures will be required for the future development. A review of historical mapping indicates the site was previously occupied by the remains of a chapel and agricultural buildings. A school was established on the site by 1962.
Site Investigation	Two site investigations (phases 1 & 2) have been undertaken on the site with the following scope of works: Phase 1: Three cable percussive boreholes to a maximum depth of 10.00mbgl. Six window sample boreholes, four machine excavated trial pits and two soakaway tests, two hand dug pits. Geotechnical and contamination laboratory testing. Phase 2: Eight cable percussive boreholes to a maximum depth of 16.45m bgl. Ten windowless sampled boreholes, 26 machine excavated trial pits, five soakaway tests, and 17 TRL DCP tests. Geotechnical and contamination laboratory testing.
Ground Conditions	The ground conditions across the site generally comprise topsoil or Made Ground over coarse grained and fine-grained alluvium. Within all but three of the deeper boreholes, and within two shallow locations, between 5.7m and 7.2m of variable strength clay and silt was encountered, from depths ranging from 2.3m to 11.2m bgl. In all locations identified, this strata was noted underlaying dense sands and gravels, and the base was marked by more dense sands and gravels.
Geotechnical Assessment	Shallow foundations, strip or pad, formed on the shallow fine-grained and coarse-grained alluvial deposits, at a minimum depth of 1m bgl, may be designed to an allowable net bearing pressure of 175kPa for strip foundations no wider than 0.7m or pads of no greater than 1m². If greater loads are required a higher bearing capacity may be achieved with foundations placed solely within coarse grained material, however this would be subject to a more detailed assessment of settlement, primarily within the underlying clay and silt. Given the instability of the alluvial soils, high groundwater, and the compressibility of the clay and silt, piled foundations may be considered a more favourable option. Floor slabs may be ground bearing.
Ground Contamination Assessment	Within the context of a human health risk assessment, no exceedances have been identified in the near surface soils within the context of the proposed development. Asbestos fibres were noted outside the proposed development. Based on the



	current development plan this is not considered a risk to end users. Made Ground is considered to pose a Low Risk to the wider environment (surface waters and groundwater).		
Ground Gas Assessment	The site is classified as Characteristic Situation 1 whereby gas protection measures are not considered necessary in new developments.		
Recommendations	 Testing and classification of any excess soils to inform reuse or disposal; Groundworkers should be informed of the nature of the historical developments on the site including the asbestos removal process and identification of a limited extent of asbestos fibres within two samples on the site. Works should be undertaken following a watching brief to identify any asbestos containing materials and outline the procedures to assess and manage any impacted soils. Preparation of a geotechnical design report to fully assess the potential for settlement once required loads and foundation type has been confirmed. 		



1. INTRODUCTION

1.1 Instruction

WYG Environment Planning Transport Ltd (WYG) was commissioned by Caerphilly County Borough Council to undertake a Ground Investigation and Interpretive Report on the site of the former Cwmcarn High School (known hereafter as "the site"), with the aim of gathering an overview of the geotechnical and geo-environmental conditions at the site.

The initial phase of works was undertaken whilst the former school buildings were still present on site, and as such, investigation locations were limited to open areas around the existing structures. Following the initial works, the school buildings were demolished following extensive asbestos removal by licenced contractors. All demolition rubble was removed from the site.

Subsequently, the proposed layout of the Cwm Gyddon Primary School was confirmed by the client, and WYG was commissioned to undertake a ground investigation specifically targeting the footprint of the proposed buildings, to gather more in depth information in areas possibly earmarked for development in the future, and to verify the ground conditions following the demolition of the former structures. The original report has been updated and re-issued as a Version 2 (V2). Data from both phases of ground investigation are included within this report.

This report should be read in conjunction with the following Desk Top Study (DTS) completed by WYG in March 2019 for the same site.

 WYG, March 2019 Cwmcarn High School. Phase 1 Geo-environmental Assessment. Desk Top Study. A110489-4. Caerphilly County Borough Council.

Key findings from the DTS have been summarised in this report for reference.

The location of the site is shown on Figure 1.

1.2 Brief

The brief was to undertake two phases of intrusive ground investigation to provide information on the ground conditions and to provide a geotechnical assessment and contaminated land risk assessment to support proposals for redevelopment.

The investigation was designed to comprise the following elements:



March 2020

Phase 1 (March 2019)

- 6 No. windowless sample boreholes to a maximum depth of 5.0m bgl with SPTs at 1m intervals to full depth;
- 3 No. cable percussive boreholes to a maximum depth of 10.0m bgl;
- 2 No. hand excavated inspection pits to expose foundations;
- 2 No. soil infiltration tests within mechanically excavated trial pits;
- Installation of 6 No. standpipes;
- On-site inspection and logging of samples;
- In-situ testing in exploratory holes;
- Chemical and geotechnical sampling in exploratory holes; and
- Laboratory geotechnical and chemical testing of soils.

Phase 2 (November 2019)

- 8 No. windowless sample boreholes to a maximum depth of 5.0m bgl with SPTs at 1m intervals to full depth;
- 6 No. cable percussive boreholes to between 10.0m and 15.0m bgl, or competent strata:
- 12 No. machine excavated pits to a maximum depth of 5.0m bgl;
- 4 No. soil infiltration tests within mechanically excavated trial pits;
- Installation of 8 No. standpipes;
- On-site inspection and logging of samples;
- In-situ testing in exploratory holes;
- Chemical and geotechnical sampling in exploratory holes; and
- Laboratory geotechnical and chemical testing of soils.

1.3 **Report Scope**

This report summarises the work undertaken during both phases of investigation and includes the following elements:

- Summary of the previous Desk Top Study undertaken by WYG in March 2019;
- Full factual records of the site works carried out (Phase 1 & 2);
- Summary of the ground conditions encountered;
- In-Situ testing results;



- Environmental laboratory testing results;
- Geotechnical laboratory testing results;
- Interpretation of Geotechnical and Environmental laboratory data, including a ground contamination risk assessment; and
- An executive summary of the report to allow a rapid, layman's overview.

1.4 Limitations

This report has been prepared in accordance with the requirements of Caerphilly County Borough Council. It is subject to the report conditions presented in Appendix A.

The information contained in this report is intended for the use of Caerphilly County Borough Council and WYG can take no responsibility for the use of this information by any third party or for uses other than that described in this report or detailed within the terms of our engagement.



2. SITE INFORMATION

2.1 Location

The site is located in Cwmcarn and is accessed via an access road (Chapel Farm Terrace) off the A467. The site is approximately 5.87ha in area and is centred on National Grid Reference (NGR) 321600, 193960.

A site location plan is presented in Figure 1.

2.2 Site Description

At the time of the Phase 1 site investigation, the site was occupied by the buildings of the former Cwmcarn High School. The former school consisted of school buildings across much of the south of the site, hard standing car parking in the south west of the site and playing fields across the majority of the northern part of the site. An all-weather sports pitch was situated in the north east of the site. The school was permanently closed in October 2018 with pupils being transferred to other schools.

Following the completion of the Phase 1 Ground Investigation, the majority of the school buildings were demolished with only the two storey performance building remaining. The all-weather pitch remained in the north east with grass sports pitches to the north and east. The footprint of the school buildings was characterised by gravel at the surface. All demolition waste had been removed from the site.

The site is generally level with a secure fence defining the site boundaries.



3. SITE SETTING

A Phase 1 Geo-environmental Desk Top Study (DTS) report has previously been prepared by WYG in March 2019. A summary of the key site information gathered as part of the DTS is presented in the following sections, however, the reader should refer to the report for full details including supporting/ referenced information.

3.1 Site Walkover

The site boundary is formed by a secure fence encompassing the entire site with pedestrian access points secured by padlocks and vehicle access secured by an electronic gate. Access to the site is via an unnamed road off Chapel Farm Terrace. At the time of the site walkover, the site was generally level with numerous school buildings and areas of hardstanding formerly used as a car parks and playing pitches. A courtyard was located adjacent to the school building which comprises a variety of low-lying shrubs and immature trees.

No visual or olfactory evidence of contamination was noted during the site walkover.

3.2 Geology, hydrogeology and hydrology

3.2.1 Geology

The DTS reviewed the anticipated geology underlying the site, based on information collated from the British Geological Survey (BGS) sheet No.249 Solid and Drift (1:50,000) and the BGS website. The geological maps show no evidence that Made Ground is present at the site. However, as the site has previously been developed, it is anticipated that deposits of Made Ground will be present below the existing school buildings and external hard standing.

Geological maps show superficial deposits on site to comprise River Terrace Deposits (sand and gravel) in the east and south and Alluvium (clay, silt, sand and gravel) in the north and west. The bedrock underlying the site is recorded as sandstone of Rhondda Member Formation which is part of the South Wales Upper Coal Measures Formation.

A review of the Coal Authority Interactive Mapper indicates that a coal outcrop encircles the site to the east west and north.



3.2.2 Hydrogeology

The Rhondda Member Sandstone is designated as a Secondary A Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The River Terrace Deposits are also designated as a Secondary A Aquifer.

3.2.3 Hydrology

The nearest watercourse is the Ebbw River which lies adjacent to the western boundary of the site flowing south.

3.3 Historical Mining

According to the Coal Authority Interactive Viewer (The Coal Authority, 2019) the site is located within a Coal Mining Reporting Area and a Development High Risk Area. As such, a site-specific Coal Authority Report has been obtained for the site and is presented in the DTS report and summarised in the table below.

Table 1 - Summary of Coal Authority Report

Feature	Details			
Past	The property is in a surface area that could be affected by underground mining in			
Underground	4 seams of coal at 70m to 90m depth, last worked in 1931. Any movement in the			
Coal Mining	ground due to coal mining activity associated with these workings should have			
	stopped by now.			
Present	The property is not within a surface area that could be affected by present			
Underground	underground mining.			
Coal Mining				
Future	The property is not in an area where the Coal Authority has received an application			
Underground	for and is currently considering whether to grant a licence to remove or work coal			
Coal Mining	by underground methods. The property is not in an area where a licence has been			
	granted to remove or otherwise work coal using underground methods. The			
	property is not in an area likely to be affected from any planned future			
	underground coal mining. However, reserves of coal exist in the local area which			
	could be worked at some time in the future. No notices have been given, under			
	Section 46 of the Coal Mining Subsidence Act 1991, stating that the land is as risk			
	of subsidence.			
Mine Entries	There are no known coal mine entries within, or within 20m of the boundary of			
	the property. There may however be mine entries/additional mine entries in the			
	local area which the Coal Authority has no knowledge of.			



Feature	Details			
Coal Mining	The Coal Authority is not aware of any damage due to geological faults or other			
Geology	lines of weakness that have been affected by coal mining.			
Past Opencast	The property is not within the boundary of an opencast site from which coal has			
Coal Mining	been removed by opencast methods.			
Present	The property does not lie within 200m of the boundary of an opencast site from			
Opencast Coal	which coal is being removed by opencast methods.			
Mining				
Future	There are no licence requests outstanding to remove coal by opencast methods			
Opencast Coal	within 800m of the boundary. The property is not within 800m of the boundary of			
Mining	an opencast site for which a licence to remove coal by opencast methods has been granted.			
Coal Mining The Coal Authority has not received a damage notice or claim for the				
Subsidence	property, or any property within 50m of the enquiry boundary, since 31st Octo			
	1994. There is no current Stop Notice delaying the start of remedial works or			
	repairs to the property. The Coal Authority is not aware of any request hav			
	been made to carry out preventive works before coal is worked under Section 33			
	of the Coal Mining Subsidence Act 1991.			
Mine Gas	The Coal Authority has no record of a mine gas emission requiring action.			
Hazards related	The property has not been subject to remedial works, by or on behalf of the			
to coal mining	Coal Authority, under its Emergency Surface Hazard Call Out procedures.			
Withdrawal of	The property is in an area where a notice to withdraw support was given in			
Support	1945. The property is not in an area where a notice has been given under			
	Section 41 of the Coal Industry Act 1994, cancelling the entitlement to withdraw			
	support.			

3.3.1 Summary

Based on the information presented above, the depth to recorded coal mine workings indicate that there is sufficient overlying bedrock, whereby in the event of the collapse of mine workings, the instability should not propagate to the surface.

3.4 Radon

The Envirocheck Report presented in the DTS report states that the site is in a low probability radon area as less than 1% of homes are estimated to be at or above the action level. However, consultation with the Public Health England online Radon UK Map showed around two-thirds of the site to fall within a grid square where there is a maximum Radon potential of 5-10% (requiring 'Basic' protection measures) and one-third of the site to fall within a grid square with a maximum Radon potential of 1% (not requiring protection measures). The BRE document 211 (Scivyer, 2015) mapping coverage for the site area was consulted and similarly indicated that the site is located



near the border of two areas where radon protection measures are, and are not, required for new developments. As such, a site-specific radon report was obtained from the BGS to clarify the site's Radon classification. The report ref. no. GR_220243/1 is presented in the DTS report and confirms that no radon protection measures will be required for new developments on the site.

3.5 Unexploded Ordnance

Based on freely available mapping data from Zetica UXO (Zetica UXO, 2008), the site is located within a Low Risk Area with regards to Unexploded Ordnance (UXO).

3.6 Site History

The earliest available mapping (1880s) records the site as being occupied by the remnants of a former chapel, Chapel Farm buildings and agricultural land. The surrounding land consisted of mainly forest with industrial usage to the north comprising a quarry (possibly associated with the Prince of Wales Colliery) and a tin plate factory accessed by the Western Valleys railway line. Through the early 1900s, residential development took place to the south in Cwmcarn. Chapel Farm was demolished, and a school was established on the site by 1962. Potentially contaminative refuse tips were located both on-site and nearby in the 1960s, although these are limited in size. Commercial development continued to the north with the building of an office and several factories by 1973. An electricity substation associated with the TA barracks was built adjacent to the southern boundary at this time. The school complex was expanded with additional sports / leisure facilities in the 1980's. By the early 2000s the site was in its current configuration with the area to the north established as an industrial estate.

3.7 Preliminary Ground Contamination Risk Assessment

The information in the DTS report was collated and evaluated to establish an initial qualitative risk assessment for the site. A conceptual model of the site was generated based on information derived from the Phase 1 Geo-environmental Assessment, supplemented by information attained during the WYG site walkover. The following potential pollutant linkages were identified:

- General contamination associated with Made Ground and re-worked materials on site with the potential to impact human health and environmental receptors;
- Potential for ACM in surface soils due to asbestos containing materials having been identified



within the school buildings; and

- Contamination associated with historical tip on site with the potential to impact human health and environmental receptors;
- Ground gas generation from on-site Made Ground, historical refuse tip and infilled ground and adjacent former refuse tip and quarry.

3.8 Recommendations

Based on the information within the DTS, ground investigation was recommended to facilitate the following:

- Investigation, logging and sampling of general ground conditions (superficial deposits and Made Ground soils) to assess the variability of soils and assess the depth to competent strata and/ or bedrock;
- Installation of land gas and groundwater monitoring wells;
- Geotechnical testing of soils (in situ and laboratory);
- Chemical laboratory testing of soils, soil derived leachate and groundwater chemistry for a range of contaminants including heavy metals, polycyclic aromatic hydrocarbons (PAHs), speciated hydrocarbons and PCBs;
- Return visits to monitor land gas (in line with CIRIA 665 guidance) and groundwater;
- An interpretive land quality assessment including development of a refined conceptual site model (based on site specific data) and a qualitative risk assessment (compliant with UK CLR guidance and CIRIA 552 methodology) within the context of a residential land use scenario;
- An interpretive geotechnical assessment of ground properties with respect to the proposed development of the site, including assessment of likely solutions for foundations, floor slabs and hard surface areas, feasibility of soakaway drainage, sulphate chemical attack and other salient matters such as potential requirements for ground stabilisation.



4. SITE INVESTIGATION

4.1 Phase 1

The Phase 1 site investigation was undertaken on the 25th March and the 28th of March to the 4th of April 2019. Three groundwater and ground gas monitoring visits were undertaken between 2nd and 16th of April 2019.

Details of the fieldwork methods are given in the notes section at the end of this report.

4.1.1 Scope

The scope of the site investigation included the following:

- Seven windowless sample boreholes (designated WS01, WS02, WS03, WS04, WS05, WS05A and WS06) to depths ranging from 1.7m to 3.0m bgl, with SPTs conducted at 1m intervals throughout;
- Four cable percussive boreholes (BH01-BH03 and BH03A) to depths ranging from 1.6m to 10.0m bgl;
- Six machine excavated trial pits designated TP01-TP04, SA01 and SA02 to a maximum depth of 2.2m bgl;
- Two soil infiltration tests undertaken within SA01 and SA02;
- Two hand excavated trial pits dug to a depth of 1.2m bgl designated HP01 and HP02;
- Installation of seven ground gas and groundwater monitoring wells;
- On-site inspection and logging of recovered samples;
- Representative soil samples taken and submitted for geotechnical classification testing;
- Representative soil samples submitted and tested for a suite of potential contaminants.
- Three return ground water and ground gas monitoring visits, including the collection of groundwater samples from five boreholes.



4.2 Phase 2

Following the completion of the initial ground investigation and demolition of the buildings, the proposed layout of the Cwm Gyddon Primary School was confirmed. WYG was commissioned to undertake a ground investigation specifically targeting the footprint of the proposed buildings, to gather more in-depth information in areas possibly earmarked for development in the future, and to verify the ground conditions following the demolition of the former structures.

The Phase 2 ground investigation was undertaken from 26th November to 20th December 2019 and three groundwater and ground gas monitoring visits between 13th December 2019 and 14th January 2020.

4.2.1 Scope

The scope of the site investigation included the following:

- Ten windowless sample boreholes (designated WS101, WS102, WS103, WS104, WS104A, WS105, WS106, WS107, WS107A, and WS108) to depths ranging from 1.36m to 4.61m bgl, with SPTs conducted at 1m intervals throughout;
- Eight cable percussive boreholes (BH101, BH101A, BH102, BH103, BH104, BH104A BH105, and BH106) to depths ranging from 2.0m to 16.45m bgl;
- Fourteen machine excavated trial pits designated TP101 to TP108 (including TP105A & TP107A) and SA101 to SA104 to a maximum depth of 3.1m bgl;
- Twelve shallow machine excavated trial pits designated S1 to S12;
- Five soil infiltration tests undertaken within SA101, SA102, SA103, SA104 and TP103;
- Seventeen transport research lab dynamic cone penetrometer (TRL DCP) tests;
- Installation of eight ground gas and groundwater monitoring wells;
- On-site inspection and logging of recovered samples;
- Representative soil samples taken and submitted for geotechnical classification testing;
- · Representative soil samples submitted and tested for a suite of potential contaminants;
- · Three return ground water and ground gas monitoring visits, including the collection of



groundwater samples from two boreholes.

Figure 2 shows the layout of the exploratory holes advanced during the site investigation. Exploratory hole logs including photographic plates are presented in Appendix B.



5. GROUND CONDITIONS ENCOUNTERED

5.1 Strata encountered

The sequence of strata encountered beneath the site was;

- Topsoil;
- Made Ground;
- Fine grained and coarse-grained alluvial deposits.

It is noted that due to the complex sequence of the superficial deposits, they have been described by the generalised term of alluvium (encompassing clay, silt, sand, and gravel) and split into fine and coarse grained for the purposes of this report.

A summary of each stratum depth is provided in Table 2 (Phase 1) and Table 3 (Phase 2) below, with descriptions of each stratum detailed in the subsequent sections. Exploratory hole logs including photographic plates can also be seen in Appendix B.

Table 2 - Summary of strata depths (m bgl) for exploratory hole (Phase 1)

	Depth to base of strata (m bgl)			
Location	T 1	Made	Alluvium	
	Topsoil	Ground	Fine grained	Coarse grained
BH01	0.0-0.3	ne	ne	0.3-10.0*
BH02	0.0-0.3	ne	ne	0.3-4.8*
BH03	0.0-0.3	ne	ne	0.0-1.6*
BH03A	0.0-0.3	ne	2.7-10.0*	0.3-2.7
HP01	0.0-0.2	0.2-0.4	ne	0.4-0.8
HP02	ne	0.0-0.1	0.1-0.45*	ne
SA01	0.0-0.3	ne	ne	0.3-1.2*
SA02	0.0-0.3	ne	ne	0.3-1.1*
TP01A	0.0-0.2	ne	ne	0.2-2.0*
TP02	0.0-0.3	ne	ne	0.3-2.2*
TP03	0.0-0.4	ne	0.9-1.7*	0.4-0.9
TP04	ne	0.0-0.4	0.4-1.2	1.2-1.9*
WS01	0.0-0.3	ne	0.3-1.0	1.0-1.3*
WS02	0.0-0.45	ne	0.45-1.0	1.0-1.7*
WS03	0.0-0.45	ne	0.45-1.0	1.0-1.7*
WS04	ne	ne	0.3-0.6	0.6-2.1*
WS05	ne	ne	ne	1.2-2.5*
WS05A	0.0-0.6	ne	0.6-1.1	1.1-2.9*
WS06	ne	0.0-1.4	1.4-2.15*	ne

^{*}Base of stratum not proven 'ne' denotes not encountered



Table 3 - Summary of strata depths (m bgl) for exploratory hole (Phase 2)

	Depth to base of strata (m bgl)			
Location	Made		Alluvium	
	Topsoil	Ground	Fine grained	Coarse grained
BH101	0.0-0.3	ne	ne	0.3-2.0*
			0.3-0.8	0.8-3.2
BH101A	0.0-0.3	ne	3.2-11.2	11.2-16.45*
			2.9-9.5	0.3-2.9
BH102	0.0-0.3	ne		9.5-15.45*
D114.00	0.0.0.0	ne	3.0-4.5	0.3-3.0
BH103	0.0-0.3			4.5-10.45*
BH104	0.0-0.3	ne	ne	0.2-2.0*
DUIDAA	0.0.0.2	ne	3.8-9.5	0.3-3.8
BH104A	0.0-0.3			9.5-10.45*
BH105	ne	0.0-0.9	ne	0.9-6.95*
BH106	ne	0.0-0.4	2.9-9.1	0.4-2.4
DITIOU				9.1-10.15*
S1	ne	0.0-0.5*	ne	ne
S2	ne	0.0-0.2	ne	0.2-0.6*
S3	ne	0.0-0.5	0.5-0.7*	ne
S4	ne	0.0-0.2	0.2-0.6*	ne
S5	0.0-0.5	ne	0.4-0.8*	ne
S6	ne	0.0-0.2	0.2-0.6*	ne
S7	ne	0.0-0.3	0.3-0.6*	ne
S8	ne	0.0-0.8*	ne	ne
S9	ne	ne	ne	0.0-0.5*
S10	ne	0.0-0.3	0.3-0.6*	ne
S11	ne	00.0-0.05	0.05-0.5*	ne
S12	ne	0.0-0.5*	ne	ne
SA101	ne	0.0-0.1	0.1-1.1*	ne
SA102	0.0-0.5	ne	0.5-1.2*	ne
SA103	ne	0.0-0.9	0.9-1.9	1.9-2.6*
SA104	ne	0.0-0.4	0.3-1.2	1.2-2.6*
TP101	0.0-0.2	ne	2.3-2.9*	0.2-2.3
TP102	0.0-0.3	ne	0.3-1.1	1.1-2.2*
TP103	0.0-0.2	ne	0.2-0.7	0.7-1.9*
TP104	ne	0.0-0.9	0.9-1.3	1.3-2.9*
TP105	ne	0.0-0.4*	ne	ne
TP105A	ne	0.0-0.5	ne	0.5-1.6*
TP106	ne	0.0-0.2	ne	0.2-1.8*
TP107	ne	0.0-0.5*	ne	ne
TP107A	ne	0.0-3.1*	ne	ne
TP108	ne	0.0-0.4	0.4-0.9	0.9-2.6*
WS101	0.0-0.3	ne	0.3-0.7	0.7-2.45*
WS102	0.0-0.3	ne	0.3-1.0 2.9-4.61*	1.0-2.9
WS103	0.0-0.1	ne	ne	0.3-2.0*



	Depth to base of strata (m bgl)						
Location	Toncoil	Made	Alluvium				
	Topsoil	Ground	Fine grained	Coarse grained			
WS104	0.0-0.3	ne	ne	0.3-2.0*			
WS104A	0.0-0.3	ne	ne	0.3-1.61*			
WS105	ne	ne	ne	0.0-2.31*			
WS106	ne	0.0-0.7	ne	0.7-1.36*			
WS107	0.0-0.3	ne	0.3-1.86*	ne			
WS107A	0.0-0.3	ne	0.3-2.14	ne			
WS108	0.0-0.3	ne	0.3-1.2 1.45-1.7	1.2-2.06*			

*Base of stratum not proven ne denotes not encountered

5.1.1 Topsoil

Topsoil was encountered within 32 of the 63 exploratory holes (see above tables) to depths ranging from 0.1m bgl to 0.6m bgl. It was generally described as dark brown to brown gravelly to very gravelly sandy to very sandy organic clay/silt with frequent rootlets.

5.1.2 Made Ground

Made Ground was encountered within 30 locations, generally from ground level to between 0.1m and 3.1m bgl. Made Ground was found underlying topsoil within HP01. Spatially, Made Ground was only encountered within the area of the former school and parking in the south, and in the area of the former all-weather pitch. None was recorded within the grass pitch areas in the north.

The Made Ground generally consisted of a subbase type limestone gravel, or natural sands, gravels and clays mixed with anthropogenic materials such as limestone and brick with occasional/rare plastic, asphalt, glass, slag and metal. Boulders and cobbles of sandstone and limestone were sporadically noted.

Some exceptions include:

- Pink sand encountered within SA101, used as the surfacing of the all-weather pitch;
- Black ashy gravel/sand encountered in SA101, S7, TP105, and TP105A; and
- A reworked topsoil type material with gravel and cobbles of brick, limestone, sandstone and rare metal within TP108.

Aside from the aforementioned ashy material no visual or olfactory evidence of contamination was noted.



Please see exploratory hole logs in Appendix B for full descriptions of each position.

5.1.3 Alluvium

As previously noted, due to the complex stratigraphy of the superficial deposits underlying the site, the soils have been classified under the general term of alluvium and divided by the grain size and depth encountered.

The general organisation of the alluvial deposits is outlined below and clearly displayed in figures 4a and 4b.

- Shallow clays overlying;
- Sands and gravels overlying;
- · Silts and clays overlying;
- Sands and gravels.

The silts and clays were not always encountered; sand and gravel being noted throughout the boreholes within BH01, BH02, and BH105.

Shallow fine-grained alluvium

Clays and silts were variable in depth and thicknesses. Shallow, soft to firm, sandy, gravelly clay was noted within 30 exploratory location from a top depth ranging from 0.05m to 1.45m bgl, to a base depth ranging from 0.45m to 2.15m bgl. This stratum ranged in thickness from 0.2m to 1.0m; averagely 0.6m. In terms of spatial distribution, the clay is present across the site.

Coarse-grained alluvium

Underlying the topsoil, Made Ground, and shallow clays, medium dense to dense sands and gravels were encountered. These materials included sub-rounded mixed gravels, cobbles and boulders. In the majority of locations, the base of this strata was not proven and was encountered to a maximum depth of 16.45mbgl within BH101A.

Fine-grained alluvium (silts and clays)

Within the majority of deeper boreholes, and two shallower locations (TP101 and WS102), low to high strength grey sandy silt/ silty clay was encountered from a minimum depth ranging from 2.3m to 3.8m bgl to a maximum depth ranging from 2.9m to 11.2m bgl. The full depth was not proven within BH03A, TP101 and WS102.



The depth of coarse-grained materials was not proven within the majority of trial pits and windowless sampled boreholes, and as such the silts and clays may extend further south and east than the logs indicate.

5.2 Groundwater

A continuous groundwater body was not identified across the site during the site investigation. Localised groundwater strikes were encountered in the superficial deposits in 30 locations at depths ranging from 0.40m (seepage) to 6.0m bgl (averagely 1.8m bgl).

5.3 In Situ Testing

5.3.1 Standard Penetration Testing

Standard Penetration Tests (SPTs) were undertaken throughout all window sample positions at approximately 1.0m intervals. SPTs were undertaken within all the cable percussive boreholes at 1.0m intervals within the top 5.00m and at every 1.5m below 5.00mbgl. The results are presented in the exploratory hole logs included in Appendix B.

5.3.2 Soil Infiltration Testing

A total of seven soil infiltration tests were carried out, designated as SA01, SA02, and SA101-105. The tests were undertaken within the shallow fine-grained alluvial deposits and the coarse-grained alluvial deposits. The results of these tests can be found in Appendix C and are summarised in Table 4 below.

It should be noted that the tests presented as part of the Phase 1 ground investigation were undertaken prior to the adoption of procedures in line with the new SAB regulations. As such these tests were terminated prior to a 24-hour test being completed. Tests undertaken during Phase 2 were continued for a minimum of 24 hours.

Table 4 – Soil Infiltration Testing Results Summary

Location Depth Strata		Hydraulic Conductivity (m/sec)				
Location	Depth	Strata	Test 1	Test 2	Test 3	
SA01	1.2	Coarse grained alluvium	5.09x10 ⁻⁵	4.75x10 ⁻⁵	Fail – did not reach 25% effective depth	
SA02	1.1	Coarse grained alluvium	Fail – did not reach 75% effective depth	-	-	



Location	Donth	Strata	Hydraulic Conductivity (m/sec)				
Location	Depth	Strata	Test 1	Test 2	Test 3		
SA101	0.6	Fine grained alluvium	3.36x10 ⁻⁶	4.99x10 ⁻⁶	5.03x10 ⁻⁶		
SA102	0.6	Fine grained 3.61x10 ⁻⁶		1.48x10 ⁻⁶	1.36x10 ⁻⁶		
CA102	1.6	Fine grained alluvium	Fail – did not reach 25% effective depth	-	-		
SA103	1.35	Fine grained alluvium	3.71x10 ⁻⁵	6.06x10 ⁻⁶	2.01x10 ⁻⁵		
SA104	1.1	Fine grained alluvium	8.95x10 ⁻⁵	8.39x10 ⁻⁵	6.42x10 ⁻⁵		
SA105	0.9	Coarse grained alluvium	1.27x10 ⁻³	6.58x10 ⁻⁴	4.07x10 ⁻⁴		

5.4 Visual or Olfactory Evidence of Contamination

During the site investigation no significant visual or olfactory signs of contamination were identified. However, components of Made Ground, outlined above included the presence of coal, clinker, slag, metal, fabric membrane and compacted gravel hardstanding. Extensive areas of asphalt hardstanding are present on site, the front carpark in the south of the site and an access road running through the site.

5.5 Foundations

Foundations to an existing performing arts building were exposed during Phase 1 by the excavation of two hand pits (HP01 and HP02). It is proposed that the existing two storey performing arts block is retained and utilisation within the proposed development.

No other in ground obstructions were noted during the ground investigation.



6. LABORATORY TESTING

6.1 Geotechnical Testing

A programme of laboratory testing was carried out on samples taken from the various strata encountered during the site investigation. Geotechnical testing was scheduled by WYG and carried out by GSTL Ltd, an approved supplier in accordance with the requirements of WYG quality system and UKAS accredited for a range of geotechnical tests. The test procedures used were generally in accordance with the methods described in BS1377:1990. Details of the specific tests used in each case are given in Table 5. Laboratory geotechnical test results are given in Appendix E.

Table 5 - Summary of Geotechnical Testing

Test	No.	Test Method
Phase 1		
Moisture Content	9	BS1377:1990 Part 2:3.2
4 Point Liquid & Plastic Limit	9	BS1377:1990
4 Forme Enquire & Flastic Entite	,	Part 2:4.3&5.3
PSD: Wet Sieve method	19	BS1377:1990 Part 2:9.2
PSD: Sedimentation by Pipette	7	BS1377:1990 Part 2:9.4
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould)	12	BS1377:1990 Part 4 3.3
BRE Reduced Suite: pH, Acid Soluble		BS1377:1990 Part 3 &
Sulphate, Water Soluble Sulphate and	19	BRE CP2/79 (non-
Total Sulphur		accredited test)
Phase 2		
Moisture Content	8	BS1377:1990 Part 2:3.2
4 Point Liquid & Plastic Limit	8	BS1377:1990
·		Part 2:4.3&5.3
PSD: Wet Sieve method	13	BS1377:1990 Part 2:9.2
PSD: Sedimentation by Pipette	8	BS1377:1990 Part 2:9.4
One-dimensional Consolidation	6	BS1377:1990 5/3
Quick Undrained Triaxial Compression	2	BS1377:1990 7/9
Test - Multi-stage	2	
BRE Reduced Suite: pH, Acid Soluble		BS1377:1990 Part 3 &
Sulphate, Water Soluble Sulphate and	5	BRE CP2/79 (non-
Total Sulphur		accredited test)



6.2 Environmental Testing

Environmental chemistry was investigated by specialist chemical analysis of selected soil samples carried out by ALS Environmental Laboratories, an approved supplier in accordance with the requirements of WYG quality system and UKAS and MCERTS accredited for a range of chemical analyses. The testing was scheduled by WYG and is summarised in Table 6 for soil samples. The test results are included in Appendix F.

Table 6 - Summary of environmental testing

	N	0.
Test suite	Phase 1	Phase 2
Soil Samples:		
WYG Suite C		
 Heavy metals including Chromium (Hexavalent), Boron (water soluble), Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Vanadium and Zinc; 		
 Inorganics – including pH, Water soluble Sulphate as SO₄ (2:1 Extract), Cyanide (Easily liberatable- low level); 	10	18
 Speciated Petroleum Hydrocarbons (TPH CWG); 		
 Speciated Polyaromatic Hydrocarbons (USEPA 16); 		
BTEX and MTBE;		
Asbestos Screen; and,		
Phenol.		
Asbestos Screening	-	11
Soil Derived Leachate Samples and Groundwater Suites		
WYG Leachate Suite C		
 Heavy metals including Antimony, Boron, Arsenic, Beryllium, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium and Zinc; 	4 (soil derived leachates)	7 (soil derived leachates)
 Inorganics – including pH, Sulphate, Chloride, Nitrite, Nitrate, Total Cyanide, Ammoniacal Nitrogen and NH₃ and NH₄ and Total Alkalinity 	5 (groundwater samples)	2 (groundwater samples)
 Speciated Petroleum Hydrocarbons (TPH CWG); 		
 Speciated Polyaromatic Hydrocarbons (USEPA 16); 		



Took quite	No.		
Test suite	Phase 1	Phase 2	
BTEX and MTBE;			
Phenol.			



7. GROUNDWATER AND GAS MONITORING

7.1 Groundwater Monitoring

Groundwater levels were monitored on three occasions following the Phase 1 investigation, between 2nd and 16th April 2019. Groundwater levels were also recorded three times following the Phase 2 works between 13th December 2019 and 14th January 2020. The monitoring data is presented in Appendix G and summarised in Table 7 below.

It should be noted that groundwater level information was not obtained from the Phase 1 boreholes within the Phase 2 works due to the loss of installations during the demolition works on the site.

Table 7- Summary of Phase 1 groundwater levels monitoring

Location	Base of borehole	Depth to water (m bgl)				
Location	(m bgl)	2 nd April	8 th April	16 th April		
BH01	6.70	nr	1.10	1.33		
BH02	4.85	0.95	0.65	0.87		
BH03A	6.54	nr	1.22	1.38		
WS01	1.60	DRY	1.45	1.53		
WS02	1.27	DRY	0.94	1.18		
WS03	1.55	1.50	1.17	1.45		
WS05	2.30	Dry	Dry	Dry		

Table 8- Summary of Phase 2 groundwater levels monitoring

Location	Base of borehole	Depth to water (m bgl)				
Location	(m bgl)	13/12/2019	16/12/2019	16 th April		
WS101	2.0	1.78	1.84	1.8		
WS102	2.0	1.59	1.85	1.8		
WS105	2.0	1.67	1.70	1.7		
WS107	1.6	1.59	1.61	1.6		
WS108	1.8	Dry	Dry	Dry		
BH101A	7.0	1.97	4.06	nr		
BH104	4.0	nr	nr	1.9		
BH105	4.5	nr	nr	0.5		

^{*}nr denotes not recorded.



7.2 Ground Gas Monitoring

Ground gas levels were monitored on three occasions following Phase 1 between 2^{nd} and 16^{th} April. The monitoring data is presented in Appendix G.

Table 9 - Summary of phase 1 Ground Gas monitoring

Location	Max. Methane (peak) (% vol)	Max. Carbon Dioxide (peak) (% vol)	Min. Oxygen (steady) (% vol)	Max. Carbon Monoxide (steady) (ppm)	Max. Hydrogen Sulphide (steady) (ppm)	Max. Borehole flow (peak) (I/h)
BH01	<0.1	1.00	15.10	2	<1	-1.50
BH02	<0.1	0.90	20.50	2	<1	-1.20
BH03A	<0.1	2.10	16.40	<1	<1	0.30
WS01	<0.1	2.00	18.20	1	<1	0.40
WS02	<0.1	1.20	20.20	<1	<1	0.20
WS03	<0.1	4.00	17.40	<1	<1	0.30
WS05	<0.1	0.70	21.90	<1	<1	0.50

Ground gas levels were also monitored on three occasions following Phase 2 between 13^{th} November 2019 and 14^{th} January 2020. This is summarised in the below table. It is noted the Phase 1 wells were not located and therefore not monitored during this round.

Table 10 - Summary of phase 2 Ground Gas monitoring

Location	Max. Methane (peak) (% vol)	Max. Carbon Dioxide (peak) (% vol)	Min. Oxygen (steady) (% vol)	Max. Carbon Monoxide (steady) (ppm)	Max. Hydrogen Sulphide (steady) (ppm)	Max. Borehole flow (peak) (I/h)
WS101	0.2	1.8	19.5	<1	<1	0.1
WS102	0.2	2.0	1.5	<1	<1	0.2
WS105	0.2	1.3	18.8	<1	<1	0.2
WS107	0.2	3.0	18.2	<1	<1	0.1
WS108	0.2	1.8	19.2	<1	<1	0.1
BH101A	0.1	0.2	20.7	<1	<1	0.1
BH104	0.2	1.7	20.2	<1	<1	0.1
BH105	0.2	1.6	20.0	<1	<1	0.1

The results indicate measurable concentrations of carbon dioxide (maximum of 4.0%/vol) and methane (maximum 0.2%/vol).

The maximum gas flow recorded across the monitoring round was a flow of -1.50 l/hr, recorded at BH01. The highest positive gas flow was 0.5l/hr recorded in WS05.



The monitoring rounds were undertaken during atmospheric pressure conditions ranging from 975mb to 1007mb. A review of atmospheric pressure graphs on weatheronline.co.uk indicates that monitoring was undertaken during periods of raising, falling and steady pressure.

In addition, the ground gas monitoring results indicate hydrogen sulphide concentrations of <1ppm across all monitoring rounds. Maximum concentrations of carbon monoxide of 2ppm were recorded.



8. GEOTECHNICAL ASSESSMENT

8.1 Ground Conditions

The ground conditions across the site generally comprise topsoil or Made Ground over coarse grained and fine-grained alluvium.

Made Ground was identified in the centre and east of the site in the footprint of the recently demolished school. The thickness and composition of the Made Ground in part reflects the use of the site and includes predominantly compacted gravel hardstanding and areas of asphalt hardstanding. Within TP107A, 3.1m of sub-base type gravel was noted, the base was not proven.

A thin layer of firm sandy gravelly clay was generally encountered at shallow depths underlying the topsoil/Made Ground.

The coarse-grained alluvial deposits generally recorded medium dense to dense sands and gravels with cobbles and boulders and was encountered across the site to a maximum depth of 16.45m bgl.

Within all but three of the deeper boreholes, and within two shallow locations, and from depths ranging from 2.3m to 11.2m bgl, variable strength clay and silt was encountered, this stratum was noted underlaying dense sands and gravels, and the base was marked by more dense sands and gravels.

The depth of the coarse-grained alluvial deposits was often not proven. Based on the locations where silts and clay were encountered it is considered likely to underlie the majority of the site.

8.2 Soil Properties

The ranges of the various soil properties measured are discussed below, to aid in the selection of design values. However, the appropriate choice of characteristic and design values will depend on the particular analysis and design philosophy used and should be selected by the designer.

Where characteristic values are given, these are reasonably conservative estimates of a measured or assessed property that may be used to represent the overall behaviour of the material. Design values are similar but also take into account the ground-structure interaction for a given structure so need to be selected by the designer. It is recommended, however, that design values used do



not exceed the characteristic values given in this report.

8.2.1 Made Ground

The Made Ground comprises both fine and coarse-grained soils, although the fine-grained soils typically have a high coarse-grained content. The deepest area of Made Ground encountered is in TP107a to 3.1m bgl. Given its shallow depth and variability it is not considered appropriate to give geotechnical parameters for this stratum.

8.2.2 Shallow fine-grained alluvium

Shallow fine-grained deposits were identified within 30 positions immediately below the Made Ground/topsoil and varied in thickness between 0.2m and 1.0m. A summary is presented in the table below.

Table 11 - Summary of test results within the fine-grained alluvial deposits

	No. of results	Range (min-max)	Average	Lower quartile	Upper quartile	Charact- eristic value ⁺	
Natural moisture content	1	40	-	-	-	40	
(m - %)							
Liquid limit (LL)	1	40	-	-	-	40	
Plastic limit (PL)	1	32	-	-	-	32	
Plasticity index (PI)	1	8	-	-	-	8	
Modified Plasticity Index ¹	1	7	-	-	-	7	
SPT N Values	6	16-50	36	ı	-	16	
Undrained shear strength (kPa):							
- from SPT N values ²	6	110-225	162	1	-	110	
- from hand vanes	1	112	112	-	-	112	

Notes:

Based on the above, it is recommended that the following values are taken as design/characteristic values for this material:

0	Undrained shear strength	110kPa
0	SPT N Value	16
0	Angle of shearing resistance, φ	32°

⁺ suggested characteristic values are appropriate for most normal applications but designers should satisfy themselves that they are suitable for the specific application and design method they are using;

^{*} Estimated from a correlation from Peck, Hansen and Thornburn, Foundation Engineering, Wiley, 2nd ed., (1974)⁽⁶⁾

¹ Modified Plasticity Index (I'P) is defined as: I'P = (PI x %passing 425um)/100%;

² Estimated from a correlation by Stroud and Butler (1975)⁽⁴⁾



8.2.3 Coarse-grained alluvium

Coarse grained alluvial deposits have been encountered across the site, and descriptions confirmed by PSD testing. A summary of the in-situ SPT N values can be seen in Table 12 below. A plot of SPN values with depth is also presented as figure 3.

Table 12 - Summary of in-situ test results within the coarse-grained alluvial deposits

	No of Results	Range (min-max)	Average	Lower quartile	Upper quartile	Characteristic value ⁺
SPT N Values	83	0 - 57	37	28	50	28
φ (°)*		27-43	38	35	41	36

Notes:

Based on the above, it is recommended that the following values are taken as design/characteristic values for this material:

0	SPT N Value	28
0	Angle of shearing resistance, φ	36°

Twelve representative samples of the coarse-grained alluvial deposits were selected for compaction tests. These indicated an optimum moisture content of 6-15% (average of 12%) with corresponding maximum dry densities ranging between 1.67 and 2.03 Mg/m³ (average 1.83 Mg/m³. Initial moisture contents ranged between 3.7% and 14% above optimum (average 9.6%) and reflects the high groundwater table encountered beneath the site.

8.2.4 Fine-grained (Deeper) Alluvium

Deeper fine-grained alluvial deposits were encountered in all but three of the exploratory locations. The alluvium was encountered between 2.3m and 11.2m bgl and generally comprised grey silt and clay. A summary of the in-situ SPT N values and other relevant parameters from the Alluvium are presented in Table 13 below and in figure 3.

⁺ suggested characteristic values are appropriate for most normal applications but designers should satisfy themselves that they are suitable for the specific application and design method they are using;

^{*} Estimated from a correlation from Peck, Hansen and Thornburn, Foundation Engineering, Wiley, 2nd ed., (1974)(6)



Table 13 - Summary of in-situ SPT N test results within the deeper fine-grained Alluvium

			Range (min-max)	Average	Lower quartile	Upper quartile	Charact- eristic value ⁺
Natural moisture conto (m - %)	ent	7	21-27	24	22	27	24
Liquid limit (LL)		7	26-72	61	51	76	61
Plastic limit(PL)		7	21-31	27	24	31	27
Plasticity index (PI)		7	5-49	34	26	49	49
Modified Plasticity Ind	7	5-48	32	21	48	48	
SPT N Values		24	4-50	14	10	15	10
Angle of shearing resis	stance, φ'*	24	28-41	31	20	32	31
Undrained shear stren	gth (kPa):						
- from SPT N values ²		24	17-210	59	41	64	59
- from lab multistage	triaxial tests	6	27-126	65	34	84	64
- from Liquidity Index	7	40-299	145	73	196	73	
Consolidation properti							
- from oedometer mv (m²/MN)		8	0.10-0.91	0.32	0.185	0.365	0.32
test	cv (m²/yr)	8	6.3-15	11.3	8.8	14.3	11.3

Notes:

- + suggested characteristic values are appropriate for most normal applications but designers should satisfy themselves that they are suitable for the specific application and design method they are using;
- * Estimated from a correlation from Peck, Hansen and Thornburn, Foundation Engineering, Wiley, 2nd ed., (1974)(6)
- ^ values of mv and cv are quoted for pressure ranges appropriate to the depth of material and probable additional pressures following development, and designers should check the detailed test results to satisfy themselves that these values are relevant to their specific design requirements;
- Modified Plasticity Index (I'P) is defined as: $I'P = (PI \times \%passing 425um)/100\%$;
- 2 Estimated from a correlation by Stroud and Butler (1975)⁽⁴⁾
- estimated assuming c = 102(1-LI), based on a correlation by Skempton and Northey (1952)⁽⁵⁾;

Based on the above, it is recommended that the following values are taken as design/characteristic values for this material:

SPT N Value 14
 Angle of shearing resistance, φ' 31°
 Undrained shear strength, cu 59kPa
 coefficient of volume compressibility, mv 0.20m²/MN



9. GEOTECHNICAL DESIGN CONSIDERATIONS

9.1 Proposed Development

The proposed development plan is presented on Figure 2 and comprises a single-story primary school located in the centre-north of the site with surrounding hardstanding and car parking. A hardstanding car park proposed in the centre south.

It is understood the two-storey performing arts block is to be retained.

9.2 Earthworks

Given the current levels of the site, significant earthworks (cut and fill) is not anticipated at this stage. Site won coarse grained alluvial deposits are likely to be considerably wet of optimum moisture content due in part to the high groundwater table and require drying out before re-use.

9.3 Foundations

Within the area of the proposed building topsoil was encountered overlying shallow fine-grained and coarse-grained alluvium. Underlying the coarse-grained material, variable strength silt/clay was encountered ranging from 2.3m to 11.3m overlying medium dense to dense gravels.

Based on the above ground conditions and given the relatively high groundwater table it is considered that shallow spread foundations, strip or pads, placed within the shallow fine grained and/or coarse grained alluvium, at a minimum depth of 1m bgl, would be a suitable foundation option for the proposed primary school. Shallow footings may be design to an allowable net bearing pressure of 175kPa, giving a factor of safety greater than 3 against ultimate bearing capacity failure, and should result in settlement less that 25mm for a strip footing of no greater than 0.7m wide or a pad of no more than 1m².

If a greater bearing capacity is required then founding only within the coarse-grained alluvium may yield higher values however, a more detailed assessment of settlement (specifically of the underlying fine-grained alluvium) would be need to be undertaken in this instance.

If foundations cross from a fine to a coarse-grained soil, reinforcement of the foundation may be required to prevent differential settlement. Foundation excavations should be extended where deeper Made Ground is encountered.



Alternatively, given the unstable nature of the soils, or if increased loadings push settlement over an allowable limit, the use of piled foundations may offer an alternative. This should be confirmed with a specialist contractor.

Foundation excavations should be inspected by a suitably experienced engineer or inspector to ensure the founding material is suitable natural deposits. Any soft, loose or otherwise unsuitable material should be excavated and replaced by compacted granular backfill or lean concrete.

Construction elsewhere on the site would require further ground investigation.

9.4 Floor Slabs

Floor slabs may be ground bearing to combined dead and live loads of 20kNm². Any topsoil should be stripped and localised made ground excavated and replaced with compacted granular fill. The formation should be proof rolled and inspected by a suitably qualified engineer.

9.5 Chemical Attack on Buried Concrete

Chemical tests undertaken on representative samples from the Made Ground and natural deposits show low levels of water-soluble sulphates and generally slightly alkaline conditions (in places up to pH10). Based on these conditions, it is recommended that for foundations the Design Sulphate Class for the site, as defined in BRE Special Digest 1, be taken as DS-1, and the Aggressive Chemical Environment for Concrete (ACEC) site classification be taken as AC-1.

9.6 Temporary Works

Trials pits were frequently terminated before target depth was achieved due to pit wall instability and groundwater ingress. It is considered that shoring or battering of even shallow excavations in the short term will be required. Groundwater is likely to be encountered at shallow depth (0.4m bgl downwards) and dewatering of excavations is likely to be required.

Within the eastern area (where the school was previously situated) two trail pits were terminated upon concrete obstructions. Further grubbing up may be required to facilitate any future development in this area.



9.7 Pavements

Hardstanding parking areas are currently proposed to the far south and north of the new primary school. Across the whole site 17 transport research lab dynamic cone penetrometer (TRL DCP) tests were undertaken and subsequently CBR values calculated based on the results.

Based on the 23 results gathered within the Made Ground, CBR values were in the range of 1% to 82% (average 30%). Given the very variable nature of the results obtained it is recommended a conservative value of 5% is adopted for pavement design within this stratum.

The results within the shallow fine grained and coarse-grained alluvium ranged from 3% to 249%. A CBR value of 5% is recommended for pavement design.

Proof rolling of the formation level will be required and any loose or soft spots should be removed and replaced with an engineer fill, in accordance with a suitable specification. The formation level will also need to be protected during inclement weather from deterioration.

Prior to placement of the founding material and the construction of the road pavement, the sub-formation and formation will need to be inspected and checked in accordance with a suitable specification to ensure the ground conditions are as expected. All testing should be carried out in accordance with DMRB IAN 73/06 to confirm that the ground conditions at the time of construction are consistent with the previous design parameters.

9.8 Drainage

Soakaway testing within the shallow fine grained and coarse-grained alluvial deposits at SA101 to SA105 has yielded soil infiltration values of the magnitude 10^{-3} to 10^{-6} with three tests undertaken at each location.

Based on the results it is considered soakaways may be feasible at the tested locations and depths, providing at least a 1m separation from the base of soakaway to the maximum anticipated water table (as per CIRIA's 2015 SuDS Manual) can be achieved. This should be further assessed when finalised soakaway positions and invert levels are known.



10. GROUND CONTAMINATION ASSESSMENT - HUMAN HEALTH

10.1 Introduction

The UK Contaminated Land Regime (CLR) allows for a tiered approach to the assessment of ground contamination which is designed to allow increasingly site-specific assessment. In order to assess the potential risk posed by contaminants contained within the soils at the study area a generic quantitative risk assessment (gQRA) has been undertaken by comparing recorded concentrations of chemical constituents in soil with Generic Assessment Criteria (GAC) to identify whether, at the concentrations recorded, the presence of the constituent has the potential to adversely affect the health of site users (a Tier 1 assessment). GAC are set at levels where potential exposure is deemed to be within acceptable limits.

If the recorded concentrations of a particular constituent are below the GAC then the risk is generally considered to be acceptable and further assessment / or mitigation measures are not required. Where a substance is recorded at concentrations higher than GAC this does not necessarily indicate that a particular risk is present, however, it does typically signify the requirement to undertake further assessment in line with the UK tiered risk assessment framework.

10.2 Assessment Criteria

10.2.1 Generic Assessment Criteria

The following GAC for soils have been utilised for the screening process, in order of preference:

- CL:AIRE published C4SL (DEFRA, 2014);
- CIEH/LQM published S4UL (LQM/CIEH, 2015);
- WYG internal Tier 1 Screening Criteria (issue 15) derived using the derivation tool CLEA version 1.06, in line with the current UK Contaminated Land Regime.

C4SL are currently available for arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI and lead¹. The C4SL were originally developed to support the categorisation of sites in accordance with Part 2A are also, based on DEFRA guidance, considered suitable for use during the assessment of sites as part of the planning process.

¹ Arsenic, benzene, benzo(a)pyrene, cadmium, chromium VI, lead assuming 6% SOM (1% SOM C4SL also published for benzene).



Where C4SLs are not available, 'Suitable for Use Levels' (S4UL) developed by CIEH/LQM have been used. The S4UL provide GAC based on minimal or tolerable risk intended to be protective of human health for individual or mixtures of substances. It is considered conservative and appropriate to use these values for contaminants for which C4SL are unavailable. GAC for volatile and semi-volatile organic compounds (VOC and SVOC) not presented in the S4UL document are sourced from CL:AIRE (CL:AIRE, January 2010).

Where no published screening values are available WYG have derived their own values (easily liberatable cyanide).

The CLEA model states that "For most exposure pathways, the contamination is assumed to be at or within one metre of the surface" (Environment Agency, 2009). It is considered that at depths greater than 1.0m, the probability of human exposure via the direct contact pathways are significantly reduced, leaving inhalation of volatile compounds as the dominant pathway with regard to human health risks. Typically, volatile compounds only significantly affect the indoor inhalation pathway. The same screening concentrations have been used for all depths at this stage, though it is noted that these are highly conservative for depths below 1.00m bgl.

10.2.2 Proposed End Use

Screening criteria have been developed for the following land use scenarios:

- Residential with plant uptake;
- Residential without plant uptake;
- Allotments;
- Public open space (park and residential);
- Commercial / Industrial.

The proposed development on site will consist of the construction of a single storey primary school positioned on the former sports pitches in the north of the site, it is assumed that any future construction on the site will be associated with education facilities. In the event that alternative development plans are proposed, further risk assessment may be required.

As the proposed land use does not fall into one of the categories listed above, the screening assessment has been undertaken against the residential without plant uptake scenario to provide a conservative assessment.



10.2.3 Soil Organic Matter

For organic contaminants, the generic soil screening values have been derived for a range of concentrations of soil organic matter (1%, 2.5%, 6%). In order to provide a conservative assessment the GAC derived for a 1% SOM have been adopted.

10.2.4 Sampling Rationale

Samples were obtained from the near surface soils across the site during both phases of ground investigation. During the fieldwork no olfactory or visual evidence of contamination was noted, and as such the testing regime was scheduled to represent a spread of material representative of the near surface soils. The results from both phases of work have been combined as part of this assessment.

In addition to this, twelve samples were obtained from the surface material across the footprint of the former school buildings during the second phase of works. These samples were scheduled for asbestos screening only are were intended to identify asbestos fibres or asbestos containing materials which may have become entrained within the surface materials during the demolition process.

10.3 Tier 1 - Soil Screening - General Ground Conditions

A total of 28 soil samples collected from across the site during both phases of investigation. These were submitted for chemical laboratory analysis in line with the testing outlined in Table 6. Full copies of laboratory certificates for all soil analysis are included in Appendix F, along with a summary table of the results.

Comparison of the chemical analysis results with the generic assessment criteria for a residential with plant uptake end use has identified three samples to have a pH in exceedance of the screening value (pH5 - pH9). These are detailed below:

Table 14 - Summary of pH exceedances

Location	Depth	Strata	Concentration
BH106	0.3	Made Ground	9.15
DITIOO	0.6	Coarse grained alluvium	10.3
TP106	0.1	Made Ground	9.22

No other exceedances were recorded with respect to the relevant screening criteria.



Marginally elevated pH is not generally considered to pose a risk to site users and is potentially linked to concrete within the Made Ground or entrained within the near surface materials. Further consideration is however given to the recorded values in the following sections.

10.4 Asbestos – General Ground Conditions

Since 2009 there have been laboratory improvements in the detection of asbestos and as such all samples of made ground and natural were subject to an asbestos screen. There is no published screening value for asbestos.

A total of 28 samples were collected and analysed for the presence of asbestos containing materials as part of the assessment of the general soils on site. The laboratory results indicated that asbestos was positively identified in one sample (WS105 at 0.5m). This sample was subsequently scheduled for quantification testing and the results are summarised below, as well as within Appendix F.

Table 15 - Summary of Asbestos Quantification

Exploratory Hole	bgl)	(Laboratory	Materiai	Gravimetric Quantification (ACM) (mass %)		Gravimetric and PCOM Total* (mass %)
WS105	0.5	Amosite	Loose fibres in soil	<0.001	<0.001	<0.001

Table Notes: ACM = asbestos containing material. PCOM = phase contrast optical microscopy. *total of mass % from gravimetric quantification and phase contrast optical microscopy quantification.

Quantification testing has indicated the presence of amosite fibers at concentration below the laboratory limit of detection.

Asbestos was not identified within any other samples and asbestos containing materials were not noted during the ground investigation.

The risks posed by the presence of asbestos are considered in more detail in the risk assessment presented in Section 13.

10.5 Asbestos – Post Demolition Survey

Following the demolition of the former school buildings samples of the shallow soils were obtained and screened for the presence of asbestos containing materials. Twelve samples were obtained from across the footprint of the buildings and asbestos containing materials were only identified



within one sample, as summarised below.

Exploratory Hole	bgl)	Asbestos Identified (Laboratory Description)	Materiai	Gravimetric Quantification (ACM) (mass %)	Quantification (fibres)	Gravimetric and PCOM Total* (mass %)
S12	0.3	Amosite	Loose fibres in soil	0.003	<0.001	0.0034

The presence of amosite within soil samples associated with the former footprint of the building is discussed further in Section 13.



11. GROUND CONTAMINATION ASSESSMENT – WIDER ENVIRONMENT

11.1 Introduction

The potential for contaminated groundwater on site to adversely affect controlled water receptors (groundwater and surface water bodies) has been assessed at this stage by direct comparison of analytical data from the WYG ground investigation with relevant Water Quality Standards (WQS).

Similarly, the potential for soil contamination to impact controlled waters has been assessed by comparing analytical data from soil derived leachate tests directly against WQS.

11.2 Assessment Criteria

In light of the environmental setting of the site under consideration. The following water quality standards have been adopted, in order of preference.

- Water Framework Directive (WFD),
- Environmental Quality Standards (EQS);²
- WHO 2008 Petroleum Products in Drinking Water (WHO 2008)
- UK Drinking Water Standards³.

11.3 Tier 1 Screening Assessment – Soil Derived Leachate

Soil derived leachate samples can be used to identify potentially mobile contamination within soil samples collected from the site. It should be noted that the laboratory preparation of leachate samples is likely to produce higher concentrations of leachable components than conditions encountered on site, as such the following assessment is considered to be inherently conservative in nature.

Four soil derived leachate samples were screened against a suite of determinants outlined in

39

² Where WFD 2015 are not presented revoked WFD 2010 standards are used

³ WHO 2005; WHO 2008; UK Water Supply Regulations 2010 and 1989 Regulations. Priority given to UK drinking water standards



Section 11.2 as part of the Phase 1 Investigation, with a further seven samples analysed in Phase 2.

The following table summarises the determinants which have been identified at concentrations in excess of the relevant WQS screening criteria.

Table 16 - Summary of Exceedances within Soil Derived Leachate Samples

				Screening	E	xceedances
Determinant	Units	Maximum	Minimum	Value	No.	Location/depth (m bgl)
Cadmium	mg/l	0.0000817	<0.00008	0.00008	1	WS108 0.2
						BH106 0.3
						SA101 0.6-0.7
			<0.0003			SA102 0.1-0.2
Copper	mg/l	0.00416		0.0001	7	TP104 0.5
						TP106 0.1
						WS102 0.2
						WS108 0.2
Lead	mg/l	0.00132	<0.0002	0.0012	1	WS108 0.2
Zinc	mg/l	0.053	<0.001	0.0109	2	WS102 0.2
ZITIC	mg/i	0.055	V0.001	0.0109	۷	WS108 0.2
Aromatics EC7-EC8	mg/l	0.021	< 0.01	0.01	1	SA01 0.2
						SA01 0.2
						TP04 0.3
						WS03 1.0
						WS06 0.9
						BH106 0.3
Fluoranthene	mg/l	0.000235	0.000059	0.0000063	11	SA101 0.6-0.7
						SA102 0.1-0.2
						TP104 0.5
						TP106 0.1
						WS102 0.2
						WS108 0.2
Benzo(b)fluoranthene	mg/l	0.000040	0.000005	0.000017	1	SA101 0.6-0.7

^{*} Inland waters EQS

A number of determinants (heavy metals, aromatic hydrocarbons, and PAH compounds) were identified within the soil derived leachate samples at concentrations in excess of the relevant screening value.

The screening criteria for lead, copper, and zinc should be considered in the context of the bioavailability of the contaminant, which can be calculated using the Water Framework Metal



Bioavailability Assessment Tool (M-BAT)⁴. The results of this assessment are presented in the table below.

Table 17 - M-BAT adjusted Screening Values for Heavy Metals - Soil Derived Leachate

Determinant	Sample	Concentration (μg/l)	Screenin g Value (µg/l)	M-BAT Screening Value (µg/l)	Exceedances
	BH106 0.3	1.94		16.59	No
	SA101 0.6-0.7	1.18		14.25	No
	SA102 0.1-0.2	3.05		15.99	No
Copper	TP104 0.5	2.41	1	9.52	No
	TP106 0.1	3.00		11.65	No
	WS102 0.2	2.48		22.23	No
	WS108 0.2	4.16		15.70	No
Lead	WS108 0.2	1.32	1.2	4.85	No
Zinc	WS102 0.2	31.1	10.9	25.42	Yes
ZIIIC	WS108 0.2	53	10.9	18.07	Yes

When these values are taken into account only the zinc exceedances remain.

The remaining exceedances pertain to elevated concentrations of cadmium, aromatic hydrocarbons and PAH compounds. These exceedances in soil derived leachate samples have been carried forward to the risk assessment presented in Section 13.

A summary of the recorded concentrations is presented in Appendix F along with the full laboratory test results.

11.4 Tier 1 Screening Assessment – Groundwater

Groundwater samples were analysed from seven locations across the site; BH01, BH02, BH03A, WS02, WS03, BH104, and BH105, from both phases of the investigation.

The samples were tested against the suite of determinants and the exceedances are summarized in the following table. A summary of the recorded concentrations is presented in Appendix F along with the full laboratory test results.

⁴ www.wfduk/org



Table 18 - Summary of Exceedances within groundwater samples

Determinant	Units	Maximum	Minimum	Screening	Exceedances		
Determinant	Units	Maximum	Millimum	Value	No.	Location	
Copper	ug/l	1.38	<0.3	1.0	1	BH105	
Fluoranthene	ug/l	0.0198	<0.005	0.0063	1	BH104	
Benzo(a)pyrene	ug/l	0.0114	<0.002	0.00017	1	BH104	
Benzo(g,h,i)perylene	ug/l	0.0145	<0.005	0.0082	1	BH104	

^{*} Freshwater waters EQS 2015

Similar to the process undertaken within the leachate assessment, copper has been considered within the context of bioavailability. The calculated site specific values indicate no further copper exceedance as summarised in the following table.

Table 19 - M-BAT adjusted Screening Values for Heavy Metals - Groundwater

Determinant	Sample	Concentration (μg/l)	Screenin g Value (µg/l)	M-BAT Screening Value (µg/l)	Exceedances
Copper	BH105	1.38	1	13.96	No

The elevated concentrations of the PAHs are considered in more detail in Section 13.

[#] DWS 1989

^{\$} Inland Surface Waters EQS 2015



12. PRELIMINARY GROUND GAS ASSESSMENT

12.1 Introduction

Six return ground gas monitoring visits were undertaken between the 2nd and 16th April 2019.

Three return ground gas monitoring visits were undertaken following phase 1 between the 2^{nd} and 16^{th} April 2019 and a further three visits following phase 2 between 13^{th} December 2019 and 14^{th} January 2020 .Full factual site records of the gas monitoring results are presented in Appendix G.

12.2 Land Gas Risk Assessment Methodology

The key reference document which has been used to undertake the semi-quantitative land gas assessment presented in this report is CIRIA C665⁵. This provides a framework for assessment of land gas risk to buildings/structures with foundations (i.e. houses and/or commercial properties).

The collected data has been used for the purposes of undertaking a semi-quantitative assessment in accordance with the CIRIA 665 methodology. The calculation used to calculate the gas screening value (GSV) for the site, together with the relevant definition of units, is as follows:

GSV (litres of gas/hr) = borehole flow rate (I/hr) x gas concentration (volume/100)

12.3 Preliminary Ground Gas Risk Assessment

12.3.1 Source potential

The site is underlain by mostly natural alluvial deposits with a limited thickness of Made Ground close to the school building, both of which are considered to represent a potential (but limited) source of ground gas generation.

12.3.2 Risk Assessment

In order to assess the significance of ground gases at the site, measured concentrations and flow rates have been used to derive Gas Screening Values (GSVs). GSVs are the product of gas concentration and gas flow measured in a borehole and provide an indication of the flow of the

43

⁵ CIRIA C665, Assessing Risks Posed by Hazardous Ground Gases to Buildings. 2007



particular gas in question out of the ground.

Based on a maximum flow recorded of 1.5l/hr and the maximum recorded concentration of carbon dioxide (CO₂) and methane (CH₄) during the two monitoring visits, the GSVs have been calculated as presented in Table 20.

Table 20 - Initial GSV Calculations

Gas	Maximum Concentration (%)	Maximum Flow Rate (I/hr)	GSV (l/hr)	Characteristic Situation (Wilson and Card)
Carbon Dioxide	4.0	1.50	0.06	1 (Very Low Risk)
Methane	0.2	1.50	0.003	1 (Very Low Risk)

These values have been compared with the Revised Wilson and Card Classification presented within the CIRIA C665 (2007) report, specifically Table 8.5. The Characteristic values presented above reflect a risk assessment designed for the majority of building types with the exception of low-rise residential buildings which are covered by the NHBC Traffic light system which is specifically designed for residential properties.

12.4 Summary and Discussion

The site has been classified as Character Situation 1 (Very Low Risk) based on consistently low concentrations of carbon dioxide and methane, coupled with low borehole flow rates. Site classification of a Characteristic Situation 1 indicates no requirement for special protection measures for new developments.

The site is also located within a low risk area with respect to radon.



13. SITE CONCEPTUAL MODEL AND GROUND CONTAMINATION RISK ASSESSMENT

13.1 Introduction

In general, ground contamination can occur through several causes, particularly from historical operations and activities. Contamination can result from either on-site sources or from on-site migration from off-site sources, leading to long term liabilities under recent legislation for any site owner.

The Environmental Protection Act 1990 (Part IIA) makes provisions for a risk-based framework for the identification, assessment, management and redevelopment of contaminated land within the UK. The provisions of the Act came into effect in England and Wales in July 2001 and are aimed at ensuring that actions taken with respect to contaminated land are directed by a technically well-founded assessment of risk.

The process of risk assessment is an evaluation of the probability of harm, and comprises the identification of sources of contamination, receptors that may be affected by the contamination and pathways by which the receptors may be harmed forming a pollution linkage. The site conceptual model (presented below) forms the basis for the qualitative assessment of ground contamination risks associated with the site.

13.2 Site Conceptual Model

The conceptual model for the site reflects the findings and observations during the site investigation. The key source, pathway, receptor model is outlined below within the context of the anticipated future residential development on the site.

13.2.1 Sources

The following sources of contamination have been identified from the site investigation and subsequent monitoring rounds:

- · General contamination associated with Made Ground on site;
- Potentially Mobile Contamination within Made Ground (PAH from soil derived leachate samples);



- Asbestos containing materials associated with general shallow soils;
- · Asbestos containing materials associated with footprint of former school buildings;
- Contaminants associated with historical refuse heaps, both on site and off site;
- · Ground Gas.

13.2.2 Pathways

The primary pathways by which sensitive receptors may come into contact with ground contamination are considered to be the following:

- Direct dermal contact or ingestion of soils, or inhalation of dust (i.e. human interaction with surface and sub-surface materials);
- Disturbance of potential asbestos impacted soils and subsequent inhalation of asbestos fibres;
- Leaching and horizontal or vertical migration through the unsaturated ground, whether through permeable sub-surface materials and/or preferential pathways;
- Lateral and vertical migration of groundwater through permeable sub-surface materials and/or preferential pathways;
- The migration and accumulation of ground gases or vapours through permeable sub-surface materials and/or preferential pathways.

13.2.3 Receptors

The following are considered to be sensitive receptors:

- Site construction workers;
- Future Site users (within the context of the proposed use following future development);
- · Groundwater within underlying Secondary A Aquifer;
- Surface waters of the Ebbw River;
- Future Building Infrastructure.



13.3 Ground Contamination Risk Assessment Table

The pollution linkages and a qualitative risk assessment are presented in the table below. The risk assessment considers the site within an area context and assesses potential risks to identified receptors in relation to the existing site setting and the proposed development. CIRIA C552 has been used to define the risk rating presented in the Qualitative Risk Assessment matrix, methodology for which is presented in Appendix H.

Table 21 - Ground Contamination Assessment Risk Table

Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements	
		Current site users		Unlikely	Low Risk	The only contaminants exceeding the GAC are high pH values within three samples.	
	Direct dermal contact or ingestion	Future site users	Medium	Unlikely	Low Risk	This is not considered a risk to human health and is likely to reflect the inclusion of concrete containing materials with near surface soils. As such no risk	
		Construction workers		Unlikely	Low Risk	management procedures are considered necessary.	
General contamination associated with Made Ground on site	Leaching and horizontal or vertical migration	Groundwater (Secondary A Aquifer)		Unlikely	Low Risk	The laboratory test results of the soil derived leachate testing from the general Made Ground, and groundwater testing indicated a limited number of elevated concentrations of metal, aromatic hydrocarbons and PAH compounds above	
		Surface waters (Ebbw River)	Medium	Unlikely	Low Risk	the EQS screening criteria. Given the conservative nature of the leachate and groundwater testing methodology and the relatively minor exceedances identified, the recorded concentrations are not considered to pose a significant risk to controlled waters.	

Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
	Direct dermal contact or	Future site users	Medium	Unlikely	Low Risk	
Potential	ingestion	Construction workers	Medium	Low likelihood	Moderate to Low Risk	Samples obtained from the general area did not identify any elevated contaminants
associated with historical refuse heaps (on- and		Groundwater (Secondary A Aquifer)	Medium	Unlikely	Low Risk	however, in the event that this area is redeveloped a watching brief should be in place, and if any contamination is identified works should cease and WYG contacted.
	vertical migration	Surface waters (Ebbw River)	Medium	Unlikely	Low Risk	

Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
		Current and future site users	Medium	Unlikely	Low Risk	Only one sample from the general made ground has identified the presence of asbestos fibres at low concentrations
Asbestos within Made Ground (general site)	Inhalation	Construction Workers	Medium	Low likelihood	Moderate to Low Risk	(<0.001%). risk management procedures are not considered necessary in the context of the proposed development. However, site construction workers should be cognisant of the potential presence of asbestos containing materials and works should be undertaken following a watching brief to identify any asbestos containing materials and outline the procedures to assess and manage any impacted soils.

Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
Asbestos within Made Ground (former building footprint)	Inhalation	Current and future site users	Medium	Unlikely	Low Risk	One sample form the shallow soils within the footprint of the former school buildings identified the presence of asbestos fibres above the laboratory limit of detection. Prior to the demolition of the school asbestos was removed from the buildings by a licenced asbestos removal contractor and materials disposed of off-site. Whilst procedures to minimise asbestos mobilisation would have been implemented some asbestos containing materials may have remained within the demolition rubble. The likely extent of any asbestos containing materials in this area of the site is considered to be limited, however it is recommended that any future development within this area of the site is undertaken under an Asbestos Management Plan to identify, assess and manage any asbestos containing materials encountered during the development phase. It should be noted that the current development proposals do not extend into this area of the site.
		Construction Workers	Medium	Low likelihood	Moderate to Low Risk	

51

June 2019

Source	Pathway	Receptor	Consequence of risk being realised	Probability of risk being realised	Risk Classification	Potential risk management requirements
Ground gas generation associated with Made Ground	Inhalation of gases	Current and future site users	Medium	Unlikely	Low Risk	The results of the ground gas monitoring undertaken across the site indicates that the site is categorised as Characteristic Situation 1 under the Wilson and Card
		Site construction workers	Medium	Unlikely	Low Risk	classification presented in CIRIA 665. This does not require the installation of gas protection measures for new developments.

52



14. CONCLUSIONS AND RECOMMENDATIONS

14.1 Ground Contamination

14.1.1 Summary

Only minimal extents of Made Ground were recorded across the site, with no contamination exceedances considered to pose a risk to the primary school development.

Historical mapping indicates the potential presence of a refuse heaps located on southern extent of the site. Investigation locations within this area did not indicate the presence of potential contamination and the current development proposals do not extend onto this part of the site. In the event that future development is proposed in this area a watching brief should be in place when excavating soils in this area.

Similarly, the general Made Ground is considered to pose a Low Risk to the wider environment (surface waters and groundwater), with a higher level of risk (Moderate to low) assigned to the possible former refuse heaps. A new hardstanding carpark is proposed within this area and it is recommended a watching brief be in place during excavations.

14.1.2 Asbestos

Asbestos samples have been obtained from the general made ground on site and in the footprint of the former school buildings.

Only one sample from the general Made Ground identified the presence of asbestos containing materials and quantification testing recorded concentrations below the laboratory limit of detection. It is also noted that this sample was obtained from outside the current proposed development area and as such, additional risk management plans are not considered necessary.

Additional asbestos screening was undertaken within the near surface soils from the footprint of the former school. Prior to their demolition, the buildings underwent asbestos removal by a licenced asbestos removal contactor, and all demolition materials were removed from site. Of the twelve samples obtained from this area, one identified asbestos fibres at concentrations above the laboratory limit of detection. Whilst the mobilisation of asbestos fibres would have been managed during the demolition process the removal of all asbestos containing materials would not have been practicable and as such some ACM may have become entrained within shallow soils in the footprint of the former buildings. testing has indicted the presence of ACM in this material; however concentrations are considered to be low and limited to one sample



location.

As a precautionary measure, it is recommended that any future development within this area of the site is undertaken under an Asbestos Management Plan to identify, assess and manage any asbestos containing materials encountered during the development phase. It should be noted that the current development proposals do not extend into this area of the site and an Asbestos Management Plan is not considered necessary to support the current proposed development.

14.1.3 Ground Gas

Ground gas monitoring from six visits has shown low concentrations of carbon dioxide and methane coupled with low flow rates. Monitoring was undertaken during periods of low, falling, and steady atmospheric pressures and monitoring data is therefore considered to have been undertaken during worst case conditions.

The site is therefore classified as Characteristic Situation 1 whereby gas protection measures are not considered necessary in new developments.

Radon protection measures are not considered necessary.

14.2 Geotechnical

Shallow foundations formed on the shallow fine grained and coarse grained alluvial deposits may be designed to an allowable net bearing pressure of 150kPa for foundations no wider than 0.7m.

If greater loads are required a higher bearing capacity may be achieved with foundations placed solely within coarse grained material, however this would be subject to a more detailed assessment of settlement, primarily within the underlying clay and silt.

Given the instability of the alluvial soils, high groundwater, and the compressibility of the clay and silt, piled foundations may be considered a more favourable option.

Floor slabs may be ground bearing.

14.3 Recommendations

Based on the findings of the site investigation, the following recommendations are presented outlining the requirements for further ground investigation and general recommendations to support the current proposed development:



June 2019

creative minds safe hands

- Testing and classification of any excess soils to inform reuse or disposal;
- Groundworkers should be informed of the nature of the historical developments on the
 site including the asbestos removal process and identification of a limited extent of
 asbestos fibres within two samples on the site. Works should be undertaken following
 a watching brief to identify any asbestos containing materials and outline the
 procedures to assess and manage any impacted soils.
- Preparation of a geotechnical design report to fully assess the potential for settlement once required loads and foundation type has been confirmed.



15. **NOTES**

Standards

All boring operations, sampling of soils, in situ testing and geotechnical laboratory testing have been carried out in accordance with the recommendations of the British Standards BS 5930(2015)⁽¹⁾, BS 1377 (1990)⁽²⁾ and BS10175 (2001)⁽³⁾. Soil and rock descriptions follow the recommendations of BS 593. Where descriptions or classifications are based on other documents (e.g. BS 8004 (1986) or CIRIA Project Report 11 (1993)), this is stated in the report text.

Site methods

Unless specifically stated otherwise, the following methods are used for exploratory holes.

- Holes described as cable percussive are bored using a light cable percussive rig. Standard penetration tests are carried out where appropriate, as shown in the logs. Disturbed and undisturbed samples are taken from the exploratory holes at the depths on the records.
- Window sampling generally uses the windowless sampling method, using a tracked Geotool.
- Dynamic probes are usually heavy dynamic probes, using the same tracked Geotool used for window sampling.

Definitions and abbreviations

The following terms are used in the exploratory hole logs

Samples

U	Undisturbed 102mm dia. sample
TW	Thin Walled undisturbed 102mm dia. sample
В	Bulk sample
D	Small disturbed sample
W	Water sample
CBR	California Bearing Ratio test or CBR value
	obtained from Mexiprobe test
	TW B D

Core recovery and rock quality				
TCR Total core recovery (%)				
SCR	Solid core recovery (%)			
RQD	Rock quality designation (%)			
FI	Fracture index			
NR	No recovery			
NI	Not intact			

SPT N value (blows/300mm)
Hand penetrometer – shear strength
Hand shear vane – shear strength
Volatile organic compounds (ppm)
Photo-ionisation detector – used to detect the presence of
VOCs.

Standard penetration test (SPT)

Rotary drilling sizes

In situ tests

, ,				
	Nominal diameter (mm)			
Index letter	Borehole	Core		
N	75	54		
Н	99	76		
Р	120	92		
S	146	113		

Water strikes

∇	Level of water strike
▼	Water level rose to this level (see
	Remarks at foot of log for details)

Depth means depth below existing ground level unless otherwise specified. Values specified in soil descriptions given in the exploratory hole logs are depths unless otherwise specified.



16. GLOSSARY

AOD above Ordnance Datum bgl below ground level BGS British Geological Survey

BTEX Benzene, Toluene, Ethylbenzene and Xylenes

C4SL Category 4 Screening Levels

CIEH Chartered Institute of Environmental Health
CLEA Contaminated Land Exposure Assessment

CoC Constituent of Concern CSM Conceptual Site Model

DEFRA Department of Environment, food and Rural Affairs

DQRA Detailed Quantitative Risk Assessment

DTS Desktop Study

DRO Diesel Range Organics
DWS Drinking Water Standard

EA Environment Agency (England)
EPH Extractable Petroleum Hydrocarbons
EQS Environmental Quality Standards

FOC Fraction Organic Carbon
GPR Ground Penetrating Radar

LOD Limit of detection

LQM Land Quality Management NRW Natural Resources Wales

OS Ordnance Survey

PAH Polycyclic aromatic hydrocarbon

PCB Polychlorinated biphenyl PHC Petroleum Hydrocarbon

PPE Personal Protection Equipment

ppm parts per million

PRO Petroleum Range Organics SGV Soil Guideline Values SOM Soil Organic Matter

SVOC Semi-volatile organic compounds
TPH Total Petroleum Hydrocarbon
TSV Tier 1 Screening Values
VOC Volatile Organic Carbon

VPH Volatile Petroleum Hydrocarbons



17. REFERENCES

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- Zetica UXO. (2008). *Zetica UXO Risk Maps*. Retrieved from https://zeticauxo.com/downloads-and-resources/risk-maps/



FIGURES



Figure 1 – Site Location Plan

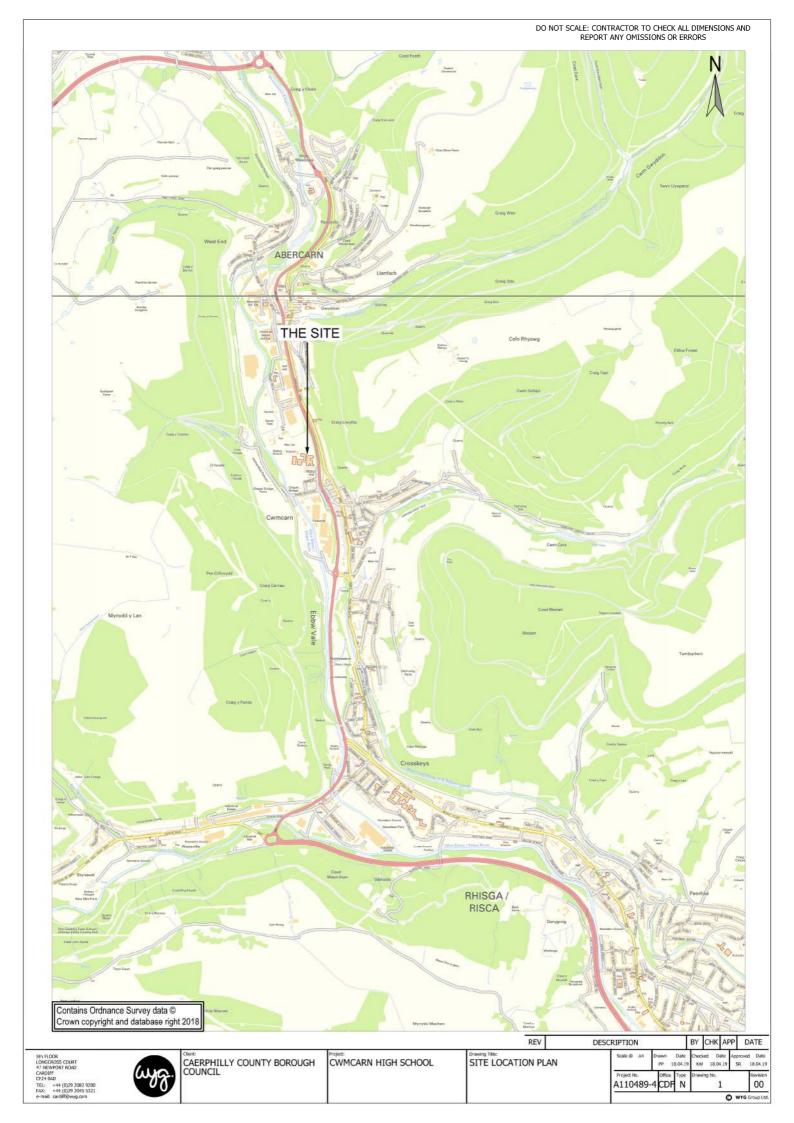




Figure 2 – Site Investigation Layout Plan

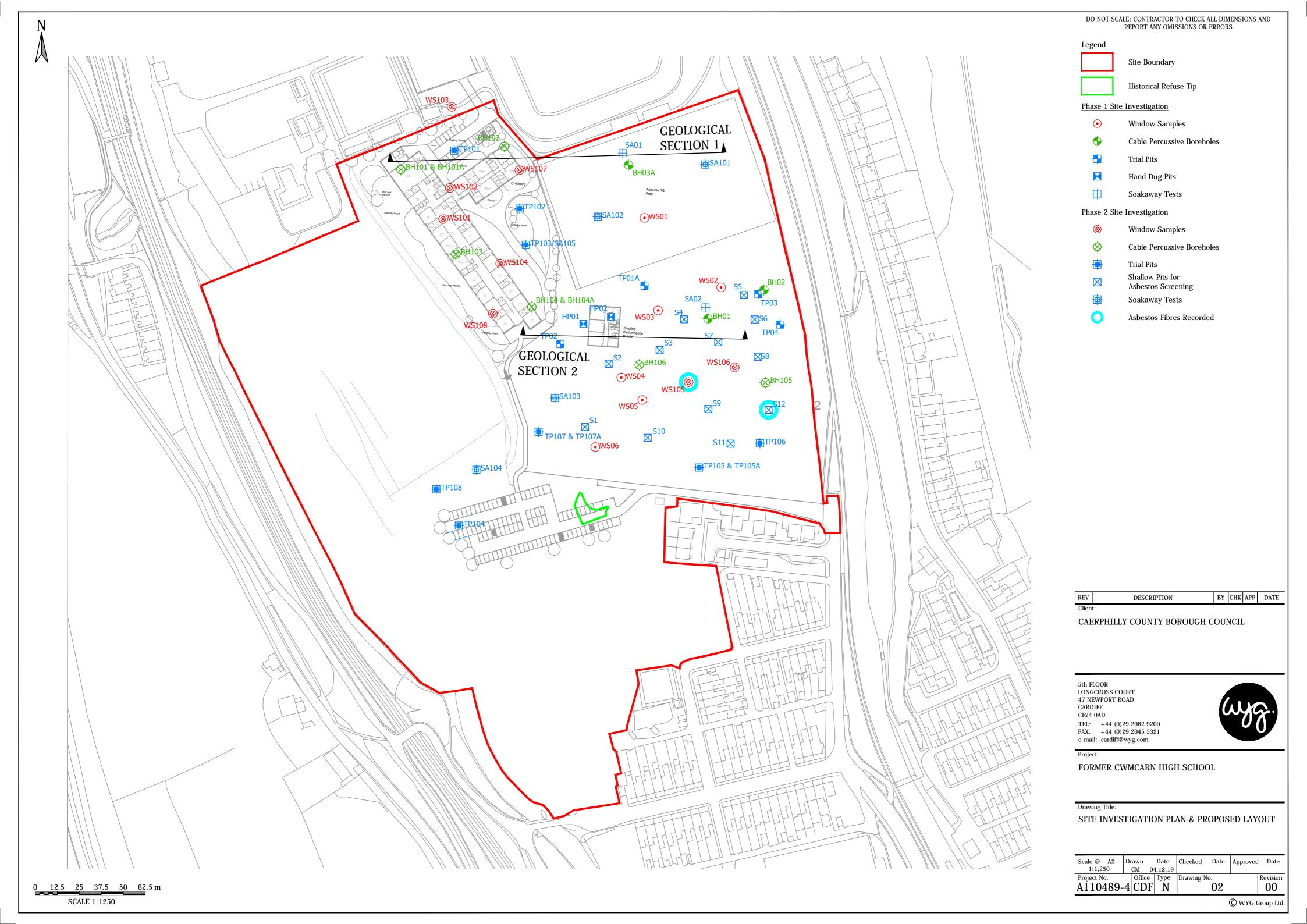
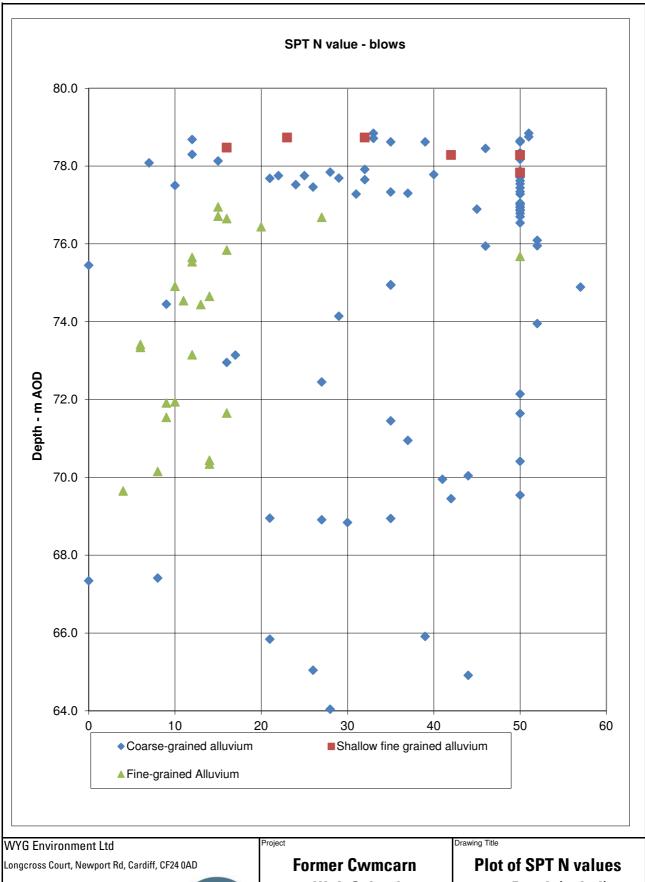




Figure 3 – SPT v Depth Plot



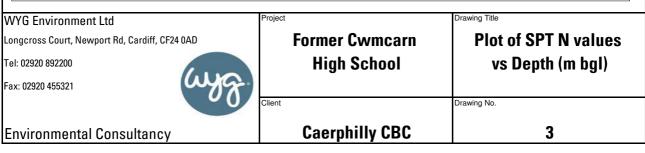
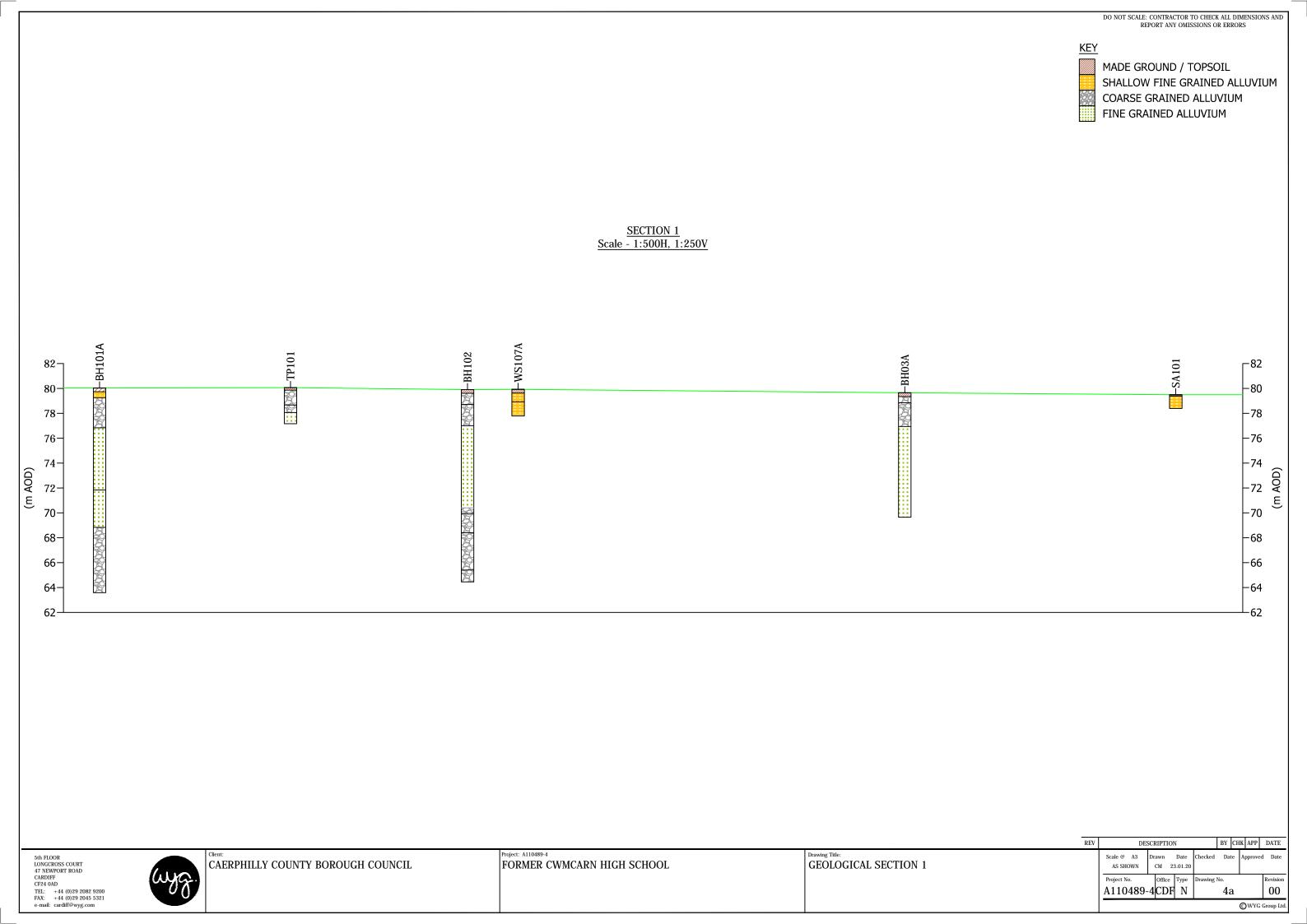




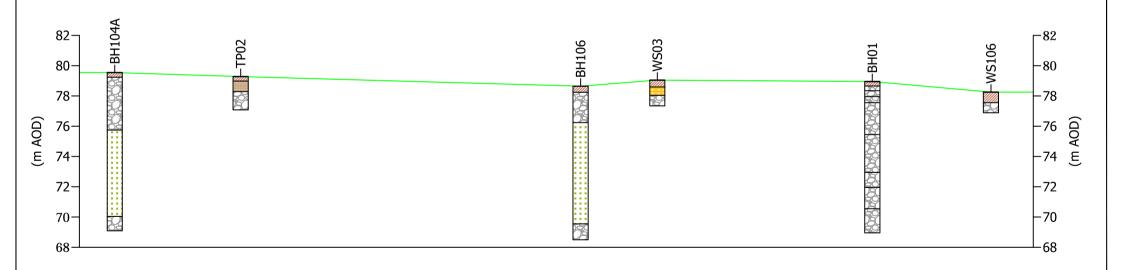
Figure 4 – Geological Sections



KEY

MADE GROUND / TOPSOIL SHALLOW FINE GRAINED ALLUVIUM COARSE GRAINED ALLUVIUM FINE GRAINED ALLUVIUM

SECTION 2 Scale - 1:500H, 1:250V



5th FLOOR LONGCROSS COURT 47 NEWPORT ROAD CARDIFF CF24 0AD TEL: +44 (0)29 2082 9200 FAX: +44 (0)29 2045 5321

CAERPHILLY COUNTY BOROUGH COUNCIL

FORMER CWMCARN HIGH SCHOOL

Drawing Title:
GEOLOGICAL SECTION 2

REV

DESCRIPTION BY CHK APP DATE AS SHOWN CM 23.01.20 Project No. Office Type
A110489-4CDF N 00

OWYG Group Ltd



APPENDICES



APPENDIX A - REPORT CONDITIONS



APPENDIX A - REPORT CONDITIONS GROUND INVESTIGATION

This report is produced solely for the benefit of Caerphilly County Borough Council and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

This report is based on a visual site inspection, reference to accessible referenced historical records, information supplied by those parties referenced in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categoric assurances that they will be accepted by Authorities or Funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYGE. In time improved practices or amended legislation may necessitate a re-assessment.

The assessment of ground conditions within this report is based upon the findings of the study undertaken. We have interpreted the ground conditions in between locations on the assumption that conditions do not vary significantly. However, no investigation can inspect each and every part of the site and therefore changes or variances in the physical and chemical site conditions as described in this report cannot be discounted.

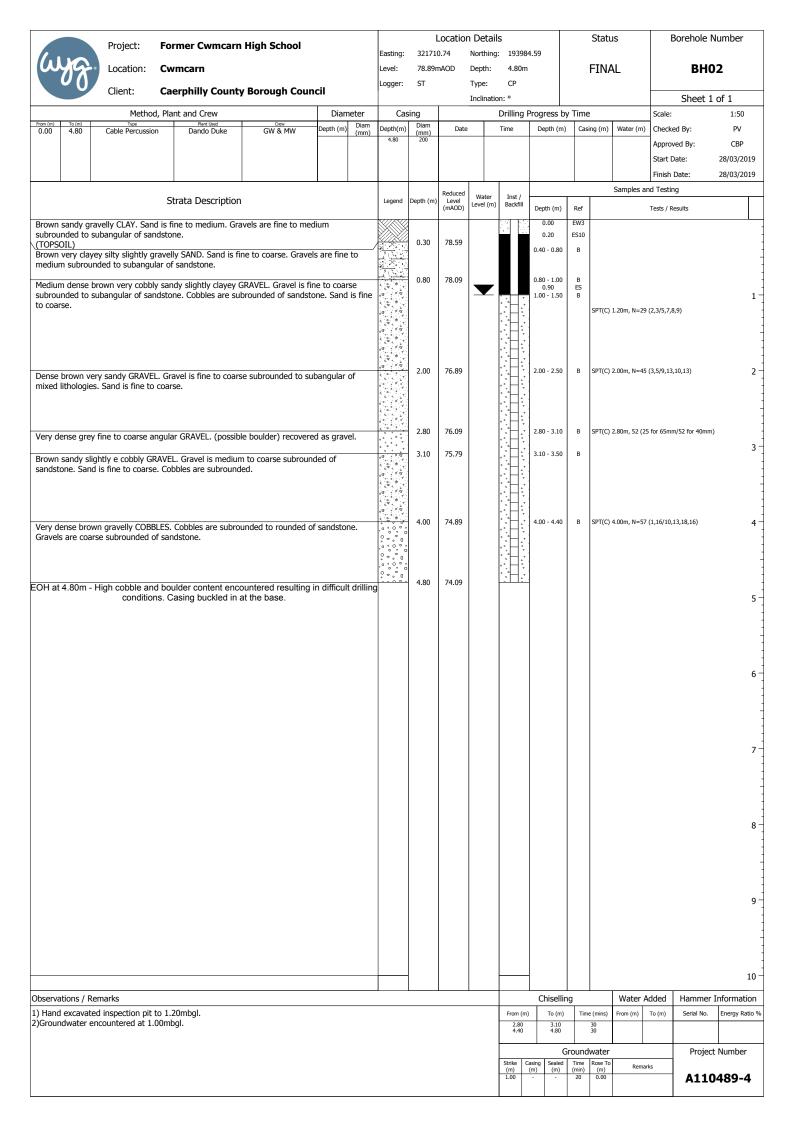
The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists further extensive research will be required before the effects can be better determined.



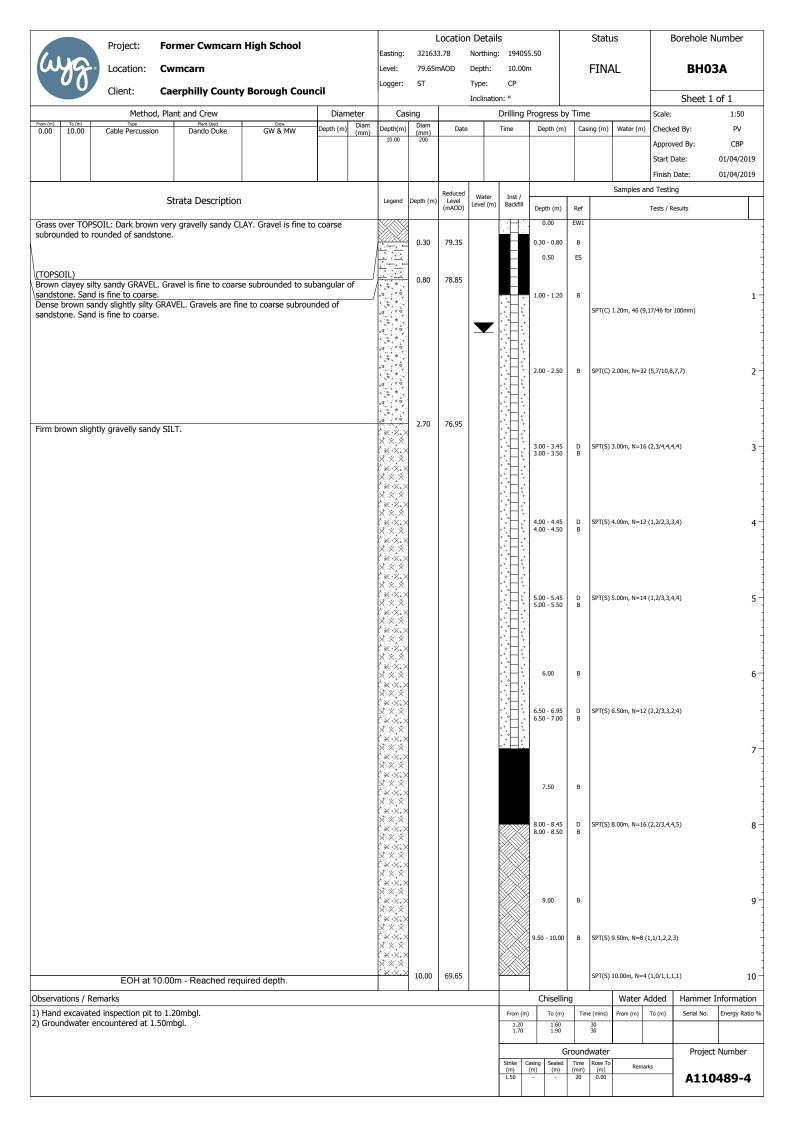
APPENDIX B - EXPLORATORY HOLE LOGS AND PHOTOGRAPHIC PLATES

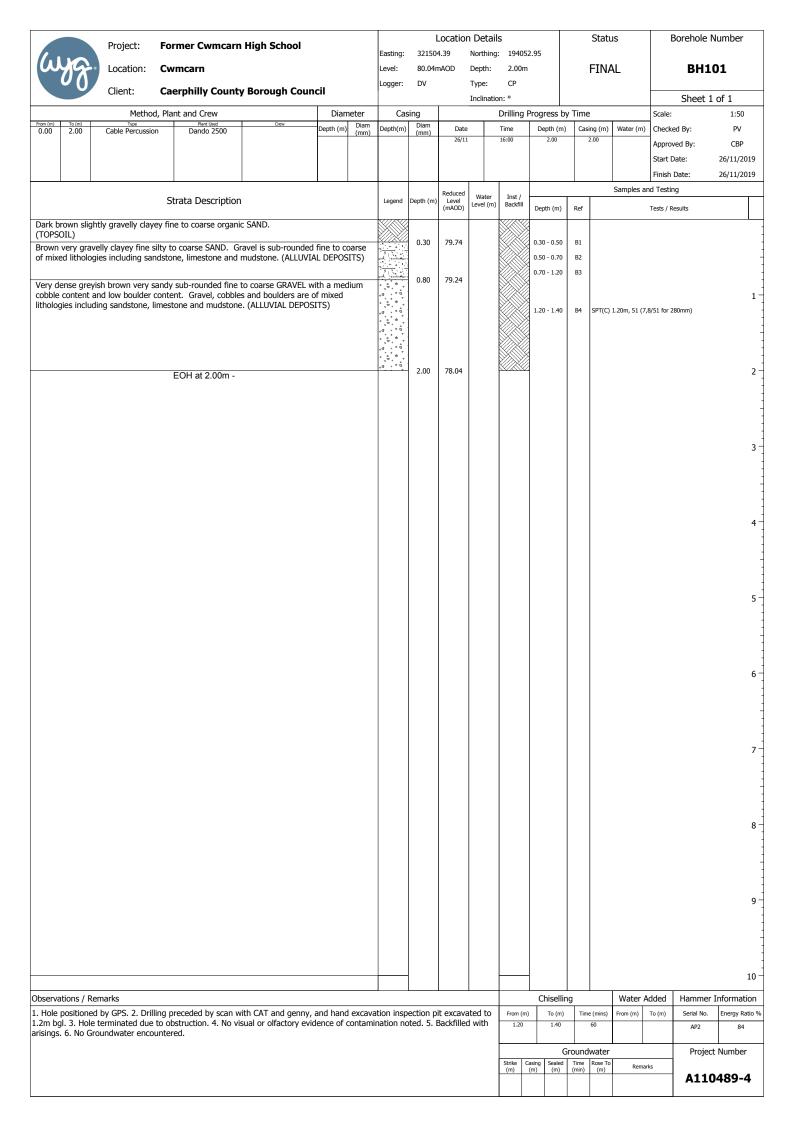
Project: Former Cwmcarn High School										Locatio	n Deta	ails				Statu	IS	Bore	hole N	ımber
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	00	Client:	Ca	erphilly County	Borough Coun	cil		Logger:	ST		Type:	CF ation: °	0					Ch	eet 1 (
		Metho	d, Pla	ant and Crew		Dia	meter	Ca	sing		THUMB		ing P	Progress by	/ Time	2		Scale:	ieet I (1:50
0.00	To (m) 10.00	Type Cable Percussion	on	Plant Used Dando Duke	GW & MW	Depth (n	n) Diam (mm)	Depth(m) 10.00) Diam (mm) 200	Date		Time		Depth (m)	Cas	ing (m)	Water (m)	Checked By Approved B Start Date: Finish Date:	y :	PV CBP 02/04/2019 03/04/2019
			S	trata Description				Legend	Depth (m)	Reduced Level	Wate		st /				Samples ar	nd Testing		
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				llar to subrounded s avels are fine to coa	andstone GRAVEL. arse rounded to suba	angular	of		0.60	78.35				0.70	ES					-
sandsto	one.								1.00	77.95				0.70 - 1.00 1.00 - 1.45	B					1-
	silty clay Jular san		to coa	arse SAND. Gravels	are fine to coarse re	ounded	to							1.00 - 1.50	В	SPT(C)	1.20m, N=22	(3,5/6,6,5,5)		
		wn very sandy sl of sandstone. Sar			avel is fine to mediu	ım subr	ounded		1.40	77.55		-		1.40	ES					- -
														2.00 2.20		CDT(C)	2.00 50.00	10/50 5 225	->	
														2.00 - 2.20	В	SPI(C)	2.00m, 50 (9,	10/50 for 225mr	n)	2 -
																				-
								-					-:	3.00 - 3.20	В	SPT(C)	3.00m, N=52	(4,12/11,13,13,	15)	3 -
Dense	hrown s	lightly clayey san	ıdv GF	RAVEL Gravels are	fine to coarse Sand	is fine t	n		3.50	75.45			-:							-
coarse.		inginary clarycy sain	uy Oi	TIVEE: GIAVES AIC	inc to course sund	15 11110 0														
													-: -:	4.00 - 4.50	В	SPT(C)	4.00m, N=35	(7,11/10,10,8,7)	4 -
													- : : - : :							-
																				- - -
Fro	om 5.00 to	o 6.00mbgl gravel b	ecome	es very dense.										5.00 - 5.40	В	SPT(C)	5.00m, N=52	(5,8/13,9,9,21)		5 -
													-::							
		brown very sand	y very	y cobbly fine to med	lium sandstone GRA	VEL. Sa	and is	0 9 9 0	6.00	72.95			:	6.00	В					6 -
fine to	coarse.							0 4 9 0					-:: -::	6.50 - 7.00	В	CDT(C)	6 F0 N 27	(2.2/4.7.7.0)		- -
								0.0 a					-:	6.50 - 7.00	ь	3F1(C)	6.50m, N=27	(2,3/4,7,7,9)		-
Dense	brown v	ery sandy very g	ravell	y COBBLES. Cobble	s are subrounded of	sandst	one.	0 4 9 D	7.00	71.95			•							7 -
Sand is	fine to	coarse. Gravel is	fine t	o coarse subrounde	ed of sandstone.			0.0.0												- -
								0 - 9 D						7.50	В					-
								0 0 0				<i>X/</i> 2	V//	8.00 - 8.40	В	SPT(C)	8.00m, N=37	(1,3/5,6,8,18)		8 -
		***		00.0051.00.11.	~			0.4.0	8.40	70.55										
Dense angular	r of sand	ith grey sandy o Istone. Sand is fi	ne to	coarse. Cobbles are	fine to medium subresubresubrounded to sub	angular	to	a 2 9												- - -
								0 0						9.00	В					9 -
								o o								Ì				
								a 9 a						9.50 - 10.00	В	SPT(C)	9.50m, N=42	(4,7/6,8,14,14)		-
								0 0	10.00	68.95						SPT(C)	10.00m, N=2	(2,3/4,4,5,8)		10
Observa	itions / F	Remarks								<u> </u>	<u> </u>			Chisellin	ıg	L	Water A	dded Ha	mmer I	nformation
		ed inspection pit encountered at :			olg after 20 minutes	. Additi	onal wate	er added	during o	Irilling.			m (m) 2.20 3.00	To (m) 3.00 3.20		e (mins) 120 60	From (m)	To (m) Se	rial No.	Energy Ratio %
												3	3.60	4.00	round	water			Project	Number
												Strike (m)	(asing Sealed (m) (m)	Time (min)	Rose To (m) 1.30	Remar	ks		489-4
												1.40		-	20	1.30			/TTO	t07-4

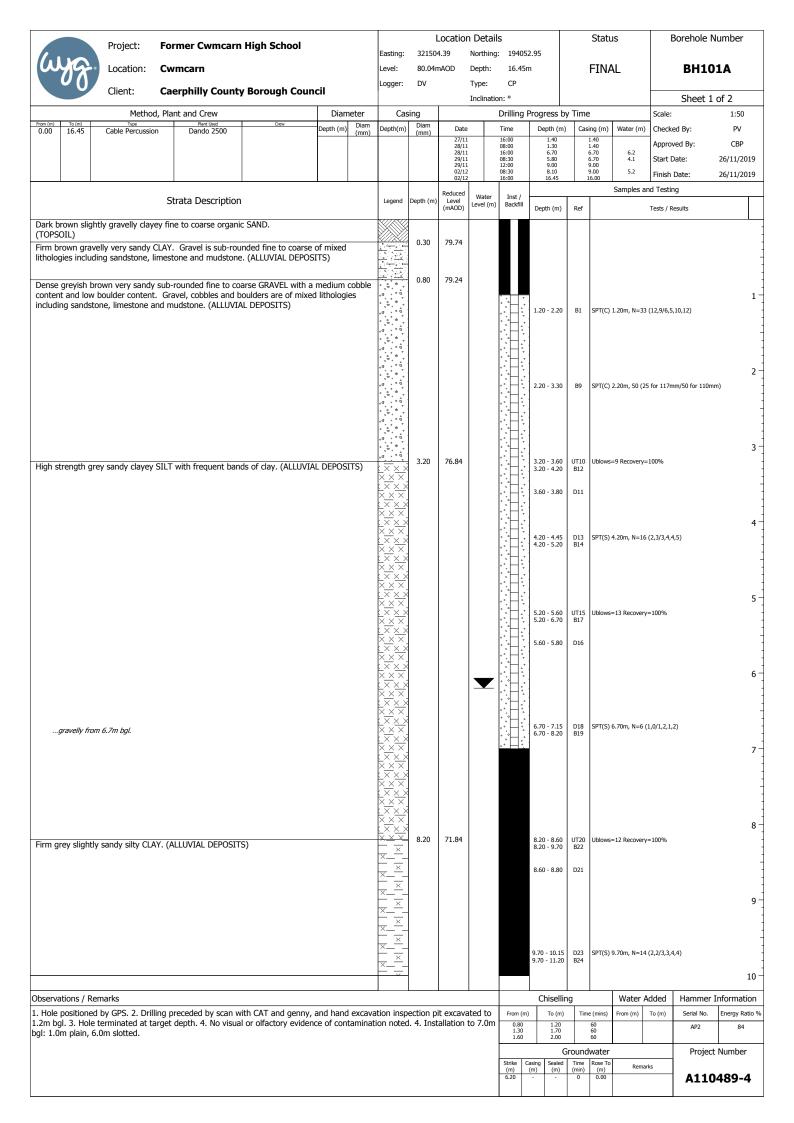
		Project:	Former Cwmcarn			ı	_ocation	n Detail	S			Status	Boreho	le Number	
ω	49	Location:	Cwmcarn	riigii School		Easting: Level:	321678 78.95r		Northing Depth:	193968 10.00n			FINAL	В	H01
	00	Client:	Caerphilly Count	y Borough Coun	cil	Logger:	ST		Type:	CP		•			
			d, Plant and Crew		Diameter	Ca	sing		Inclinatio		Progress t	by Time		Scale:	t 2 of 2
From (m) 0.00	To (m) 10.00	Cable Percussion	n Dando Duke	GW & MW	Depth (m) Diam (mm)	Depth(m)	Diam (mm) 200	Date		Time	Depth (m	n) Casii	ng (m) Water (m)	Checked By:	PV
														Approved By: Start Date:	CBP 02/04/2019
														Finish Date:	03/04/2019
			Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Depth (m)	Ref	Samples ar	Tests / Results	
		EOH at	10.00m - Reached req	uired depth.											-
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Observa	itions / Rei	marks									Chisell	ina	Water A	dded Hamn	20 ner Information
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_, 5,00				. 9 2.12. 20 mmacca				91		5.40 8.40	5.70 8.60		60 30		in at Ni
										Strike C	asing Sealed	Ground	Rose To Remark	s	ject Number
														A1	10489-4



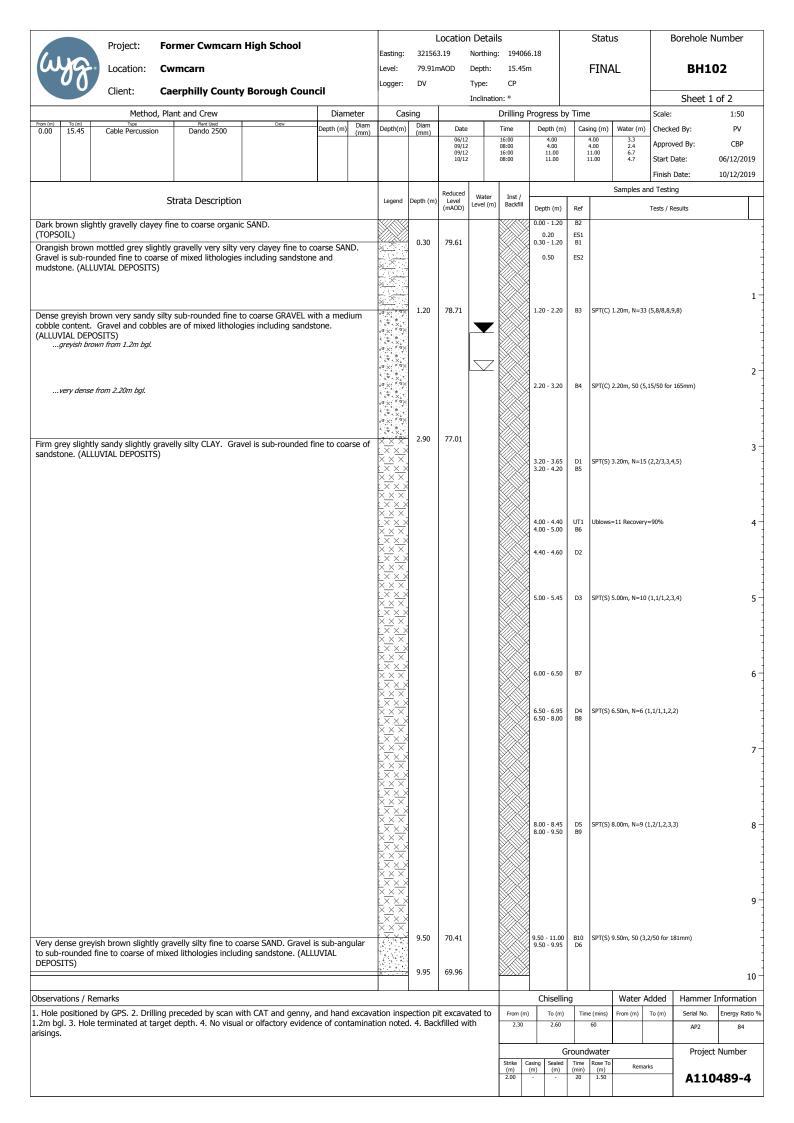
	Project: Former Cwmcarn High School								321633	ocation	n Deta		1.00		Status	Borehole	Number
W	19	Location:	Cw	mcarn				Easting: Level:	79.65n		Depth:	1.60m			FINAL	ВН	03
	0	Client:	Cae	erphilly County	Borough Coun	cil		Logger:	ST		Type: Inclinat	CP				Sheet	1 of 1
		Metho	d, Plai	nt and Crew		Diar	neter	Cas	sing		TITCHITAU		Progress by	Time	<u> </u>	Scale:	1:50
0.00	To (m) 1.60	Cable Percussion	n	Plant Used Dando Duke	GW & MW	Depth (m)	Diam (mm)	Depth(m)	Diam (mm) 200	Date		Time	Depth (m)	Cas	ing (m) Water (m)	Checked By:	PV
																Approved By: Start Date:	CBP 28/03/2019
																Finish Date:	28/03/2018
			St	trata Description				Legend	Depth (m)	Reduced Level	Water Level (m	Inst / Backfill			Samples a	nd Testing	
				CLAY. Gravel is fine	to coarse subround	ed of				(mAOD)			Depth (m)	Ref		Tests / Results	
(TOPSC	OIL)	is fine to coars					/		0.30	79.35			0.30 - 0.60	В			-
coarse	subround	ed to subangula	r. Col	bbles are subround	nal boulders. Gravels led of sandstone. Sa	are fine nd is fine	e to e to										- -
coarse.								0 0 0 0							CDT/C) 1 00m F0 /2	5 for 35mm/50 for 30m	- - - 1
								0 - 0 - 0							3F1(C) 1.00III, 30 (2	3 101 3311111/30 101 30111	m) 1 —
															SPT(C) 1.40m, 50 (4	for 23mm/50 for 42mm	n) -
EOH at	1.60m - I	High cobble an	d bou	ulder content enco	ountered resulting in	n difficu	lt drilling		1.60	78.05							- -
																	2 -
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	tions / Re		L	20				•			•		Chisellin	_	Water A		r Information
1) Hand 2) Grour	excavate ndwater e	d inspection pit incountered at 0	to 1.2 .60ml	zumogi bgl.								0.70 1.00	1.00 1.40 1.60	Tim	e (mins) From (m) 60 90 60	To (m) Serial No.	Energy Ratio %
												1.40	_	round	water	Proie	ect Number
												(m)	Casing Sealed (m) (m)	Time (min)	Rose To (m) Rema	rks	
												0.60		0	0.00	A11	0489-4







Project: Former Cwmcarn High School				n Detail		2.05		Status	Boreh	ole Number
Location: Cwmcarn	Easting: Level:	32150- 80.04r		Northing Depth:	: 19405 16.45r			FINAL	ВІ	H101A
Client: Caerphilly County Borough Council	Logger:	DV		Type: Inclination	CP on: °				She	eet 2 of 2
Method, Plant and Crew Diameter	Cas	sing Diam				Progress b			Scale:	1:50
0.00 16.45 Cable Percussion Dando 2500 Depth (m) Origin (mm)	Depth(m)	(mm)	27/11 28/11 28/11 29/11 29/11		Time 16:00 08:00 16:00 08:30 12:00	1.40 1.30 6.70 5.80 9.00) Casi	ing (m) Water (m) 1.40 1.40 5.70 6.2 6.70 4.1 9.00	Checked By: Approved By Start Date:	
			29/11 02/12 02/12		12:00 08:30 16:00	9.00 8.10 16.45	- 1 '	9.00 5.2 6.00	Finish Date:	26/11/2019
Strata Description	Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Depth (m)	Ref	Samples ar	Tests / Results	
Firm grey slightly sandy silty CLAY. (ALLUVIAL DEPOSITS)	<u>×_^</u> _								<u> </u>	
	<u>×</u> _×									-
	×									- - -
	\times									11 -
Dense dark grey sandy silty sub-angular to sub-rounded fine to coarse GRAVEL with a low cobble content. Cobbles and gravel are of sandstone. (ALLUVIAL DEPOSITS)		11.20	68.84			11.20 - 11.65	D25	SPT(S) 11.20m, N=30	(4,4/6,5,9,10)	- -
										= - -
										12 -
										-
								SPT(S) 12.70m, N=0	(1.0/0.0.0.0)	-
very loose from 12.7m bgl.									(=,-,-,-,-,	13
										-
										=
medium dense from 14.2m bgl.								SPT(S) 14.20m, N=21	. (4,5/5,5,4,7)	14 -
										-
										-
								SPT(S) 15.00m, N=26	(3,3/4,3,4,15)	15 –
high cobble content from 15.5m bgl.										- - -
ngr Couse Content nom 23.3m sg.										- -
								SPT(S) 16.00m, N=28	8 (8,9/6,7,6,9)	16
EOH at 16.45m -		16.45	63.59							-
EON at 10.45III -										-
										17
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										18
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										- - -
										- - - -
										20 –
Observations / Remarks						Chisellir	ng	Water A	dded Han	nmer Information
1. Hole positioned by GPS. 2. Drilling preceded by scan with CAT and genny, and hand excave 1.2m bgl. 3. Hole terminated at target depth. 4. No visual or olfactory evidence of contaminate					From (m)				To (m) Seri	al No. Energy Ratio %
bgl: 1.0m plain, 6.0m slotted.		21130								P2 84
					Strike (m)	asing Sealed (m) (m)	Time (min)	Rose To Remar	ks	roject Number
									A	110489-4



Dusington Farmon Commonwe Wigh Cahool			Locatio	n Deta	ils			Status	Boreho	le Number
Project: Former Cwmcarn High School	Easting		63.19	Northin	-					
Location: Cwmcarn	Level: Logger		1mAOD	Depth: Type:	15.45r CP	n		FINAL	RI	1102
Client: Caerphilly County Borough Council			_	Inclinat					Shee	et 2 of 2
Method, Plant and Crew Diameter From (m) To (m) Plant Libed Crew Depth (m) Dimeter 0.00 15.45 Cable Percussion Dando 2500 Depth (m) Dimeter	m Donth/s	asing	Dat	.	Drilling	Progress b		ing (m) Water (m)	Scale: Checked By:	1:50 PV
0.00 15.45 Cable Percussion Dando 2500 Depth (m) (m	n) Deptii(i	(mm)	06/1	.2	16:00 08:00	4.00 4.00		4.00 3.3 4.00 2.4	Approved By:	CBP
			09/1 10/1	.2	16:00 08:00	11.00 11.00	1	11.00 6.7 11.00 4.7	Start Date:	06/12/2019
				$\frac{1}{1}$				Samples ar	Finish Date:	10/12/2019
Strata Description	Legend	Depth (r	n) Reduced Level (mAOD)	l aval (n		Depth (m)	Ref		Tests / Results	
Greyish brown silty fine to coarse SAND. (ALLUVIAL DEPOSITS)	. x: . ? x: . x	2								-
	× ×	×								-
	× × · · · · · · · · · · · · · · · · · ·	X								- -
dense from 11.0m bgl.	× ×					11.00 - 12.5	0 B11	SPT(C) 11.00m, N=27	(6,5/5,5,11,6)	11
	××									- - -
Loose greyish brown slightly gravelly silty fine to coarse SAND. Gravel is sub-angular to sub-rounded fine to coarse of mixed lithologies including sandstone. (ALLUVIAL DEPOSIT	5)	11.50	68.41							- - -
										12 -
										12 -
						12.50 - 14.0	0 B12	SPT(C) 12.50m, N=8	(1,2/2,2,2,2)	- -
										-
										13
										-
										-
									(2.5/2.44.42.40)	
dense from 14.0m bgl.						14.00 - 15.0	0 B13	SPT(C) 14.00m, N=39	(3,6/8,11,10,10)	14 -
		14.50	65.41							
Dense greyish brown sandy silty sub-rounded fine to coarse GRAVEL with a high cobble content. Gravel and cobbles are of mixed lithologies including sandstone. (ALLUVIAL										- - -
DEPOSITS)	,a .o							SPT(C) 15.00m, N=44	(6,7/9,9,12,14)	15
	0 0 0 0									-
EOH at 15.45m -	* 4 . * .	15.45	64.46		\$/25.57/					- - -
										- - -
										16 -
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										-
										20 –
Observations / Remarks	avation in	anosti - ·	nit over	ntod to	-	Chiselli		Water A		mer Information
 Hole positioned by GPS. 2. Drilling preceded by scan with CAT and genny, and hand exc 1.2m bgl. 3. Hole terminated at target depth. 4. No visual or olfactory evidence of contami arisings. 	avation ins nation not	ed. 4. Ba	pit excav	vith	11.00 11.50) To (m) 11.50 12.00		e (mins) From (m) 60 60	To (m) Serial	
uriongs.					-		Ground		Pro	oject Number
					Strike (m)	Casing Sealed (m) (m)	I Time	Rose To Remark	'S	
									A1	10489-4

Location Details Status Borehole Number Project: Former Cwmcarn High School 321535.63 Northing: 194004.82 Easting: **FINAL BH103** Location: Cwmcarn 79.95mAOD Depth: 10.45m Level: DV Type: CP Logger: **Caerphilly County Borough Council** Client: Sheet 1 of 2 Inclination: Method, Plant and Crew Diameter Casing Drilling Progress by Time Scale: 1:50 Dian To (m) 10.45 Dando 2500 Depth (m) Depth(m) Date Time Depth (m) Cable Percussion Casing (m) Water (m) Checked By: PV (mm) (mm) 11/12 12/12 CBP Approved By: Start Date: 11/12/2019 12/12/2019 Finish Date: Samples and Testing Water Strata Description epth (m Level (mAOD) evel (m) Backfill Depth (m) Ref Tests / Results Dark brown slightly gravelly clayey fine to coarse organic SAND. 0.00 - 1.20 (TOPSOIL) 0.30 79.65 0.30 - 1.20 B2 Very dense greyish brown slightly sandy sub-rounded fine to coarse GRAVEL with a medium cobble content. Gravel and cobbles are of mixed lithologies including sandstone. 0.50 ES2 (ALLUVIAL DEPOSITS) SPT(C) 1.20m, N=51 (25 for 75mm/21,7,15,8) 2.20 - 3.00 SPT(C) 2.20m, N=25 (6,19/9,5,5,6) ...medium dense from 2.2m bal. 76.95 3.00 3.00 - 4.00 SPT(C) 3.00m, N=15 (4,2/3,3,2,7) B5 X X 3 Grey sandy SILT with occasional bands of clay. (ALLUVIAL DEPOSITS) 4.00 - 4.45 4.00 - 4.50 UT1 Ublows=50 Recovery=0% 4.50 75.45 4.50 - 5.50 В7 SPT(C) 4.50m, N=0 (1,0/0,0,0,0) Very loose brownish grey silty fine to medium SAND. (ALLUVIAL DEPOSITS) 5.50 74.45 5.50 - 7.00 В8 SPT(C) 5.50m, N=9 (2,2/2,2,3,2) Loose greyish brown sandy silty sub-rounded fine to coarse GRAVEL with a low cobble content. Gravel and cobbles are of mixed lithologies including sandstone. (ALLUVIAL DEPOSITS) 6 SPT(C) 7.00m, N=16 (1,3/3,4,4,5) ...medium dense from 7.0m bgl. 8 8.50 - 10.00 B10 SPT(C) 8.50m, N=35 (4,10/9,8,9,9) ...dense from 8.5m bal. 9 SPT(C) 10.00m, N=41 (7,9/11,10,10,10) 10 Observations / Remarks Chiselling Water Added Hammer Information 1. Hole positioned by GPS. 2. Drilling preceded by scan with CAT and genny, and hand excavation inspection pit excavated to From (m) To (m) Time (mins) From (m) To (m) Serial No. Energy Ratio % 1.2m bgl. 3. Hole terminated at target depth. 4. No visual or olfactory evidence of contamination noted. 4. Backfilled with 1.30 1.60 1.60 2.00 arisings. Groundwater Project Number (m) A110489-4 20

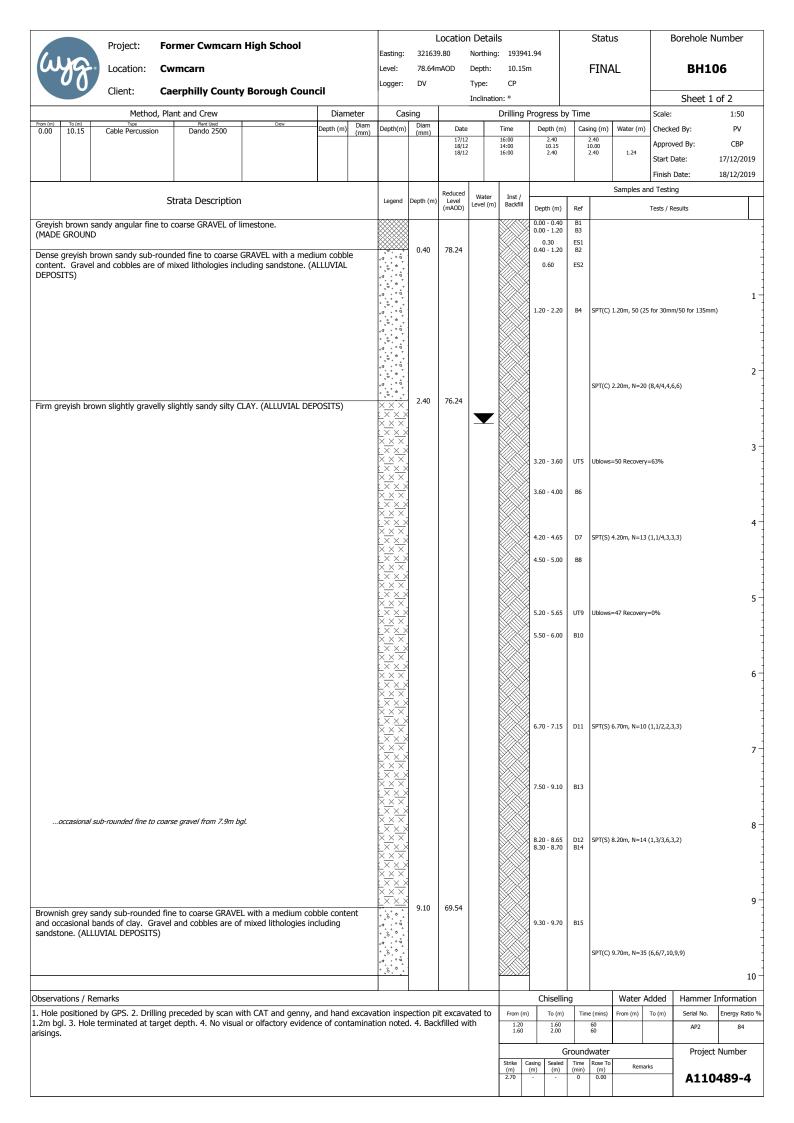
	Project: Former Cwmcarn High School								_ocatior	n Detail		1 93		Status		Borehole I	Number
W	49.	Location:	Cwmcarn				Easting: Level:	32153 79.95r		Depth:	10.45n		i	FINAL		BH1	03
	00	Client:	Caerphilly County	y Borough Counc	cil		Logger:	DV		Type: Inclination	CP on: °					Sheet 2	of 2
		Method	d, Plant and Crew		Diamete		Cas	sing				Progress b	y Time		Scal		1:50
0.00	To (m) 10.45	Cable Percussio	n Plant Used n Dando 2500	Crew	Depth (m) [Diam mm)	Depth(m)	Diam (mm)	Date 11/12 12/12		Time 16:00	Depth (m) 4.50 10.00			2.2	cked By: roved By:	PV CBP
									12/12		14:30	10.00	10	0.00		t Date:	11/12/2019
																h Date:	12/12/2019
			Strata Description				Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Depth (m)	Ref	Sam	ples and Tes	Results	
Loose	greyish bro	wn sandy silty	sub-rounded fine to coa	rse GRAVEL with a lo	ow cobble		· ·		()			Depar (iii)	i.c.		100	results	
DEPOS		and cobbles are	of mixed lithologies inc	luding sandstone. (Al	LLUVIAL			10.45	69.50								-
			EOH at 10.45m -					10.43	09.30								- - - -
																	11 -
																	- -
																	-
																	12
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																1	20 -
1. Hole	tions / Rer positioned	by GPS. 2. Dril	ing preceded by scan w	ith CAT and genny, a	and hand ex	cava	tion inst	pection p	it excava	ted to	From (m)	Chiselli To (m)		(mins) From	ter Added	_	Information Energy Ratio %
1.2m bg arisings.	I. 3. Hole t	erminated at ta	arget depth. 4. No visua	l or olfactory evidence	e of contan	ninati	on noted	d. 4. Bac	kfilled wi	ith		1,7				AP2	84
											Groundy			Projec	t Number		
											Strike C (m)	asing Sealed (m) (m)	Time (min)	Rose To (m)	Remarks	A110	0489-4
													,				

Project: Former Cwmcarn High School			Location					Status	Borehole N	lumber
Location: Cwmcarn	Easting Level:		78.78 ImAOD	Northing Depth:	g: 19397 2.00m			FINAL	BH1	04
Client: Caerphilly County Borough Council	Logge	: DV		Type: Inclination	CP				Sheet 1	of 1
Method, Plant and Crew Diamete		asing		Tremida		Progress b	y Time		Scale:	1:50
	Depth(i	n) Diam (mm)	Date 13/12		Time 13:00	Depth (m)		ing (m) Water (m) 2.00	Checked By: Approved By:	PV CBP
									Start Date:	13/12/2019
								Samples an	Finish Date:	13/12/2019
Strata Description	Legen	d Depth (m	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Depth (m)	Ref		Tests / Results	
Dark brown slightly gravelly clayey fine to coarse organic SAND. (TOPSOIL)						0.00 - 1.20	B2 ES1			-
Dense greyish brown slightly sandy slightly silty sub-rounded fine to coarse GRAVEL with medium cobble content. Gravel and cobbles are of mixed lithologies including sandstone	a	0.30	79.24			0.30 - 1.20	B1 ES2			-
(ALLUVIAL DEPOSITS)		. 1								- -
										1 -
						1.20 - 2.00	В3	SPT(C) 1.20m, 50 (25	for 75mm/50 for 95mm)) - -
										-
		2.00	77.54			1.85	EW2	SPT(C) 2.00m. 50 (25	for 29mm/50 for 85mm)	2 -
EOH at 2.00m -		2.00						, , , , , , , , , , , , , , , , , , , ,	,	- - -
										-
										-
										3 -
										-
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										4 -
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										- - -
										- - -
										9 – - -
										-
										-
						_				10
Observations / Remarks						Chiselli		Water A		Information
 Hole positioned by GPS. 2. Drilling preceded by scan with CAT and genny, and hand exc 1.2m bgl. 3. Hole terminated due to obstruction. 4. No visual or olfactory evidence of cont arisings. 6. No Groundwater encountered. 	avation in amination	spection noted. 5.	pit excava Backfilled	ated to d with	1.30 1.60 2.00	1.60 2.00 2.00		90 120 90	To (m) Serial No. AP2	Energy Ratio %
anangs. 6. 110 Groundwater encountered.					2.00	_	Ground		Project	t Number
					Strike (m)	Casing Sealed (m) (m)		Rose To Remark	is .	489-4
									AIIC	7 1 07-4

	Project: Former Cwmcarn High School									Location					Status	5	Е	orehole N	lumber
W	49.	Location:		/mcarn	<u>.</u>			Easting: Level:	32157 79.54r		Northin Depth:	g: 1939 10.45			FINA	L		BH10	4 A
	00	Client:	Ca	erphilly County	y Borough Counc	cil		Logger:	DV		Type: Inclinat	CP						Sheet 1	
		Metho	d, Pla	nt and Crew		Diar	neter	Cas	sing		Inclinat		Progress	by Tim	e		Scale:	Sheet 1	1:50
0.00	To (m) 10.45	Cable Percussion	on	Plant Used Dando 2500	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date 13/12		Time 16:00	Depth (r	n) Ca	sing (m)	Water (m)	-		PV
										16/12 17/12 17/12		16:00 08:00 09:00	9.50 9.50 10.45		9.50 9.50 10.00	7.9 3.1	Approv Start D		CBP 13/12/2019
												1				Samples a	Finish I		17/12/2019
			S	trata Description				Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m	Inst / Backfill	Depth (m	Ref	Ī	oumpies ui	Tests / Re		
Dark b		tly gravelly clay	ey fir	ne to coarse organi	c SAND.														
					GRAVEL with a medial luding sandstone. (A				0.30	79.24									· ·
DEPOS	ITS)																		
																			1 -
													.]						
																			-
													2.00 - 3.0) B1					2 -
																			-
													3.00 - 4.0) B2	SPT(C) 3	.00m, 50 (18	8,7/50 for :	171mm)	3 -
													;						-
				and alkaliana	II. alle CLAV alle a				3.80	75.74			,						
bands	of sandy s	ilt and silty san	dv. G	andy sligntly grave Gravel is sub-round IVIAL DEPOSITS)	lly silty CLAY with oc ed fine to coarse of r	nixed	ıy						4.00 - 5.0) Вз	SPT(C) 4	.00m, N=12	(4,4/5,3,2	,2)	4 -
iidiolog	jies iricidai	ing surfusione.	(/ 1220	VIIIE DEI OSITS)															
																			-
		/ /: CDT	, ,	50.44									5.00 - 5.4	5 D1	SPT(S) 5	.00m, N=11	(2,2/2,3,3	.3)	5 -
	iandy siit red	corded in SPT san	тріе ас	s.um bgi.									5.00 - 6.5) B4					
																			- -
																			6 -
													6.50 - 6.9		Ublows=	25 Recovery	=90%		- -
													6.50 - 8.0) B5					
													6.90 - 7.1	D2					7 -
																			-
													8.00 - 8.4	5 D3	SPT(S) 8	.00m, N=9 (1.1/2.2.2.3	3)	8 -
																, ,		,	
																			- -
																			9 -
									9.50	70.04			9.50 - 10.0	0 B6	SPT(C) 9	.50m, N=44	(4 9/11 10	112 11)	
				angular to sub-rou . (ALLUVIAL DEPOS	nded fine to coarse (SITS)	GRAVEL	of		3.30	70.01			3.30 10.0		5. 1(0) 5	.50.11, 11	(1)5/11/10	,,12,11)	
															SPT(C) 1	0.00m, N=5	0 (7,11/14	.15,15,6)	10 -
-	itions / Re							1	l	I	l .		Chisel	ling		Water A	Added	Hammer	Information
1.2m bg	l. 3. Hole	terminated at t			ith CAT and genny, a I or olfactory evidend							From (n			ne (mins)	From (m)	To (m)	Serial No.	Energy Ratio % 84
bgl: 1.0	m plain, 3.	0m slotted.												Ground	dwater				t Number
												(m)	Casing Seale (m) (m)	d Time (min)	Rose To (m)	Remar	rks		
												2.00		20	1.10			A110	489-4

	Project: Former Cwmcarn High School							321578	ocation	n Detail Northing		4 01		Status	Boreh	ole Number
W	49	Location:	Cwmcarn				Easting: Level:	79.54n		Depth:	10.45r		1	FINAL	ВІ	H104A
	00	Client:	Caerphilly Count	Borough Counc	cil		Logger:	DV		Type: Inclination	CP on: °				She	eet 2 of 2
From (m)	To (m)	Method	d, Plant and Crew	Craw	Diamet			sing			Drilling I	Progress b			Scale:	1:50
0.00	10.45	Cable Percussio	n Dando 2500	den	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date 13/12 16/12		Time 16:00 16:00	Depth (m)) Casii	ng (m) Water (m) .20 .50 7.9 .50 3.1	Checked By: Approved By:	PV CBP
									16/12 17/12 17/12		08:00 09:00	1.20 9.50 9.50 10.45	9	7.9 0.50 0.00	Start Date:	13/12/2019
									Reduced					Samples a	Finish Date: nd Testing	17/12/2019
			Strata Description				Legend	Depth (m)	Level (mAOD)	Water Level (m)	Inst / Backfill	Depth (m)	Ref	· · ·	Tests / Results	
			sub-angular to sub-roustone. (ALLUVIAL DEPOS		GRAVEL of											-
			EOH at 10.45m -					10.45	69.09							-
																<u>-</u>
																11 -
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																20 -
1. Hole	itions / Rei	by GPS. 2. Dril	ling preceded by scan w	ith CAT and genny, a	and hand ex	xcava	tion insp	ection p	it excava	ted to	From (m)	Chisellin		Water A	Added Han To (m) Seria	nmer Information al No. Energy Ratio %
1.2m bg	Jl. 3. Hole 1	terminated at to 0m slotted.	arget depth. 4. No visua	l or olfactory evidenc	e of contar	minati	on noted	d. 4. Inst	allation t	to 4.0m						P2 84
	ion polity state stated.										Chuil		Ground	D T-		roject Number
											Strike (m)	asing Sealed (m) (m)	Time (min)	Rose To (m) Rema		110489-4

Project: Former Cwmcarn High School			Location	n Detail	ls			Status	Borehole Number
	Easting:	32171 78.14r		Northing	: 19393 6.95m			ETNIAL	BU10E
	Level: Logger:	76.14i		Depth: Type:	CP			FINAL	BH105
Client: Caerphilly County Borough Council			1	Inclinatio					Sheet 1 of 1
Method, Plant and Crew Diameter From (m) To (m) Plant Used One Depth (m) 0.00 6.95 Cable Percussion Dando 2500 Depth (m) (mm)	Donth/m)	Diam (mm)	Date		Drilling	Progress I		ing (m) Water (m)	Scale: 1:50 Checked By: PV
Sund 2500		(mm)	19/12		16:00	6.95		5.00	Approved By: CBP
									Start Date: 19/12/2019 Finish Date: 19/12/2019
			Reduced					Samples an	
Strata Description	Legend	Depth (m)	Level (mAOD)	Water Level (m)	Inst / Backfill	Depth (m)	Ref		Tests / Results
Greyish brown very gravelly slightly clayey fine to coarse SAND. Gravel is angular fine to coarse of limestone, sandstone and rare brick.						0.00 - 0.90 0.00 - 0.90	B1 ES1		1
(MADE GROUND						0.45 - 4.50	EW1		
Dense greyish brown very sandy silty sub-rounded fine to coarse GRAVEL with a medium cobble content. Gravel and cobbles are of mixed lithologies including sandstone.		0.90	77.24			0.90 - 1.20 0.90 - 1.20 1.00 - 1.20	ES2		1
(ALLUVIAL DEPOSITS)						1.20 - 2.20		SPT(C) 1.20m, N=50	7,9/12,13,14,11)
					• • - •				
						2.20 - 3.20	B5	SPT(C) 2.20m, N=46	2.5/14.9.11.12)
									,
									3
						3.20 - 4.00	B6	SPT(C) 3.20m, N=35	6,9/8,8,9,10)
		4.20	73.94			4.00 - 4.45 4.00 - 5.00		SPT(S) 4.00m, N=29	2,3/6,7,8,8) 4
Medium dense greyish brown very gravelly fine to coarse SAND with a low cobble content. Gravel and cobbles are sub-rounded fine to coarse of mixed lithologies including sandstone		4.20	73.94						
(ALLUVIAL DEPOSITS)						ĺ			
						5.00 - 5.45	D2	SPT(S) 5.00m, N=17	1,2/3,4,6,4) 5
						5.00 - 6.00	B8		
Dense greyish brown very sandy sub-rounded fine to coarse GRAVEL with a medium cobble		6.00	72.14					SPT(C) 6.00m, 50 (25	for 28mm/50 for 135mm) 6
content. Gravel and cobbles are of mixed lithologies including sandstone. (ALLUVIAL DEPOSITS)									
								SPT(C) 6.50m, 50 (25	for 75mm/50 for 225mm)
EOH at 6.95m -		6.95	71.19			1			7
									8
									9
									10
Observations / Remarks 1. Hole positioned by GPS. 2. Drilling preceded by scan with CAT and genny, and hand exca	ration incr	nection n	it evcava	ated to	From (m	Chisell To (m		Water A	dded Hammer Information To (m) Serial No. Energy Ratio 9
1. The positioned by Grs. 2. Drilling preceded by scall with CAT and genity, and hand excar 1.2m bgl. 3. Hole terminated due to obstruction. 4. No visual or olfactory evidence of contan 4.5m bgl: 1.5 plain, 3.0 slotted.					6.00	6.50		60 From (m)	AP2 84
							Ground	water	Project Number
					Strike (m)	Casing Sealed	Time (min)	Rose To (m) Remark	s
					2.00		20	1.10	A110489-4



	Project: Former Cwmcarn High School								ocation	n Detail Northing		1.04		Status	Boreho	le Number
W	19	Location:	Cwmcarn				Easting: Level:	32163 78.64r		Depth:	10.15r		ı	FINAL	Bi	1106
	00	Client:	Caerphilly County	/ Borough Counc	cil		Logger:	DV		Type: Inclination	CP				Char	et 2 of 2
		Method	d, Plant and Crew		Diame	ter	Cas	sing				Progress b	y Time		Scale:	1:50
0.00	To (m) 10.15	Cable Percussio	n Dando 2500	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date		Time 16:00	Depth (m)		ng (m) Water (m)	Checked By:	PV
									17/12 18/12 18/12		14:00 16:00	2.40 10.15 2.40	10	2.40 0.00 2.40 1.24	Approved By: Start Date:	CBP 17/12/2019
															Finish Date:	18/12/2019
			Strata Description				Legend	Depth (m)	Reduced Level	Water Level (m)	Inst / Backfill			Samples ar		
Brownie	sh arev sar	ndv suh-rounde	d fine to coarse GRAVE		hle conten	t	.a . ° °		(mAOD)	Level (III)	Backiii	Depth (m)	Ref		Tests / Results	
and occ	casional ba	nds of clay. G	ravel and cobbles are of S)	mixed lithologies inc	cluding	. /		10.15	68.49		//////X					-
	•		EOH at 10.15m -													-
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	tions / Ren		ing garage de d li	ill CAT 1	and leave		Lian '					Chisellin		Water A		mer Information
 Hole participation Hole participatio	I. 3. Hole to	oy GPS. 2. Drill erminated at ta	ing preceded by scan warget depth. 4. No visua	lui CAT and genny, a l or olfactory evidenc	e of conta	xcava minati	on noted	d. 4. Bac	ιι excava kfilled wi	ith	From (m)	To (m)	Time	(mins) From (m)	To (m) Serial	
ai isii iys.										Ground	water	Pro	oject Number			
											Strike (m)	asing Sealed (m) (m)		Rose To (m) Remar	ks	
															Al	10489-4

	Project: Forme	r Cwmcarn High School			cation Deta			S	tatus	Pit Number	
(JUG)			Easting:	321611		ing: 193			'N I A I		
	Location: Cwmca		Level: Logger:	79.01m KW	AOD Depth Type:		um	LI	NA	L HP01	
	Client: Caerph	nilly County Borough Council			.,,,					Sheet 1 of 1	
		Hole Information				Groundy				Scale: 1:3	10
CAERDHILIV	Pit Dimensions	Orientation: °	Strike	(m)	Rose To (m)	Afte	er (mins)	R	emarks	Checked By: P	
CAERFFILI	m	Shoring: Stability:								Approved By: CE Start Date: 28/03,	
	m	Plant: Hand Excavated								Finish Date: 28/03,	
	Ctwata	Description	Logond	Donth (m	Reduced	Water	Backfill			Samples and Testing	
		a Description	Legend	Depth (m	(mAOD)	Level (m)	Backfill	Depth (m)	Ref	Tests / Results	
subangular to su cobbles and rare (TOPSOIL) MADE GROUND: coarse subangular subangular sands (MADE GROUND	Dark greyish brown or sandstone and free stone fragments. The company of the com	velly SILT. Gravel is fine to coarse ne and occasional subangular sandstone s. very sandy gravelly SILT. Gravel is fine to quent fine to coarse concrete, tarmac and bbly SAND. Gravel is fine to coarse ubrounded of sandstone.		0.20	78.81 78.61			0.30	ES		1-
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				-							2 -
Observations / Re	marks					<u> </u>	<u> </u>			Longcross Court,	
1) No groundwater e										Cardiff, CF24 0AD 029 2082 9200	
										Project Number	
										A110489-4	

	Project:	Former (Cwmcarn High School				cation Deta			S	tatus		Pit Nun	nber
(AUC)					_	321623.7		ing: 193			'N I A I	.	нро	22
	Location:	Cwmcar				79.14mA KW	OD Depth Type:		5M	LI	NAI	L	про	12
	Client:	Caerphil	ly County Borough Cou	ncil	20990		.,,,						Sheet 1	of 1
			Hole Information				G	Groundy	vater				Scale:	1:10
	Pit Dim	nensions	Orientation: °		Strike (m)	Rose To (m)	Afte	er (mins)	R	emarks		Checked By:	PV
CAERFILLY	1	m	Shoring:										Approved By:	CBP
	m		Stability: Plant:										Start Date: Finish Date:	28/03/2019 28/03/2019
			T IGHT.				Reduced						s and Testing	
		Strata D	Description		Legend	Depth (m)	Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results	
MADE GROUND:	Dark brown	gravelly S	ILT. Gravel is fine subangu	lar to										
subrounded of sa plastic.	andstone. Co	ontains con	crete, red brick fragments	and occasional										=
plastic.						0.10	79.04							-
(MADE GROUND)				XXXXX									-
Dark orangish br	own very sa	indy gravell	ly cobbly CLAY. Gravel is fi c. Cobbles are subrounded	ne to coarse	XXXXX XXXX									-
subangular to su	ibrounded of	r sandstone	e. Cobbles are subrounded	of sandstone.	XXXXX					0.25	ES23			-
					XXXXX									=
					XXXXX									-
					XXXXX					0.40 - 0.80	В			
					× × × ×	0.45	78.69							
	EOH at	0.45m - Rea	ached base of footings.			01.15	70.03							_
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Observations / Re	emarks					•			·			Longcro	oss Court,	
1) No groundwater e	encountered.											Cardiff, CF24 0A		
												029 2082	9200	
													Project Numb	er
													A110489-	-4

	Project:	Former (Cwmcarn H	iah School	S	tatus		Pit Nur	nber						
(AUC)				.g.,	-	321609.0		ing: 193		ГТ	N I A I		C.	i	
700	Location:	Cwmcar			Level: Logger:	78.56mA DV	OD Depth Type:		JM	LI	NAI	L	S1	_	
	Client:	Caerphil	lly County B	orough Council			.,,,,,,						Sheet 1	. of 1	
			Hole Inforr					Groundy					cale:	1:25	
CAERPHILLY	Pit Dim	ensions	Orientation:	0	Strike ((m)	Rose To (m)	Afte	er (mins)	Re	emarks		hecked By:	PV	
CAERFFILI		0.80m	Shoring: Stability:	Unstable									pproved By: tart Date:	CBP 28/11/2019	9
	1.00m		Plant:	JCB 3CX									inish Date:	28/11/2019	
		Ctrata D	Description		Legend	Depth (m)	Reduced Level	Water	Backfill			Samples	and Testing		
				of limestone with occasional	Legenu	Deptil (III)	(mAOD)	Level (m)	Dackilli	Depth (m)	Ref		Tests / Results		
brick and clay pipe. (MADE GROUND EOH at 0.50m -						0.50	78.06			0.40	ES1			;	1
															1
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Observations / Re					I	l	1	ı				Longcross	s Court,		\exists
Hole positioned by contamination noted	, GPS. 2. Exca . 5. Backfilled	avation prece with arisings	eded by scan w s.	vith CAT and genny. 3. Pit terminate	ed at targe	et depth. 4	. No visual	or olfact	ory evidend	ce of		Cardiff, CF24 0AD			
												029 2082 9			4
													Project Numb		
													A110489	-4	

	Project:	Former C	Cwmcarn H	ligh School			cation Deta			S	tatus		Pit Nu	mber	
Wa.	Location:	Cwmcarı			Easting: Level:	321644.5 78.53mA		ing: 193 ı: 0.60		ET	NAI	.	S1	0	
00						DV	Туре:		7111	1.1	INAI	-	31	.0	
	Client:	Caerphill	ly County E	Borough Council									Sheet	1 of 1	
			Hole Infor					Groundy					Scale:	1:25	
CAERPHILLY	Pit Dim	ensions	Orientation: Shoring:	0	Strike ((m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By: Approved By:	PV CBP	
CAERFFILI		0.80m	Stability:	Unstable									Start Date:	29/11/2019	
	1.00m		Plant:	JCB 3CX									Finish Date:	29/11/2019	
		Strata D	escription		Legend	Depth (m)	Reduced Level	Water	Backfill		1 1	Samples	and Testing		
					Legenu	Depti (III)	(mAOD)	Level (m)	Dackilli	Depth (m)	Ref	<u> </u>	Tests / Results		
rounded fine to c (MADE GROUND	oarse of lim	estone and	sandstone.			0.30	78.23			0.20	ES1				
Firm brown grave mixed lithologies	elly very san including sa	dy CLAY.(indstone, lii	Gravel is sub mestone and	rounded fine to coarse of mudstone.			7 0125								-
		EOH a	t 0.60m -			0.60	77.93								1
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Observations / Re							1	•				Longcros	ss Court,		1
 Hole positioned by contamination noted 	, GPS. 2. Exca . 5. Backfilled	vation prece with arisings	eded by scan v s.	vith CAT and genny. 3. Pit terminate	ed at targe	et depth. 4	4. No visual	or olfact	ory eviden	ce of		Cardiff, CF24 0AI			
		,										029 2082 9			
													Project Numl		
													A110489	-4	

	Project:	Former C	Cwmcarn Hig	nh School		Loc	cation Deta	ils		S	tatus		Pit Nun	nber	
				, Janooi	_	321691.7		ng: 193			NI A I		64.		
Wy X	Location:	Cwmcarr	1			78.12mA DV	OD Depth Type:)m	ŀΙ	NAI	-	S1 :	L	
	Client:	Caerphill	y County Bo	orough Council	Logger.	DV	Type.	11					Sheet 1	of 1	
			Hole Inform	ation			G	roundv	vater				Scale:	1:25	
	Pit Dim	ensions	Orientation:	0	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERPHILLY		0.80m	Shoring:										Approved By:	CBP	
	1.00		-	Unstable									Start Date: Finish Date:	29/11/2019 29/11/2019	
	1.00m		Pidit:	JCB 3CX									s and Testing	29/11/2019	-
		Strata D	escription		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results		_
Greyish brown sa	ındv angular	r fine to coa	rse GRAVEL o	of limestone.	******	0.05	78.07		X//XX//						_
\(MADE GROUND				/											1
mixed lithologies	including sa	andstone, lir	mestone and	rounded fine to coarse of mudstone.						0.30	ES1				1
										0.30	E31]
		FOH at	t 0.50m -			0.50	77.62								-
		LOTTAL	0.50111 -												1
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Observations / Ba	marks														
Observations / Rel		avation preced	ded by scan wit	th CAT and genny. 3. Pit terminate	ed at targe	t depth. 4	1. No visual	or olfact	ory eviden	ce of		Cardiff,	oss Court,		
contamination noted	. 5. Backfilled	with arisings	,	J. ,		10.000			,			CF24 0A			
											}	2002	Project Numb	er	\dashv
													A110489-		
													VTT0403.	-r	

	Project:	Former C	Cwmcarn Hi	gh School			ation Deta			S	tatus		Pit Nun	nber
wa.	Location:	Cwmcarr		-	_	321713.3 78.10mA		ng: 193 : 0.50		ΕT	NA		S1 :	2
00						DV	Туре:		,,,,	1.1	.1 \	-	31.	_
	Client:	Caerpniii		orough Council									Sheet 1	
	Pit Dim	ensions	Hole Inform Orientation:		Strike (m)	Rose To (m)	iroundy	vater er (mins)	R	emarks		Scale: Checked By:	1:25 PV
CAERPHILLY	FIC DIIII	ierisioris	Shoring:		Strike (i	,	Rose To (III)	Parce	21 (1111113)	100	cindino		Approved By:	СВР
CAERFFILI		0.80m	Stability:	Unstable									Start Date:	29/11/2019
	1.00m		Plant:	JCB 3CX			1 1						Finish Date:	29/11/2019
		Strata D	escription		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref	Sample	rests / Results	
Dark greyish brown very gravelly fine to coarse SAND with a medium cobble content. Gravel and cobbles are angular to sub-rounded fine to coarse of mixed lithologies including sandstone, limestone, brick and concrete. (MADE GROUND EOH at 0.50m -						0.50	77.60			0.30	ES1			2-
														3 –
														4-
Observations / Re												Longcro	oss Court,	
Hole positioned by contamination noted	y GPS. 2. Exca l. 5. Backfilled	avation prece with arisings	ded by scan wi	ith CAT and genny. 3. Pit terminat	ed at targe	t depth. 4	1. No visual o	or olfact	ory evidend	ce of		Cardiff, CF24 0/ 029 2082	AD 2 9200	
													Project Numb	

	Project:	Former (Cwmcarn Hi	gh School		Loc	ation Deta	ils		S	tatus		Pit Nur	mber	
				g., oc., oc.	_	321622.4		ng: 193			N I A I		6		
wy X	Location:	Cwmcar	n		Level:	79.05mA)m	ΓI	NAI	-	S	2	
	Client:	Caerphil	ly County B	orough Council	Logger:	DV	Type:	117					Sheet 1	of 1	
			Hole Inform	nation			G	iroundv	vater				Scale:	1:25	
	Pit Dir	nensions	Orientation:	0	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERPHILLY		0.00	Shoring:										Approved By:	CBP	
	100	0.80m	Stability:	Unstable									Start Date:	02/12/201	
	1.00r	n	Plant:	JCB 3CX									Finish Date: es and Testing	02/12/201	19
		Strata D	Description		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref	Sumple	Tests / Results		
Pale grey slightly	sandy and	ular fine to	medium GRA	VFL of limestone.	*******	0.03	79.02		\//\\\	Deptii (iii)	rtci		rests / results		_
(MADE GROUND				/						0.10	ES1				1
Dark grey sandy membrane at bas	angular fin se of strata	e to coarse .	GRAVEL of III	mestone. Geotextile		0.20	78.85								1
(MADE GROUND			coarco CAND	with a low cobble content.	9 9 0										1
Gravel and cobble	es are sub-	rounded fin	e to coarse of	f mixed lithologies including	° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° ° °					0.50	ES2				- 1
sandstone, limes	tone and m	udstone. EOH a	at 0.60m -			0.60	78.45								3
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Observations / Re					•	•						Longcro	oss Court,		
1. Hole positioned by contamination noted	, GPS. 2. Exc . 5. Backfille	cavation preceded with arising	eded by scan wi s.	ith CAT and genny. 3. Pit terminate	ed at targe	t depth. 4	. No visual o	or olfacto	ory eviden	ce of		Cardiff, CF24 0	AD		
		/9										029 2082	2 9200		
													Project Numb	oer	
													A110489	-4	

Project: Former Cwmcarn High School			cation Deta	ils		S	tatus		Pit Nur	mber	
		321651.		ng: 193		ГТ			-		
Location: Cwmcarn		78.58m <i>A</i> DV	AOD Depth Type:)m	F1	NAI	L	S	5	
Client: Caerphilly County Borough Council	Logger.	DV	туре.	11					Sheet 1	. of 1	
Hole Information			G	iroundv	vater			Sci	ale:	1:25	l
Pit Dimensions Orientation: °	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks	Ch	ecked By:	PV	
Shoring: CAERFFILI 0.80m Stability: Unctable									proved By:	CBP	
0.80m Stability: Unstable 1.00m Plant: JCB 3CX									art Date: ish Date:	02/12/2019 02/12/2019	
Fight. JCD JCA			Reduced					Samples a		02/12/2013	ł
Strata Description	Legend	Depth (m)) Level	Water Level (m)	Backfill	Depth (m)	Ref				1
Strata Description Greyish brown sandy angular to sub-rounded fine to coarse GRAVEL of limestone, sandstone and mudstone. (MADE GROUND Firm brown gravelly very sandy CLAY. Gravel is sub-rounded fine to coarse of mixed lithologies including sandstone, limestone and mudstone. EOH at 0.70m -	Legend	0.50 0.70	78.08 77.88	water Level (m)	Backfill	0.30	Ref ES1		Tests / Results	2-	
											1
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										- -	1
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										5 -	
Observations / Remarks 1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny. 3. Pit terminal contamination noted. 5. Backfilled with arisings.	ed at targe	t depth.	4. No visual	or olfacto	ory evidend	ce of		Longcross Cardiff, CF24 0AD 029 2082 92	00		
									Project Numb		

	Project:	Former (Cwmcarn H	iah School			cation Deta			S	tatus		Pit Nu	mber	
(JUO)				.5 5		321665		ing: 193		ГТ	. N. I. A. I	.	•		
	Location:	Cwmcarı			Level: Logger:	79.01m <i>A</i>	AOD Depth Type:		Jm	LI	NAI	ᅵ	S ²	+	
	Client:	Caerphil	ly County B	orough Council			.,,,,,,						Sheet 1	1 of 1	
			Hole Inforr					Groundy					Scale:	1:25	1
CAERPHILLY	Pit Dim	ensions	Orientation:	0	Strike ((m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV CBP	
CAERFFILI		0.80m	Shoring: Stability:	Unstable									Approved By: Start Date:	02/12/2019	9
	1.00m		Plant:	JCB 3CX									Finish Date:	02/12/2019	
		Ctrata D	escription		Legend	Depth (m)	Reduced Level	Water	Backfill		1 1	Sample	s and Testing		
					Legenu	Deptil (III)	(mAOD)	Level (m)	Dackilli	Depth (m)	Ref		Tests / Results		
Grey very sandy (MADE GROUND						0.20	70.04			0.10	ES1				-
Firm brown grave mixed lithologies	elly very san including sa	ndy CLAY. (andstone, li	Gravel is sub- mestone and	rounded fine to coarse of mudstone.		0.20	78.81								
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		EOH a	t 0.60m -			0.60	78.41								-
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Observations / Re	marks								\Box	lan	occ Court		\dashv		
1. Hole positioned by	y GPS. 2. Exca	avation prece	eded by scan w	ith CAT and genny. 3. Pit terminat	ed at targe	et depth.	4. No visual	or olfact	ory eviden	ce of		Cardiff, CF24 0A	oss Court,		
contamination noted	I. 5. Backfilled	with arisings	5.									029 2082			
													Project Numb	per	\dashv
													A110489	-4	

	Project:	Former C	Cwmcarn Hi	gh School			cation Deta	ils		S	tatus		Pit Nun	mber	
				J. 30.1001		321699.3		ing: 193				.		-	
Wy X	Location:	Cwmcarr	1			78.89mA DV	OD Depth Type:)m	F1	NAI	L	S5	•	
	Client:	Caerphill	y County Bo	orough Council	Logger.	DV	Type.	11					Sheet 1	of 1	
_			Hole Inform	ation			G	Groundy	vater			9	Scale:	1:25	٦
	Pit Dim	nensions	Orientation:	0	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks	(Checked By:	PV	
CAERPHILLY CAERFFILI		0.80m	Shoring:										Approved By:	CBP	
	1.00m		Stability: Plant:	Unstable JCB 3CX									Start Date: Finish Date:	02/12/2019	
	1.0011	·	ridit.	JCD JCA			Dadward						and Testing	02/12/2013	$\dot{-}$
		Strata D	escription		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results		7
Dark brown sligh	tly gravelly	clayey fine t	to coarse orga	anic SAND.	XXXXX		, ,		XXXXX	-1- ()					-
(TOPSOIL)	, ,	, ,	,												-
										0.30	ES1]
-		1 0 1 1 / 0		1.16		0.40	78.49			0.50					-
mixed lithologies	elly very sar including sa	ndy CLAY. G andstone, lir	aravel is sub- mestone and	rounded fine to coarse of mudstone.											-
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							70.00								-
		EOH at	t 0.80m -			0.80	78.09								-
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Observations / Re	marks				1							Longcros	ss Court,		\dashv
1. Hole positioned by	GPS. 2. Exc	avation preced	ded by scan wit	th CAT and genny. 3. Pit terminat	ed at targe	t depth. 4	1. No visual	or olfacto	ory eviden	ce of		Cardiff, CF24 0A			
contamination noted	. 5. Backfilled	ı witti arisings										029 2082			
													Project Numb	er	٦
													A110489-	-4	

	Project:	Former (Cwmcarn	High School			cation Deta			S	tatus		Pit Nu	mber	
(JUO)				g 0 d00.		321705.		ing: 193		ГТ	. N. I. A. I	.	C	_	
TO TO	Location:	Cwmcarı			Level: Logger:	78.72m/ DV	AOD Depth Type:		VIII	LI	NAI	L	S	J	
	Client:	Caerphil	ly County	Borough Council			.,,,						Sheet 1	1 of 1	
			Hole Info					Groundy					Scale:	1:25	1
CAERDHIIIV	Pit Dim	ensions	Orientation	n: °	Strike	(m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERFFILI		0.80m	Shoring: Stability:	Unstable									Approved By: Start Date:	CBP 02/12/2019	
	1.00m		Plant:	JCB 3CX									Finish Date:	02/12/2019	
		Ctrata D	escription		Legend	Depth (m)	Reduced Level	Water	Backfill		1 1	Samples	s and Testing	1	
					Legenu	Deptii (iii,	(mAOD)	Level (m)	Dackilli	Depth (m)	Ref		Tests / Results		
limestone and sa (MADE GROUND	ndstone.			ine to coarse GRAVEL of		0.20	78.52			0.10	ES1				
is sub-rounded fi and mudstone.	wn becoming ne to coarse	g orangish l e of mixed l	brown grav ithologies i	relly very sandy CLAY. Gravel ncluding sandstone, limestone											-
						0.60	78.12								-
		ЕОН а	t 0.60m -			0.00	70.12								-
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														5	1
Observations / Re												Longcros Cardiff,	ss Court,		1
Hole positioned by contamination noted	y GPS. 2. Exca . 5. Backfilled	avation prece with arisings	ded by scan s.	with CAT and genny. 3. Pit terminat	ed at targe	et depth.	4. No visual	or olfact	ory eviden	ce of		CF24 0A			
												029 2082			4
													Project Numb		
													A110489	-4	

	Project:	Former C	Cwmcarn Hi	iah School			cation Deta			S	tatus		Pit Nu	mber	
(JUO)				.g., 20,,00.	_	321684.7		ing: 193			. N. I. A. I	.	6-		
NO.	Location:	Cwmcarı			Level: Logger:	78.64mA DV	OD Depth Type:		m	[1	NAI	L	S	7	
	Client:	Caerphill	ly County B	orough Council	Logger.		1,700.						Sheet 1	of 1	
			Hole Inform	nation			C	Groundy	vater			S	cale:	1:25	1
	Pit Dim	ensions	Orientation:	0	Strike ((m)	Rose To (m)	Afte	er (mins)	Re	emarks	C	hecked By:	PV	
CAERFILI CAERFFILI		0.80m	Shoring:										pproved By:	CBP	
	1.00m		Stability: Plant:	Unstable JCB 3CX									tart Date: inish Date:	02/12/2019 02/12/2019	
	1.00111		riaiit.	JCB JCX			T						and Testing	02/12/2019	1
		Strata D	escription		Legend	Depth (m)	Level	Water Level (m)	Backfill	Depth (m)	Ref	· ·			1
content of angula limestone. (MADE GROUND	ar limestone.	gravelly fin . Gravel is dy CLAY. O andstone, lin	ne to coarse s angular fine Gravel is sub-	SAND with a medium cobble to coarse of clinker and rounded fine to coarse of mudstone.	Legend	0.30 0.60	Reduced Level (mAOD) 78.34 78.04	Water Level (m)	Backfill	Depth (m) 0.20	ES1	Samples	Tests / Results	2-	
															1
														-	1
														- -	1
														- -	
															-
						-								5 -	1
Observations / Re	marks							<u> </u>				leng	c Court		-
1. Hole positioned by	y GPS. 2. Exca	avation prece	ded by scan w	rith CAT and genny. 3. Pit terminate	ed at targe	t depth.	4. No visual	or olfact	ory eviden	ce of		Longcros Cardiff, CF24 0AI			
contamination noted	l. 5. Backfilled	with arisings	5.		_							029 2082 9			
													Project Numb	er	1
													A110489	-+	

	Project:	Former 0	Cwmcarn Hi	gh School			ation Deta			S	tatus		Pit Nu	ımber	
(AUG.)	Location:	Cwmcarı		-	_	321707.1 78.42mA		ing: 193 : 0.80		CT	NAI	.	s	Q	
						DV	Туре:		וווו	ГΙ	INAI	-	3	0	
	Client:	Caerphil	ly County B	orough Council	33=		.,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	••					Sheet	1 of 1	
			Hole Inforn				C	Froundy	vater				Scale:	1:25	
	Pit Dim	ensions	Orientation:	0	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERPHILLY CAERFFILI		0.80m	Shoring: Stability:	Unstable									Approved By: Start Date:	CBP 02/12/20	110
	1.00m		Plant:	JCB 3CX									Finish Date:	02/12/20	
							Reduced	L				Sample	s and Testing		
		Strata D	escription		Legend	Depth (m)	Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results		
medium cobble a	nd boulder obbles and b	content. G coulders are	ravel is of sar e of concrete	ne to coarse GRAVEL with a ndstone, limestone, brick brick and sandstone.		0.80	77.62			0.50	ES1				2-
						1									5 -
Observations / Re	marks					<u> </u>		<u> </u>				Longcro	oss Court,		\dashv
1. Hole positioned by	GPS. 2. Exca	vation prece	ded by scan w	ith CAT and genny. 3. Pit terminate	ed at targe	t depth. 4	I. No visual	or olfact	ory eviden	ce of		Cardiff, CF24 0			
contamination noted	. s. backtilled	with arisings	·.									029 2082			
											ŀ		Project Num	ber	\dashv
													A110489	-4	

	Project:	Former C	wmcarn Hi	iah School			cation Deta			S	tatus	Pit Number	
(JUG)				.g., 20,100.		321679.		ing: 193		ГТ	'N I A I		
	Location:	Cwmcarr			Level: Logger:	78.18m/ DV	AOD Depth Type:		Jm	LI	NA	L S9	
	Client:	Caerphill	y County B	orough Council								Sheet 1 of 1	L
			Hole Inform					Groundy					1:25
CAERPHILLY	Pit Dim	ensions	Orientation:	0	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks	Checked By:	PV CBP
CAERFFILI		0.80m	Shoring: Stability:	Unstable									11/2019
	1.00m		Plant:	JCB 3CX									11/2019
		Strata D	escription		Legend	Depth (m)	Reduced Level	Water	Backfill			Samples and Testing	
					Legenu	Depti (III)	(mAOD)	Level (m)	Dackilli	Depth (m)	Ref	Tests / Results	
Greyish brown wo cobble content. Iimestone and m	Gravel and	cobbles are	fine to coarse of mixed little	e GRAVEL with a medium hologies including sandstone,		0.50	77.68			0.30	ES1		2-
													4 -
													5-
Observations / Re	marke				<u> </u>			<u> </u>					
	y GPS. 2. Exca	vation prece with arisings	ded by scan w	ith CAT and genny. 3. Pit terminate	ed at targe	t depth.	4. No visual	or olfact	ory evidend	ce of		Longcross Court, Cardiff, CF24 0AD 029 2082 9200	
												Project Number	
												A110489-4	

	Project:	Former C	Cwmcarn Hi	ah School			ation Deta			S	tatus		Pit Nur	mber
(AUC)				3	_	321630.4		ing: 194			N I A I		CA	
COOK.	Location:	Cwmcarı			Level: Logger:	79.70mA	OD Depth. Type:		Jm	LI	NA	L	SAC)1
	Client:	Caerphill	ly County B	orough Council	Logger.	51	1,700.						Sheet 1	L of 1
			Hole Inform	nation			G	Groundy	vater				Scale:	1:25
	Pit Dim	ensions	Orientation:	0	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV
CAERPHILLY CAERFFILI		0.70m	Shoring:										Approved By:	CBP
	2.10m	0.76111	Stability: Plant:	Pit remained open and stable. JCB Excavator									Start Date: Finish Date:	25/03/2019 25/03/2019
	2.10111		riant.	JCD Excavator			Deduced						s and Testing	23/03/2013
		Strata D	escription		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results	
Grass over TOPS	OIL: Dark b	rown verv o	aravelly sandy	y CLAY. Gravels are fine to	X//XX/		, ,		\\/\\\\	0.00 - 0.30	В		, , , , , , , , , , , , , , , , , , , ,	
medium subroun	ded of sand	stone. Sand	d is fine to me	edium.										
(TOPSOIL)						0.20	70.40			0.20	ES4			=
Brown sandy ver sandstone.	y clayey COI	BBELS. Cob	bles are subr	ounded to angular of	~ o= .	0.30	79.40			0.30 - 1.20	В]
sariustorie.					~ o= .									-
					~ o= .					0.60	ES]
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					~ o= .									-
					م محره محره ا									1
					~ 0 ~ 0 . 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~ 0 ~									1
FOH at 1	20m - Termi	nated at 1.2	Ombal require	d depth for soakaway.	o	1.20	78.50							1
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														7 -
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														1
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														5 -
Observations / Re												Longcro	oss Court,	
1) No groundwater e	encountered.											Cardiff, CF24 0	AD	
												029 2082	2 9200	
													Project Numb	
													A110489	-4

	Project:	Former (Cwmcarn Hi	ah School			cation Deta			S	tatus		Pit Nu	mber
(AUC)				3	_	321677.		ing: 193			'N I A I	.	CA.	
COOK.	Location:	Cwmcarı				78.88m <i>A</i> KW	OD Depth Type:		Jm	LI	NA	┕ │	SAC	02
	Client:	Caerphil	ly County B	orough Council			, ypc.						Sheet 1	1 of 1
			Hole Inform					Groundy	vater				Scale:	1:25
	Pit Dim	ensions	Orientation:	0	Strike (m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV
CAERFFILI CAERFFILI		0.60m	Shoring:	Dit name in a 1 control of 1 control									Approved By:	CBP
	2.20m		Stability: Plant:	Pit remained open and stable. JCB Excator									Start Date: Finish Date:	25/03/2019 25/03/2019
							Reduced	l					s and Testing	-,,
		Strata D	escription		Legend	Depth (m)	Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results	
subrounded of sa (TOPSOIL)	andstone. slightly grave	elly clayey	SAND. Sand i	T. Gravel is fine to medium s fine to coarse. Gravel is		0.30	78.58			0.50 - 1.00	В			
EOH at 1	.10m - Termi	nated at 1.2	Ombgl require	d depth for soakaway.		1.10	77.78			0.70	ES			1-
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Observations / Re 1) No groundwater e												Cardiff,	oss Court,	
11) NO GLOUINGWATER 6	arcountered.											CF24 0A	AD	
												029 2082		nor
													Project Numb	
													A110489	-4

	Project:	Former (Cwmcarn H	ligh School		Loc	cation Deta			Si	tatus		Pit Nur	nber	
(AUC)					_	321677.		ing: 194			N I A I		644	04	
wy X	Location:	Cwmcar			Level: Logger:	79.49m <i>A</i> LH	OD Depth Type:)m		NAI	-	SA1	01	
	Client:	Caerphil	ly County I	Borough Council	Logger.	LII	Type.	11					Sheet 1	of 1	
-			Hole Infor	mation			G	Groundy	vater				Scale:	1:25	
	Pit Din	nensions	Orientation:	•	Strike (Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERPHILLY CAERFFILI	1	1.80m	Shoring:		1.10		1.10		0				Approved By:	CBP	
	0.70-		Stability:	Unstable									Start Date:	26/11/2019	
	0.70n	n	Plant:	JCB 3CX								Sample	Finish Date: es and Testing	29/11/2019	
		Strata D	Description		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref	Sample	Tests / Results		-
Pinkish brown sli	ahtly claves	, fine to coa	rca SAND		********	0.05	79.44		X//XX//X		B1 ES1		rests / Results		_
(MADE GROUND))				**************************************	0.10	79.39			0.00 - 0.05 0.00 - 0.05	ES1]
Black slightly san		gular mediu	ım and coars	se GRAVEL of limestone.	<u> </u>										1
Firm light brown	sandy grav	elly silty CL	AY. Gravel is	s sub-angular to rounded fine	×— —×										1
to coarse of sand	dstone.				×—×]
					×—×					0.60 - 0.70	B2				1
					X———X					0.60 - 0.70	ES2				1
					X———X										1
					X———X										-
					×									:	1 -
		ЕОН а	at 1.10m -			1.10	78.39		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						1
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Observations / Re	marks											Longcr	oss Court,		\exists
1. Hole positioned by	y GPS. 2. Exc	cavation prece	eded by scan v	with CAT and genny. 3. Pit terminate ken at 0.7m bgl. 6. Backfilled with a	ed upon er	ixounterii	ng groundwa	ater. 4. N	lo visual or	olfactory		Cardiff, CF24 0	,		
CTICCICE OF COHCAITIII	nadon noted.	. J. Juanaway	, acot undertal	con ac o.zmi byt. o. backilileu with di	ısırıys.							029 208	2 9200		
											İ		Project Numb	er	\exists
													A110489	-4	
															_

	Project:	Former (Cwmcarn H	igh School			ation Deta			S	tatus		Pit Nu	mber	
(JUG)	-				_	321616.3		ing: 194			N I A I		644	00	
COOK.	Location:	Cwmcarı			Level: Logger:	79.54mA LH	OD Depth Type:		Jm	LI	NA	L	SA1	.02	
	Client:	Caerphil	ly County B	orough Council			, ype.						Sheet	1 of 1	
			Hole Inforr				(Groundy	vater			5	Scale:	1:25	\exists
	Pit Dim	ensions	Orientation:	0	Strike (Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERPHILLY CAERFFILI	1	0.50m	Shoring:		1.40		1.40		0				Approved By:	CBP	_
	1.40m		Stability: Plant:	Unstable JCB 3CX									Start Date: Finish Date:	26/11/201 29/11/201	
			i idiici				Reduced						and Testing	23,11,201	_
		Strata D	escription		Legend	Depth (m)	Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results		
Soft dark brown angular to round 10mm). (TOPSOIL)	slightly sand ed fine to co	ly slightly g parse of sar	ravelly orgar ndstone. Rare	nic CLAY. Gravel is sub- e fragments of glass (up to						0.10 - 0.20 0.10 - 0.20	B1 ES1			1	
Soft becoming fir slightly gravelly s Gravel is sub-ang	silty CLAY wi	th a low co	bble content	ed dark brown slightly sandy of sub-rounded sandstone. indstone.		0.50	79.04			0.60 - 0.70 0.60 - 0.70	B2 ES2				1
Firm multicoloure	ed slightly sa	andy slightly	y gravelly silt	y CLAY. Gravel is sub-		1.20	78.34			1.20 - 1.30	В3				
rounded to round		oarse of sa	ndstone.				70 14								=
		ЕОН а	t 1.40m -			1.40	78.14]
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Observations / Re								-				Longcros	ss Court,		
Hole positioned by evidence of contamination	y GPS. 2. Exca nation noted.	avation prece 5. Soakaway	ded by scan w test undertak	vith CAT and genny. 3. Pit terminat en at 0.6m bgl. 6. Backfilled with a	ed upon er risings.	nxounterin	ng groundwa	ater. 4. N	lo visual or	olfactory		Cardiff, CF24 0AI 029 2082 9			
													Project Num	ber	\dashv
													A110489		

	Projects	Former (Cwmcarn Hig	th School		Loc	ation Deta	ils		S	tatus	Pit Nur	nber
(4110	Project:	rormer (CWINCARN MIS	jn School	Easting:	321591.9	6 Northi	ing: 193	923.13				
wyg.	Location:	Cwmcarı	n		Level:	78.69mA)m	FI	NAL	SA1	03
00	Client:	Caerphil	ly County Bo	rough Council	Logger:	LH	Type:	TP				Chaot 1	of 1
			Hole Inform	ation				Groundy	vater			Sheet 1	1:25
	Pit Dim	nensions	Orientation:		Strike (m) [Rose To (m)		er (mins)	Re	emarks	Checked By:	PV
CAERPHILLY			Shoring:		2.60		2.60		0			Approved By:	CBP
CAERFFILI		1.40m	Stability:	Unstable								Start Date:	26/11/2019
	3.00m	1	Plant:	JCB 3CX								Finish Date:	29/11/2019
		Strata D	escription		Legend	Depth (m)	Reduced Level	Water	Backfill		9	Samples and Testing	
					Legeno	Depar (III)	(mAOD)	Level (m)	bocam	Depth (m)	Ref	Tests / Results	
Light pinkish brow and rare brick.	wn slightly s	sandy angul	lar fine to coa	rse GRAVEL of limestone						0.10 - 0.20	B1		
(MADE GROUND))									0.10 - 0.20	ES1		
													-
													1
													-
													1
			_			0.90	77.79]
Firm light brown	mottled ligh	nt yellowish f dark browi	brown slightly	sandy slightly gravelly silty rounded fine to medium	×_ ××	3.50	.,,,,						1 -
of sandstone.		010771	J Graver I	to mediam	× × -×								_
					<u> </u>					1.20 - 1.30 1.20 - 1.30	B2 ES2]
					× × ÷								
					×_×_÷								1
					×_×_÷]
					×_×_÷								
					<u> </u>								1
Light brown sand	lv sub-round	ded to roun	ded fine to co	arse GRAVEL with a high		1.90	76.79]
cobble and bould	er content.	Gravel, col	bbles and bou	lders are sub-rounded to						2.00 - 2.10	В3		2 –
rounded of mixed	lithologies	including s	andstone and	quartzite.									1
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		ЕОН а	t 2.60m -			2.60	76.09		X//XX///X				
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Observations / Re	marks				1	<u> </u>					1	ongcross Court,	
1. Hole positioned by	GPS. 2. Exca	avation prece	eded by scan wit	th CAT and genny. 3. Pit terminate	ed upon er	nxounterin	g groundwa	ater. 4. N	lo visual or	olfactory		Cardiff, CF24 OAD	
evidence of contami	nation noted.	5. Soakaway	test undertaker	n at 1.35m bgl. 6. Backfilled with	arisings.							29 2082 9200	
												Project Numb	er
												A110489-	

	Project:	Former (Cwmcarn Hi	ah School			cation Deta			S	tatus		Pit N	lumber	
(AUC)	-			g., o.,,,,,	-	321547.		ing: 193			N I A I	.	64	101	
COOK.	Location:	Cwmcarı	n		Level: Logger:	76.91m <i>A</i> LH	OD Depth Type:		Jm		NAI	L	SA	104	
	Client:	Caerphil	ly County B	orough Council	Logger.		турс.						Shee	t 1 of 1	
			Hole Inforn	nation			(Groundy	vater	ı			Scale:		1:25
	Pit Dim	ensions	Orientation:	0	Strike (Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:		PV
CAERFILI CAERFFILI		1.00m	Shoring:		2.60		2.60		0				Approved By:		CBP
	2.50m	1.0011	Stability: Plant:	Unstable JCB 3CX									Start Date: Finish Date:		11/2019 11/2019
	2.50111		ridit.	JCD JCX			Deduced						s and Testing	2//.	11/2019
		Strata D	Description		Legend	Depth (m)	Level	Water Level (m)	Backfill	Depth (m)	Ref			ts	
rounded fine to of tile and plastic. (MADE GROUND) Firm thinly laminar rounded fine to n	coarse sands ated brown and the same same same same same same same sam	elly slightly tone, brick slightly san andstone and ded to roun- poulder cor andstone, lin	r sandy silty C and rare slag dy slightly gr nd quartzite.	clay. Gravel is angular to g. Rare fragments of metal, avelly silty CLAY. Gravel is coarse GRAVEL with a high cobbles and boulders are of mudstone.	Legend	0.30 1.20	76.61 74.31	Water Level (m)	Backfill	Depth (m) 0.10 - 0.20 0.10 - 0.80 0.70 - 0.80 1.30 - 1.40	Ref B1 E51 B2 E52 B3 B3	Sample	Tests / Resu	ts	2-
															4-
															5 -
Observations / Re	marks					<u> </u>		<u> </u>		<u> </u>		Longero	oss Court,		
1. Hole positioned by	GPS. 2. Exca	vation prece	eded by scan w	ith CAT and genny. 3. Pit terminate	ed upon er	nxounterii	ng groundwa	ater. 4. N	lo visual o	r olfactory		Cardiff, CF24 0/			
evidence of contamii	nation noted.	o. Soakaway	rest undertake	en at 1.1m bgl. 6. Backfilled with a	risings.							029 2082			
													Project Nu	mber	
													A11048		

Pr	roject:	Former (Cwmcarn Hi	ah School		Loca	ation Deta	ails		S	tatus		Pit Nu	ımber
/.1.0				gii ocilooi		321642.8		ing: 193			NIAI		TD	14 A
$O(\Lambda)$		Cwmcarı			Level: Logger:	79.36mA0 ST	DD Depth Type:		JITI	LI	NAI	-	TPO	JIA
Cli	lient:	Caerphill	ly County Bo	orough Council	33								Sheet	1 of 1
			Hole Inform					Groundy					Scale:	1:25
CAERPHILLY	Pit Dime	ensions	Orientation: Shoring:	0	Strike (tose To (m) 1.60	Afte	er (mins)		emarks t Ingress		Checked By: Approved By:	PV CBP
CAERFFILI		m	Stability:	Pit became unstable below									Start Date:	25/03/2019
	m		Plant:	2.00mbgl. JCB Excator									Finish Date:	25/03/2019
		Strata D	escription		Legend	Depth (m)	Reduced Level	Water	Backfill			Sample	s and Testing	
					9		(mAOD)	Level (m)	×	Depth (m)	Ref		Tests / Results	i
Grass over TOPSOII course. Cobbles are	L: Brown s e rounded	sandy cobb to subroun	oly slightly gra oded. Gravels	avelly CLAY. Sand is fine to are fine subrounded of						0.00 - 0.20	В			
sandstone. Frequen (TOPSOIL)				/		0.20	79.16			0.20 - 1.30	В			
Brown slightly claye	ey sandy c	obbly GRA	VEL. Sand is t	fine to coarse. Gravels are subrounded of sandstone.										
fine to coarse subro	ounded of	sandstone.	. Cobbles are	subrounded of sandstone.						0.50	ES			
														1 -
														-
										1.30 - 2.00	В			
FOH at 2 00m. Torn	minated at	2.00mbal.de	ua ta nit inatak	pility and groundwater ingress.		2.00	77.36							2 -
EOH at 2.00m - Tem	minateu at .	2.00mbgr di	ue to pit iristat	onity and groundwater ingress.										
														3 -
														4 -
						-								5 -
Observations / Rema	arks				1								oss Court,	
1) Groundwater encoun	ntered at 1.6	60mbgl as a	major seepage	e								Cardiff, CF24 0		
												029 2082	9200	
											Ī		Project Num	ber
													A110489	9-4

	Draiosti	Farmer (Cumanum Hia	sh Cahaal		Loc	ation Deta	ails		S	tatus		Pit Nu	mber	
(4110	Project:	rormer	Cwmcarn Hig	in School	Easting:	321595.0	5 North	ing: 193	953.80						
wyg.	Location:	Cwmcar	n			79.28mA)m	FI	NA	L	TPO)2	
00	Client:	Caerphil	ly County Bo	rough Council	Logger:	ST	Type:	TP					Chast	6 1	
			Hole Informa	ation				Groundy	vater				Sheet :	1:25	
	Pit Dim	nensions		0	Strike (m)	Rose To (m)		er (mins)	Re	emarks		Checked By:	PV	
CAERPHILLY			Shoring:		2.20		2.20		20	Fast	Ingres	s	Approved By:	CBP	
CAERFFILI		m	Ctability	Pit became unstable below 2.20mbgl.									Start Date:	25/03/20	19
	m		Plant:	JCB Excavator									Finish Date:	25/03/20	19
		Strata F	Description		Legend	Depth (m)	Reduced Level	Water	Backfill			Sample	es and Testing		
					Legend	Depair (iii)	(mAOD)	Level (m)	bocam	Depth (m)	Ref		Tests / Results		
Grass over TOPS	OIL: Brown	sandy sligh	ntly gravelly CL	AY. Sand is fine to						0.00 - 0.30	В				
medium. Graveis	are fine to	mealum su	brounded to si	ubangular of sandstone.											1
Proug dayou CA	ND Candid	fine to see	area Ossasian	al gravale are fine		0.30	78.98			0.30 - 1.00	В				1
subrounded to su				al gravels are fine											1
										0.50	ES2				-
															1
															-
]
						1.00	78.28			1.00 - 1.50	В				1 -
Brown slightly cla	nyey sandy o	cobbly GRA obbles are re	VEL. Gravel is	fine to coarse rounded to dstone. Low boulder	×O.	1.00	70.20			1.00 1.50	J				1
content.	nastorie: co	bbics are in	ourided or sam	astorie. Low boulder	×O.										-
					×0××]
					~~~~										1
					0.0					1.50 - 2.20	В				-
															1
															-
															-
															2 -
															- }
EOH at 2.20m - T	erminated at	t 2.20mbgl d	lue to pit instabi	lity and groundwater ingress.		2.20	77.08		Y//\\Y//\\						1
															1
															1
															1
															3 –
															1
															-
															‡
															]
															=
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															4
															. ‡
															1
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															-
															=
															]
															-
															‡
															5 -
Observations / Re	marks							<u> </u>				Longer	oss Court,		$\dashv$
1) Groundwater enco		.20mbgl as a	major seepage.									Cardiff, CF24 0			
												029 208			
													Project Numb	per	$\dashv$
													A110489		
														-	

Project: Former Cwmcarn High School		Loc	ation Deta	ils	:	Status	Pit Nur	mber
		321707.4		ng: 193982.17		TNIAI	TO	
Location: Cwmcarn	Level: Logger:	78.87mA(	DD Depth Type:		F.	INAL	_ TPO	13
Client: Caerphilly County Borough Council	Logger	51	1,700.				Sheet 1	. of 1
Hole Information			G	Groundwater			Scale:	1:25
Pit Dimensions Orientation: °	Strike (		Rose To (m) 1.10	After (mins		Remarks	Checked By:	PV
Shoring:  The shilling of the	1.10	'	1.10	20	,	Seepage	Approved By:	CBP
m Stability: Pit Decame unstable below 1,70mbgl. 1,70mbgl. 3GB Excavator							Start Date: Finish Date:	25/03/2019 25/03/2019
			Reduced				Samples and Testing	.,,
Strata Description	Legend	Depth (m)	Level (mAOD)	Water Level (m) Backf	Depth (m)	Ref	Tests / Results	
Grass over TOPSOIL: Dark brown very gravelly very sandy CLAY. Gravel is fine to coarse subrounded of sandstone. Sand is fine to coarse.					0.00 - 0.40	В		- - - - -
Brown sandy clayey silty GRAVEL. Gravel is fine to coarse subrounded of sandstone. Sand is fine to coarse.		0.40	78.47		0.40 - 0.90	В		-
Soft brown very sandy silty CLAY.	X	0.90	77.97	•	0.90 - 1.70 1.00	B ES		1
EOH at 1.70m - Terminated at 1.70mbgl due to water ingress and pit instability.	×	1.70	77.17					-
								2 -
								3 -
								4
								- - - - - - - - - -
Observations / Remarks							Longcross Court,	
1) Groundwater encountered at 1.10mbgl as a medium seepage.							Cardiff, CF24 0AD 029 2082 9200	
						-	Project Numb	er
							A110489	

	Project:	Former (	Cwmcarn Hi	igh School			ation Deta			S	tatus		Pit Nur	mber
(AUC)				- <b>3</b>	-	321719.9		ing: 193			N I A I	.	TD	
NO.	Location:	Cwmcar			Level: Logger:	78.69mA ST	OD Depth Type:		ım	[1	NA	L	TPO	J <del>4</del>
	Client:	Caerphil	lly County B	orough Council	Logger	51	1,700.						Sheet 1	1 of 1
			Hole Inforr	nation			(	Groundy	vater	I			Scale:	1:25
	Pit Dim	ensions	Orientation:	0	Strike (		Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV
CAERFFILI		m	Shoring:	Pit became unstable below	0.40 1.80		0.40 1.80		20 20				Approved By:	CBP
		""	Stability: Plant:	1.90mbgl. JCB Excavator									Start Date: Finish Date:	25/03/2019
	m		Platit:	JCD EXCAVALUI				 					s and Testing	25/03/2019
		Strata D	Description		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results	
MADE GROUND:	Moss over r	eddish bro	wn sandv cla	yey GRAVEL. Gravel is fine to			1		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	0.00 - 0.40	В			
coarse angular of														
										0.20	ES6			-
						0.40	78.29			0.30 0.40 - 1.20	ES6 B			]
Brown clayey SAI rounded to subro			irse. Occasior	nal gravels fine to medium			70.23			0.50	ES			
														]
										0.70	ES			-
														1
														1
														1
Brown sandy slig	htly clavey (	GRAVEL G	ravel is fine to	o coarse subrounded to		1.20	77.49			1.20 - 1.90	В			1
subangular of sar				o course subrounded to	0,000,000									
					0,000,000									1
					0,000,000									]
					0,000,000									1
					0 - 0 0 0 0 0									]
EOH at 1.90m - T	erminated at	1.90mbgl d	due to ground	vater ingress and pit instability.	0000	1.90	76.79							]
														2 -
														]
														-
														]
														-
														]
														-
														1
														3 –
														1
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														4 -
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														1
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														1
														5 -
														5 -
Observations / Re		40mhal ac a	minor seenso	e and 1.80mbgl as a medium seepa	ane							Cardiff,	oss Court,	
1) Groundwater ente	ounced at U.	v.iibyi as d	ог эссрау	с ана 1.00тоді вз в інешині ѕеерс	age.							CF24 0/ 029 2082	AD	
												029 2082		oor
													Project Numb	
													A110489	-4

	Project:	Former (	Cwmcarn Hig	ih School		Lo	cation Deta	ils		S	tatus		Pit Nur	mber	
				, Janea.		321534.		ng: 1940		ГТ	N I A I		TD4	0.1	
W A	Location:	Cwmcarr	n		Level: Logger:	80.07m/ LH	AOD Depth Type:		)m	LI	NAL	-	TP1	01	
	Client:	Caerphill	ly County Bo	rough Council	Logger.	ш	Type.	11					Sheet 1	l of 1	
			Hole Inform	ation			G	iroundw	vater			S	cale:	1:25	
	Pit Din	nensions	Orientation:	0	Strike (	m)	Rose To (m)	Afte	er (mins)	Re	emarks	c	hecked By:	PV	
CAERPHILLY			Shoring:									А	pproved By:	CBP	
		1.00m	1	Unstable									tart Date:	26/11/201	
	3.20m	1	Plant:	JCB 3CX									inish Date:	27/11/201	.9
		Strata D	escription		Legend	Depth (m	Reduced Level	Water Level (m)	Backfill			Samples	and Testing		-
C-A d-d-b			:- CI AV:H	a a bisab a abbis and bandian	V//XV//X		(mAOD)	,	V//XV//X	Depth (m)	Ref		Tests / Results		_
				n a high cobble and boulder and to rounded fine to coarse						0.10 - 0.20	B1				1
of mixed lithologi	es including	g sandstone.		,		0.20	79.87			0.10 - 0.20	ES1				}
\(TOPSOIL) Light brown sand	ly sub-angu	lar to round	led fine to coa	rse GRAVEL with a high											-
cobble and bould	er content.	Gravel, cob	bles and boul	ders are of sandstone and						0.40 - 0.50 0.40 - 0.50	B2 ES2				-
quartzite.															7
															]
															-
															-
															1
															]
						1.40	78.67			1.40 - 1.50	В3				- 1
Light brown sligh	tly clayey s	andy sub-ar	ngular to roun	ded fine to coarse GRAVEL d boulders are of sandstone		1.40	76.07			1.40 - 1.50	55				_
and quartzite.	boulder co	nicht. Grave	ci, cobbics and	a bodiacis are or sanastone											-
															]
															1
															. 1
															2 -
															-
Dark grey sandy	CTI T				* * * * *	2.30	77.77								-
Dark grey sariuy	SILI.				X					2.40 - 2.50	B4				]
					(										-
					(										1
					(										
		FOU of	t 2.90m -		( X X X )	2.90	77.17								1
		ЕОП а	t 2.90III -												3 -
															]
															1
															- 1
															1
															]
															-
															_
															4 -
															1
															]
															1
															]
															1
															- 1
															5 –
Observations / Re	marks						1					Longcros	s Court,		$\exists$
Hole positioned by contamination noted.				h CAT and genny. 3. Pit terminate	ed due to i	nstability	of gravel. 4.	No visu	al or olfact	ory eviden	ce of	Cardiff, CF24 0AI			
concamination Hoteu	. J. DUCKIIIEC	. •••••• ariolityS	•									029 2082 9	9200		
											ľ		Project Numb	per	$\exists$
													A110489	-4	

	Project:	Former (	Cwmcarn Hi	ah School			ation Deta			S	tatus	Pit	Number	
(JUG)	-			<b>5</b> • • • • • • • • • • • • • • • • • •	_	321571.9		ing: 194			N I A I	.   _	D4 00	
W A	Location:	Cwmcarı	n		Level: Logger:	79.70mA DV	OD Depth. Type:		Jm	LI	NAI	└   <b>'</b>	P102	
	Client:	Caerphil	ly County B	orough Council	Logger		1,750.					She	eet 1 of 1	
			Hole Inform	nation			(	Groundy	vater			Scale:	1:2	25
	Pit Dime	ensions	Orientation:	0	Strike (		Rose To (m)	Afte	er (mins)	Re	emarks	Checked By:	P\	V
CAERPHILLY CAERFFILI	1	1.00m	Shoring:		1.60	)	1.60		5			Approved By:		
	3.00m	1.00111	Stability: Plant:	Unstable JCB 3CX								Start Date: Finish Date:	28/11/ 28/11/	
	3.00111		riant.	JCD JCX			Deduced					Samples and Testing		2013
		Strata D	escription		Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref	Tests / Res		$\Box$
Dark brown sligh	tly gravelly o	lavev fine	to coarse org	anic SAND.	X//XX/		` '		XXXXX	-1- ( )				
(TOPSOIL)	., 5 , .	, , ,	<b>,</b>											1
						0.20	70.40			0.20	ES1			1
				is sub-rounded fine to stone and mudstone.		0.30	79.40			0.30 - 1.10	B1			]
coarse or mixed	ilulologies ili	cidding sai	iustorie, iirries	stone and mudstone.						0.50	ES2			1
														- 1
														1
														1
				CAND C. I.		1.10	78.60			1.10 - 1.60	B2			1
Grey mottled ora sub-rounded fine	ingish brown to coarse of	gravelly ve f mixed lith	ery clayey find ologies includ	e to coarse SAND. Gravel is ding sandstone, limestone										-
and mudstone.			J	,										]
														1
						1.60	78.10			1.60 - 2.20	В3			7
				AVEL with a medium cobble m long. Gravel, cobbles and	0,00	1.60	78.10			1.00 - 2.20	БЭ			]
boulders are of n	nixed litholog	gies includii	ng sandstone	, limestone and mudstone.	9 9 9									1
pit sides unstab	ble from 1.6m bg	1/.			9 9 9									]
					9 9 0									2 -
					9 9 0									1
		ЕОН а	t 2.20m -			2.20	77.50		,,,,,,,,,,					]
														-
														-
														-
														1
														3 -
														1
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														]
														-
														=
						1								5 -
Observations / Re	marks				1		1	I	1	I		Longcross Court,		
1. Hole positioned by	y GPS. 2. Exca			th CAT and genny. 3. Pit terminat	ed due to i	instability	of gravel. 4	. No visu	al or olfact	tory eviden	ce of	Cardiff, CF24 0AD		
contamination noted	ı. ə. Backtilled	with arisings	<b>.</b>									029 2082 9200		
												Project N	lumber	
												A1104	89-4	

Location Comman Control County Service County Servi		Project:	Former	Cwmcarn Hi	iah School			cation Deta			S	tatus		Pit Nu	mber
Clear   County Spreads   County Spread	Wa.	_			•	_					 ⊑T	NΙΛΙ		TD1	U3
Hole Information  Fig. Directions  Properties  Propert	00									JIII	1 1	IVAI	-	1171	.03
Per Circy cross   Street House   Street Description   Street Descripti		Client:	Caerpni												
Soft dark force or direction of specific control of the control of		Dit Dim	onsions			Strika (	m)		_		p	amarks			
Soft dark from sightly sardy sightly gravely sity organic CLAY. Gravel is  Soft dark from sightly sardy sightly gravely sity organic CLAY. Gravel is  Soft dark from sightly sardy sightly gravely sity organic CLAY. Gravel is  Soft dark from sightly sardy sightly gravely sity organic CLAY. Gravel is  Soft accounting time lay fix caraging the production of similations.  Soft accounting time lay fix caraging the production of similations.  Soft accounting time lay fix caraging the production of similations.  Soft accounting time lay fix caraging the production of similations.  Soft accounting time lay fix caraging the production of similations of similations.  Soft accounting time lay fix caraging the production of similations of simil	CAERPHILLY	FICDIII	Terisions	1					74100		100	cinario			
Soft direct from digitally analysis graphs (analysis) groups of CLAY. Graved is control from digitally particle (analysis) groups of the control from digital particle (analysis	CAERFFILI		0.70m	Stability:	Unstable									Start Date:	27/11/2019
Soft facts from slightly sarryly sight greagest CLAY. Grande is created from the first first and inediction of another or another for each residence and medium of anothers. Such societies are sub-former sightly sarryly sub-rounded for counsed fire to coarse of mixed lithrologies including sandstone, limestone and muditione.  EOH at 1.95m -  EOH at		1.90m	1	Plant:	JCB 3CX				 				CI-		27/11/2019
Set dark from slightly samely slightly regards (QAY, Geyed is rounded the and medium of sandstone. (TUPSCII)  To a some slightly samely sub-rounded from slightly samely rounded from the consequence of mixed throughes including sandstone, limestone and quartile. Sere pockets (up to 15 month of the for some samelstone and quartile. Sere pockets (up to 15 month of the for some samelstone and quartile. Sere pockets (up to 15 month of the for some samelstone and quartile. Sere pockets (up to 15 month of the for some and medium content. Claws cobile and boulders content. Claws cobile and modifiers.  EOH at 150m.  EOH at 150m.  EOH at 150m.  To a some slightly samely sub-rounded fine to coarse (GAYART, with a low cobile and boulders content. Claws cobile and modifiers.)  1.50 77.33   To a some slightly days (Samels of Samels of Samels of Samels of Markets)  1.50 77.33   To a some slightly days (Samels of Samels of Samel			Strata	Description		Legend	Depth (m)	Level		Backfill	Depth (m)	Dof	Sample		
Substituting from light complicit brown frequently matter brown skiptify savely substituting which is substituting and substitution of the consess candidone and quartitle. Rare podeets (up to 1.2 mm) of light ones, the and medium and college are under the consessed for many fleshing sandy substituting sandy substitution sandy substituting sandy substitution sandy sandy sandy substituting sandy substituting sandy substituting sandy substituting sandy	rounded fine and				organic CLAY. Gravel is			(iiiiiii)			0.10 - 0.20	B1		rests / Results	
elighting servicely stilly CLAY with a low cobble content. Gravel and cobbles are sub- rounded for content from to coarse-sections and quantifies. Pare pockets (up to 15- 5-min) of light grey fine and medium sand.  Brown slightly dayey slightly sandy sub-content. Gravel and boulders are of more all hindurgs including sendstone, limestone and mudstone.  ECH at 190m.  ECH at 190m.  ECH at 190m.  1.100 77.53   To 79.13   1.100 77.53   To 79.13   Characteristics of contents of the coarse of the coarse of the coarse of more all hindurgs including sendstone, limestone and mudstone.  1.100 77.53   Characteristics of contents of the coarse of the		rm light orar	ngish brow	n frequently n	nottled brown slightly sandy	 //X////X///	0.20	79.63							-
15mm) of light grey fine and medium sand.  Town dightly layer glightly acidy sub-trained to rounded fire to core:  Core of mixed lithologies including sandstone, linestone and mudstone.  EOH at 1.96m  EOH at 1.96m  Conservations / Remarks  Lines protocol by USEA in Vision (1998) and the core of mixed lithologies including sandstone, linestone and mudstone.  190  77.793  9.70  79.13  190  77.793  79.13  100  77.793  79.13  100  100  100  100  100  100  100	slightly gravelly s	silty CLAY wi	ith a low c	obble content.	. Gravel and cobbles are sub-										- -
Brown slightly clayery slightly samily sub-rounded to rounded fine to coarse GRAVEL with a low cobble and boulder content. Graved cobblies and boulders are of mixed lithologies including sandstone, limestone and mudstone.  150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93   150 77.93					arezite. Nare poekets (up to						0.50 - 0.60				-
ECOM at 1.90m - 190 77.93  ECOM at 1.90m - 190 7											0.30 - 0.00	LJZ			
Observations / Remarks  Observ							0.70	79.13							- -
EOH at 1.50m -  1.90 77.53   FOR at 1.50m -  2.2  Observations / Remarks  Observations / Remarks  1. Indic protocode by uses, 2. Exception proceeded by scan with CNT and genory, 3. Pit terminated upon encountering groundwater, 4. No visual or officiatory where or commandation roted. 5. Soaldway text undertaken at 6.5m by 6. 6. Societies with sentings.  The commandation roted. 5. Soaldway text undertaken at 6.5m by 6. 6. Societies with sentings.  Project Number	of mixed lithologi	ies including	g sandston	e, limestone a	nd mudstone.										-
Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny, 3. Pit terminated upon encountering groundwater. 4. No visual or offsctory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.    Angloss Court, Carallif, CP21 AND consumer of the contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.											1.00 - 1.10	В3			1 -
Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny, 3. Pit terminated upon encountering groundwater. 4. No visual or offsctory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.    Angloss Court, Carallif, CP21 AND consumer of the contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.															-
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Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny, 3. Pit terminated upon encountering groundwater. 4. No visual or offsctory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.    Angloss Court, Carallif, CP21 AND consumer of the contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.															
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Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny. 3. Pit terminated upon encountering groundwater. 4. No visual or olfactory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.  Longcross Court, Carriff, CFZ40 AD 029 2002 2000  Project Number															2 -
Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny. 3. Pit terminated upon encountering groundwater. 4. No visual or olfactory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.  Longcross Court, Carriff, CFZ40 AD 029 2002 2000  Project Number															-
Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny. 3. Pit terminated upon encountering groundwater. 4. No visual or olfactory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.  Longcross Court, Carriff, CFZ40 AD 029 2002 2000  Project Number															-
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Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny. 3. Pit terminated upon encountering groundwater. 4. No visual or olfactory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.  Longcross Court, Cardiff, CF24 0AD 029 2082 9200  Project Number															-
Observations / Remarks  1. Hole positioned by GPS. 2. Excavation preceded by scan with CAT and genny. 3. Pit terminated upon encountering groundwater. 4. No visual or olfactory evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.  Longcross Court, Cardiff, CF24 0AD 029 2082 9200  Project Number															-
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evidence of contamination noted. 5. Soakaway test undertaken at 0.9m bgl. 6. Backfilled with arisings.  O29 2082 9200  Project Number	1. Hole positioned by	y GPS. 2. Exca	avation prec	eded by scan w	ith CAT and genny. 3. Pit terminate	ed upon en	counterir	ng groundwa	ater. 4. N	lo visual or	r olfactory		Cardiff,	,	
	evidence of contamii	nation noted.	5. Soakawa	y test undertake	en at U.9m bgl. 6. Backfilled with a	risings.									
A110489-4														Project Numl	ber
														A110489	-4

	Project:	Former (	Cwmcarn Hi	igh School		Loc	cation Deta	ails		S	tatus		Pit Nu	mber	
	-			.g., 50,100.		321537.3		ing: 193				.			
wyg.	Location:	Cwmcar	n		Level:	76.52mA	•		)m		NAI	ᆫ	TP1	.04	
	Client:	Caerphil	ly County B	orough Council	Logger:	DV	Type:	TP					Choot	1 of 1	
			Hole Inforn	nation				Groundy	vater			Sı	Sheet :	1:25	+
	Pit Dim	ensions	Orientation:		Strike (	(m)	Rose To (m)		er (mins)	Re	emarks		hecked By:	PV	
CAERPHILLY			Shoring:		1.30		1.30		5				pproved By:	CBP	
CAERFFILI		1.00m	Stability:	Unstable								St	tart Date:	28/11/2019	
	3.00m		Plant:	JCB 3CX								Fir	inish Date:	28/11/2019	
		Churche D	\i			Depth (m)	Reduced	Water	Backfill			Samples a	and Testing		
		Strata L	Description		Legend	Depth (m)	Level (mAOD)	Level (m)	Backfill	Depth (m)	Ref		Tests / Results		
sub-rounded san- rounded fine to c (MADE GROUND)  Soft greyish brow coarse of sandsto	dstone. Bou coarse of lim ) vn gravelly v one, limesto ery sandy su nd low bould including sa	very gravel Iders are < estone and very sandy ( ne and much b-rounded der content andstone, li	CLAY. Graved dstone.	a low boulder content of fravel is angular to sub- vith rare glass and plastic.  I is sub-rounded fine to  e GRAVEL with a medium obles and boulders are of mudstone.		0.90 1.30		Level (m)		Depth (m)  0.00 - 0.90  0.50  0.90 - 1.30  1.00	ES1 B2 ES2 B3		Tests / Results	2	
Observations / Re				th CAT and array 2 Distancian				Nacional				Longcross Cardiff,	s Court,	5	
contamination noted	y Gro. 2. EXC I. 5. Backfilled	wath arisings	sueu by SCBN W S.	ith CAT and genny. 3. Pit terminat	.eu uue to I	ııısıdUllITY	or graver. 4	. INO VISU	ai ui uliaci	lory eviden	CE UI	CF24 0AD			
		- 5										029 2082 92	200		
													Project Numl	ber	
													A110489	-4	
															- 1

	Project:	Former (	Cwmcarn Hi	igh School			Loca	ation Deta			S	tatus		Pit Nu	mber	
Location: Cwmcarn Location: Cwmcarn Level: 78.26mAOD Depth: 0.40m												NI A I		TD1	05	
NO						Level: Logger:		OD Depth Type:		ufl	ΓI	NAL	-	TP1	.UO	
	Client:	Caerphil	ly County B		uncil									Sheet	1 of 1	
	Dit Dise		Hole Information:			Christo (	m) [	Rose To (m)	Groundy	r (mins)	D.	emarks		Scale:	1:25	
CAERPHILLY COUNTY HOROUGH COUNTY	PIT DIM	ensions	Shoring:	Ü		Strike (	m) i	Rose To (m)	Arte	r (mins)	KE	emarks		Checked By: Approved By:	PV CBP	
CAERFFILI		1.00m	Stability:	Unstable										Start Date:	29/11/201	19
	2.00m		Plant:	JCB 3CX										inish Date:	29/11/201	19
		Strata D	escription			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref	Samples	and Testing		
Greyish brown ve	rv sandy ar	ngular to su	h-rounded fi	ne to coarse	GRAVEL of	*********		(MAUD)		X//XX//X	Depth (m)	кег		Tests / Results		
limestone and sa (MADE GROUND)	ndstone.	.gaiai to oa			0.0.1.22											-
Black ashy very g	ravelly fine	to coarse S	SAND. Grave	l is angular 1	fine to coarse of		0.20	78.06			0.30	ES1				1
coal, clinker and (MADE GROUND)	rare slag.				/		0.40	77.86								
		ЕОН а	t 0.40m -													-
																1
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																]
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Observations / Re						1		1					Longcros	ss Court,		
<ol> <li>Hole positioned by olfactory evidence of</li> </ol>	GPS. 2. Exca contamination	avation prece on noted. 5. E	ded by scan w Backfilled with	ith CAT and g arisings.	enny. 3. Pit terminate	ed due to a	concrete	obstruction	at 0.4m	bgl. 4. No	visual or		Cardiff, CF24 0AI			
													029 2082 9			
														Project Num		
														A110489	-4	

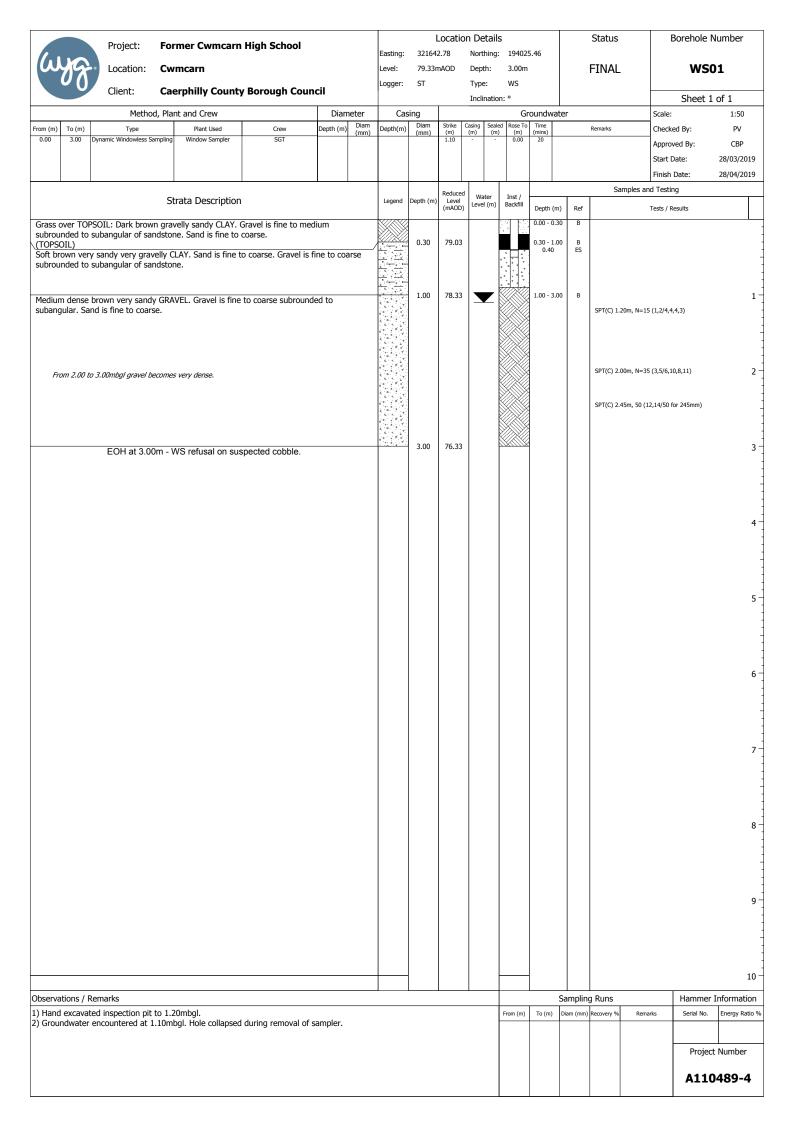
	Project:	Former (	Cwmcarn H	iah School			cation Deta			S	tatus		Pit Nu	ımber	
(JUC)		Cwmcar				321708.4		ing: 193		СТ	NI A I	.	TD1	OFA	
	Location:				Level: Logger:	78.22mA DV	OD Depth Type:		JITI	LI	NAI	<u> </u>	TP1	USA	
	Client:	Caerphil	ly County B	orough Council			.,,,,						Sheet	1 of 1	
			Hole Inforr					Groundy					Scale:	1:25	
CAFRPHILIY	Pit Dim	ensions	Orientation:	o	Strike (		Rose To (m) 1.50	Afte	er (mins)	Re	emarks		Checked By:	PV CBP	
CAERFFILI		1.50m	Shoring: Stability:	Unstable									Approved By: Start Date:	29/11/2019	
	3.00m		Plant:	JCB 3CX									inish Date:	29/11/2019	
		Ctrata C	Description		Legend	Depth (m)	Reduced Level	Water	Backfill			Samples	and Testing	1	
					Legenu	Depti (III)	(mAOD)	Level (m)	Dackilli	Depth (m)	Ref		Tests / Results		
Reddish brown sa (MADE GROUND)		r fine to co	arse GRAVEL	of limestone.						0.10	ES1				-
Black ashy very o	gravelly fine	to coarse S	SAND. Grave	l is angular fine to coarse of		0.15	78.07			0.15 - 0.50	B1				1
coal, clinker and (MADE GROUND)															1
						0.50	77.72								-
Orangish brown	very sandy s	Sub-rounde Gravel co	d fine to coa	rse GRAVEL with a medium ulders are of mixed	9 0	0.50	//./2			0.60 - 1.60	B2				1
lithologies includi										0.70	ES2				-
					9 9 0										-
					9 9 0										1
					9 9 0	1								1	1
					9 9 9										1
					9 9 9										1
					9 9										-
			1.1.00		9 64 0	1.60	76.62								1
		ЕОН а	at 1.60m -												1
															-
														2	1
														2	-
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															]
						-								5	-
Observations / Re	marks				<u> </u>	<u> </u>		<u> </u>				Longcros	ss Court		-
1. Hole positioned by	GPS. 2. Exca	avation prece	eded by scan w	ith CAT and genny. 3. Pit terminate	ed due to i	nstability	of gravel. 4	. No visu	al or olfact	ory eviden	ce of	Cardiff, CF24 0AI			
contamination noted	. s. Backfilled	with arising	5.									029 2082 9			
											Ì		Project Num	ber	1
													A110489	)-4	

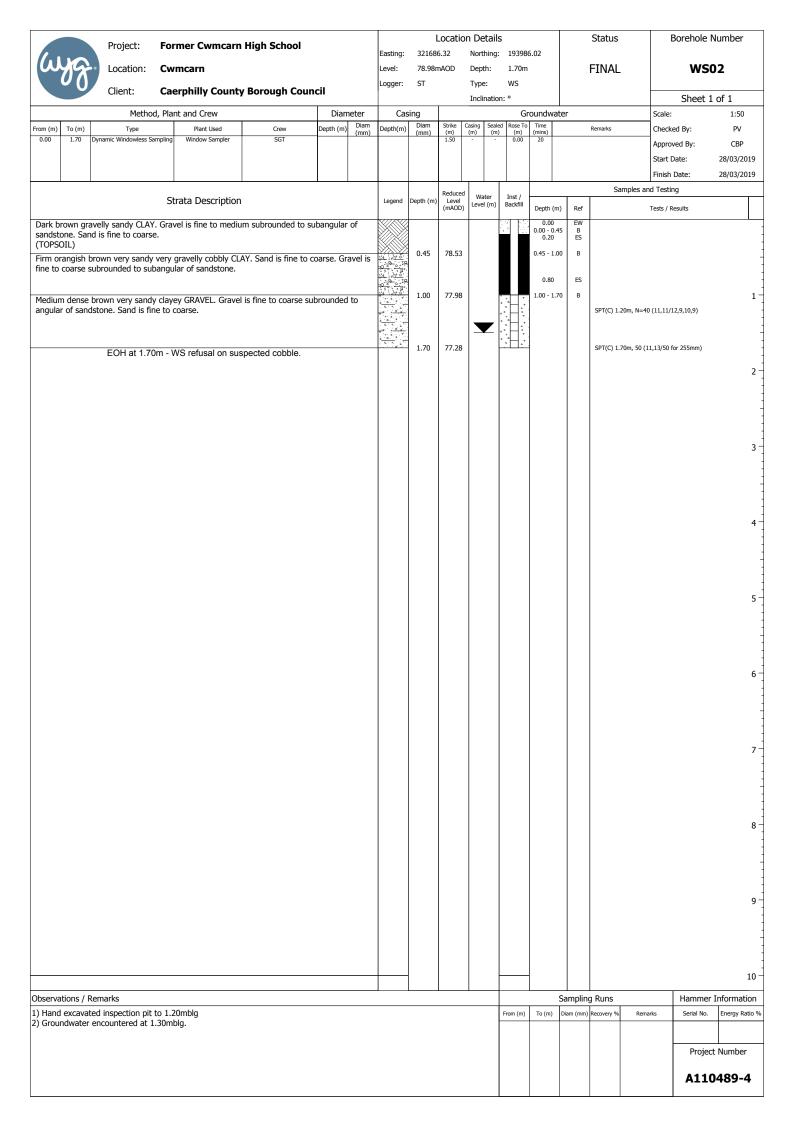
	Project:	Former (	Cwmcarn Hi	gh School		Lo	cation Deta	ils		S	tatus		Pit Nur	mber	]
				g.: • • • • • • • • • • • • • • • • • • •		321708.		ing: 193			N I A I		TD4	0.6	
Wy X	Location:	Cwmcar			Level: Logger:	78.22m/ DV	AOD Depth Type:		)m	FI	NAI	-	TP1	06	
	Client:	Caerphil	ly County Bo	orough Council	Logger.	DV	rype.	11					Sheet 1	. of 1	
			Hole Inform	nation			G	Groundy	vater				Scale:	1:25	1
	Pit Dim	nensions	Orientation:	0	Strike (		Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERFILI CAERFILI		2.00m	Shoring:		1.60	)	1.60		5				Approved By:	CBP	
	3.00m		Stability: Plant:	Unstable JCB 3CX									Start Date: Finish Date:	29/11/2019 29/11/2019	
	3.0011	·	Fidit.	JCD JCA			Dadasad					Sample	es and Testing	23/11/2013	1
		Strata D	Description		Legend	Depth (m	Reduced Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results		1
Greyish brown ve	ery gravelly	fine to coar	rse SAND. Gr	avel is angular fine to coarse			1		\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	0.00 - 0.20	B1		,		1
of limestone and	brick.			J						0.10	ES1				-
(MADE GROUND) Greyish brown ve	ery sandy su	ub-rounded	fine to coarse	e GRAVEL with a medium	a a . 0	0.20	78.02			0.20 - 1.00	B2				]
cobble content . limestone and mu	Gravel and	cobbles are	e of mixed lith	nologies including sandstone,	9 9 9										1
iiiicstoric and me	austorie:				9 9					0.50	ES2				-
					9 9 9										
					9 9										1
					9 9										-
					9 ,4 ,0									1 -	]
					9 ,4 ,0									1	1
					9 ,4 ,0										1
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					9 9										-
					9 9										1
					9 9 9										-
		EOH a	at 1.80m -			1.80	76.42								1
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															-
														5 -	
Observations / Re		12		UL CAT				. ·	.1			Longcr Cardiff	oss Court,		
<ol> <li>Hole positioned by contamination noted</li> </ol>	y GPS. 2. Exc J. 5. Backfilled	avation prece I with arising:	eded by scan wi s.	th CAT and genny. 3. Pit terminate	ed due to i	instability	of gravel. 4.	. No visu	al or olfac	ory eviden	ce of	CF24 0	AD		
												029 208			
													Project Numb		
													A110489	-4	

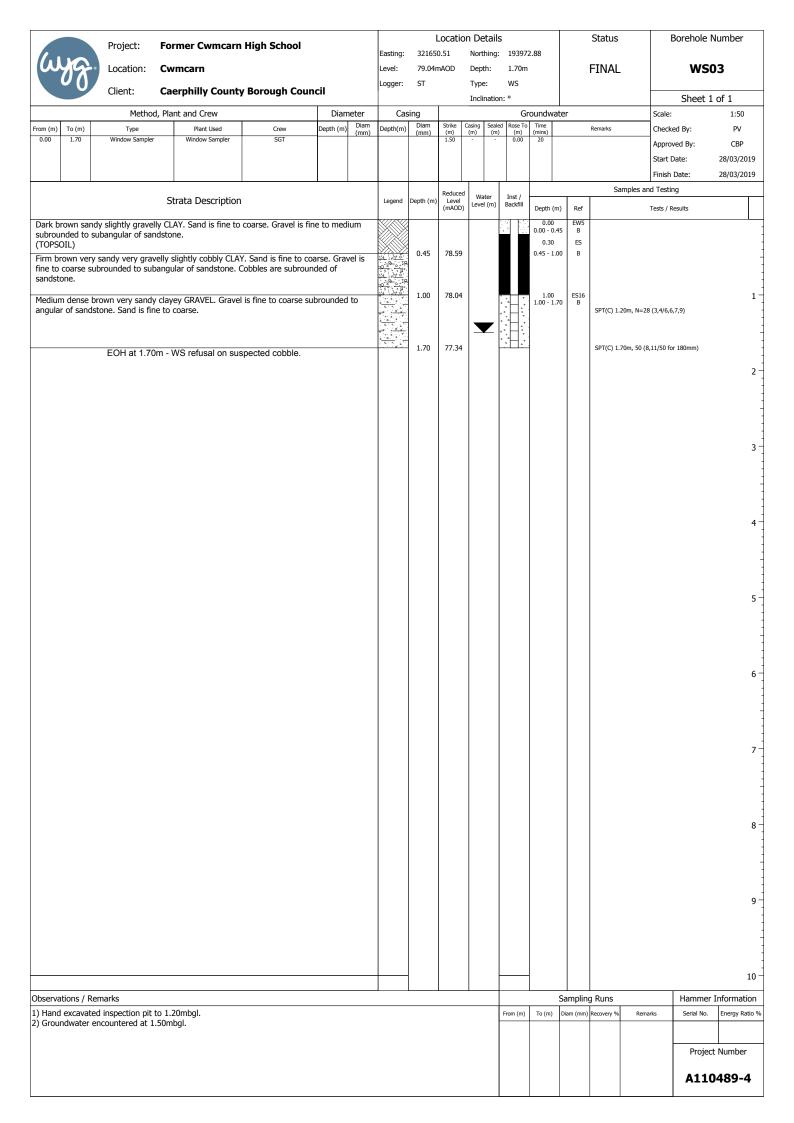
	Project:	Former (	Cwmcarn Hi	ah School			ation Deta			S	tatus		Pit Nur	mber	
(JUO)				g oso.	_	321582.6		ing: 193		ГТ	. N. I. A. I	.	TD4	07	
NO.	Location:	Cwmcar			Level: Logger:	78.59mA DV	OD Depth Type:		ım	ΓI	NAI	L	TP1	U/	
	Client:	Caerphil	ly County B	orough Council	Logger.	<b></b>	1,700.	••					Sheet 1	l of 1	
			Hole Inform				G	Groundy	vater			9	Scale:	1:25	Ī
	Pit Dim	ensions	Orientation:	0	Strike (	m)	Rose To (m)	Afte	er (mins)	Re	emarks		Checked By:	PV	
CAERPHILLY CAERFFILI		1.00m	Shoring: Stability:	Unetable									Approved By:	CBP	
	2.00m		Plant:	Unstable JCB 3CX									Start Date: Finish Date:	28/11/2019 28/11/2019	
							Reduced						and Testing		1
		Strata D	Description		Legend	Depth (m)	Level (mAOD)	Water Level (m)	Backfill	Depth (m)	Ref		Tests / Results		1
Reddish brown viboulder content of (MADE GROUND)	of angular co	ngular fine oncrete.		AVEL of limestone with a low		0.50	78.09			Depth (m)	Ref		Tests / Results	2	
															-
															1
															-
														4	1
															1
															1
															1
															1
															1
															1
															1
														5	1
Observations / Re	marks											lona	es Court		+
1. Hole positioned by	GPS. 2. Exca	avation prece	eded by scan w	ith CAT and genny. 3. Pit terminate	ed due to a	concrete	obstruction	at 0.4m	n bgl. 4. No	visual or		Cardiff, CF24 0A	ss Court,		
olfactory evidence of	contaminatio	n noted. 5. I	Backfilled with	arisings.								029 2082			
													Project Numb	per	+
													A110489		
														-	

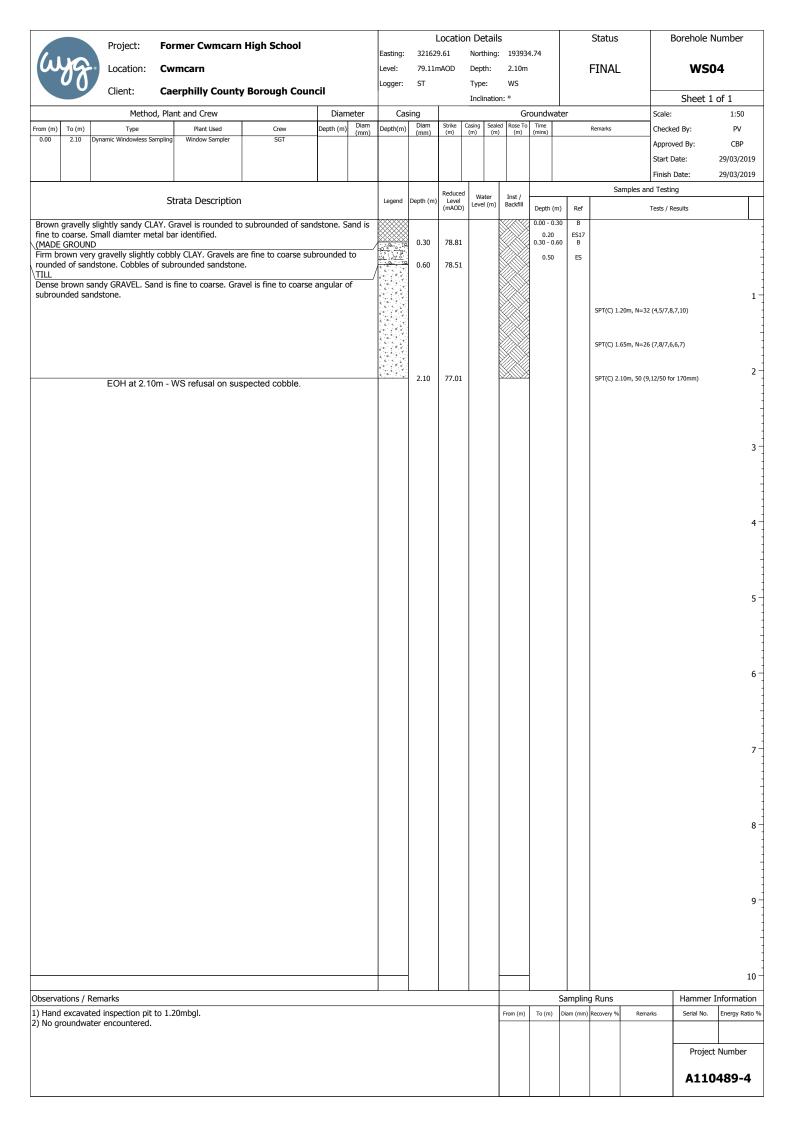
	Project:	Former (	Cwmcarn Hi	ah School		Loc	ation Deta	ils		S	tatus	Pit Nu	mber
				gii School		321582.6		ng: 193					
wy x	Location:	Cwmcarı	n			78.59mA	•		)m	FI	NAL	TP1	07A
	Client:	Caerphil	ly County B	orough Council	Logger:	DV	Type:	IP				Sheet	1 of 1
			Hole Inforn	nation			G	roundv	vater			Scale:	1:25
	Pit Dim	ensions	Orientation:		Strike (		Rose To (m)		er (mins)	Re	emarks	Checked By:	PV
CAERPHILLY			Shoring:		3.00		3.00		5			Approved By:	CBP
CAERFFILI		3.00m	Stability:	Unstable								Start Date:	28/11/2019
	3.00m		Plant:	JCB 3CX								Finish Date:	28/11/2019
		Strata D	escrintion		Legend	Depth (m)	Reduced Level	Water	Backfill			Samples and Testing	
content and low l	andy angula boulder con k, rubber ar ular of conc	Strata D	Description  arse GRAVEL I is angular fi	with a medium cobble ne to coarse of limestone angular of limestone.	Legend	3.10	Reduced Level (mAOD)	Water Level (m)	Backfill	1.50 - 2.50 1.50 - 2.50	Ref B1 ES1	Samples and Testing  Tests / Results	
													5-
Ohaan II / 5													
Observations / Re  1. Hole positioned by evidence of contamin	GPS. 2. Exca	avation prece 5. Backfilled	ded by scan wi with arisings.	ith CAT and genny. 3. Pit terminat	ed due to i	nstability (	of Made Gro	ound. 4.	No visual o	or olfactory	'	Longcross Court, Cardiff, CF24 0AD 029 2082 9200	
											-	Project Num	ber
												A110489	

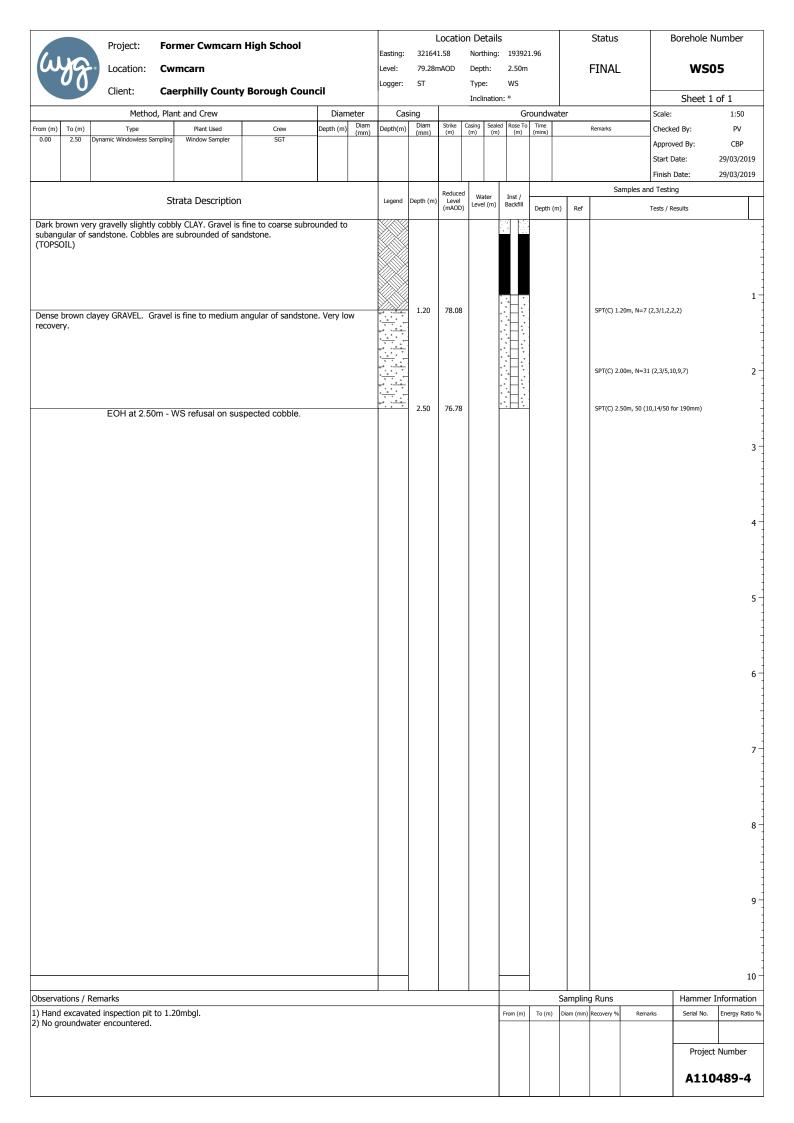
	Project:	Former (	Cwmcarn Hi	ah School		Loc	cation Deta	ails		S	tatus	Pit Nun	nber
(100)	-			g oso	_	321524.		ing: 193			N I A I	TD1	20
W A	Location:	Cwmcar			Level: Logger:	76.91mA DV	OD Depth Type:		um	LI	NAI	_ TP10	J8
	Client:	Caerphil	ly County B	orough Council			.,,,					Sheet 1	of 1
			Hole Inform					Groundy				Scale:	1:25
CAFRPHILIY	Pit Dim	nensions	Orientation:	0	Strike ( 2.40		Rose To (m) 2.40	Afte	er (mins)	R	emarks	Checked By:	PV CBP
CAERFFILI		1.00m	Shoring: Stability:	Unstable								Approved By: Start Date:	28/11/2019
	3.00m		Plant:	JCB 3CX								Finish Date:	28/11/2019
		Ctrata C	Description		Legend	Depth (m)	Reduced Level	Water	Backfill			Samples and Testing	
					Legend	Depti (III)	(mAOD)	Level (m)	Dackilli	Depth (m)	Ref	Tests / Results	
angular brick and brick, limestone, (MADE GROUND)	d limestone. sandstone a ) vn slightly g	Gravel is a and rare me	angular to subetal. dy CLAY. Gra	low cobble content of orrounded fine to coarse of over its sub-rounded fine to stone and mudstone.		0.40	76.51			0.20 0.40 - 0.90	ES1 B1		
Greyish brown ve	ery sandy su	ıb-rounded	fine to coarse	e GRAVEL with a low cobble		0.90	76.01			0.60	ES2	HV 0.60m, (p)=112 kPa (r)= kPa	
content. Gravel a		are of mix	ed lithologies	including sandstone,						1.60 - 2.60	B2		1-
													2-
		ЕОН а	ut 2.60m -			2.60	74.31	•					
													3 –
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Observations / Re 1. Hole positioned by contamination noted	GPS. 2. Exca	avation prece I with arising	eded by scan wi s.	ith CAT and genny. 3. Pit terminat	ed due to i	nstability	of gravel. 4	. No visu	ial or olfact	tory evider	ce of	Longcross Court, Cardiff, CF24 0AD 029 2082 9200	
												Project Numb	er
												A110489-	4

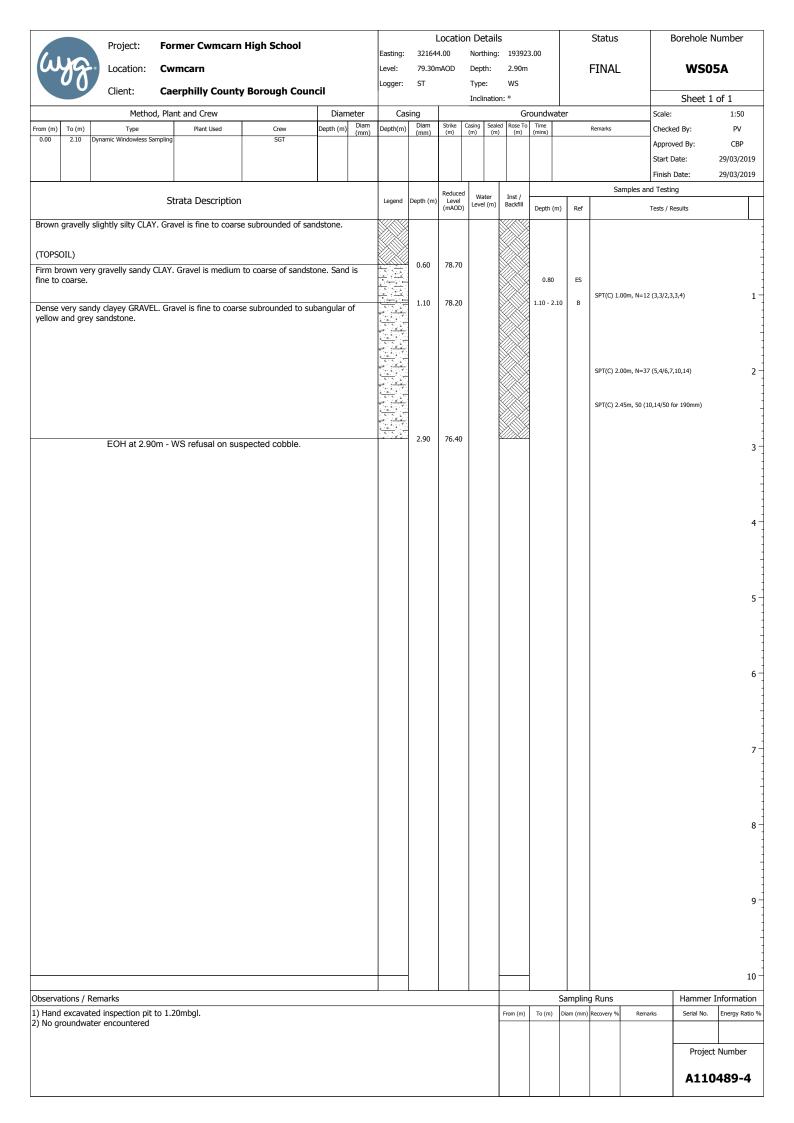


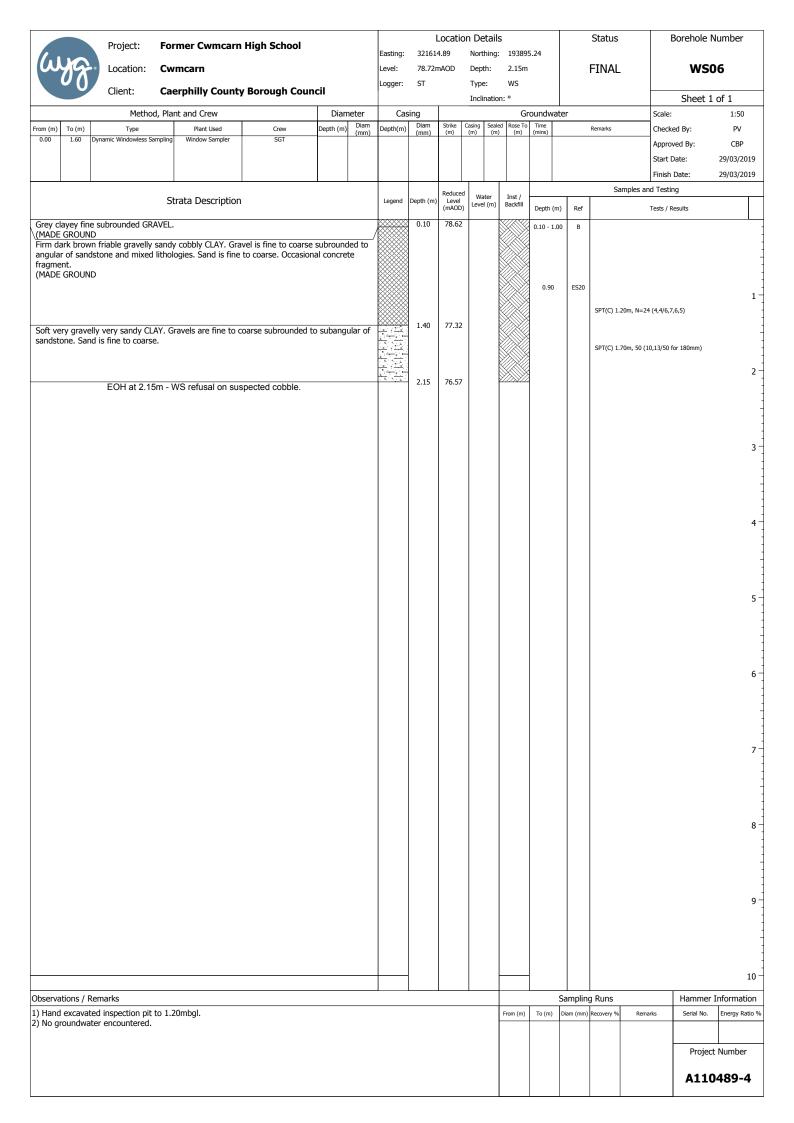


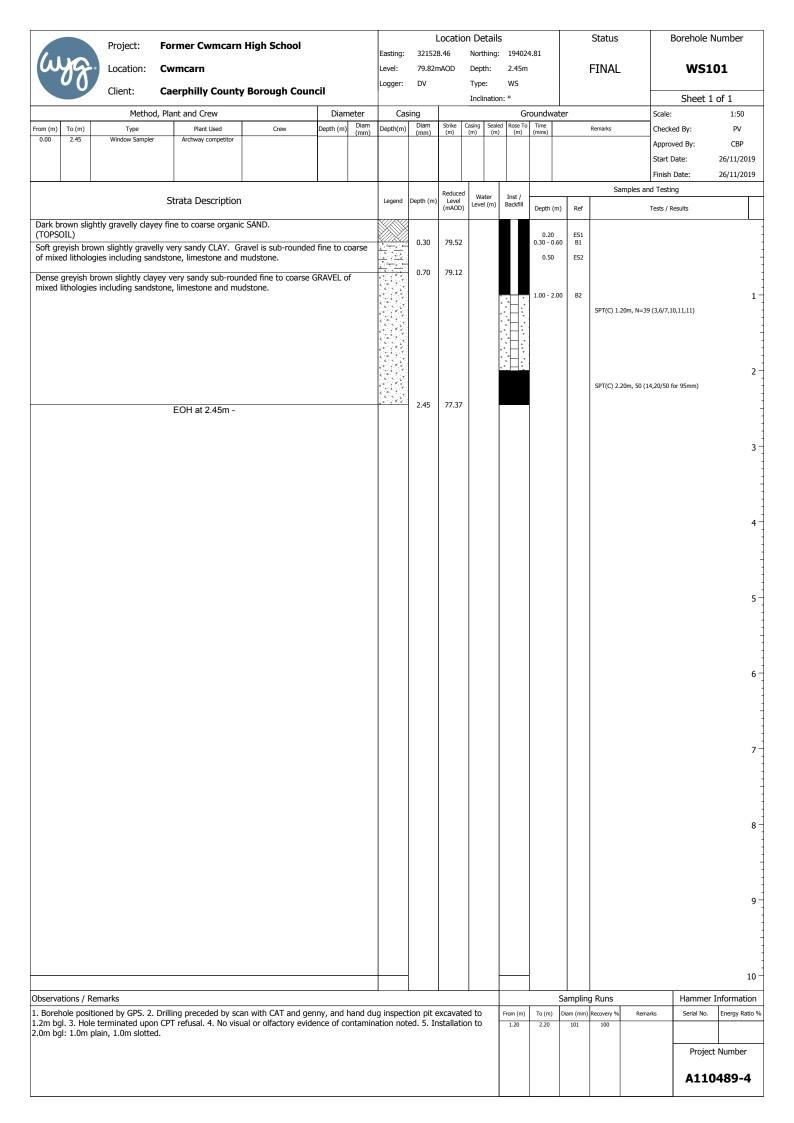


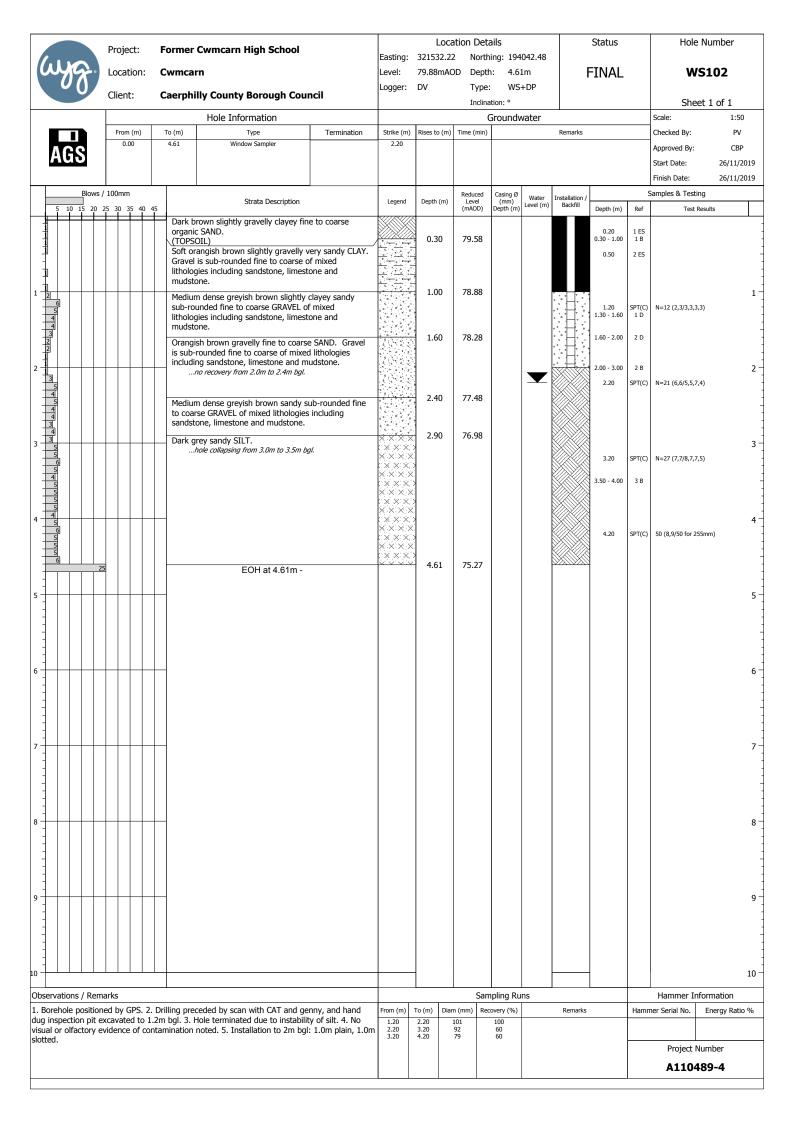


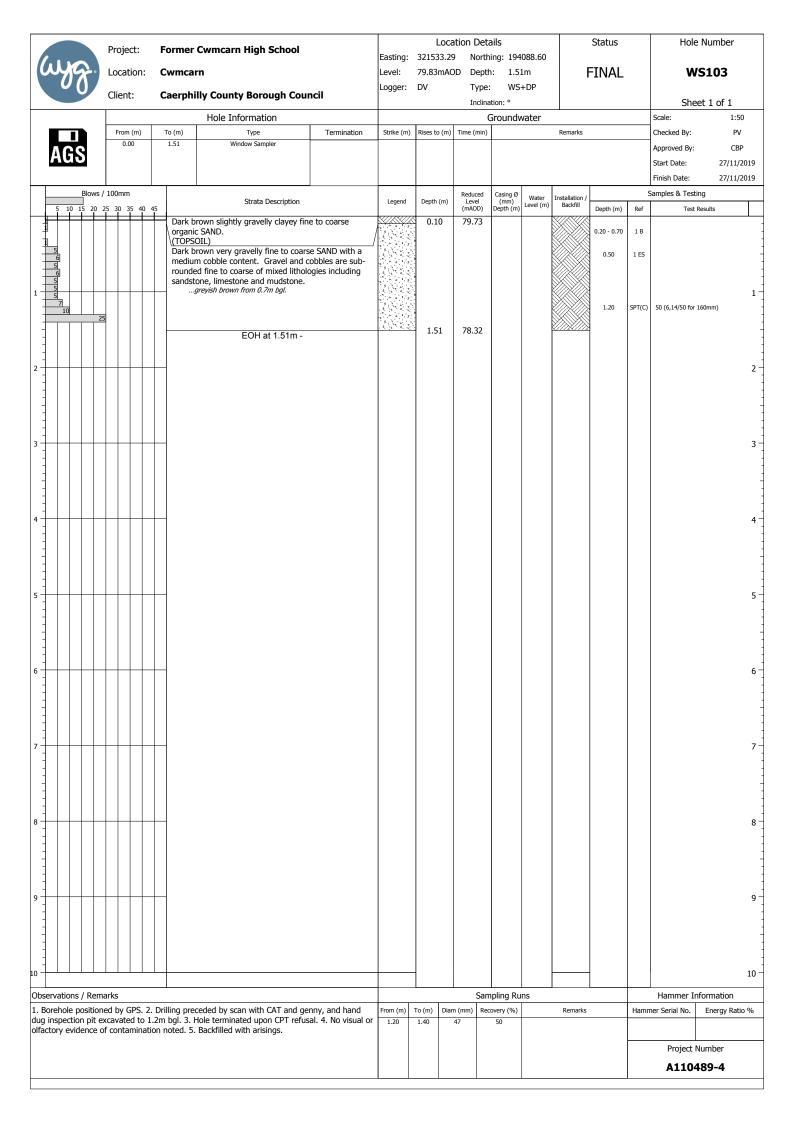


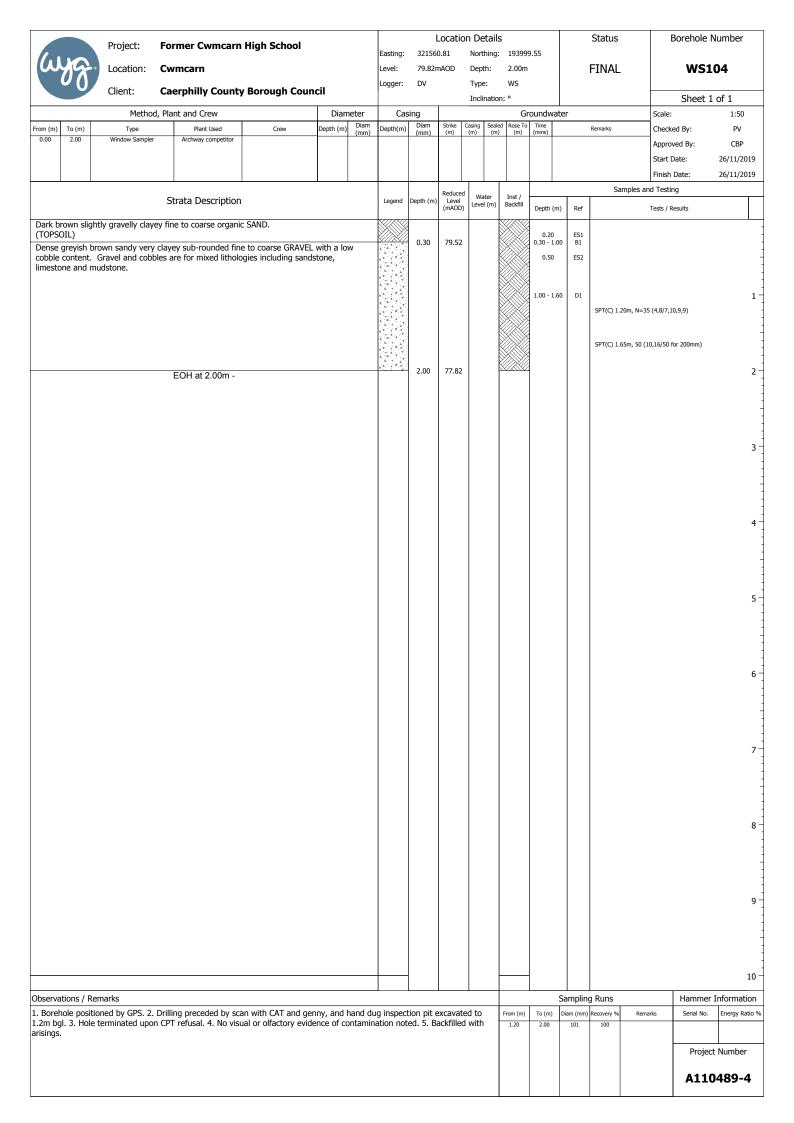


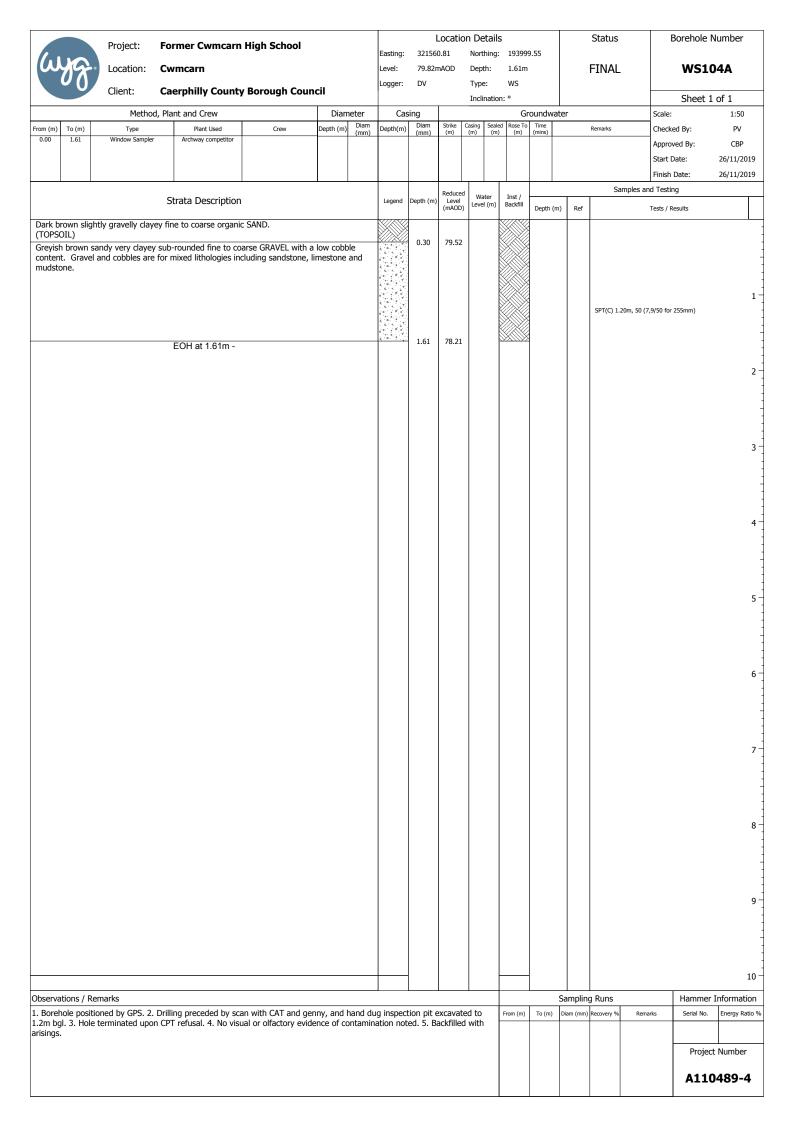


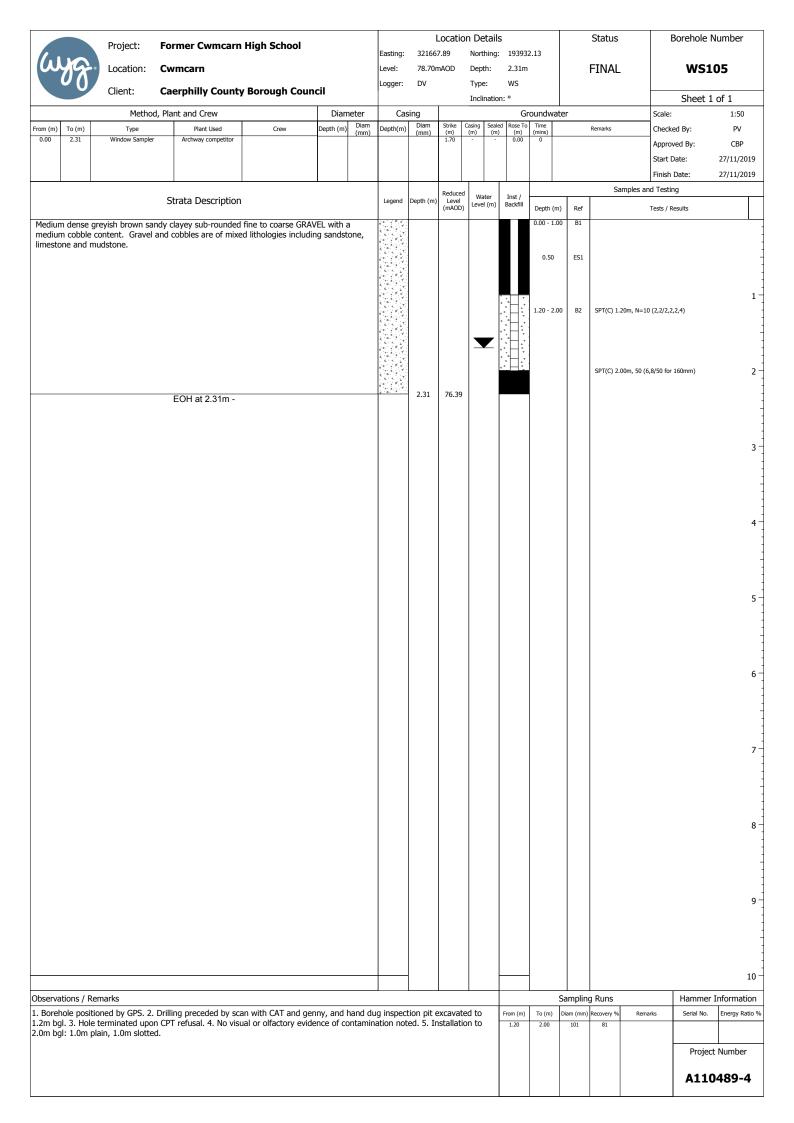


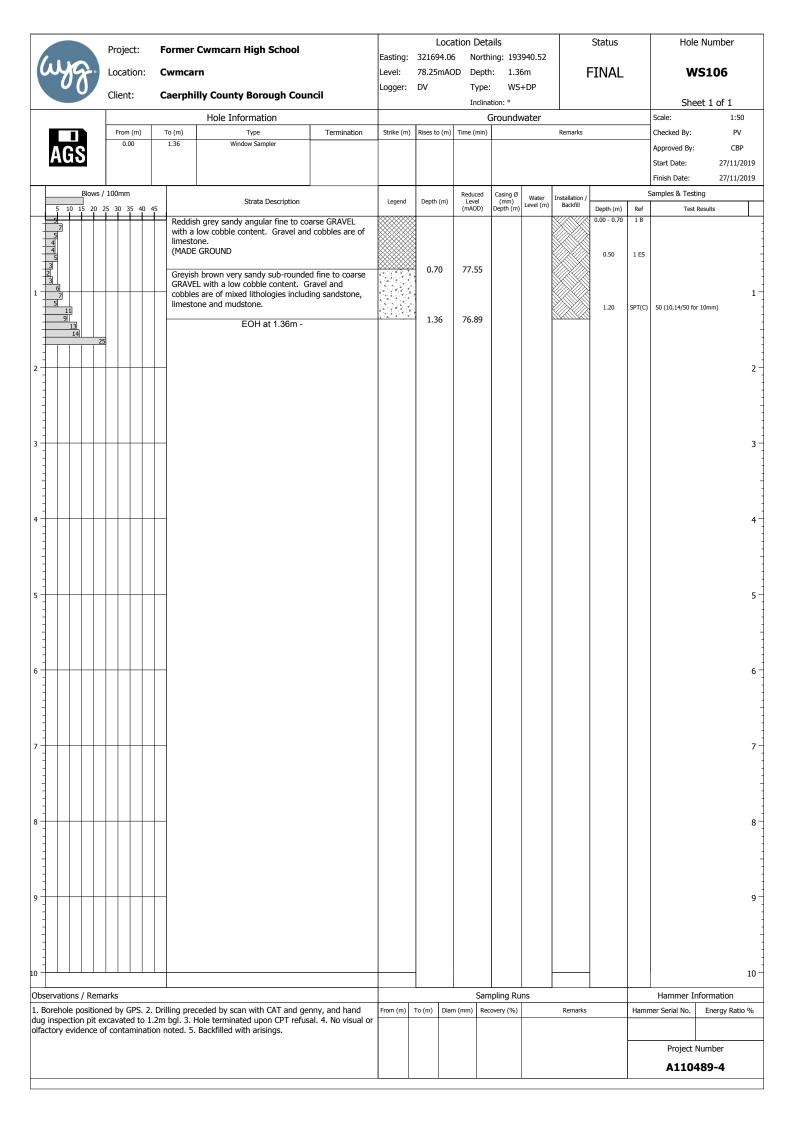




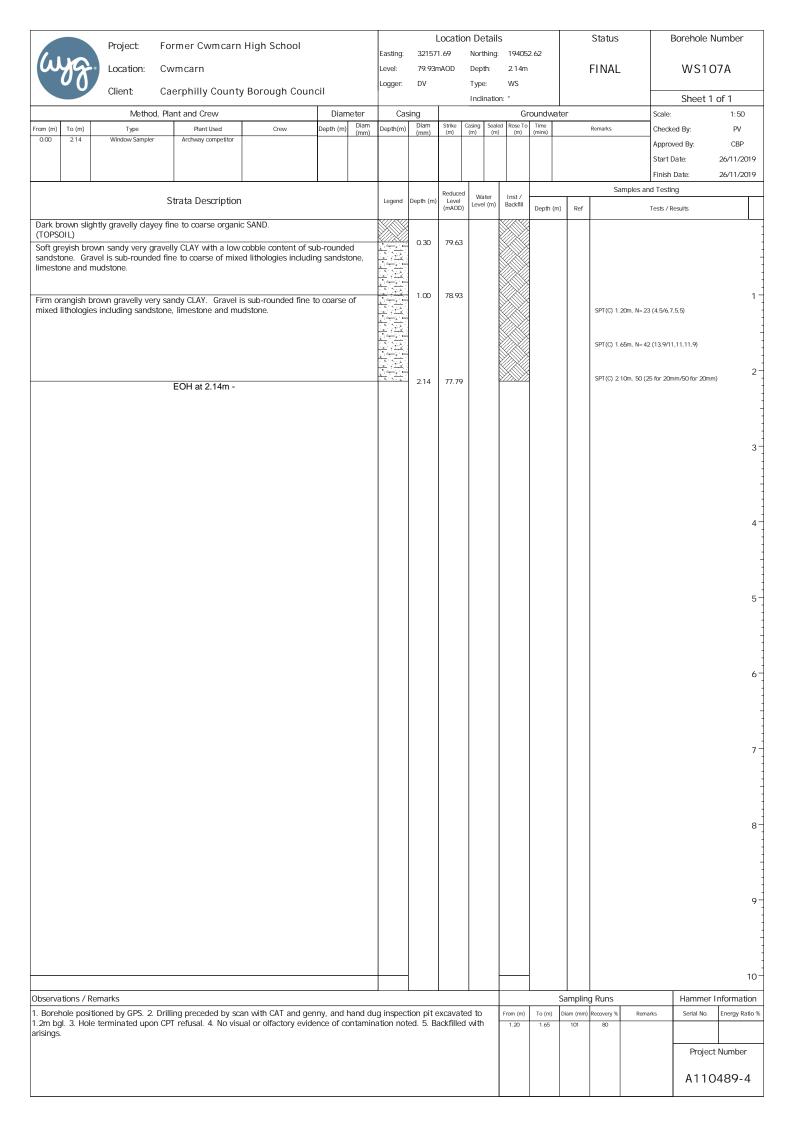


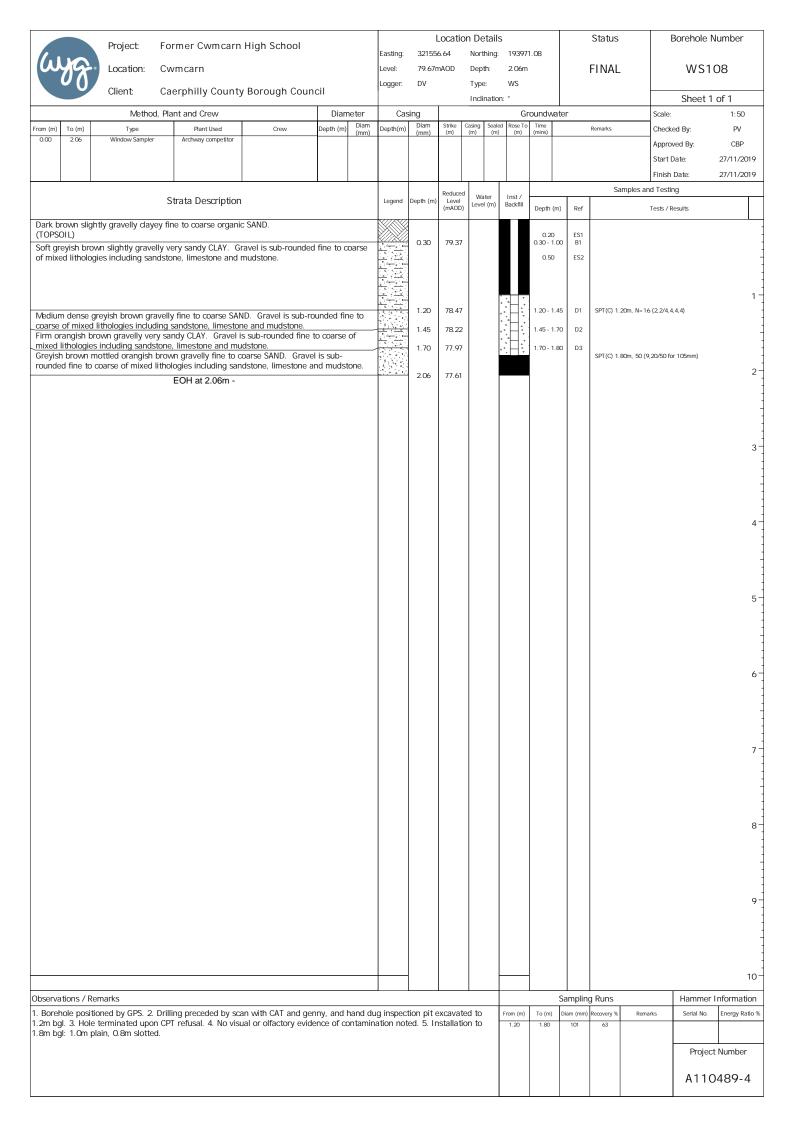


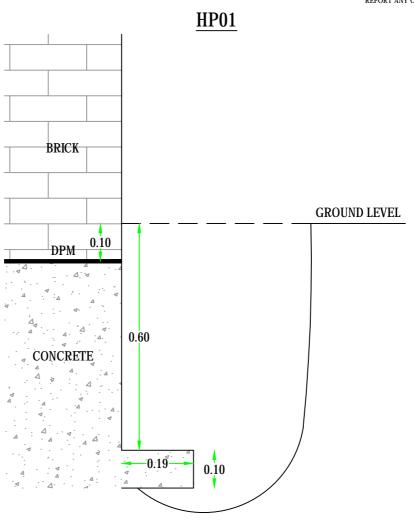




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00								/RJJH			Η :6			), 1	φ/	VV	3107
	& O I	<b>МН</b> С	. Ca	erphil	ly County Boroug	า Cou	ncil					W L R Q .				6 K	HWH RI
					+ROH, ODMLAR	WP.	T				1	( OD)(GH ZU				6FDOH	·
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				723 6RIV	<u>62,/</u> / JUH\LVK EUF	RZQ	VDQG\ YHU\	1	400\ 8	/\$< Zl	wk c				9/		
<b>å</b>					FREEOH FR <b>Q</b> I UXREXQGHG ILQ				*UDY	но					'		
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LQVSH	OH SF F[WVID.1R	V L V	LOSV	WHR	P EJO +R	OH V	QJ SUHFHGI WHUPLQDWH	G XSR	Q -& 37	PLWPK 54	BI \$R7Y HD.	QGJI 1R	HQQH\PU YLVXD	ORU		⊋РНИ 6НИ	
RUHKRO LQVSH	OH SF F[WVID.1R	V L V	LOSV	WHR		OH V	WHUPLQDWH	G XSR	Q -& 37	PLWPK 54	BI \$R7Y HD.	QGJI 1R	HQQH\PU YLVXD			⊋РНИ 6НU Р	LQQHIURJ\5[
RUHKRO LQVSH DFWRU\	OH SF F[WVID.1R	V L V	LOSV	WHR	P EJO +R	OH V	WHUPLQDWH	G XSR	Q -& 37	PLWPK 54	BI \$R7Y HD.	QGJI 1R	HQQH\PU YLVXD	ORU		⊋РНИ 6НU Р	LQQHURJ\50











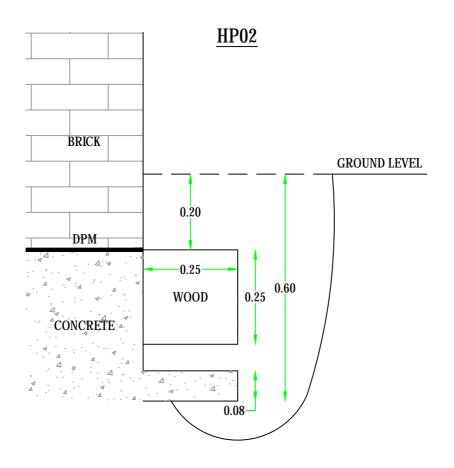
CRERPHILLY COUNTY BOROUGH COUNCIL

CWMCARN HIGH SCHOOL

HAND PIT SKETCH - HP01

BY CHK APP DATE DESCRIPTION Project No. Office Type
A110489-4 CDF N Wing No.
HPSK/01

WYG Group Ltd







5th FLOOR LONGCROSS COURT 47 NEWPORT RIAD CARDIFF CF24 0AD TEL: +44 (0)29 2082 9200 e-mail: cardiff@wwg.com

CAERPHILLY COUNTY BOROUGH COUNCIL

NTY BOROUGH CWMCARN HIGH SCHOOL

Drawing Title: HAND PIT SKETCH - HP02

REV

WYG Group Ltd.



Plate 1 SA103 Side 1



Plate 2 SA103 Side 2

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Project :-Cwmcarn High School

Project No.: A110489-4-1



Plate 3 SA103 Side 3



Plate 4 SA103 Side 4

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Project :-		
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Project No.: A110489-4-1



Plate 5 SA103 Spoil

Plate 6 BLANK

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Project No.: A110489-4-1



Plate 7 SA104 Side 1



Plate 8 SA104 Side 2

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Plate 9 SA104 Side 3



Plate 10 SA104 Side 4

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Project :-		
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Project No.: A110489-4-1



Plate 11 SA104 Spoil

Plate 12 BLANK

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Project No.: A110489-4-1



**Plate 13** SA105/TP103 Side 1



**Plate 14** SA105/TP103 Side 2

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Project No.: A110489-4-1



**Plate 15** SA105/TP103 Side 3



**Plate 16** SA105/TP103 Side 4

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Project No.: A110489-4-1



Plate 17 SA105/TP103 Spoil

Plate 18 BLANK

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Plate 19 TP101 Side 1



Plate 20 TP101 Side 2

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Plate 21 TP101 Side 3



Plate 22 TP101 Side 4

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Project No.: A110489-4-1



Plate 23 TP101 Spoil



Plate 24 TP102 spoil

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Project No.: A110489-4-1



Plate 25 TP104



**Plate 26** TP105

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Project No.: A110489-4-1



Plate 27 TP105A



Plate 28 TP106

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Project No.: A110489-4-1



Plate 29 TP107A



Plate 30 TP108

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Project :-Cwmcarn High School

Project No.: A110489-4-1



**Plate 31** WS101 - 0.0m - 1.0m bgl



**Plate 32** WS101 - 1.0m - 2.0m bgl.

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Project :-Cwmcarn High School

Project No.: A110489-4-1



Plate 33 WS102 - 0.0m - 1.0m bgl.



Plate **34** WS102 - 1.0m - 3.0m bgl.

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Project :-Cwmcarn High School

Project No.: A110489-4-1



Plate **35** WS102 - 3.0m - 4.0m bgl.



**Plate 36** WS103 - 0.0m - 1.2m bgl.

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Project :-Cwmcarn High School

Project No.: A110489-4-1



**Plate 37** WS103 - 1.2m - 1.4m bgl.



**Plate 38** WS104 - 0.0m - 1.2m bgl.

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Project :-Cwmcarn High School

Project No.: A110489-4-1



**Plate 39** WS104 - 1.2m - 1.6m bgl.



Plate 40 WS105 - 0.0 - 1.2m bgl.

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Project :-		
Cwmcarn	High	School

Project No.: A110489-4-1



**Plate 41** WS105 - 1.2m - 2.0m bgl.



**Plate 42** WS105 - 0.0m - 1.0m bgl.

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Project :-		
Cwmcarn	High	School

Project No.: A110489-4-1



Plate 43 S1



Plate 44 S2

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Project :-		
Cwmcarn	High	School

Project No.: A110489-4-1



**Plate 45** S3



Plate 46 S4

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Project :-Cwmcarn High School

Project No.: A110489-4-1



Plate 47 S5



Plate 48 S6

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Project :-		
Cwmcarn	High	School

Project No.: A110489-4-1



**Plate 49** S7



Plate 50 S8

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Project :-		
Cwmcarn	High	School

Project No.: A110489-4-1



**Plate 51** S9



**Plate 52** S10

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Project :-		
Cwmcarn	High	School

Project No.: A110489-4-1



**Plate 53** S11



**Plate 54** S12

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Project :-		
Cwmcarn	High	School

Project No.: A110489-4-1



Plate Title SA01 Plate No 1



## WYG Environment 5th Floor, Longcross Court, 47 Newport Road, Cardiff

Tel: 02920 829200 Fax: 02920 455321

Environmental Consultancy
Ground Engineering Services

Project
Former Cwmcarn High
School

SA01

CCBC Checked by SR

d by Plate No.

2



Plate Title Plate No 3 TP01



## WYG Environment 5th Floor, Longcross Court, 47 Newport Road, Cardiff

Tel: 02920 829200 Fax: 02920 455321

Environmental Consultancy
Ground Engineering Services

Former Cwmcarn High School

TP01

Checked by Plate No. **CCBC** SR

4



Plate Title TP02 Plate No 5



WYG Environment	Project	Plate Title	
5 th Floor, Longcross Court, 47 Newport Road, Cardiff	Former Cwmcarn High		TP02
Tel: 02920 829200	School		1702
Fax: 02920 455321			
Environmental Consultancy (4)	Client	Checked by	Plate No.
Ground Engineering Services	CCBC	SR	O



Plate Title TP03 Plate No 7



WYG Environment	Project	Plate Title		
5 th Floor, Longcross Court, 47 Newport Road, Cardiff	Former Cwmcarn High		TP03	
Tel: 02920 829200	School	1705		
Fax: 02920 455321				
Environmental Consultancy (4)	Client	Checked by	Plate No.	
Ground Engineering Services	ССВС	SR	O	



Plate Title TP04 Plate No 9



WYG Environment	Project	Plate Title	
5 th Floor, Longcross Court, 47 Newport Road, Cardiff	Former Cwmcarn High		TP04
Tel: 02920 829200	School		IFU <del>T</del>
Fax: 02920 455321			
Environmental Consultancy (4)		Checked by	Plate No.
Ground Engineering Services	CCBC	SR	10

# Former Cwmcarn High School

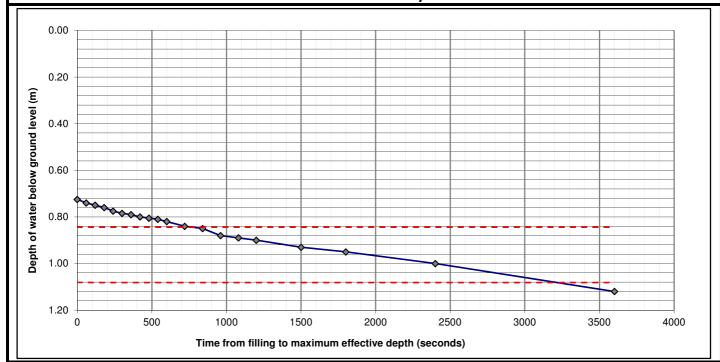


## **APPENDIX C – SOIL INFILTRATION TESTING RESULTS**

Environmental Consultancy Ground Engineering Services



DATE:	25/03/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn
CLIENT:	CCBC
TRIAL PIT ID:	SA01
TEST NUMBER:	1



		Distance to	PIT LENGTH (m):	2.10	Pit	construct	ion	
Time Elapsed	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.70				
(s)	(IIIIIS)	level (m)	PIT DEPTH (m):	1.20				
0	0.00	0.725		IN	PUT PARAMETERS:			
60	1.00	0.740			Total volume of pit	(m ³ )	0.70	
120	2.00	0.750	Pit volume betwee	Pit volume between 75% and 25% depths = L x W x $\frac{1}{2}$ D (m ³ )				
180	3.00	0.760			Effective depth of Pit	(m)	0.48	
240	4.00	0.775	Propo	ortion of pit volume	occupied by gravel solids	(0-1)	0.00	
300	5.00	0.785		Maximum p	otential volume of Water	$(m^3)$	0.70	
360	6.00	0.790	Leve	el of water in pit at 7	'5% effective depth (p ₇₅ )	(m)	0.12	
420	7.00	0.800	Leve	el of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.36	
480	8.00	0.805						
540	9.00	0.810			depth Vp75-25 = V x Pg	$(m^3)$	0.35	
600	10.00	0.820	Surface	Surface area of pit up to 50% effective depth $(A_{p50})$ $(m^2)$				
720	12.00	0.840						
840	14.00	0.850			'5% effective depth (p ₇₅ )	(s)	765	
960	16.00	0.880		Time at 2	25% effective depth (p ₂₅ )	(s)	3213	
1080	18.00	0.890	Time for outflow f	for 75% and 25% ef	fective depth (Tp75-25)	(s)	2448	
1200	20.00	0.900			OUTPUT:			
1500	25.00	0.930	SOIL INFILTRATION	N DATE (f)	V _{p75 - 25}	(m/s)	5.09E-05	
1800	30.00	0.950	SOIL INFILIRATION	TRAIL (I)	A _{p50} x T _{p75 - 25}	(111/5)	5.092-05	
2400	40.00	1.000						
3600	60.00	1.120	WATER INPUT:	500L	in 2 min	S		
			<b>GEOLOGY OF TEST S</b>	SECTION:				
				Brown sa	andy very clayey COBBLE	S.		
					Compiled by:		KW	
					Checked by:		SR	
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1	

After BRE Digest 365, Soakaway Design, 2016

Environmental Consultancy Ground Engineering Services



DATE:	25/03/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn
CLIENT:	CCBC
TRIAL PIT ID:	SA01
TEST NUMBER:	2

0.69 0.35 0.47 0.00 0.69 0.12

0.35 2.79

900 3511 2611

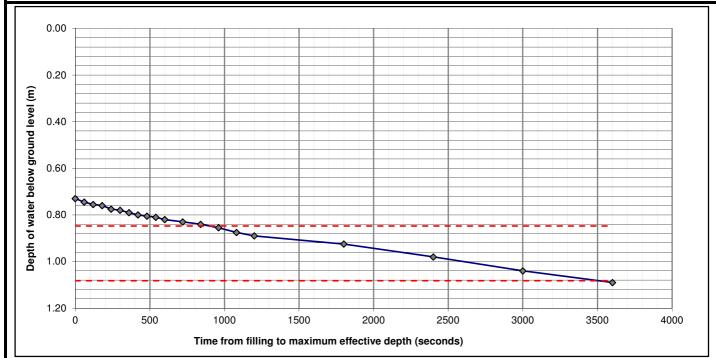
4.75E-05

ΚW

SR

Page 1 of 1

Checked by:



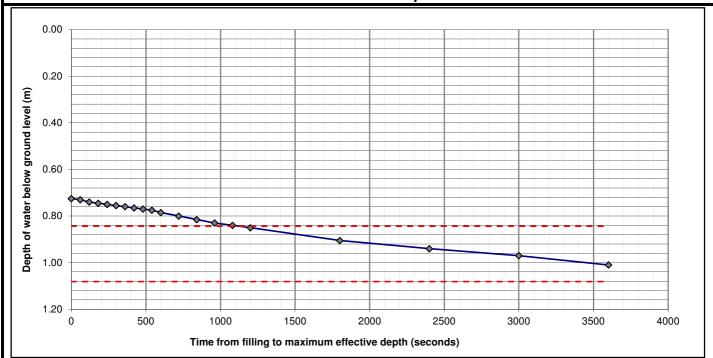
Time Flanced	Time Florida	Distance to water surface	PIT LENGTH (m):	2.10	Pit	construct	ion
Time Elapsed (s)	Time Elapsed (mins)	from ground	PIT WIDTH (m):	0.70			
(5)	(111115)	level (m)	PIT DEPTH (m):	1.20			
0	0.00	0.730		IN	PUT PARAMETERS:		
60	1.00	0.745			Total volume of pit	(m ³ )	
120	2.00	0.755	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	$(m^3)$	
180	3.00	0.760			Effective depth of Pit	(m)	
240	4.00	0.775	Propo	rtion of pit volume of	occupied by gravel solids	(0-1)	
300	5.00	0.780	Maximum potential volume of Water			$(m^3)$	
360	6.00	0.790	Level of water in pit at 75% effective depth (p ₇₅ )			(m)	
420	7.00	0.800	Leve	l of water in pit at 2	5% effective depth (p ₂₅ )	(m)	
480	8.00	0.805					
540	9.00	0.810	Effective volume bet	tween 75% & 25% (	depth Vp75-25 = V x Pg	$(m^3)$	
600	10.00	0.820	Surface	area of pit up to 50	0% effective depth (A _{p50} )	(m ² )	
720	12.00	0.830					
840	14.00	0.840		Time at 7	'5% effective depth (p ₇₅ )	(s)	
960	16.00	0.855		Time at 2	5% effective depth (p ₂₅ )	(s)	
1080	18.00	0.875	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	
1200	20.00	0.890			OUTPUT:		
1800	30.00	0.925	COTI TNETI TRATTON	LDATE (6)	V _{p75 - 25}	( (-)	
2400	40.00	0.980	SOIL INFILTRATION	I KAIE (T)	A _{p50} x T _{p75 - 25}	(m/s)	
3000	50.00	1.040					
3600	60.00	1.090	WATER INPUT:	450	in 2 min	S	
			GEOLOGY OF TEST S	ECTION:			
				Brown sa	andy very clayey COBBLES	5.	
					Compiled by:		

Environmental Consultancy Ground Engineering Services



DATE:	25/03/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn
CLIENT:	CCBC
TRIAL PIT ID:	SA01
TEST NUMBER:	3

### **SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION**



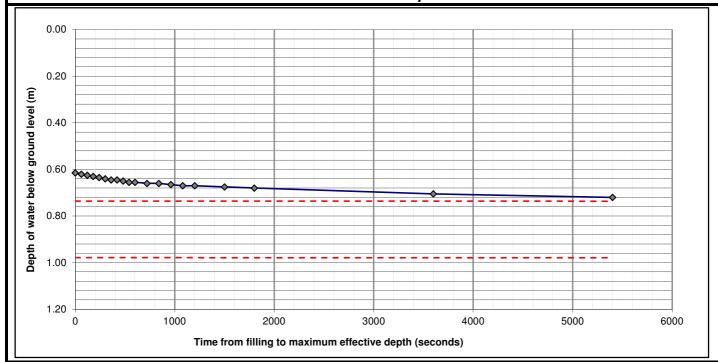
Distance to DIT LENGTH (m)

		Distance to	PIT LENGTH (m):	2.10	Pit	constructi	on
Time Elapsed (s)	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.70			
(5)	(1111115)	level (m)	PIT DEPTH (m):	1.20			
0	0.00	0.725		IN	PUT PARAMETERS:		
60	1.00	0.730			Total volume of pit	(m ³ )	0.70
120	2.00	0.740	Pit volume betwee	en 75% and 25% de	pths = L x W x ½D	(m ³ )	0.35
180	3.00	0.745			Effective depth of Pit	(m)	0.48
240	4.00	0.750	Propo	rtion of pit volume o	occupied by gravel solids	(0-1)	0.00
300	5.00	0.755		Maximum po	otential volume of Water	$(m^3)$	0.70
360	6.00	0.760		· ·	5% effective depth (p ₇₅ )	(m)	0.12
420	7.00	0.765	Leve	l of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.36
480	8.00	0.770					
540	9.00	0.775			depth Vp75-25 = V x Pg	(m ³ ) (m ² )	0.35
600	10.00	0.785	Surface	Surface area of pit up to 50% effective depth (A _{p50}			2.80
720	12.00	0.800					
840	14.00	0.815	Time at 75% effective depth (p ₇₅ ) (s) 1338				
960	16.00	0.830		Time at 2	5% effective depth (p ₂₅ )	(s)	4307
1080	18.00	0.840	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	2969
1200	20.00	0.850			OUTPUT:		
1800	30.00	0.905	SOIL INFILTRATION	I DATE /f\	V _{p75 - 25}	(m/s)	4.20E-05
2400	40.00	0.940	SOIL INFILIRATION	I KAIL (I)	A _{p50} x T _{p75 - 25}	(111/5)	4.20E-05
3000	50.00	0.970					
3600	60.00	1.010	WATER INPUT:	450	in 2 mins	s	
			<b>GEOLOGY OF TEST S</b>	ECTION:			
				Brown sa	andy very clayey COBBLES	5.	
					Compiled by:		KW
					Checked by:		SR
After BRE Digest	365, Soakaway [	Design, 2016					Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	25/03/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn
CLIENT:	CCBC
TRIAL PIT ID:	SA02
TEST NUMBER:	1

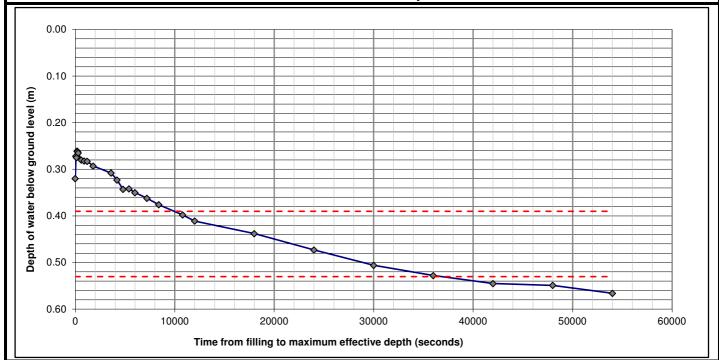


		Distance to	PIT LENGTH (m):	LENGTH (m): 2.20 Pit construction			ion
Time Elapsed (s)	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.60			
(3)	(111113)	level (m)	PIT DEPTH (m):	1.10			
0	0.00	0.615		IN	PUT PARAMETERS:		
60	1.00	0.620			Total volume of pit	(m ³ )	0.64
120	2.00	0.625	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	$(m^3)$	0.32
180	3.00	0.630			(m)	0.49	
240	4.00	0.635	Propo	ortion of pit volume o	occupied by gravel solids	(0-1)	0.00
300	5.00	0.640		Maximum p	otential volume of Water	$(m^3)$	0.64
360	6.00	0.645	Leve	el of water in pit at 7	5% effective depth (p ₇₅ )	(m)	0.12
420	7.00	0.645	Leve	el of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.36
480	8.00	0.650					
540	9.00	0.655		tween 75% & 25%	$(m^3)$	0.32	
600	10.00	0.655	Surface	e area of pit up to 50	$1\%$ effective depth ( $A_{p50}$ )	$(m^2)$	2.68
720	12.00	0.660					
840	14.00	0.660	Time at 75% effective depth (p ₇₅ ) (s) 8849				
960	16.00	0.665		Time at 2	5% effective depth (p ₂₅ )	(s)	183300848
1080	18.00	0.670	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	183291999
1200	20.00	0.670			OUTPUT:		
1500	25.00	0.675	SOIL INFILTRATION	I DATE (f)	V _{p75 - 25}	(m/s)	6.52E-10
1800	30.00	0.680	SOIL IN ILIKATIO	TRAIL (I)	A _{p50} x T _{p75 - 25}	(11/3)	0.32L-10
3600	60.00	0.705					
5400	90.00	0.720	WATER INPUT:	450	in 2 min	S	
			<b>GEOLOGY OF TEST S</b>	SECTION:			
				Orangish brov	vn slightly gravelly clayey	SAND.	
			I				
					Compiled by:		KW
			I		Checked by:		SR
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	26/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA101
TEST NUMBER:	1



		Distance to	PIT LENGTH (m):	1.80	Pit	construct	ion
Time Elapsed	Time Elapsed	water surface	PIT WIDTH (m):	0.70	Open - no gravel.		
(s)	(mins)	from ground level (m)	PIT DEPTH (m):	0.60			
0	0.00	0.320	. ,	IN	PUT PARAMETERS:		
60	1.00	0.272			Total volume of pit	(m ³ )	0.35
120	2.00	0.275	Pit volume between 75% and 25% depths = $L \times W \times 1/2D$ (m ³ ) 0.18			0.18	
180	3.00	0.261	Effective depth of Pit (m) 0.28				
240	4.00	0.262	Propo	Proportion of pit volume occupied by gravel solids (0-1) 0.00			
300	5.00	0.265		Maximum p	otential volume of Water	$(m^3)$	0.35
600	10.00	0.280	Leve	l of water in pit at 7	5% effective depth (p ₇₅ )	(m)	0.07
900	15.00	0.282	Leve	l of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.21
1200	20.00	0.283					
1800	30.00	0.293			depth Vp75-25 = V x Pg	$(m^3)$	0.18
3600	60.00	0.308	Surface	Surface area of pit up to 50% effective depth $(A_{p50})$ $(m^2)$ 1.96			1.96
4200	70.00	0.323					
4800	80.00	0.343			5% effective depth (p ₇₅ )	(s)	9934
5400	90.00	0.342		Time at 2	5% effective depth (p ₂₅ )	(s)	36710
6000	100.00	0.350	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	26776
7200	120.00	0.362			OUTPUT:		
8400	140.00	0.376	SOIL INFILTRATION	I DATE (f)	V _{p75 - 25}	(m/s)	3.36E-06
10800	180.00	0.398	SOIL INITETRATION	I KAIL (I)	A _{p50} x T _{p75 - 25}	(111/3)	J.JUL-00
12000	200.00	0.411					
18000	300.00	0.438	WATER INPUT:		in		
24000	400.00	0.473	<b>GEOLOGY OF TEST S</b>	ECTION:			
30000	500.00	0.506		San	dy gravelly sitly CLAY.		
36000	600.00	0.528					
42000	700.00	0.545					
48000	800.00	0.549			Compiled by:		LH
54000	900.00	0.566			Checked by:		DV
After BRE Digest	365, Soakaway [	Design, 2016					Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA101
TEST NUMBER:	2

Pit construction

### **SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION**



<b>iTH (m):</b> 1.80	PIT LENG	Distance to		
<b>OTH (m):</b> 0.70	PIT WID	water surface from ground	Time Elapsed (mins)	Time Elapsed (s)
<b>PTH (m):</b> 0.70	PIT DEF	level (m)	(111113)	(3)
		0.280	0.00	0
		0.263	1.00	60
me between 75% and 2	Pit volu	0.263	2.00	120
		0.267	3.00	180
Proportion of pit vo		0.271	4.00	240
Maxir		0.272	5.00	300

0	0.00	0.280
60	1.00	0.263
120	2.00	0.263
180	3.00	0.267
240	4.00	0.271
300	5.00	0.272
600	10.00	0.270
900	15.00	0.271
1200	20.00	0.281
1800	30.00	0.288
3600	60.00	0.316
4200	70.00	0.321
4800	80.00	0.331
5400	90.00	0.337
6000	100.00	0.345
7200	120.00	0.364
8400	140.00	0.374
10800	180.00	0.406
12000	200.00	0.422
18000	300.00	0.474
24000	400.00	0.537
30000	500.00	0.580
36000	600.00	0.621
42000	700.00	0.636
48000	800.00	0.644

900.00

After BRE Digest 365, Soakaway Design, 2016

0.664

54000

	PIT DEPTH (m):	0.70					
		IN	PUT PARAMETERS:				
			Total volume of pit	(m ³ )	0.53		
	Pit volume between	en 75% and 25% de	epths = L x W x ½D	(m³)	0.26		
			Effective depth of Pit	(m)	0.42		
	Propo	ortion of pit volume o	occupied by gravel solids	(0-1)	0.00		
		Maximum po	otential volume of Water	(m ³ )	0.53		
	Leve	el of water in pit at 7	5% effective depth (p ₇₅ )	(m)	0.11		
	Leve	el of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.32		
	Effective volume be	tween 75% & 25% o	depth Vp75-25 = V x Pg	(m ³ )	0.26		
	Surface area of pit up to 50% effective depth (A _{p50} )				2.31		
		Time at 7	5% effective depth (p ₇₅ )	(s)	9228		
		Time at 2	5% effective depth (p ₂₅ )	(s)	32200		
	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	22973		
			OUTPUT:				
l	SOIL INFILTRATION	N RATE (f)	(m/s)	4.99E-06			
	WATER INPUT:						
	GEOLOGY OF TEST SECTION:						
	Sandy gravelly sitly CLAY.						

Compiled by:

Checked by:

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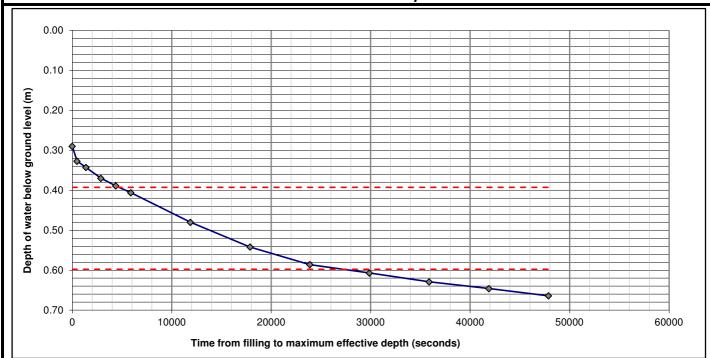
Page 1 of 1

Open - no gravel.

Environmental Consultancy Ground Engineering Services



DATE:	28/11/2019		
PROJECT No:	A110489-4-1		
PROJECT NAME:	Cwmcarn School		
CLIENT:	Caerphilly Council		
TRIAL PIT ID:	SA101		
TEST NUMBER:	3		



		Distance to	PIT LENGTH (m):	1.80	Pit	construct	ion
Time Elapsed	Time Elapsed	water surface	PIT WIDTH (m):	0.70	Open - no gravel.		
(s)	(mins)	from ground	PIT DEPTH (m):	0.70			
0	0.00	level (m) 0.290	PII DEPIH (M):		PUT PARAMETERS:		
				IN	-	(3)	0.50
480	8.00	0.327			Total volume of pit	(m ³ )	0.52
1380	23.00	0.343	Pit volume betwee	Pit volume between 75% and 25% depths = L x W x $\frac{1}{2}$ D (m ³ ) 0.26			
2880	48.00	0.370		Effective depth of Pit (m) 0.41			
4380	73.00	0.389	Propo		occupied by gravel solids	(0-1)	0.00
5880	98.00	0.406			otential volume of Water	(m ³ )	0.52
11880	198.00	0.480		•	75% effective depth (p ₇₅ )	(m)	0.10
17880	298.00	0.542	Leve	l of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.31
23880	398.00	0.586					
29880	498.00	0.607			depth Vp75-25 = V x Pg	(m³)	0.26
35880	598.00	0.629	Surface	Surface area of pit up to 50% effective depth $(A_{p50})$ $(m^2)$			2.29
41880	698.00	0.646					
47880	798.00	0.664		Time at 7	'5% effective depth (p ₇₅ )	(s)	4691
				Time at 2	25% effective depth (p ₂₅ )	(s)	27181
			Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	22491
					OUTPUT:		
			SOIL INFILTRATION	I DATE (f)	V _{p75 - 25}	(m/s)	5.03E-06
			SOIL INFILIRATION	TRAIE (I)	A _{p50} x T _{p75 - 25}	(m/s)	5.032-00
			WATER INPUT:		in		
			<b>GEOLOGY OF TEST S</b>	SECTION:			
			Sandy gravelly sitly CLAY.				
					Compiled by:		DV
					Checked by:		
After BRE Digest	365, Soakaway I	Design, 2016			· · · · · · · · · · · · · · · · · · ·		Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	26/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA102
TEST NUMBER:	1

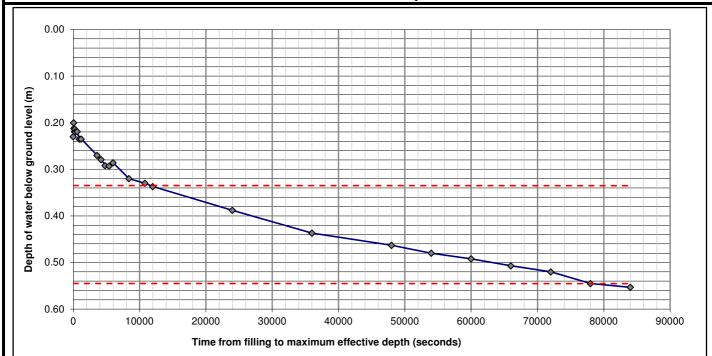


		Distance to	PIT LENGTH (m):	1.40	Pit	constructi	ion
Time Elapsed	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.50	Open - no gravel.		
(s)	(IIIIIS)	level (m)	PIT DEPTH (m):	0.60			
0	0.00	0.260	` , ,	IN	PUT PARAMETERS:		
60	1.00	0.215			Total volume of pit	(m ³ )	0.24
120	2.00	0.221	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	(m ³ )	0.12
180	3.00	0.209			Effective depth of Pit	(m)	0.34
240	4.00	0.220	Propo	ortion of pit volume	occupied by gravel solids	(0-1)	0.00
300	5.00	0.232			otential volume of Water	(m ³ )	0.24
600	10.00	0.246	Leve	l of water in pit at 7	'5% effective depth (p ₇₅ )	(m)	0.09
900	15.00	0.252	Leve	l of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.26
1200	20.00	0.259					
1800	30.00	0.298			depth Vp75-25 = V x Pg	(m³)	0.12
3600	60.00	0.326	Surface	area of pit up to 50	)% effective depth (A _{p50} )	(m ² )	1.35
4200	70.00	0.327					
4800	80.00	0.342			'5% effective depth (p ₇₅ )	(s)	5105
5400	90.00	0.348		Time at 2	25% effective depth (p ₂₅ )	(s)	29619
6000	100.00	0.366	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	24514
7200	120.00	0.369			OUTPUT:		
8400	140.00	0.386	SOIL INFILTRATION	I DATE (f)	V _{p75 - 25}	(m/s)	3.61E-06
9600	160.00	0.392	SOIL INFILIRATION	TRAIL (I)	A _{p50} x T _{p75 - 25}	(111/5)	3.01E-00
10800	180.00	0.407					
12000	200.00	0.412	WATER INPUT:		in		
18000	300.00	0.463	<b>GEOLOGY OF TEST S</b>	SECTION:			
24000	400.00	0.487		Slightly san	dy, slightly gravelly sitly C	LAY.	
30000	500.00	0.517					
36000	600.00	0.543					
42000	700.00	0.573			Compiled by:		LH
48000	800.00	0.612			Checked by:		DV
After BRE Digest	365, Soakaway I	Design, 2016	-				Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA102
TEST NUMBER:	2

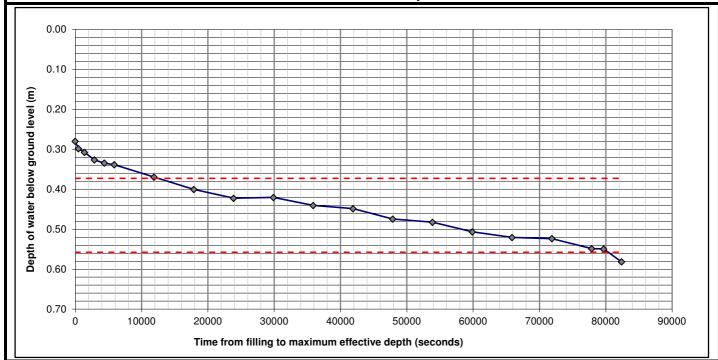


		Distance to	PIT LENGTH (m):	1.40	Pit	constructi	ion
Time Elapsed	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.50	Open - no gravel.		
(s)	(IIIIIIS)	level (m)	PIT DEPTH (m):	0.65			
0	0.00	0.230	` , ,	IN	PUT PARAMETERS:		
60	1.00	0.200			Total volume of pit	(m ³ )	0.29
120	2.00	0.212	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	$(m^3)$	0.15
180	3.00	0.219			Effective depth of Pit	(m)	0.42
240	4.00	0.214	Propo	rtion of pit volume	occupied by gravel solids	(0-1)	0.00
300	5.00	0.220		Maximum p	otential volume of Water	$(m^3)$	0.29
600	10.00	0.219	Leve	l of water in pit at 7	5% effective depth (p ₇₅ )	(m)	0.11
900	15.00	0.235	Leve	l of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.32
1200	20.00	0.235					
3600	60.00	0.270			depth Vp75-25 = V x Pg	(m ³ )	0.15
4200	70.00	0.279	Surface	area of pit up to 50	0% effective depth (A _{p50} )	$(m^2)$	1.50
4800	80.00	0.292					
5400	90.00	0.293			'5% effective depth (p ₇₅ )	(s)	11670
6000	100.00	0.286		Time at 2	5% effective depth (p ₂₅ )	(s)	78000
8400	140.00	0.320	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	66330
10800	180.00	0.330			OUTPUT:		
12000	200.00	0.337	SOIL INFILTRATION	I DATE (f)	V _{p75 - 25}	(m/s)	1.48E-06
24000	400.00	0.388	SOIL INFILIRATION	I KATE (I)	A _{p50} x T _{p75 - 25}	(111/5)	1.402-00
36000	600.00	0.437					
48000	800.00	0.463	WATER INPUT:		in		
54000	900.00	0.480	<b>GEOLOGY OF TEST S</b>	ECTION:			
60000	1000.00	0.492		Slightly san	dy, slightly gravelly sitly C	LAY.	
66000	1100.00	0.507					
72000	1200.00	0.520					
78000	1300.00	0.545			Compiled by:		LH
84000	1400.00	0.553			Checked by:		DV
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	28/11/2019
PROJECT No:	A110489-4-1
PROJECT NAME:	Cwmcarn School
CLIENT:	Caerphilly Council
TRIAL PIT ID:	SA102
TEST NUMBER:	3

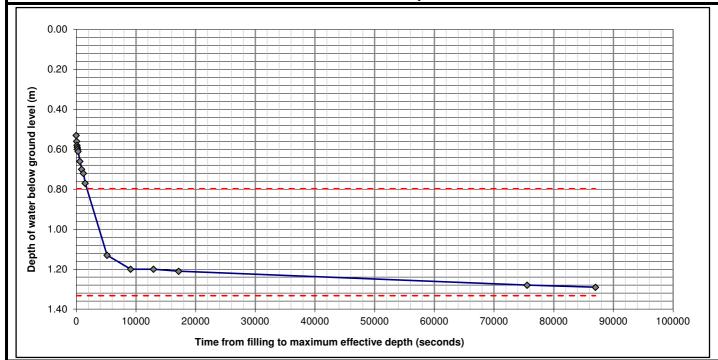


		Distance to	PIT LENGTH (m):	1.40	Pit	construct	ion
Time Elapsed	Time Elapsed	water surface	PIT WIDTH (m):	0.50	Open - no gavel.		
(s)	(mins)	from ground level (m)	PIT DEPTH (m):	0.65			
0	0.00	0.280	121 221 111 ().		IPUT PARAMETERS:		
480	8.00	0.299			Total volume of pit	(m ³ )	0.26
1380	23.00	0.308	Pit volume betwee				0.13
2880	48.00	0.327			Effective depth of Pit	(m)	0.37
4380	73.00	0.335	Propo	rtion of pit volume	occupied by gravel solids	(0-1)	0.00
5880	98.00	0.339		Maximum p	otential volume of Water	(m ³ )	0.26
11880	198.00	0.370	Leve	l of water in pit at :	75% effective depth (p ₇₅ )	(m)	0.09
17880	298.00	0.401	Leve	l of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.28
23880	398.00	0.423					
29880	498.00	0.421	Effective volume bet	tween 75% & 25%	depth Vp75-25 = V x Pg	(m ³ )	0.13
35880	598.00	0.441	Surface	Surface area of pit up to 50% effective depth (A _{p50} ) (m ² )			1.40
41880	698.00	0.449					
47880	798.00	0.475			75% effective depth (p ₇₅ )	(s)	12463
53880	898.00	0.483		Time at 3	25% effective depth (p ₂₅ )	(s)	80357
59880	998.00	0.507	Time for outflow f	or 75% and 25% e	ffective depth (Tp75-25)	(s)	67895
65880	1098.00	0.521			OUTPUT:		
71880	1198.00	0.524	SOIL INFILTRATION	I DATE (f)	V _{p75 - 25}	(m/s)	1.36E-06
77880	1298.00	0.549	SOIL INFILIRATION	I KATE (I)	A _{p50} x T _{p75 - 25}	(111/5)	1.302-00
79680	1328.00	0.550					
82380	1373.00	0.582	WATER INPUT:		in		
			<b>GEOLOGY OF TEST S</b>	ECTION:			
				Slightly sar	ndy, slightly gravelly sitly C	LAY.	
					Compiled by:		DV
					Checked by:		
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	26/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA103
TEST NUMBER:	1

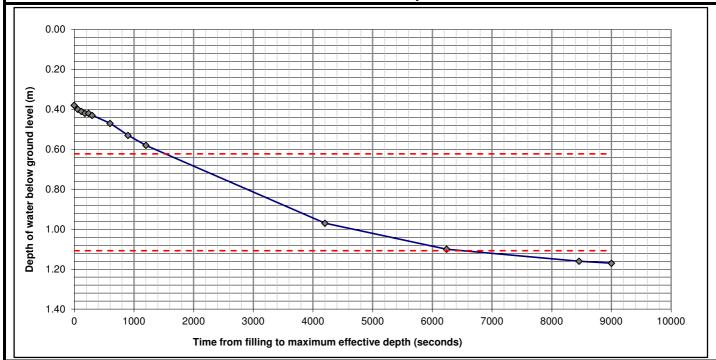


		Distance to	PIT LENGTH (m):	1.80	Pit	construction	on	
Time Elapsed (s)	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.90	Open - no gravel.			
(5)	(111115)	level (m)	PIT DEPTH (m):	1.60				
0	0.00	0.530		INPUT PARAMETERS:				
60	1.00	0.560			Total volume of pit	(m ³ )	1.73	
120	2.00	0.580	Pit volume between	n 75% and 25% d	epths = L x W x ½D	(m ³ )	0.87	
180	3.00	0.590			Effective depth of Pit	(m)	1.07	
240	4.00	0.600	Propor	tion of pit volume	occupied by gravel solids	(0-1)	0.00	
300	5.00	0.610			ootential volume of Water	(m ³ )	1.73	
600	10.00	0.660	Level	of water in pit at	75% effective depth (p ₇₅ )	(m)	0.27	
900	15.00	0.700	Level	of water in pit at	25% effective depth (p ₂₅ )	(m)	0.80	
1200	20.00	0.720						
1500	25.00	0.770		Effective volume between 75% & 25% depth Vp ₇₅₋₂₅ = V x Pg (m ³ )			0.87	
5160	86.00	1.130	Surface a	Surface area of pit up to 50% effective depth (A _{p50} ) (m ² )		(m ² )	4.51	
9120	152.00	1.200						
12960	216.00	1.200	Time at 75% effective depth $(p_{75})$ (s) 1780				1780	
17160	286.00	1.210		Time at 25% effective depth $(p_{25})$ (s)		#N/A		
75540	1259.00	1.280	Time for outflow fo	Time for outflow for 75% and 25% effective depth (Tp75-25) (s) #N/A		#N/A		
87000	1450.00	1.290			OUTPUT:			
			SOIL INFILTRATION	RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	#N/A	
			WATER INPUT:		in	$\neg$		
			GEOLOGY OF TEST SE	CTION:				
				Slightly sar	ndy, slightly gravelly silty C	LAY.		
					Compiled by:		LH	
					Checked by:		DV	
After BRE Digest	365, Soakaway [	Design, 2016			-		Page 1 of 1	

Environmental Consultancy Ground Engineering Services



DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA103
TEST NUMBER:	2

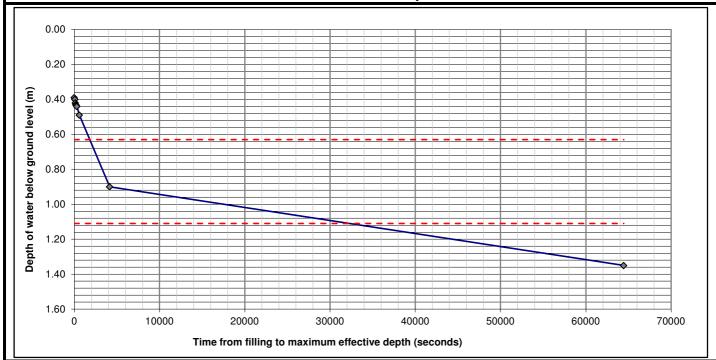


		Distance to	PIT LENGTH (m):	1.80	Pit	construct	ion	
Time Elapsed	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.90	Open - no gravel.			
(s)	(IIIIIS)	level (m)	PIT DEPTH (m):	1.35	1			
0	0.00	0.380		INPUT PARAMETERS:				
60	1.00	0.400			Total volume of pit	$(m^3)$	1.57	
120	2.00	0.410	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	$(m^3)$	0.79	
180	3.00	0.420			Effective depth of Pit	(m)	0.97	
240	4.00	0.420	Propo	ortion of pit volume	occupied by gravel solids	(0-1)	0.00	
300	5.00	0.430		Maximum p	otential volume of Water	(m ³ )	1.57	
600	10.00	0.470		•	'5% effective depth (p ₇₅ )	(m)	0.24	
900	15.00	0.530	Leve	el of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.73	
1200	20.00	0.580						
4200	70.00	0.970	1 1			$(m^3)$	0.79	
6240	104.00	1.100	Surface	Surface area of pit up to 50% effective depth $(A_{p50})$			4.24	
8460	141.00	1.160						
9000	150.00	1.170	Time at 75% effective depth $(p_{75})$ (s) 1527					
			Time at 25% effective depth (p ₂₅ ) (s) 6518					
			Time for outflow for 75% and 25% effective depth (Tp75-25) (s) 4991					
					OUTPUT:			
			SOIL INFILTRATION	N RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	3.71E-05	
			WATER INPUT:		in			
			GEOLOGY OF TEST S	SECTION:	III			
			GEOLOGI OF 1E31 3		dy, slightly gravelly silty C	ΊΔΥ		
				Slightly Sun	dy, slightly gravelly slicy e			
					Compiled by:		LH	
					Checked by:		DV	
After BRE Digest	365, Soakaway [	Design, 2016					Page 1 of 1	

Environmental Consultancy Ground Engineering Services



DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA103
TEST NUMBER:	3

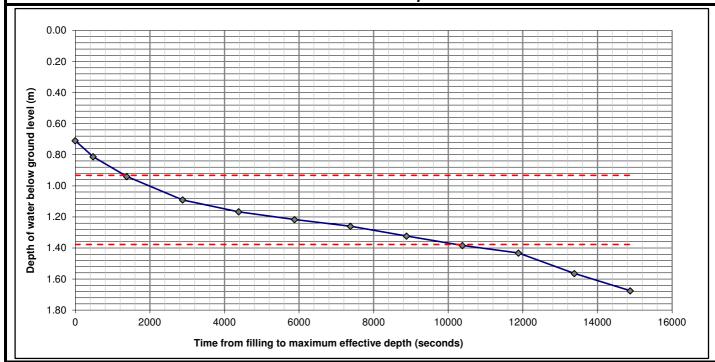


		Distance to	PIT LENGTH (m):	1.80	Pit	construction	on	
Time Elapsed	Time Elapsed	water surface from ground	PIT WIDTH (m):	0.90	Open - no gravel.			
(s)	(mins)	level (m)	PIT DEPTH (m):	1.35				
0	0.00	0.390		INPUT PARAMETERS:				
60	1.00	0.400			Total volume of pit	(m ³ )	1.56	
120	2.00	0.420	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	(m ³ )	0.78	
180	3.00	0.430			Effective depth of Pit	(m)	0.96	
240	4.00	0.435	Propo	rtion of pit volume	occupied by gravel solids	(0-1)	0.00	
300	5.00	0.440		Maximum p	otential volume of Water	(m ³ )	1.56	
600	10.00	0.490			'5% effective depth (p ₇₅ )	(m)	0.24	
4140	69.00	0.900	Leve	l of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.72	
64440	1074.00	1.350						
				Effective volume between 75% & 25% depth Vp75-25 = V x Pg			0.78	
			Surface	Surface area of pit up to 50% effective depth $(A_{p50})$			4.21	
					'5% effective depth (p ₇₅ )	(s)	1809	
			Time at 25% effective depth (p ₂₅ ) (s) 32286					
			Time for outflow for	Time for outflow for 75% and 25% effective depth (Tp75-25) (s) 30477				
					OUTPUT:			
			SOIL INFILTRATION	RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	6.06E-06	
			WATER INPUT:		in			
			<b>GEOLOGY OF TEST S</b>	ECTION:				
				Slightly san	dy, slightly gravelly silty C	LAY.		
					Compiled by:		LH	
					Checked by:		DV	
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1	

Environmental Consultancy Ground Engineering Services



DATE:	28/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA103
TEST NUMBER:	4



		Distance to	PIT LENGTH (m):	1.80	Pit	constructi	on	
Time Elapsed	Time Elapsed	water surface	PIT WIDTH (m):	0.90	Open - no gravel.			
(s)	(mins)	from ground level (m)	PIT DEPTH (m):	1.60				
0	0.00	0.710		INPUT PARAMETERS:				
480	8.00	0.813			Total volume of pit	(m ³ )	1.44	
1380	23.00	0.940	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	(m ³ )	0.72	
2880	48.00	1.091			Effective depth of Pit	(m)	0.89	
4380	73.00	1.167	Propo	rtion of pit volume	occupied by gravel solids	(0-1)	0.00	
5880	98.00	1.217		Maximum p	otential volume of Water	(m ³ )	1.44	
7380	123.00	1.260	Leve	l of water in pit at 7	'5% effective depth (p ₇₅ )	(m)	0.22	
8880	148.00	1.323	Leve	l of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.67	
10380	173.00	1.384				(m ³ )		
11880	198.00	1.432		Effective volume between 75% & 25% depth Vp75-25 = V x Pg			0.72	
13380	223.00	1.564	Surface	Surface area of pit up to 50% effective depth $(A_{p50})$			4.02	
14880	248.00	1.675						
					75% effective depth (p ₇₅ )	(s)	1328	
			Time at 25% effective depth (p ₂₅ ) (s) 10222					
			Time for outflow for 75% and 25% effective depth (Tp75-25) (s) 8895					
					OUTPUT:			
			SOIL INFILTRATION	I RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	2.01E-05	
			WATER INPUT:		in			
			<b>GEOLOGY OF TEST S</b>	ECTION:				
				Slightly san	dy, slightly gravelly silty C	LAY.		
					Compiled by: Checked by:		DV	
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1	

Environmental Consultancy Ground Engineering Services



DATE:	26/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA104
TEST NUMBER:	1

### SOAKAWAY TEST - SOIL INFILTRATION RATE/PERMEABILITY CALCULATION

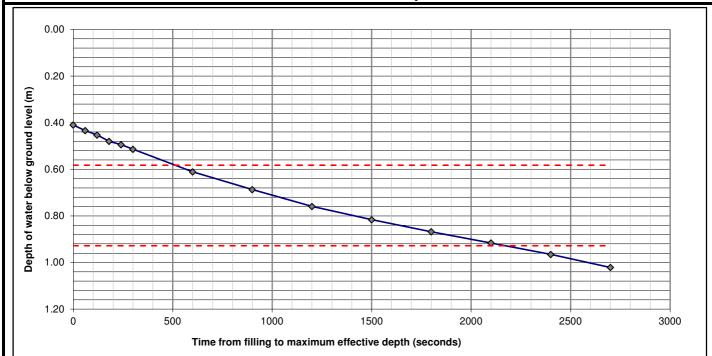


Distance to PIT LENGTH (m): Pit construction 1.40 Time Elapsed Time Elapsed water surface PIT WIDTH (m): Open - no gravel. 0.70 from ground (s) (mins) PIT DEPTH (m): 1.10 level (m) 0.00 **INPUT PARAMETERS:** 0 0.510 1.00 0.540 (m³)60 Total volume of pit 0.58 0.29 120 2.00 0.568 Pit volume between 75% and 25% depths =  $L \times W \times \frac{1}{2}D$  $(m^3)$ 180 3.00 0.591 Effective depth of Pit (m) 0.59 0.00 240 4.00 0.614 Proportion of pit volume occupied by gravel solids (0-1)5.00 (m³)0.628 Maximum potential volume of Water 0.58 300 Level of water in pit at 75% effective depth (p₇₅) 600 10.00 0.712 (m) 0.15 Level of water in pit at 25% effective depth (p₂₅) 900 15.00 0.793 (m) 0.44 1200 20.00 0.847 0.897 0.29 1500 25.00 Effective volume between 75% & 25% depth  $Vp_{75-25} = V \times Pg$  $(m^3)$ Surface area of pit up to 50% effective depth (A_{p50}) 1800 30.00 0.941 (m²)2.22 0.998 2100 35.00 Time at 75% effective depth (p₇₅) 405 40.00 1.054 (s) 2400 Time at 25% effective depth (p₂₅) 2700 45.00 1.099 1861 (s) Time for outflow for 75% and 25% effective depth (Tp75-25) 1455 (s) OUTPUT: V_{p75 - 25} SOIL INFILTRATION RATE (f) (m/s)8.95E-05  $A_{p50} \times T_{p75-25}$ WATER INPUT: **GEOLOGY OF TEST SECTION:** Slightly sandy, slightly gravelly silty CLAY. Compiled by: ΙH Checked by: DV After BRE Digest 365, Soakaway Design, 2016 Page 1 of 1

Environmental Consultancy Ground Engineering Services



DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA104
TEST NUMBER:	2

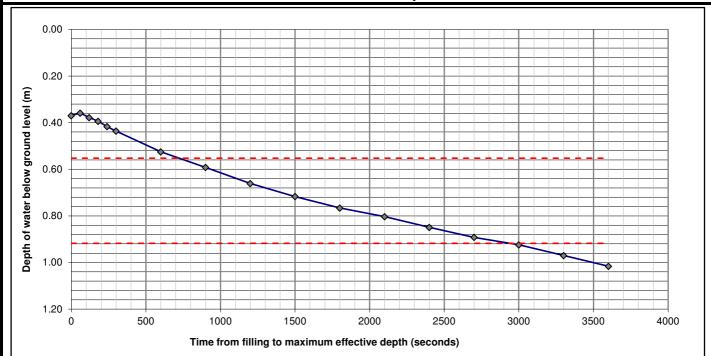


		Distance to	PIT LENGTH (m):	1.40	Pit	construct	ion		
Time Elapsed	Time Elapsed	water surface from ground	PIT WIDTH (m):	0.70	Open - no gravel.				
(s)	(mins)	level (m)	PIT DEPTH (m):	1.10	1				
0	0.00	0.410	. ,	INPUT PARAMETERS:					
60	1.00	0.434			Total volume of pit	(m ³ )	0.68		
120	2.00	0.453	Pit volume betwee	en 75% and 25% d	epths = L x W x ½D	$(m^3)$	0.34		
180	3.00	0.480			Effective depth of Pit	(m)	0.69		
240	4.00	0.494	Propo	ortion of pit volume	occupied by gravel solids	(0-1)	0.00		
300	5.00	0.514		Maximum p	otential volume of Water	(m ³ )	0.68		
600	10.00	0.611	Leve	el of water in pit at 7	75% effective depth (p ₇₅ )	(m)	0.17		
900	15.00	0.687	Leve	el of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.52		
1200	20.00	0.759							
1500	25.00	0.816		Effective volume between 75% & 25% depth $Vp_{75-25} = V \times Pg$ (m ³ )					
1800	30.00	0.868	Surface	Surface area of pit up to 50% effective depth $(A_{p50})$ $(m^2)$					
2100	35.00	0.916							
2400	40.00	0.965	Time at 75% effective depth (p ₇₅ ) (s) 512						
2700	45.00	1.021	Time at 25% effective depth (p ₂₅ ) (s) 2171		2171				
			Time for outflow for 75% and 25% effective depth (Tp75-25) (s) 1658						
					OUTPUT:				
			SOIL INFILTRATION	N RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	8.39E-05		
			WATER INPUT:		in				
			GEOLOGY OF TEST S	SECTION:					
			0202001 01 1201		ndy, slightly gravelly silty C	LAY.			
					Compiled by:		LH		
					Checked by:		DV		
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1		

Environmental Consultancy Ground Engineering Services



DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA104
TEST NUMBER:	3

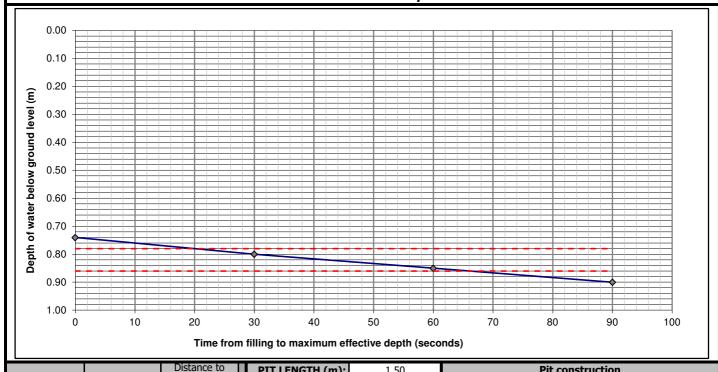


		Distance to	PIT LENGTH (m): 1.40 Pit construction							
Time Elapsed	Time Elapsed	water surface from ground	PIT WIDTH (m):	0.70	Open - no gravel.					
(s)	(mins)	level (m)	PIT DEPTH (m):	1.10						
0	0.00	0.370		INPUT PARAMETERS:						
60	1.00	0.359			$(m^3)$	0.72				
120	2.00	0.378	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	(m ³ )	0.36			
180	3.00	0.394			Effective depth of Pit	(m)	0.73			
240	4.00	0.417	Propo	rtion of pit volume	occupied by gravel solids	(0-1)	0.00			
300	5.00	0.436		Maximum p	otential volume of Water	$(m^3)$	0.72			
600	10.00	0.525	Leve	l of water in pit at 7	5% effective depth (p ₇₅ )	(m)	0.18			
900	15.00	0.592	Leve	l of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.55			
1200	20.00	0.661								
1500	25.00	0.717			depth Vp75-25 = V x Pg	$(m^3)$	0.36			
1800	30.00	0.766	Surface area of pit up to 50% effective depth (A _{p50} )			$(m^2)$	2.51			
2100	35.00	0.803								
2400	40.00	0.849	Time at 75% effective depth (p ₇₅ ) (s) 723							
2700	45.00	0.892	Time at 25% effective depth ( $p_{25}$ )			(s)	2940			
3000	50.00	0.924	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	2216			
3300	55.00	0.970			OUTPUT:					
3600	60.00	1.016	SOIL INFILTRATION	I RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	6.42E-05			
			WATER INPUT:		in					
			GEOLOGY OF TEST S	SECTION:						
					dy, slightly gravelly silty C	LAY.				
					Compiled by:		LH			
					Checked by:		DV			
After BRE Digest	365, Soakaway I	Design, 2016	-				Page 1 of 1			

Environmental Consultancy Ground Engineering Services



DATE:	26/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA105
TEST NUMBER:	1

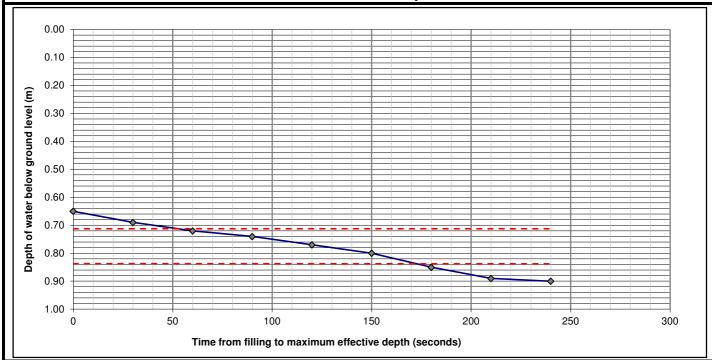


		Distance to	PIT LENGTH (m):	1.50	Pit	constructi	ion				
Time Elapsed (s)	Time Elapsed (mins)	water surface from ground	PIT WIDTH (m):	0.60	Open - no gravel.						
(3)	(111113)	level (m)	PIT DEPTH (m):	0.90							
0	0.00	0.740		INPUT PARAMETERS:							
30	0.50	0.800		Total volume of pit (m ³ )							
60	1.00	0.850	Pit volume between	Pit volume between 75% and 25% depths = L x W x $\frac{1}{2}$ D (m ³ )							
90	1.50	0.900			Effective depth of Pit	(m)	0.16				
			Proport	ion of pit volume	occupied by gravel solids	(0-1)	0.00				
					otential volume of Water	(m ³ )	0.14				
			Level	of water in pit at 7	75% effective depth (p ₇₅ )	(m)	0.04				
			Level	of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.12				
			Effective volume betw	(m ³ )	0.07						
			Surface area of pit up to 50% effective depth $(A_{p50})$				1.24				
				Time at 75% effective depth $(p_{75})$ (							
				Time at 25% effective depth $(p_{25})$ (s)							
			Time for outflow for	Time for outflow for 75% and 25% effective depth (Tp75-25) (s)							
					OUTPUT:						
		$\vdash$	SOIL INFILTRATION	RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	1.27E-03				
			WATER INPUT:		in						
			GEOLOGY OF TEST SE	CTION:							
			GEOLOGI OF TEST SE		andy, slightly clayey GRAV	FI					
				Singility Sc	, ongrid, daye, did wi						
					Compiled by:		LH				
					Checked by:		DV				
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1				

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DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA105
TEST NUMBER:	2



		Distance to	PIT LENGTH (m):	1.50	Pit	constructi	ion	
Time Elapsed	Time Elapsed	water surface	PIT WIDTH (m):	0.60	Open - no gravel.			
(s)	(mins)	from ground level (m)	PIT DEPTH (m):	0.90				
0	0.00	0.650	111 521 111 (111)1		PUT PARAMETERS:			
30	0.50	0.690		Total volume of pit (m³)				
60	1.00	0.720	Pit volume betwee	en 75% and 25% de	epths = L x W x ½D	(m ³ )	0.23 0.11	
90	1.50	0.740	The volume between	75 70 and 25 70 ac	Effective depth of Pit	(m)	0.25	
120	2.00	0.770	Propo	rtion of pit volume o	occupied by gravel solids	(0-1)	0.00	
150	2.50	0.800		•	otential volume of Water	(m ³ )	0.23	
180	3.00	0.850	Leve		5% effective depth (p ₇₅ )	(m)	0.06	
210	3.50	0.890	Leve	of water in pit at 2	5% effective depth (p ₂₅ )	(m)	0.19	
240	4.00	0.900						
			Effective volume bet	ween 75% & 25% (	depth Vp75-25 = V x Pg	(m ³ )	0.11	
			Surface	Surface area of pit up to 50% effective depth (A _{p50} )			1.43	
			Time at 75% effective depth (p ₇₅ ) (s) 53					
			Time at 25% effective depth (p ₂₅ ) (s) 173					
			Time for outflow for	or 75% and 25% ef	fective depth (Tp75-25)	(s)	120	
					OUTPUT:			
			SOIL INFILTRATION	RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	6.58E-04	
					7 psu A 1 p/s - 25			
			WATER INPUT:		in			
		i	GEOLOGY OF TEST S	ECTION:				
				Slightly sa	ndy, slightly clayey GRAV	EL.		
_								
					Compiled by:		LH	
					Checked by:		DV	
After BRE Digest	365, Soakaway I	Design, 2016					Page 1 of 1	

Environmental Consultancy Ground Engineering Services



DATE:	27/11/2019
PROJECT No:	A110489-4
PROJECT NAME:	Cwmcarn High School
CLIENT:	CCBC
TRIAL PIT ID:	SA105
TEST NUMBER:	3



		Distance to	PIT LENGTH (m):	1.50	Pit	construction	on
Time Elapsed	Time Elapsed	water surface	PIT WIDTH (m):	0.60	Open - no gravel.		
(s)	(mins)	from ground level (m)	PIT DEPTH (m):	0.90			
0	0.00	0.530		IN	PUT PARAMETERS:		
30	0.50	0.560			Total volume of pit	(m ³ )	0.33
60	1.00	0.580	Pit volume betwee	Pit volume between 75% and 25% depths = L x W x ½D			0.17
90	1.50	0.600			Effective depth of Pit	(m)	0.37
120	2.00	0.620	Propo	rtion of pit volume	occupied by gravel solids	(0-1)	0.00
150	2.50	0.640			otential volume of Water	(m ³ )	0.33
180	3.00	0.660	Leve	l of water in pit at 7	'5% effective depth (p ₇₅ )	(m)	0.09
210	3.50	0.680	Leve	l of water in pit at 2	25% effective depth (p ₂₅ )	(m)	0.28
240	4.00	0.700					
270	4.50	0.720	Effective volume between 75% & 25% depth Vp75-25 = V x Pg			(m ³ ) (m ² )	0.17
300	5.00	0.750	Surface	Surface area of pit up to 50% effective depth (A _{p50} )			1.68
330	5.50	0.770					
360	6.00	0.800	Time at 75% effective depth $(p_{75})$ (s) 124				
390	6.50	0.830		Time at 25% effective depth $(p_{25})$ (s)			368
420	7.00	0.840	Time for outflow f	or 75% and 25% ef	fective depth (Tp75-25)	(s)	244
450	7.50	0.880			OUTPUT:		
480	8.00	0.920	SOIL INFILTRATION	I RATE (f)	V _{p75 - 25} A _{p50} x T _{p75 - 25}	(m/s)	4.07E-04
			WATER INPUT:		in		
			GEOLOGY OF TEST S	SECTION:			
				Slightly sa	indy, slightly clayey GRAVI	EL.	
					Compiled by: Checked by:		LH
After BRE Digest	365, Soakaway [	Design, 2016					Page 1 of 1

# Former Cwmcarn High School



## **APPENDIX D -TRL DCP RESULTS**

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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP01

#### **DCP-CBR Corellation**

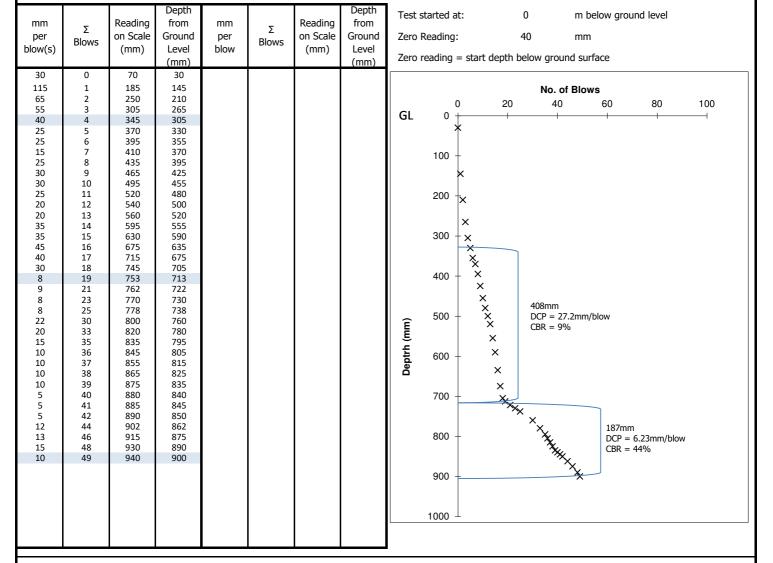
 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

# In situ CBR by TRL Probe

Reference: DCP01 Position: WS108 Date: 27 November 2019



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Test started at:

PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

m below ground level

CLIENT: **CCBC** 

FIGURE No.: DCP02

#### **DCP-CBR Corellation**

mm

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

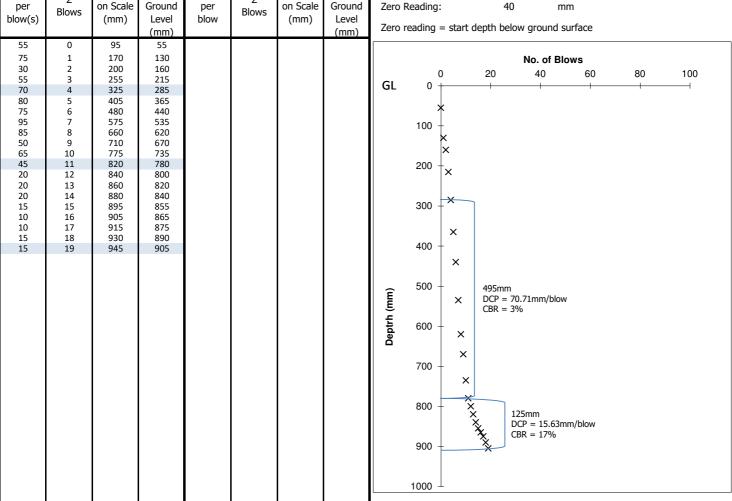
0

## In situ CBR by TRL Probe

Depth

Reference: DCP02 Position: WS104 27 November 2019 Date: Depth

Reading Reading from mm from Σ Σ on Scale Ground per on Scale Ground Zero Reading: 40 Blows Blows (mm) Level blow (mm) Level



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

m below ground level

CLIENT: **CCBC** 

FIGURE No.: DCP03

#### **DCP-CBR Corellation**

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

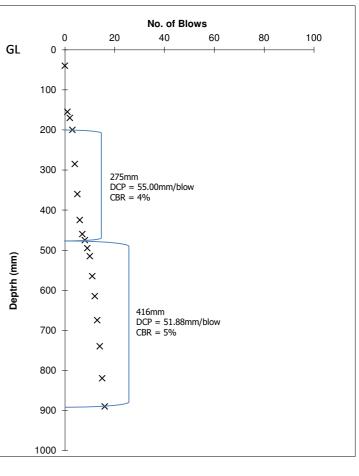
## In situ CBR by TRL Probe

Reference: DCP03 Position: TP103 27 November 2019 Date:

rted at:
ading:
iding = s

Zero Reading: 40 Zero reading = start depth below ground surface

0



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: **CCBC** 

FIGURE No.: DCP04

#### **DCP-CBR Corellation**

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} \text{ (mm/blow)}$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

230

235

Depth

190

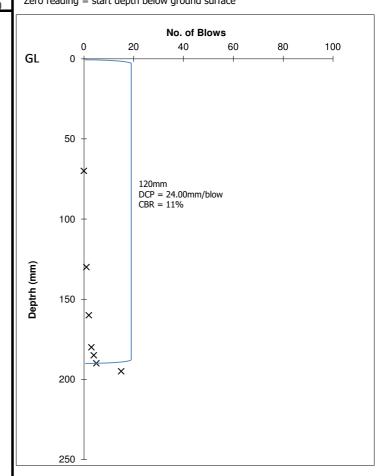
195

Reference: DCP04 Position: TP104 27 November 2019 Date: Depth

mm per blow(s)	Σ Blows	Reading on Scale (mm)	from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	from Ground Level (mm)	
70	0	110	70					Г
60	1	170	130					1
30	2	200	160					1
20	3	220	180					1
5	4	225	185					1

Test started at: 0 m below ground level Zero Reading: 40

Zero reading = start depth below ground surface



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

**CCBC** CLIENT:

FIGURE No.: DCP04A

#### **DCP-CBR Corellation**

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

22

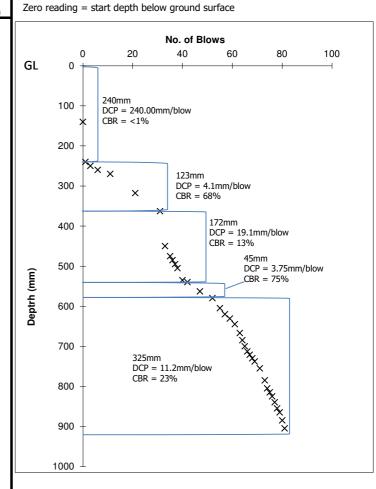
9 8

15 15

Reference: DCP04A Position: TP104 27 November 2019 Date:

mm per blow(s)	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	Depth from Ground Level (mm)
140	0	180	140				
100	1	280	240				
10	3	290	250				
10	6	300	260				
10	11	310	270				
48	21	358	318				
45	31	403	363				
87	33	490	450				

 Test started at: m below ground level Zero Reading: 



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: **CCBC** 

FIGURE No.: DCP05

#### **DCP-CBR Corellation**

mm

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} \text{ (mm/blow)}$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

Reading

Depth

from

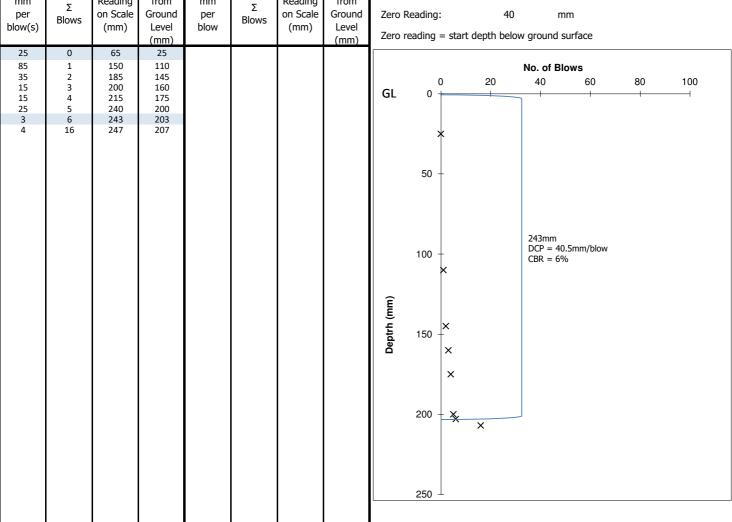
mm

Reference: DCP05 Position: TP108 27 November 2019 Date: Depth

from

Reading

Test started at: 0 m below ground level Zero Reading: 40



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Test started at:

PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: **CCBC** 

FIGURE No.: DCP05A

#### **DCP-CBR Corellation**

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

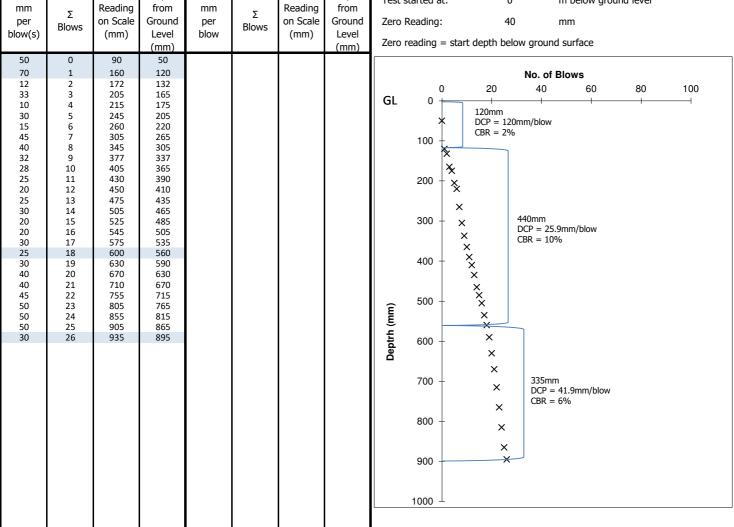
0

# In situ CBR by TRL Probe

Depth

Reference: DCP05A Position: TP108 27 November 2019 Date: Depth

m below ground level



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP06

#### **DCP-CBR Corellation**

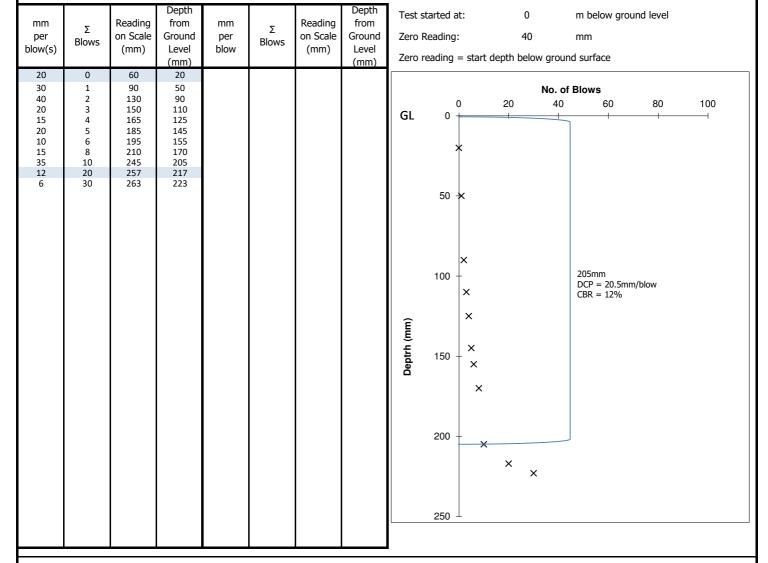
 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

Reference: DCP06 Position: TP107 Date: 28 November 2019



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

**CCBC** CLIENT:

FIGURE No.: DCP06A

#### **DCP-CBR Corellation**

15

25

20 20

5 20

20 35

10

15

7 8

22

26 27

32 34

46

52

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

Depth

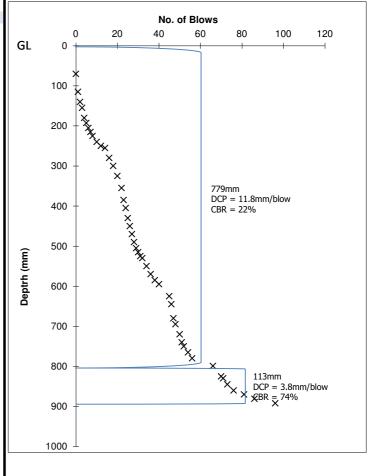
Reference: DCP06A Position: TP107 28 November 2019 Date: Depth

Reading Reading from mm from mm Σ Σ per on Scale Ground per on Scale Ground Blows Blows blow(s) (mm) Level blow (mm) Level (mm) (mm)

3 

Test started at: m below ground level Zero Reading: 

Zero reading = start depth below ground surface



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP07

### **DCP-CBR Corellation**

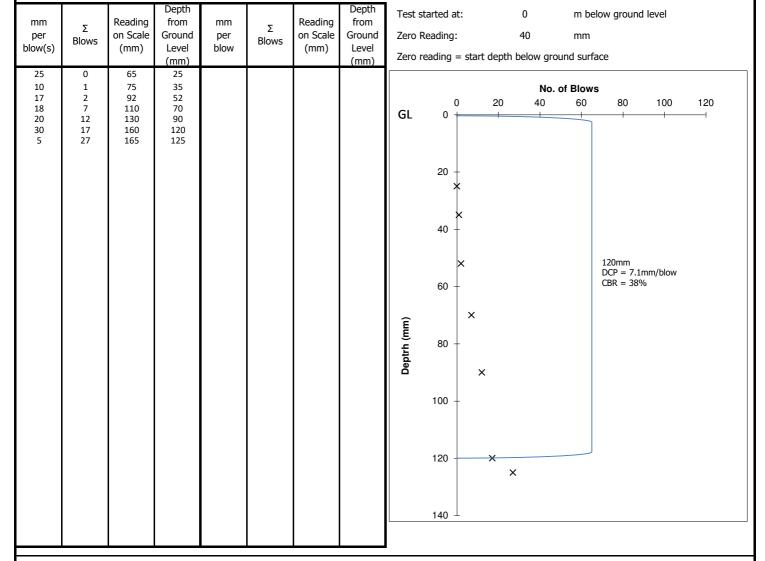
 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

Reference: DCP07 Position: TP105A Date: 28 November 2019



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP07A

#### **DCP-CBR Corellation**

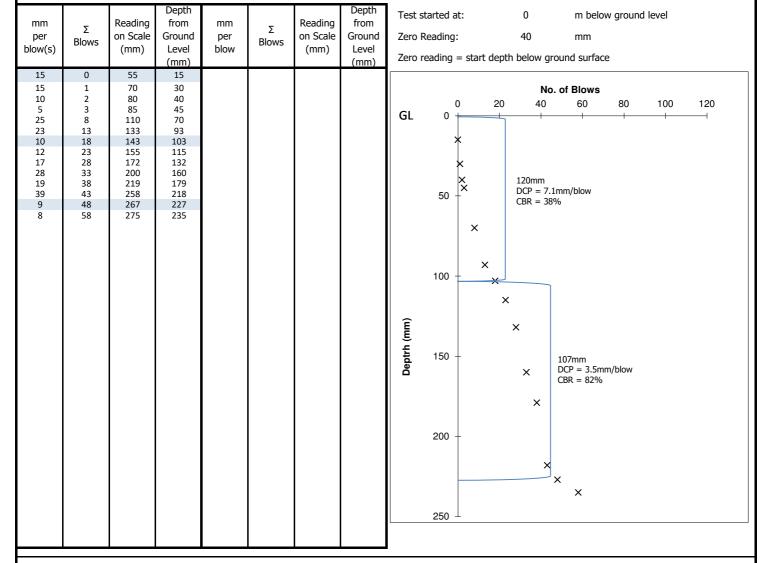
 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

Reference: DCP07A Position: TP105A Date: 28 November 2019



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP08

#### **DCP-CBR Corellation**

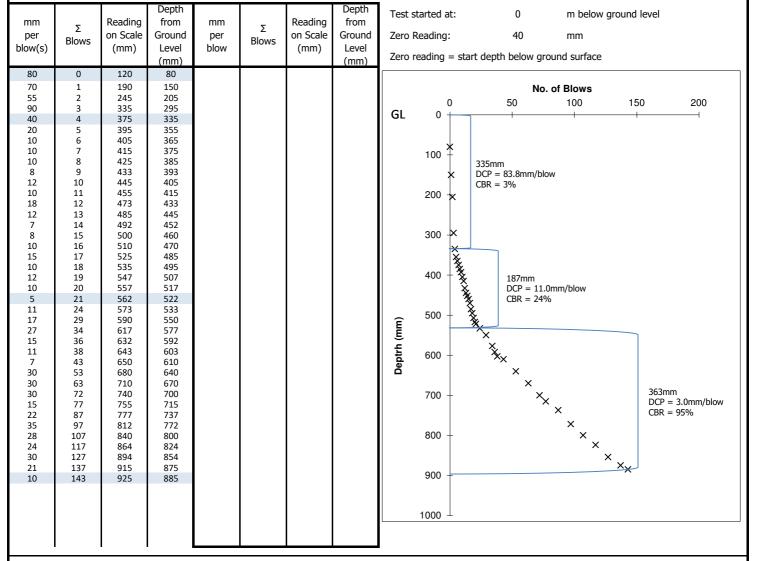
 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

### **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

## In situ CBR by TRL Probe

Reference: DCP08 Position: TP106 Date: 28 November 2019



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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP09

## **DCP-CBR Corellation**

Ground Engineering Services

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

## **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

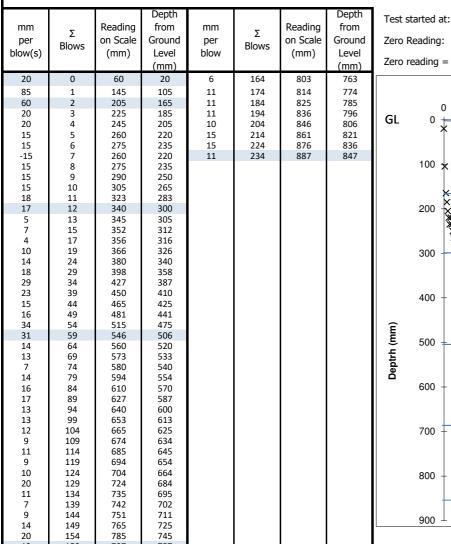
# In situ CBR by TRL Probe

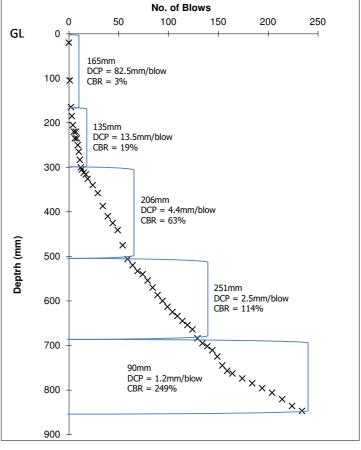
Reference: DCP09 Position: BH106 Date: 28 November 2019

Test started at: 0 m below ground level

Zero Reading: 40 mm

Zero reading = start depth below ground surface





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PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP10

## **DCP-CBR Corellation**

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

## **DCP - Modulus E Corellation**

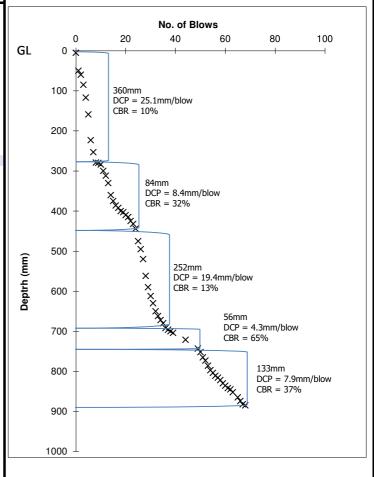
 $E = 17.6 (CBR)^{0.64} MPa$ 

# In situ CBR by TRL Probe

Reference: DCP10 Position: BH105 Date: 28 November 2019

mm per blow(s)	Σ Blows	Reading on Scale (mm)	from Ground Level (mm)	mm per blow	Σ Blows	Reading on Scale (mm)	from Ground Level (mm)
5	0	45	5	13	53	826	786
45	1	90	50	11	54	837	797
10	2 3	100	60	7	55	844	804
25		125	85	7	56	851	811
32	4	157	117	5	57	856	816
42	5 6	199	159	6	58	862	822
64		263	223	8	59	870	830
30	7	293	253	6	60	876	836
26	8	319	279	6 3 7	61	882	842
1	9	320	280	3	62	885	845
4	10	324	284		63	892	852
16	11	340	300	13	65	905	865
12	12	352	312	9	66	914	874
18	13	370	330	8	67	922	882
30	14	400	360	3	68	925	885
15	15	415	375				
11	16	426	386				

Test started at: 0 m below ground level
Zero Reading: 40 mm
Zero reading = start depth below ground surface



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Test started at:

PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

m below ground level

CLIENT: **CCBC** 

FIGURE No.: DCP11

## **DCP-CBR Corellation**

mm

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

## **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

# In situ CBR by TRL Probe

Reading

Depth

from

mm

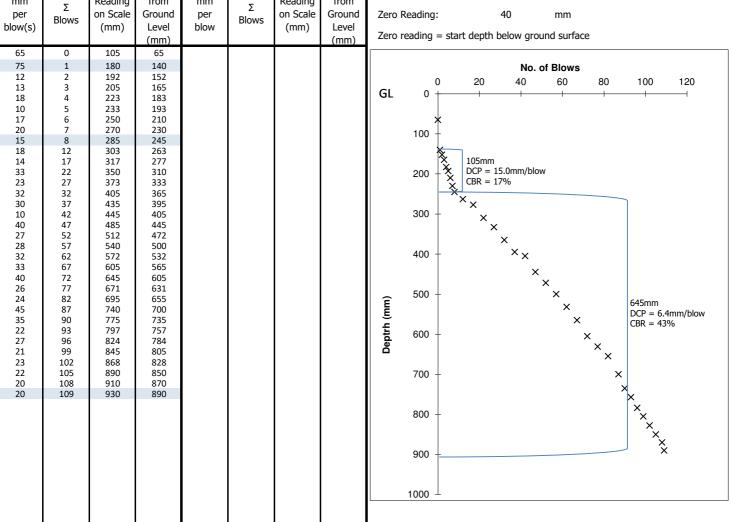
Reference: DCP11 Position: BH104 28 November 2019 Date: Depth

from

Reading

Zero Reading: 40

0



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Tel: 02920 829200 Fax: 02920 455321 **Environmental Consultancy** Ground Engineering Services



Test started at:

PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

m below ground level

CLIENT: **CCBC** 

FIGURE No.: DCP12

### **DCP-CBR Corellation**

mm

 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} \text{ (mm/blow)}$ 

## **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

# In situ CBR by TRL Probe

Reading

Depth

from

mm

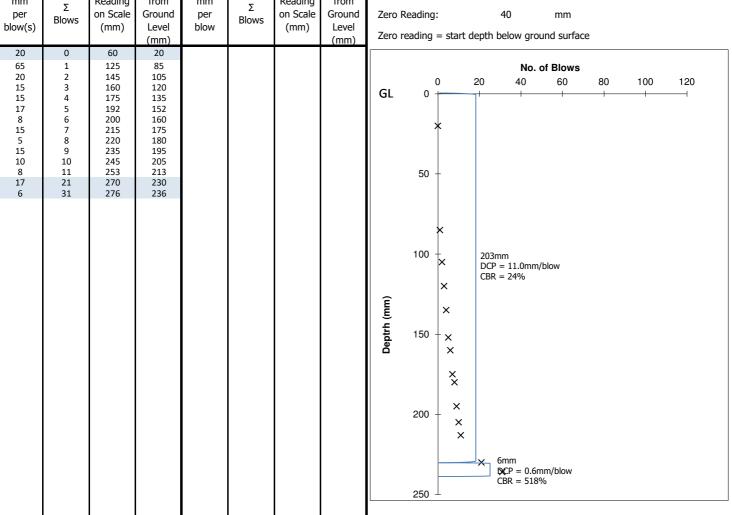
Reference: DCP12 Position: BH103 28 November 2019 Date: Depth

from

Reading

Zero Reading: 40

0



After Design manual for Roads and Bridges, Volume 7 Pavement Design and maintenance, Section 3 Pavement Maintenace Assessment, Part 2 HD29/08

Data compiled by: DV Data checked by:

5th Floor, Longcross Court, 47 Newport Road, Cardiff

Tel: 02920 829200 Fax: 02920 455321 Environmental Consultancy Ground Engineering Services



PROJECT No.: A110489-4-1

PROJECT NAME: Cwmcarn High School

CLIENT: CCBC

FIGURE No.: DCP12A

## **DCP-CBR Corellation**

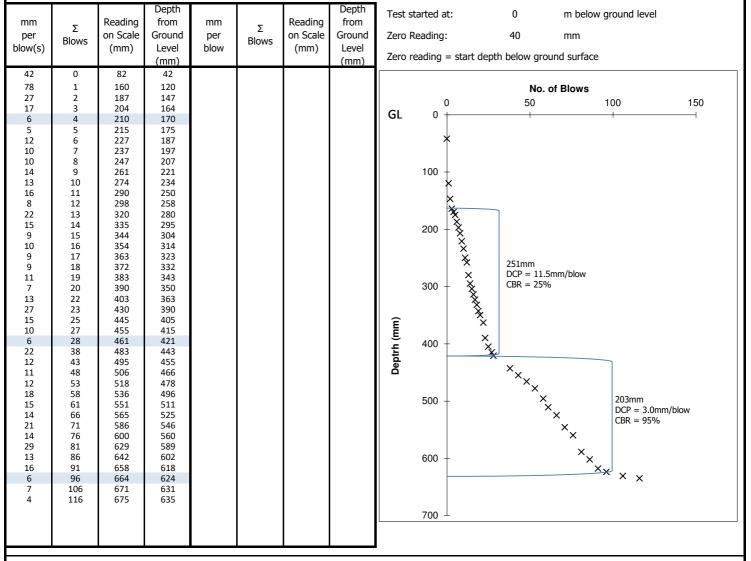
 $Log_{10}(CBR) = 2.48-1.057 \times Log_{10} (mm/blow)$ 

## **DCP - Modulus E Corellation**

 $E = 17.6 (CBR)^{0.64} MPa$ 

# In situ CBR by TRL Probe

Reference: DCP12A Position: BH103 Date: 28 November 2019



After Design manual for Roads and Bridges, Volume 7 Pavement Design and maintenance, Section 3 Pavement Maintenance Assessment, Part 2 HD29/08

Data compiled by: DV Data checked by:

# Former Cwmcarn High School



## **APPENDIX E – GEOTECHNICAL LABORATORY TEST RESULTS**





## Contract Number: 43788

Client Ref: **A110489-1**Client PO: **C19/407** 

Report Date: **08-05-2019** 

Client WYG Group
Arndale Court
Headingly
Leeds
LS6 2UJ

Contract Title: **Cwmcarn**For the attention of: **Paul Vincent** 

Date Received: **08-04-2019**Date Commenced: **08-04-2019**Date Completed: **08-05-2019** 

Test Description	Qty
<b>Moisture Content</b> BS 1377:1990 - Part 2 : 3.2 - * UKAS	9
<b>4 Point Liquid &amp; Plastic Limit</b> BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	9
<b>PSD Wet Sieve method</b> BS 1377:1990 - Part 2 : 9.2 - * UKAS	19
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2: 9.4 - * UKAS	7
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur BRE - BR279 - @ Non Accredited Test	19
Dry Den/MC (2.5kg Rammer Method 1 Litre Mould) BS 1377:1990 - Part 4: 3.3 - * UKAS	12
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

- * denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

### **Approved Signatories:**

Ben Sharp (Contracts Manager) - Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager)
Richard John (Advanced Testing Manager) - Sean Penn (Administrative/Accounts Assistant) - Wayne Honey (Administrative/Quality Assistant)

GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX ( BS 1377 : Part 2 : 1990 Method 5 ) DESCRIPTIONS	
Contract Number	43788	
Site Name	Cwmcarn	

			I			
Sample/Hole Reference	Sample Number	Sample Type	Depth (m)		m)	Descriptions
BH01		В	0.70	-	1.00	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL
BH01		В	1.00	-	1.50	Brown silty fine to coarse gravelly clayey fine to coarse SAND
BH02		В	0.40	-	0.80	Brown slightly fine to medium gravelly slightly silty clayey fine to coarse SAND
BH03A		В	0.30	-	0.80	Brown clayey silty fine to coarse sandy fine to coarse GRAVEL
BH03A		В	3.00	-	3.50	Brown slightly fine to coarse gravelly clayey fine to coarse sandy SILT
BH03A		В	6.00	-		Brown slightly fine to medium gravelly clayey fine to coarse sandy SILT
TP02		В	0.30	-	1.00	Brown slightly fine gravelly silty/clayey fine to coarse SAND
TP03		В	0.40	-	0.90	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL
TP04		В	0.40	-	1.20	Brown slightly fine to medium gravelly clayey/silty fine to coarse SAND
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		
				-		

Operators	Checked	08/05/2019	Paul Evans (Quality/Technical Manager)
Darren Bourne	Approved	08/05/2019	Emma Sharp (Office Manager)

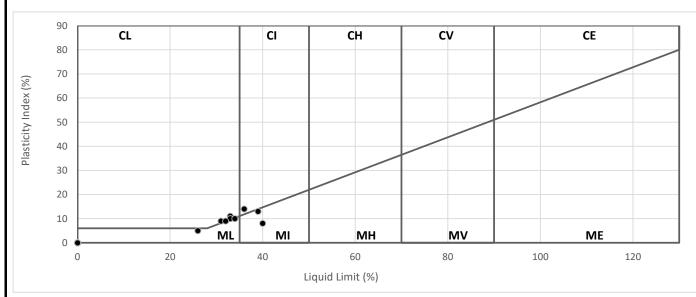


GSTL	LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX (BS 1377 : Part 2 : 1990 Method 5)	
Contract Number	43788	
Site Name	Cwmcarn	

Sample/Hole Reference	Sample Number	Sample Type	De	epth (r	n)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BH01		В	0.70	-	1.00	23	33	22	11	44	CL Low Plasticity
BH01		В	1.00	-	1.50	25	33	23	10	73	CL Low Plasticity
BH02		В	0.40	-	0.80	22	36	22	14	85	CI Intermediate Plasticity
BH03A		В	0.30	-	0.80	23	39	26	13	48	MI Intermediate Plasticity
BH03A		В	3.00	-	3.50	25	34	24	10	89	ML Low Plasticity
BH03A		В	6.00	-		22	26	21	5	92	ML Low Plasticity
TP02		В	0.30	-	1.00	22	31	22	9	88	CL Low Plasticity
TP03		В	0.40	-	0.90	22	32	23	9	57	CL Low Plasticity
TP04		В	0.40	-	1.20	40	40	32	8	85	MI Intermediate Plasticity
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							

Symbols: NP : Non Plastic # : Liquid Limit and Plastic Limit Wet Sieved

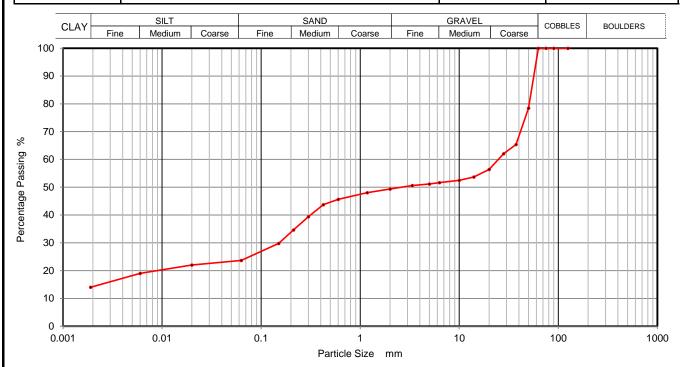
## PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010



Operators	Checked	08/05/2019	Paul Evans (Quality/Technical Manager)
Darren Bourne	Approved	08/05/2019	Emma Sharp (Office Manager)



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH01
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	0.70
	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL	Depth Base	1.00
		Sample Type	В



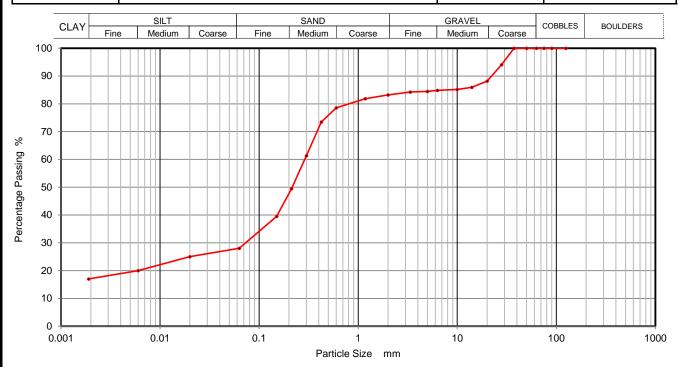
Siev	ring	Sedimentation				
Particle Size mm	% Passing	Particle Size mm	% Passing			
125	100	0.0200	22			
90	100	0.0060	19			
75	100	0.0020	14			
63	100					
50	78					
37.5	65					
28	62					
20	56					
14	54					
10	52					
6.3	52					
5	51					
3.35	51					
2	49					
1.18	48					
0.6	46					
0.425	44					
0.3	39					
0.212	35					
0.15	30					
0.063	24					

Sample Proportions	% dry mass		
Cobbles	0		
Gravel	51		
Sand	25		
Silt	10		
Clay	14		

Operators	Checked	06/05/2019	Ben Sharp	3
RO/MH	Approved	07/05/2019	Paul Evans	DP Grans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH01
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	1.00
	Brown silty fine to coarse gravelly clayey fine to coarse SAND	Depth Base	1.50
		Sample Type	В



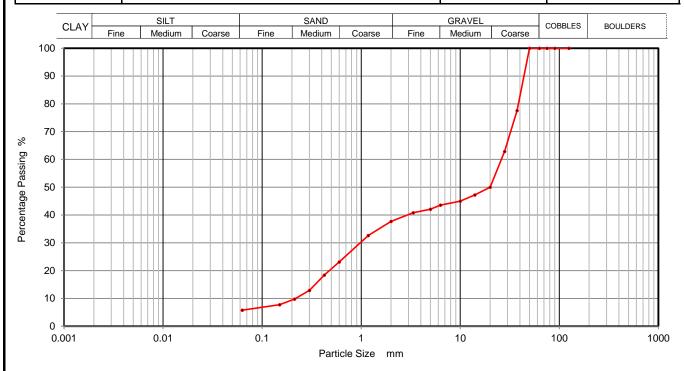
Siev	/ing	Sedime	entation		
Particle Size mm	% Passing	Particle Size mm	% Passing		
125	100	0.0200	25		
90	100	0.0060	20		
75	100	0.0020	17		
63	100				
50	100				
37.5	100				
28	94				
20	88				
14	86				
10	85				
6.3	85				
5	84				
3.35	84				
2	83				
1.18	82				
0.6	79				
0.425	73				
0.3	61				
0.212	49	]			
0.15	39	]			
0.063	28				

Sample Proportions	% dry mass
Cobbles	0
Gravel	17
Sand	55
Silt	11
Clay	17

Operators	Checked	06/05/2019	Ben Sharp	25
RO/MH	Approved	07/05/2019	Paul Evans	2 P Glons



CCTI	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	43788
GOIL		Borehole/Pit No.	BH01
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	2.00
	Brown clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Base	2.20
		Sample Type	В



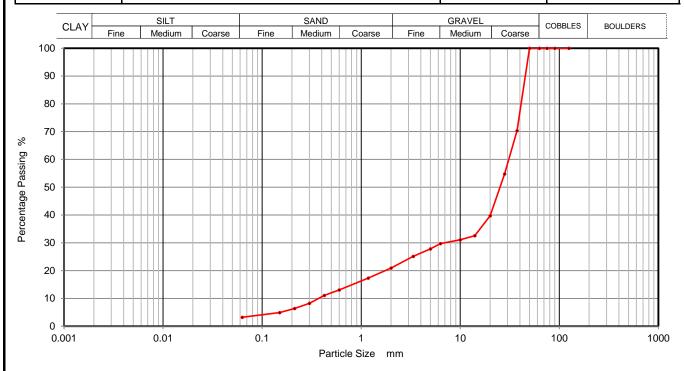
Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	78		
28	63		
20	50		
14	47		
10	45		
6.3	44		
5	42		
3.35	41		
2	38		
1.18	33		
0.6	23		
0.425	18		
0.3	13		
0.212	10	]	
0.15	8	]	
0.063	6		

Sample Proportions	% dry mass
Cobbles	0
Gravel	62
Sand	32
Silt and Clay	6

Operators	Checked	06/05/2019	Ben Sharp	
RO/MH	Approved	07/05/2019	Paul Evans	8 P Grans



CCTI	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	43788
GOIL		Borehole/Pit No.	BH01
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	5.00
	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Base	5.40
		Sample Type	В



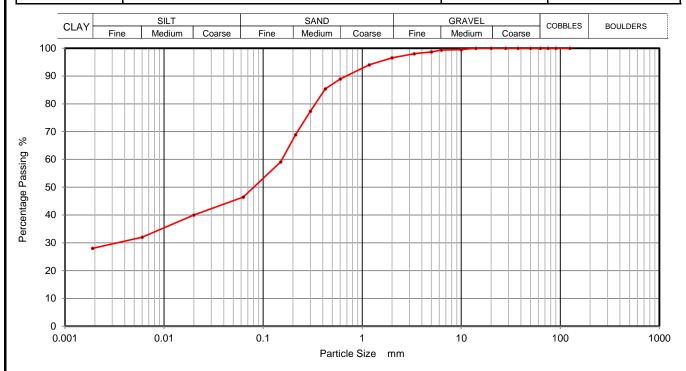
Siev	ring	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100			
90	100			
75	100			
63	100			
50	100			
37.5	70			
28	55			
20	40			
14	33			
10	31			
6.3	30			
5	28			
3.35	25			
2	21			
1.18	17			
0.6	13			
0.425	11			
0.3	8			
0.212	6			
0.15	5			
0.063	3			

Sample Proportions	% dry mass
Cobbles	0
Gravel	79
Sand	18
Silt and Clay	3

Operators	Checked	06/05/2019	Ben Sharp	25
RO/MH	Approved	07/05/2019	Paul Evans	DP Gans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH02
Site Name	Cwmcarn	Sample No.	
Soil Description	Brown slightly fine to medium gravelly slightly silty clayey fine to	Depth Top	0.40
	coarse SAND	Depth Base	0.80
		Sample Type	В



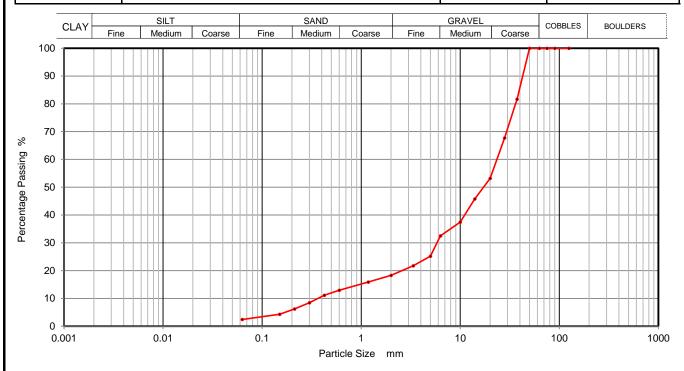
Siev	/ing	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	40
90	100	0.0060	32
75	100	0.0020	28
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	98		
2	97		
1.18	94		
0.6	89		
0.425	85		
0.3	77		
0.212	69		
0.15	59		
0.063	46		

Sample Proportions	% dry mass
Cobbles	0
Gravel	3
Sand	51
Silt	18
Clay	28

Operators	Checked	06/05/2019	Ben Sharp	
RO/MH	Approved	07/05/2019	Paul Evans	2 P Gans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
GOIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	BH02
Site Name	Cwmcarn	Sample No.	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.00
		Depth Base	1.50
		Sample Type	В



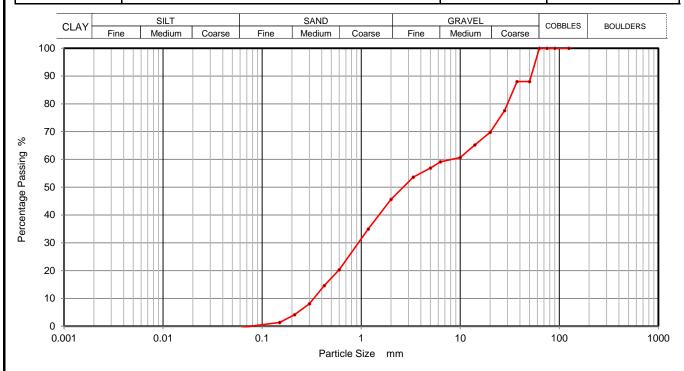
Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	82		
28	68		
20	53		
14	46		
10	37		
6.3	33		
5	25		
3.35	22		
2	18		
1.18	16		
0.6	13		
0.425	11		
0.3	8		_
0.212	6	]	
0.15	4	]	
0.063	2		

Sample Proportions	% dry mass
Cobbles	0
Gravel	82
Sand	16
Silt and Clay	2

Operators	Checked	06/05/2019	Ben Sharp	25
RO/MH	Approved	07/05/2019	Paul Evans	DP Gans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
GOIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	BH02
Site Name	Cwmcarn	Sample No.	
Soil Description	000/5	Depth Top	2.00
	Brown fine to coarse sandy fine to coarse GRAVEL	Depth Base	2.50
		Sample Type	В



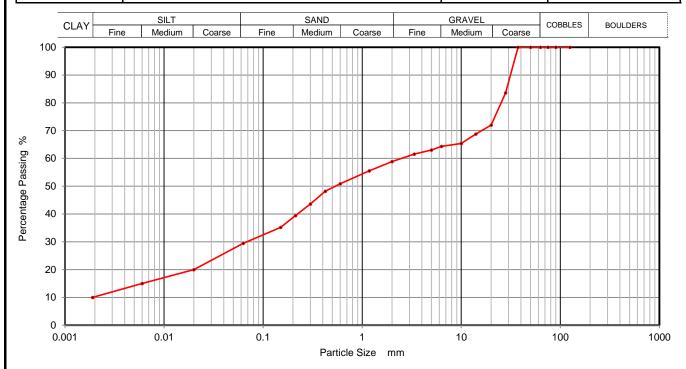
Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	88		
37.5	88		
28	78		
20	70		
14	65		
10	61		
6.3	59		
5	57		
3.35	54		
2	46		
1.18	35		
0.6	20		
0.425	15		
0.3	8		_
0.212	4	]	
0.15	1	]	
0.063	0		

Sample Proportions	% dry mass
Cobbles	0
Gravel	54
Sand	46
Silt and Clay	0

Operators	Checked	06/05/2019	Ben Sharp	3
RO/MH	Approved	07/05/2019	Paul Evans	DP Grans



CCTI	PARTICLE SIZE DISTRIBUTION		43788
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	ВН03А
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	0.30
	Brown clayey silty fine to coarse sandy fine to coarse GRAVEL	Depth Base	0.80
		Sample Type	В



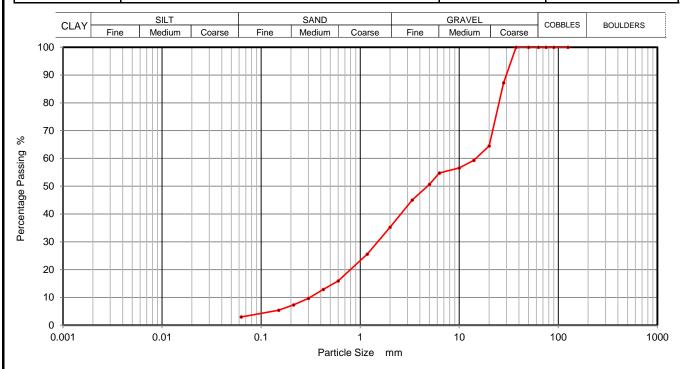
Siev	/ing	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	20
90	100	0.0060	15
75	100	0.0020	10
63	100		
50	100		
37.5	100		
28	84		
20	72		
14	69		
10	65		
6.3	64		
5	63		
3.35	62		
2	59		
1.18	56		
0.6	51		
0.425	48	1	
0.3	44		
0.212	39	]	
0.15	35	][	
0.063	29		

Sample Proportions	% dry mass
Cobbles	0
Gravel	41
Sand	30
Silt	19
Clay	10

Operators	Checked	06/05/2019	Ben Sharp	25
RO/MH	Approved	07/05/2019	Paul Evans	DP Gans



CCTI	RS 1377 Part 2:1990	Contract Number	43788
GOIL		Borehole/Pit No.	ВН03А
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	1.00
	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Base	1.20
		Sample Type	В



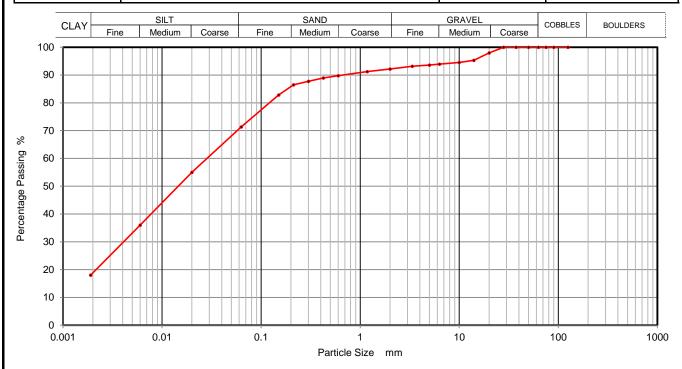
Siev	ring	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100			
90	100			
75	100			
63	100			
50	100			
37.5	100			
28	87			
20	65			
14	59			
10	57			
6.3	55			
5	51			
3.35	45			
2	35			
1.18	26			
0.6	16			
0.425	13			
0.3	10			
0.212	7			
0.15	5			
0.063	3			

Sample Proportions	% dry mass	
Cobbles	0	
Gravel	65	
Sand	32	
Silt and Clay	3	

Operators	Checked	06/05/2019	Ben Sharp	25
RO/MH	Approved	07/05/2019	Paul Evans	DP Gons



CCTI	PARTICLE SIZE DISTRIBUTION		43788
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	ВН03А
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	3.00
	Brown slightly fine to coarse gravelly clayey fine to coarse sandy SILT	Depth Base	3.50
		Sample Type	В



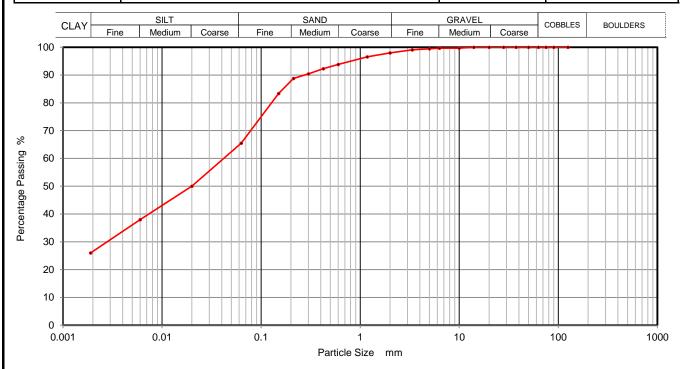
Siev	/ing	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	55
90	100	0.0060	36
75	100	0.0020	18
63	100		
50	100		
37.5	100		
28	100		
20	98		
14	95		
10	95		
6.3	94		
5	94		
3.35	93		
2	92		
1.18	91		
0.6	90		
0.425	89		
0.3	88		
0.212	86	]	
0.15	83	]	
0.063	71		

Sample Proportions	% dry mass
Cobbles	0
Gravel	8
Sand	21
Silt	53
Clay	18

Operators	Checked	06/05/2019	Ben Sharp	
RO/MH	Approved	07/05/2019	Paul Evans	DP Gons



CCTI	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Contract Number	43788
GOIL		Borehole/Pit No.	ВН03А
Site Name	Cwmcarn	Sample No.	
Soil Description	Brown slightly fine to medium gravelly clayey fine to coarse sandy SILT	Depth Top	6.00
		Depth Base	
		Sample Type	В



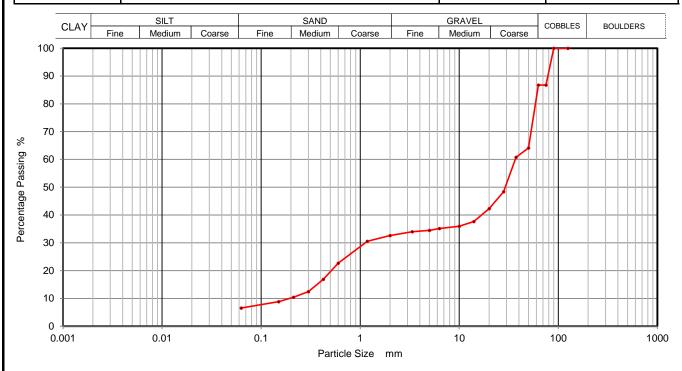
Siev	/ing	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	50
90	100	0.0060	38
75	100	0.0020	26
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	98		
1.18	97		
0.6	94		
0.425	92	1	
0.3	90		
0.212	89	1	
0.15	83	1	
0.063	66	<u> </u>	

Sample Proportions % dry mass	
Cobbles	0
Gravel	2
Sand	32
Silt	40
Clay	26

Operators	Checked	06/05/2019	Ben Sharp	25
RO/MH	Approved	07/05/2019	Paul Evans	DP Gans



CCTI PARTIC	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
GOIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	TP01A
Site Name	Cwmcarn	Sample No.	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	0.20
		Depth Base	1.30
		Sample Type	В



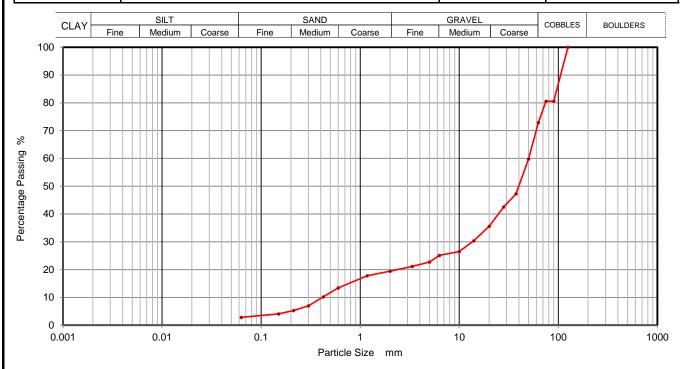
Siev	ring	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	87		
63	87		
50	64		
37.5	61		
28	48		
20	42		
14	38		
10	36		
6.3	35		
5	35		
3.35	34		
2	33		
1.18	31		
0.6	23		
0.425	17		
0.3	12		•
0.212	10		
0.15	9		
0.063	7		

Sample Proportions	% dry mass	
Cobbles	13	
Gravel	54	
Sand	26	
Silt and Clay	7	

Operators	Checked	06/05/2019	Ben Sharp	
RO/MH	Approved	07/05/2019	Paul Evans	DP Gons



CCTI	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	43788
GOIL		Borehole/Pit No.	TP01A
Site Name	Cwmcarn	Sample No.	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	1.30
		Depth Base	2.00
		Sample Type	В



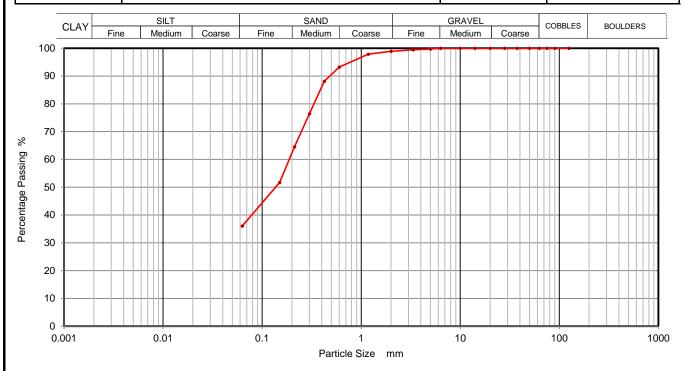
Siev	ring	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	81		
75	81		
63	73		
50	60		
37.5	47		
28	42		
20	36		
14	30		
10	27		
6.3	25		
5	23		
3.35	21		
2	19		
1.18	18		
0.6	13		
0.425	10		
0.3	7		•
0.212	5		
0.15	4		
0.063	3		

Sample Proportions	% dry mass
Cobbles	27
Gravel	54
Sand	16
Silt and Clay	3

Operators	Checked	06/05/2019	Ben Sharp	
RO/MH	Approved	07/05/2019	Paul Evans	8 P Grans



CCTI P	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
GOIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	TP02
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	0.30
	Brown slightly fine gravelly silty/clayey fine to coarse SAND	Depth Base	1.00
		Sample Type	В



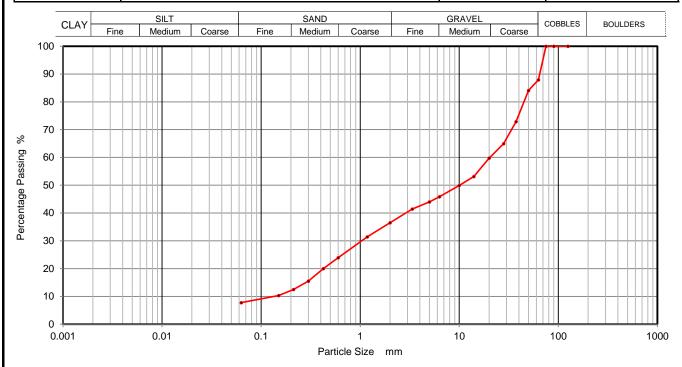
Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	98		
0.6	93		
0.425	88		
0.3	76		
0.212	65	1	
0.15	52	]	
0.063	36		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	63
Silt and Clay	36

Operators	Checked	06/05/2019	Ben Sharp	25
RO/MH	Approved	07/05/2019	Paul Evans	DP Gans



CCTI	PARTICLE SIZE DISTRIBUTION  BS 1377 Part 2:1990	Contract Number	43788
GOIL		Borehole/Pit No.	TP02
Site Name	Cwmcarn	Sample No.	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.00
	(with cobbles)	Depth Base	1.50
		Sample Type	В



Siev	ving	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	88		
50	84		
37.5	73		
28	65		
20	60		
14	53		
10	50		
6.3	46		
5	44		
3.35	41		
2	37		
1.18	31		
0.6	24		
0.425	20		
0.3	16		_
0.212	12	]	
0.15	10	]	
0.063	8		

Sample Proportions	% dry mass
Cobbles	12
Gravel	51
Sand	29
Silt and Clay	8

Operators	Checked	07/05/2019	Ben Sharp	
RO/MH	Approved	08/05/2019	Paul Evans	8 P Grans



CCTI	PARTICLE SIZE DISTRIBUTION  RS 1377 Part 2:1990	Contract Number	43788
GOIL		Borehole/Pit No.	TP03
Site Name	Cwmcarn	Sample No.	
Soil Description		Depth Top	0.40
	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL	Depth Base	0.90
		Sample Type	В



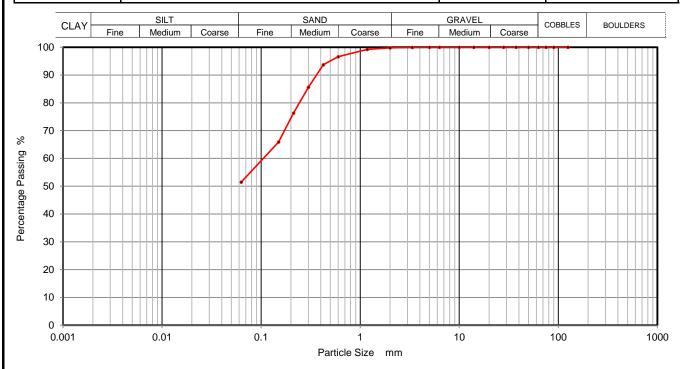
Siev	/ing	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	38
90	100	0.0060	32
75	100	0.0020	25
63	100		
50	96		
37.5	89		
28	86		
20	81		
14	78		
10	76		
6.3	71		
5	69		
3.35	66		
2	64		
1.18	63		
0.6	62		
0.425	57	1	
0.3	54		
0.212	49	1	
0.15	46	]	
0.063	45		

Sample Proportions	% dry mass
Cobbles	0
Gravel	36
Sand	19
Silt	20
Clay	25

Operators	Checked	07/05/2019	Ben Sharp	25
RO/MH	Approved	08/05/2019	Paul Evans	DP Gons



PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	PARTICLE SIZE DISTRIBUTION	Contract Number	43788
	Borehole/Pit No.	TP03	
Site Name	Cwmcarn	Sample No.	
Soil Description	5 ( ) ( ) ( ) ( ) ( )	Depth Top	0.90
	Brown fine to coarse sandy SILT/CLAY	Depth Base	1.70
		Sample Type	В



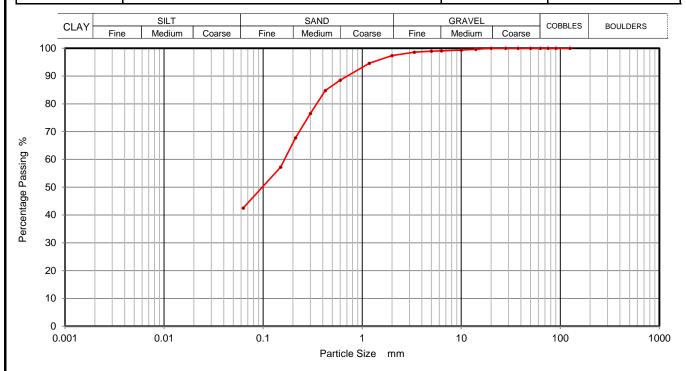
Siev	ring	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	97		
0.425	94		
0.3	86		
0.212	76	]	
0.15	66	]	
0.063	51	<u> </u>	

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	49
Silt and Clay	51

Operators	Checked	07/05/2019	Ben Sharp	25
RO/MH	Approved	08/05/2019	Paul Evans	DP Gons



CCTI	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	43788
GOIL		Borehole/Pit No.	TP04
Site Name	Cwmcarn	Sample No.	
Soil Description	Brown slightly fine to medium gravelly clayey/silty fine to coarse SAND	Depth Top	0.40
		Depth Base	1.20
		Sample Type	В



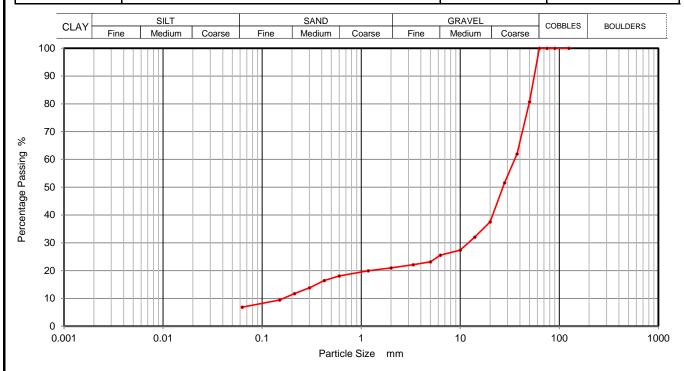
Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	99		
2	97		
1.18	95		
0.6	89		
0.425	85		
0.3	77		
0.212	68	1	
0.15	57	]	
0.063	43		

Sample Proportions	% dry mass
Cobbles	0
Gravel	3
Sand	54
Silt and Clay	43

Operators	Checked	07/05/2019	Ben Sharp	25
RO/MH	Approved	08/05/2019	Paul Evans	DP Gons



CCTI	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Contract Number	43788
GOIL		Borehole/Pit No.	TP04
Site Name	Cwmcarn	Sample No.	
Soil Description	D	Depth Top	1.20
	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Base	1.90
		Sample Type	В



Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	81		
37.5	62		
28	52		
20	38		
14	32		
10	27		
6.3	26		
5	23		
3.35	22		
2	21		
1.18	20		
0.6	18		
0.425	16		
0.3	14		
0.212	12	1	
0.15	9	]	
0.063	7		

Sample Proportions	% dry mass	
Cobbles	0	
Gravel	79	
Sand	14	
Silt and Clay	7	

Operators	Checked	07/05/2019	Ben Sharp	7
RO/MH	Approved	08/05/2019	Paul Evans	8 P Gas



CCTI	Certificate of Chemical Analysis	Contract Number	43788
GSIL	(BRE BR 279)	Client Reference	A110489-4
Client	WYG	Date Received	
Site Name	Cwmcarn	Date Started	24/04/2019
		Date Completed	08/05/2019
		No. of Samples	19

Hole Number	Sample Number	Sample Type	D	epth (	m)	Acid Soluble Sulphate	Aqueous Extract Sulphate	Chloride Content	Ph Value	Total Sulphur	Magnesium	Nitrate
BH01		В	0.70	-	1.00	0.25	0.03		8.25	0.11		
BH01		В	1.00	-	1.50	0.21	0.03		8.21	0.09		
BH01		В	2.00	-	2.20	0.25	0.03		8.18	0.11		
BH01		В	5.00	-	5.40	0.27	0.03		8.00	0.11		
BH02		В	0.40	-	0.80	0.33	0.04		7.93	0.14		
BH02		В	1.00	-	1.50	0.47	0.03		8.05	0.18		1
BH02		В	2.00	-	2.50	0.33	0.04		8.12	0.14		
BH03A		В	0.30	-	0.80	0.19	0.03		8.10	0.08		1
BH03A		В	1.00	-	1.20	0.14	0.04		8.06	0.07		
BH03A		В	3.00	-	3.50	0.23	0.04		7.96	0.10		1
BH03A		В	6.00	-		0.31	0.04		7.82	0.13		
TP01A		В	0.20	-	1.30	0.29	0.03		7.75	0.12		1
TP01A		В	1.30	-	2.00	0.27	0.03		7.82	0.11		1
TP02		В	0.30	-	1.00	0.31	0.03		7.94	0.13		
TP02		В	1.00	-	1.50	0.27	0.03		7.89	0.11		
TP03		В	0.40	-	0.90	0.31	0.04		7.67	0.13		
TP03		В	0.90	-	1.70	0.31	0.03		7.70	0.13		1
TP04		В	0.40	-	1.20	0.29	0.03		7.59	0.12		
TP04		В	1.20	-	1.90	0.29	0.03		7.68	0.12		1
				-								1
				-								1
				-								1
				-								1
				-								1
				-								1
				-								
				-								
				-								
				-								
				-								

 Acid Soluble Sulphate
 % SO₄

 Aqueous Extract Sulphate
 g/l SO₄

 Chloride Content (Semi)
 mg Cl/l

 PH Value
 @ 25°

 Total Sulphur
 % S

 Magnesium
 g/l SO₄

Key

Nitrate

Reported As

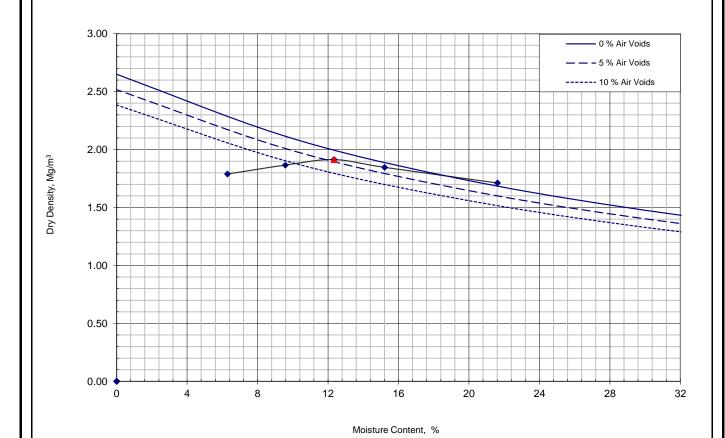
NO₃ mg/l

Remarks

NCP = No Chloride Present

Test Operator	Checked and	Authorised by	Ben Sharp	
Darren Bourne	Date	08/05/2019	Bell Sliaip	

CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	BH01
Site Name	Cwmcarn	Sample No	
Soil Description	Brown silty clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.70
Compaction Method	2.5 Kg Rammer	Depth Base	1.00
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



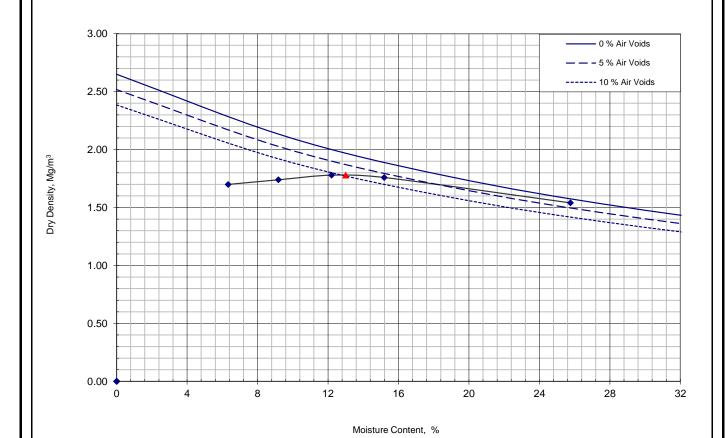
Compaction Point	1	2	3	4	5				
Moisture Content	6.3	9.6	12	15	22				
Bulk Density	1.90	2.05	2.15	2.13	2.08				
Dry Density	1.79	1.87	1.91	1.85	1.71				

Initial Moisture Content	22	%
Maximum Dry Density	1.91	Mg/m3
Optimum Moisture Content	12	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	35	%
Material Retained 20mm	9	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	BH01
Site Name	Cwmcarn	Sample No	
Soil Description	Brown silty fine to coarse gravelly clayey fine to coarse SAND	Depth Top	1.00
Compaction Method	2.5 Kg Rammer	Depth Base	1.50
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



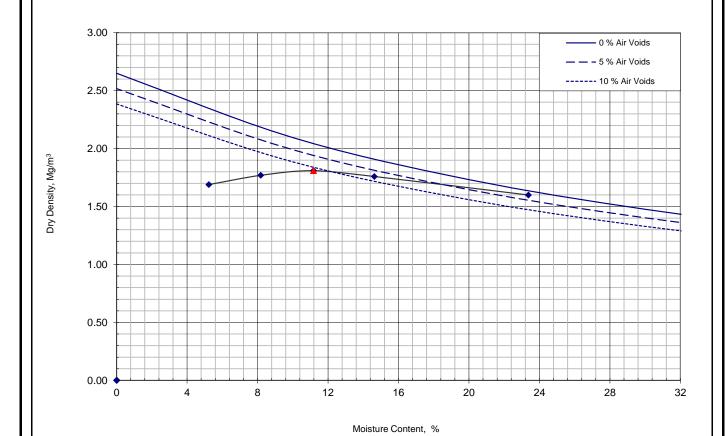
Compaction Point	1	2	3	4	5				
Moisture Content	6.3	9.2	12	15	26				
Bulk Density	1.81	1.90	2.00	2.03	1.94				
Dry Density	1.70	1.74	1.78	1.76	1.54				

Initial Moisture Content	26	%
Maximum Dry Density	1.78	Mg/m3
Optimum Moisture Content	13	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	12	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP GOOD



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	ВН03А
Site Name	Cwmcarn	Sample No	
Soil Description	Brown clayey silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.30
Compaction Method	2.5 Kg Rammer	Depth Base	0.80
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



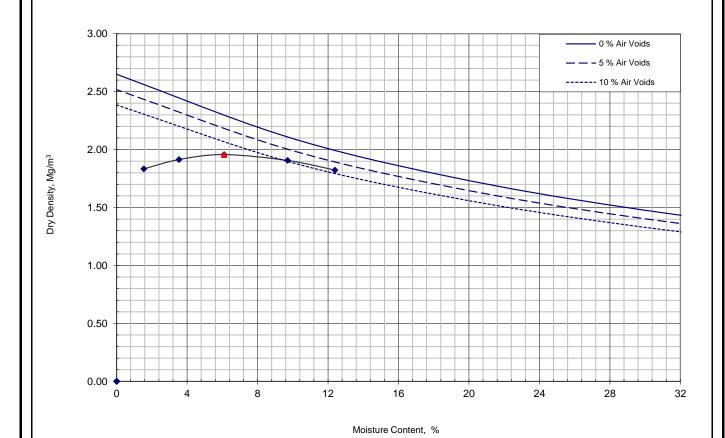
Compaction Point	1	2	3	4	5				
Moisture Content	5.2	8.2	11	15	23				
Bulk Density	1.78	1.91	2.01	2.02	1.97				
Dry Density	1.69	1.77	1.81	1.76	1.60				

Initial Moisture Content	23	%
Maximum Dry Density	1.81	Mg/m3
Optimum Moisture Content	11	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	28	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	ВН03А
Site Name	Cwmcarn	Sample No	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.00
Compaction Method	2.5 Kg Rammer	Depth Base	1.20
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



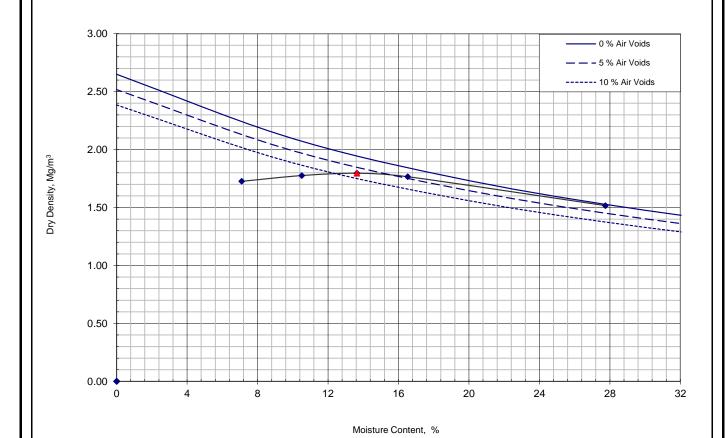
Compaction Point	1	2	3	4	5				
Moisture Content	1.5	3.5	6.1	9.7	12				
Bulk Density	1.86	1.98	2.08	2.09	2.05				
Dry Density	1.83	1.91	1.96	1.91	1.82				

Initial Moisture Content	9.7	%
Maximum Dry Density	1.96	Mg/m3
Optimum Moisture Content	6	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	35	%

Operators	Checked	07/05/2019	Ben Sharp	35
CA	Approved	08/05/2019	Paul Evans	DP Grons



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP01A
Site Name	Cwmcarn	Sample No	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	0.20
Compaction Method	2.5 Kg Rammer	Depth Base	1.30
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



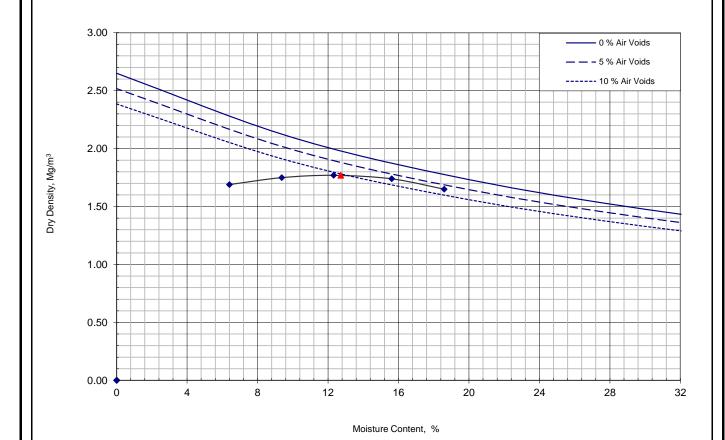
Compaction Point	1	2	3	4	5				
Moisture Content	7.1	11	14	17	28				
Bulk Density	1.85	1.96	2.04	2.06	1.94				
Dry Density	1.73	1.78	1.80	1.77	1.52				

Initial Moisture Content	28	%
Maximum Dry Density	1.80	Mg/m3
Optimum Moisture Content	14	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	41	%
Material Retained 20mm	19	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP GOOD



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP01A
Site Name	Cwmcarn	Sample No	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	1.30
Compaction Method	2.5 Kg Rammer	Depth Base	2.00
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



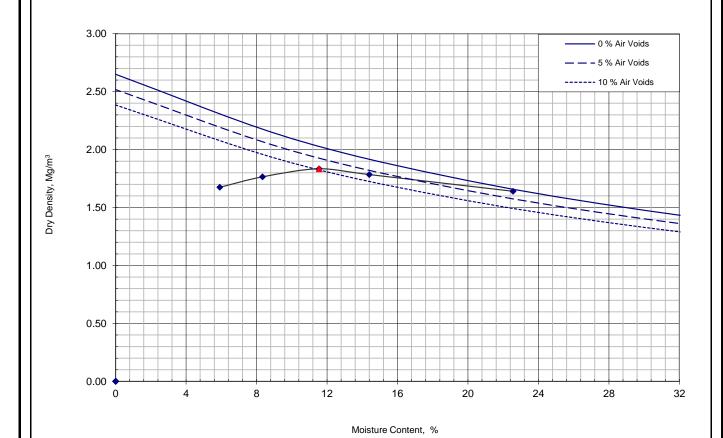
Compaction Point	1	2	3	4	5				
Moisture Content	6.4	9.4	12	16	19				
Bulk Density	1.80	1.91	1.99	2.01	1.96				
Dry Density	1.69	1.75	1.77	1.74	1.65				

Initial Moisture Content	16	%	
Maximum Dry Density	1.77	Mg/m3	
Optimum Moisture Content	13	%	
Particle Density	2.65 Assumed	Mg/m3	
Material Retained 37.5mm	53	%	
Material Retained 20mm	17	%	

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP02
Site Name	Cwmcarn	Sample No	
Soil Description	Brown slightly fine gravelly silty/clayey fine to coarse SAND	Depth Top	0.30
Compaction Method	2.5 Kg Rammer	Depth Base	1.00
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



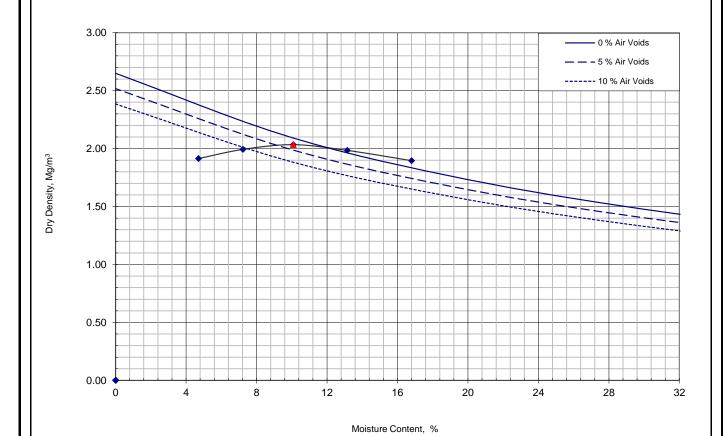
Compaction Point	1	2	3	4	5				
Moisture Content	5.9	8.3	12	14	23				
Bulk Density	1.77	1.91	2.05	2.04	2.01				
Dry Density	1.67	1.76	1.83	1.78	1.64				

Initial Moisture Content	23	%	
Maximum Dry Density	1.83	Mg/m3	
Optimum Moisture Content	12	%	
Particle Density	2.65 Assumed	Mg/m3	
Material Retained 37.5mm	0	%	
Material Retained 20mm	0	%	

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP02
Site Name	Cwmcarn	Sample No	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL (with cobbles)	Depth Top	1.00
Compaction Method	2.5 Kg Rammer	Depth Base	1.50
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



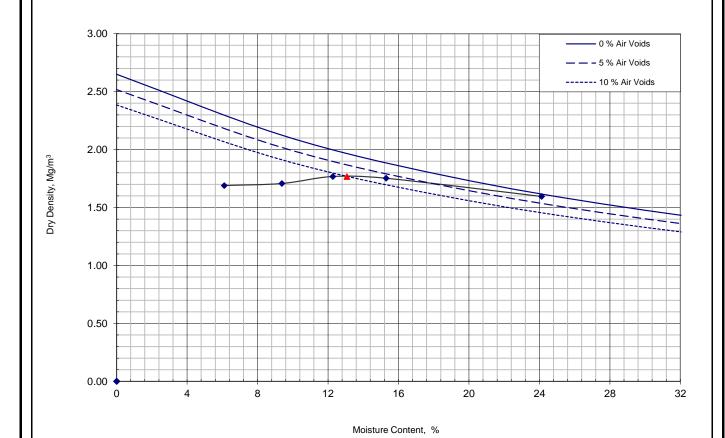
Compaction Point	1	2	3	4	5				
Moisture Content	4.7	7.2	10	13	17				
Bulk Density	2.00	2.14	2.24	2.25	2.21				
Dry Density	1.91	1.99	2.03	1.98	1.90				

Initial Moisture Content	17	%
Maximum Dry Density	2.03	Mg/m3
Optimum Moisture Content	10	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	27	%
Material Retained 20mm	13	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grons



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP03
Site Name	Cwmcarn	Sample No	
Soil Description	Brown fine to coarse sandy silty clayey fine to coarse GRAVEL	Depth Top	0.40
Compaction Method	2.5 Kg Rammer	Depth Base	0.90
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



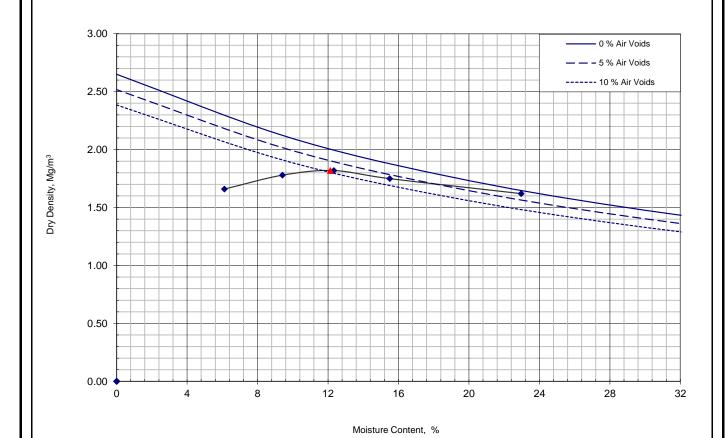
Compaction Point	1	2	3	4	5				
Moisture Content	6.1	9.4	12	15	24				
Bulk Density	1.79	1.87	1.98	2.02	1.98				
Dry Density	1.69	1.71	1.77	1.75	1.60				

Initial Moisture Content	24	%
Maximum Dry Density	1.77	Mg/m3
Optimum Moisture Content	13	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	11	%
Material Retained 20mm	8	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans



CCTI	Dry Density / Moisture Content Relationship		43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP03
Site Name	Cwmcarn	Sample No	
Soil Description	Brown fine to coarse sandy SILT/CLAY	Depth Top	0.90
Compaction Method	2.5 Kg Rammer	Depth Base	1.70
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



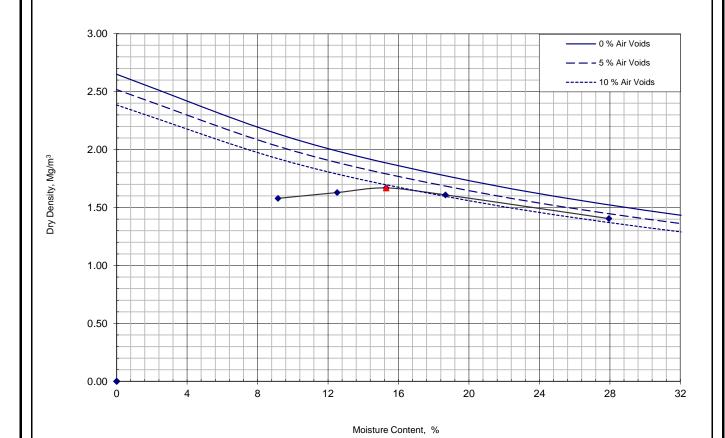
Compaction Point	1	2	3	4	5				
Moisture Content	6.1	9.4	12	16	23				
Bulk Density	1.76	1.95	2.04	2.02	1.99				
Dry Density	1.66	1.78	1.82	1.75	1.62				

Initial Moisture Content	23	%
Maximum Dry Density	1.82	Mg/m3
Optimum Moisture Content	12	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	0	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP04
Site Name	Cwmcarn	Sample No	
Soil Description	Brown slightly fine to medium gravelly clayey/silty fine to coarse SAND	Depth Top	0.40
Compaction Method	2.5 Kg Rammer	Depth Base	1.20
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



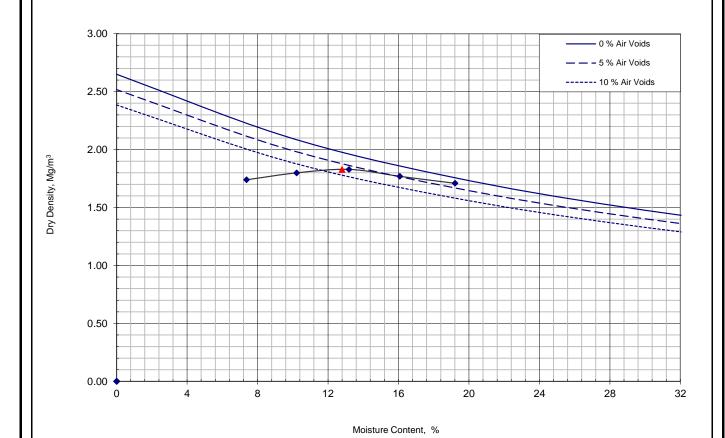
Compaction Point	1	2	3	4	5				
Moisture Content	9.2	13	15	19	28				
Bulk Density	1.72	1.83	1.92	1.91	1.80				
Dry Density	1.58	1.63	1.67	1.61	1.40				

Initial Moisture Content	28	%
Maximum Dry Density	1.67	Mg/m3
Optimum Moisture Content	15	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	0	%
Material Retained 20mm	0	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans



CCTI	Dry Density / Moisture Content Relationship	Contract Number	43788
GOIL	BS 1377:Part 4:1990	Borehole / Pit No	TP04
Site Name	Cwmcarn	Sample No	
Soil Description	Brown slightly clayey/silty fine to coarse sandy fine to coarse GRAVEL	Depth Top	1.20
Compaction Method	2.5 Kg Rammer	Depth Base	1.90
Compaction Clause	BS1377:Part 4:1990, Clause 3.3	Sample Type	В



Compaction Point	1	2	3	4	5				
Moisture Content	7.4	10	13	16	19				
Bulk Density	1.87	1.98	2.07	2.05	2.04				
Dry Density	1.74	1.80	1.83	1.77	1.71				

Initial Moisture Content	19	%
Maximum Dry Density	1.83	Mg/m3
Optimum Moisture Content	13	%
Particle Density	2.65 Assumed	Mg/m3
Material Retained 37.5mm	38	%
Material Retained 20mm	24	%

Operators	Checked	07/05/2019	Ben Sharp	
CA	Approved	08/05/2019	Paul Evans	DP Grans







## **Contract Number: 46882**

Client Ref: Cwmcarn

Client PO:

Report Date: 21-01-2020

Client WYG Group **Arndale Court** Headingly Leeds **LS6 2UJ** 

Contract Title: Cwmcarn School For the attention of: Nicholas Bool

Date Received: 03-12-2019 Date Completed: 21-01-2020

Test Description	Qty
<b>Moisture Content</b> BS 1377:1990 - Part 2 : 3.2 - * UKAS	8
<b>4 Point Liquid &amp; Plastic Limit</b> BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	8
PSD Wet Sieve method BS 1377:1990 - Part 2: 9.2 - * UKAS	13
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2: 9.4 - * UKAS	8
BRE Suite C Brownfield Site (pyrite absent) includes pH, water soluble sulphate, magnesium, chloride and nitrate BRE - BR279 - @ Non Accredited Test	5
One-dimensional Consolidation 75mm or 50mm diameter specimens (5 days) BS 1377:1990 - Part 5 : 3 - * UKAS	6

Notes: Observations and Interpretations are outside the UKAS Accreditation

- * denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

#### Approved Signatories:

Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)





**Contract Number: 46882** 

Test Description	Qty
Quick Undrained Triaxial Compression Test - Multi-stage Loading of a single specimen (100mm diameter) BS 1377:1990 - Part 7:9 - * UKAS	2
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation

- * denotes test included in laboratory scope of accreditation
- # denotes test carried out by approved contractor
- @ denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

#### Annual Cianatarias

Emma Sharp (Office Manager) - Paul Evans (Quality/Technical Manager) - Richard John (Advanced Testing Manager) Sean Penn (Administrative/Accounts Assistant) - Shaun Jones (Laboratory manager) - Wayne Honey (Administrative/Quality Assistant)

GEO Site & Testing Services Ltd

Unit 3-4, Heol Aur, Dafen Ind Estate, Dafen, Llanelli, Carmarthenshire SA14 8QN

Tel: 01554 784040 Fax: 01554 784041 info@gstl.co.uk gstl.co.uk

CSTI	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND PLASTICITY INDEX	
GSTL	( BS 1377 : Part 2 : 1990 Method 5 )	
Contract Number	46882	
Site Name	Cwmcarn School	
Date Tested	15/01/2020	
	DESCRIPTIONS	

Sample/Hole Reference	Sample Number	Sample Type	D	Depth (m)		Descriptions
BH101		В	0.30	-	0.50	Brown silty clayey fine to coarse gravel fine to coarse SAND
BH102		В	0.30	-	1.20	Brown slightly fine gravelly silty clayey fine to coarse SAND
BH102		В	1.20	-	2.20	Brown slightly silty slightly clayey fine to coarse sandy fine to coarse GRAVEL
BH101A		UT	3.20	-	3.60	Grey/ brown slightly fine gravelly silty clayey fine to coarse SAND
BH101A		UT	8.20	-	8.60	Brown slightly fine gravelly fine to coarse sandy silty CLAY
BH102		UT	4.00	-	4.40	Grey/ brown slightly fine gravelly fine to coarse sandy silty CLAY
BH104A		UT	6.50	-	6.95	Grey slightly fine gravelly slightly fine to coarse snady silty CLAY
BH106		UT	3.20	•	3.60	Grey/ brown slightly fine gravelly slightly fine to coarse sandy silty CLAY
				•		
				•		
				•		
				1		
				•		
				•		
				•		
				•		
				•		
				•		

Operators	Checked	21/01/2020	Wayne Honey (Administrative/Quality Assistant)
Clayton Jenkins	Approved	21/01/2020	Paul Evans (Quality/Technical Manager)

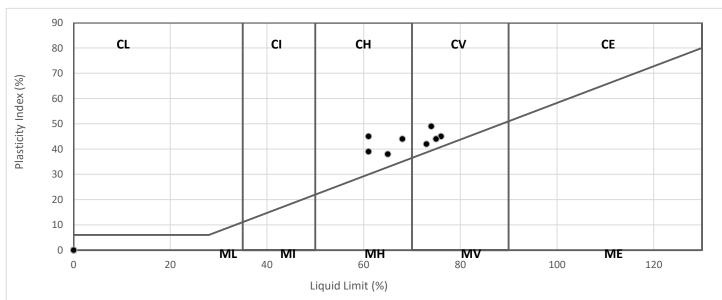


OCTI	NATURAL MOISTURE, LIQUID LIMIT, PLASTIC LIMIT AND	
GSIL	PLASTICITY INDEX ( BS 1377 : Part 2 : 1990 Method 5 )	
Contract Number	46882	
Project Location	Cwmcarn School	
Date Tested	15/01/2020	

Sample/Hole Reference	Sample Number	Sample Type	D	epth (r	m)	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity index %	Passing 0.425mm %	Remarks
BH101		В	0.30	-	0.50	36	65	27	38	53	CH High Plasticity
BH102		В	0.30	-	1.20	26	61	22	39	96	CH High Plasticity
BH102		В	1.20	-	2.20	12	61	16	45	23	CH High Plasticity
BH101A		UT	3.20	-	3.60	21	73	31	42	77	CV Very High Plasticity
BH101A		UT	8.20	-	8.60	25	76	31	45	99	CV Very High Plasticity
BH102		UT	4.00	-	4.40	21	68	24	44	96	CH High Plasticity
BH104A		UT	6.50	-	6.95	24	75	31	44	98	CV Very High Plasticity
BH106		UT	3.20	-	3.60	27	74	25	49	97	CV Very High Plasticity
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				-							
				•							
				-							

Symbols: NP : Non Plastic #: Liquid Limit and Plastic Limit Wet Sieved

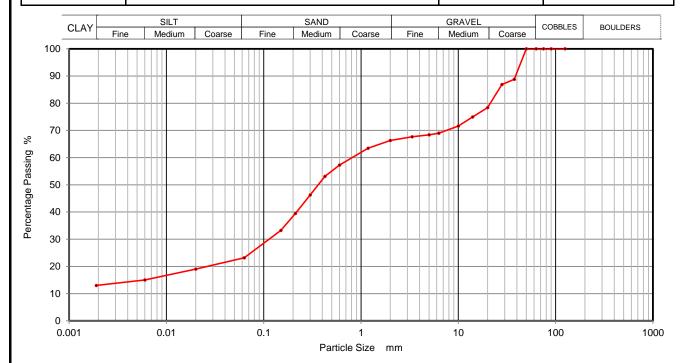
# PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION BS 5930:1999+A2:2010



Operators	Checked	21/01/2020	Wayne Honey (Administrative/Quality Assistant)
Clayton Jenkins	Approved	21/01/2020	Paul Evans (Quality/Technical Manager)



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH101
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown silty clayey fine to coarse gravel fine to coarse SAND	Depth Top	0.30
Soil Description	Brown sitty diayey line to coarse graver line to coarse SAND	Depth Base	0.50
Date Tested	10/01/2020	Sample Type	В



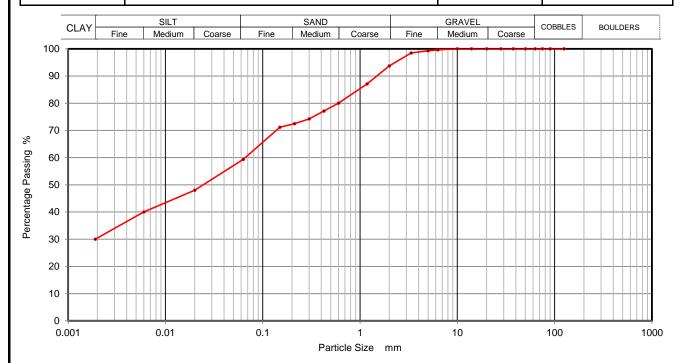
Siev	ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100	0.0200	19	
90	100	0.0060	15	
75	100	0.0020	13	
63	100			
50	100			
37.5	89			
28	87			
20	78			
14	75			
10	72			
6.3	69			
5	68			
3.35	68			
2	66			
1.18	63			
0.6	57			
0.425	53			
0.3	46			
0.212	39			
0.15	33			
0.063	23			

Sample Proportions	% dry mass
Cobbles	0
Gravel	34
Sand	43
Silt	10
Clay	13

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH101A
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey/ brown slightly fine gravelly silty clayey fine to coarse SAND	Depth Top	3.20
Soil Description	Grey, brown slightly line gravelly slity dayey line to coarse SAND	Depth Base	3.60
Date Tested	10/01/2020	Sample Type	UT



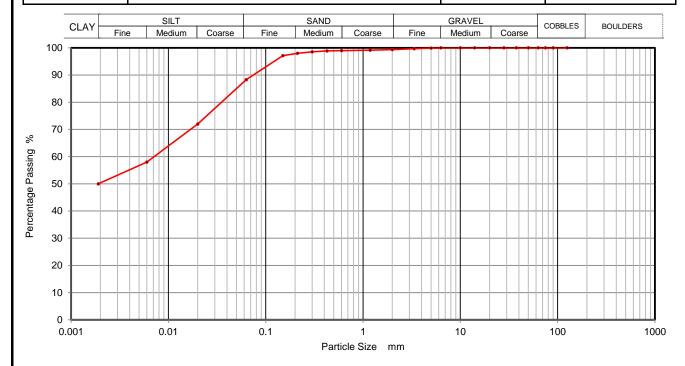
Siev	/ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100	0.0200	48	
90	100	0.0060	40	
75	100	0.0020	30	
63	100			
50	100			
37.5	100			
28	100			
20	100			
14	100			
10	100			
6.3	100			
5	99			
3.35	98			
2	94			
1.18	87			
0.6	80			
0.425	77	1		
0.3	74			
0.212	72	1		
0.15	71	]		
0.063	59			

Sample Proportions	% dry mass
Cobbles	0
Gravel	6
Sand	35
Silt	29
Clay	30

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	8 P Grans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH101A
Site Name	Cwmcarn School	Sample No.	
Sail Description	Decum alimbate fine available fine to accome conductible CLAV	Depth Top	8.20
Soil Description	Brown slightly fine gravelly fine to coarse sandy silty CLAY	Depth Base	8.60
Date Tested	10/01/2020	Sample Type	UT



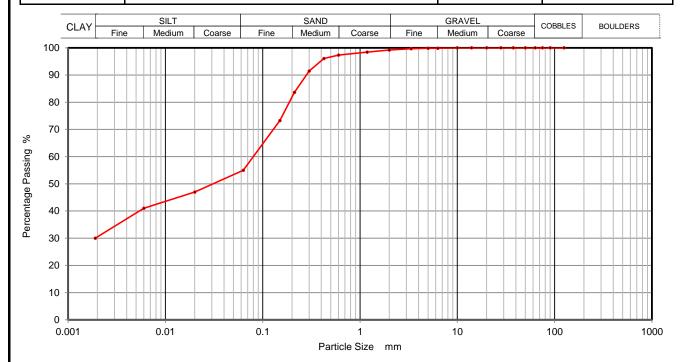
Siev	ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100	0.0200	72	
90	100	0.0060	58	
75	100	0.0020	50	
63	100			
50	100			
37.5	100			
28	100			
20	100			
14	100			
10	100			
6.3	100			
5	100			
3.35	100			
2	99			
1.18	99			
0.6	99			
0.425	99			
0.3	99			
0.212	98			
0.15	97			
0.063	88			

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	11
Silt	38
Clay	50

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GSIL	BS 1377 Part 2:1990  Net Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH102
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown slightly fine gravelly silty clayey fine to coarse SAND	Depth Top	0.30
Soil Description	Brown slightly line gravelly slity dayey line to coarse SAND	Depth Base	1.20
Date Tested	10/01/2020	Sample Type	В



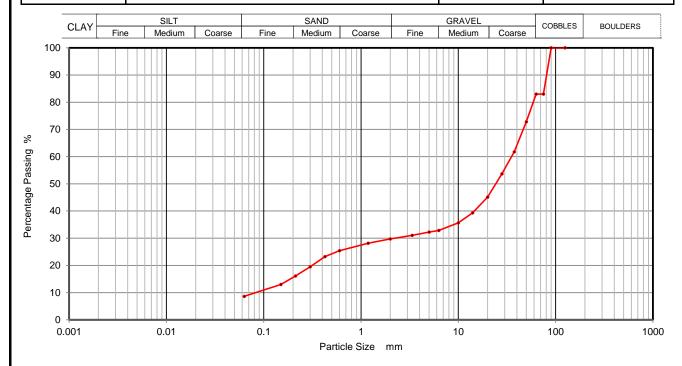
Siev	ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100	0.0200	47	
90	100	0.0060	41	
75	100	0.0020	30	
63	100			
50	100			
37.5	100			
28	100			
20	100			
14	100			
10	100			
6.3	100			
5	100			
3.35	100			
2	99			
1.18	98			
0.6	97			
0.425	96	1		
0.3	91			
0.212	84	1		
0.15	73	1		
0.063	55	1		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	44
Silt	25
Clay	30

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GSIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	BH102
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL with some cobbles	Depth Top	1.20
Soil Description		Depth Base	2.20
Date Tested	10/01/2020	Sample Type	В



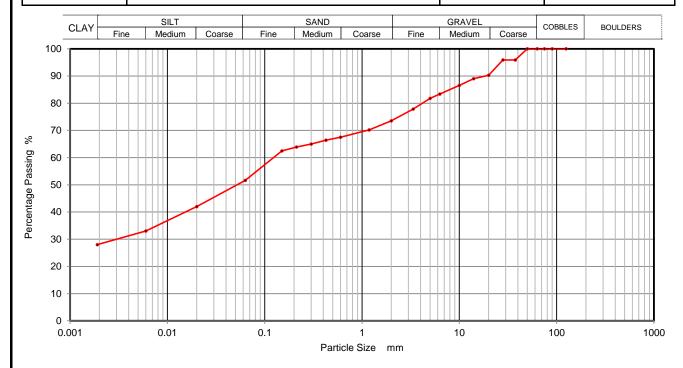
Siev	/ing	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	83		
63	83		
50	73		
37.5	62		
28	54		
20	45		
14	39		
10	36		
6.3	33		
5	32		
3.35	31		
2	30		
1.18	28		
0.6	25		
0.425	23		
0.3	19		
0.212	16	1	
0.15	13		
0.063	9	1	

Sample Proportions	% dry mass
Cobbles	17
Gravel	53
Sand	21
Silt and Clay	9

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH102
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grow/ brown fine to goodse conductibly fine to goodse growelly CLAV	Depth Top	3.20
Soil Description	Grey/ brown fine to coarse sandy silty fine to coarse gravelly CLAY	Depth Base	4.20
Date Tested	10/01/2020	Sample Type	UT



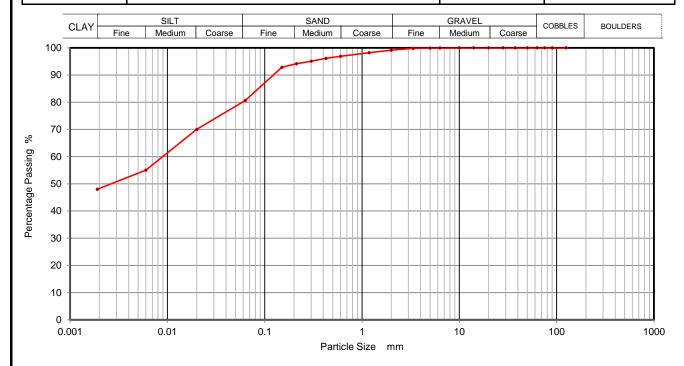
Siev	ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100	0.0200	42	
90	100	0.0060	33	
75	100	0.0020	28	
63	100			
50	100			
37.5	96			
28	96			
20	90			
14	89			
10	87			
6.3	83			
5	82			
3.35	78			
2	74			
1.18	70			
0.6	68			
0.425	66			
0.3	65			
0.212	64			
0.15	62			
0.063	52			

Sample Proportions	% dry mass
Cobbles	0
Gravel	26
Sand	22
Silt	24
Clay	28

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GSIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH102
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey/ brown slightly fine gravelly fine to coarse sandy silty CLAY	Depth Top	4.00
Soil Description	Grey, brown slightly line gravelly line to coarse sandy slity CLAY	Depth Base	4.40
Date Tested	10/01/2020	Sample Type	UT



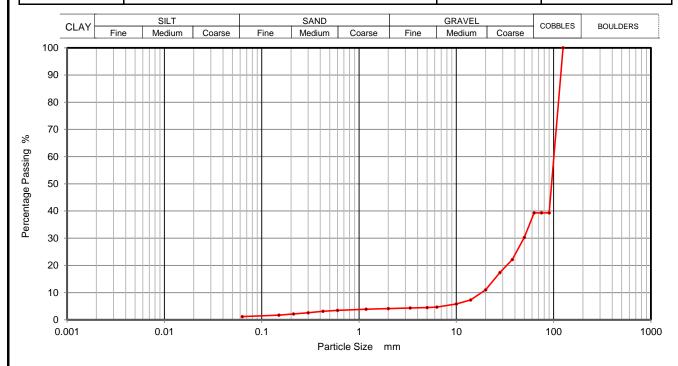
Siev	ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100	0.0200	70	
90	100	0.0060	55	
75	100	0.0020	48	
63	100			
50	100			
37.5	100			
28	100			
20	100			
14	100			
10	100			
6.3	100			
5	100			
3.35	100			
2	99			
1.18	98			
0.6	97			
0.425	96			
0.3	95			
0.212	94			
0.15	93			
0.063	81			

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	18
Silt	33
Clay	48

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GOIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	BH103
Site Name	Cwmcarn School	Sample No.	
Sail Description	Brown slightly silty/ clayey slightly fine to coarse sandy fine to coarse	Depth Top	0.30
Soil Description	GRAVEL with many cobbles	Depth Base	1.20
Date Tested	10/01/2020	Sample Type	В



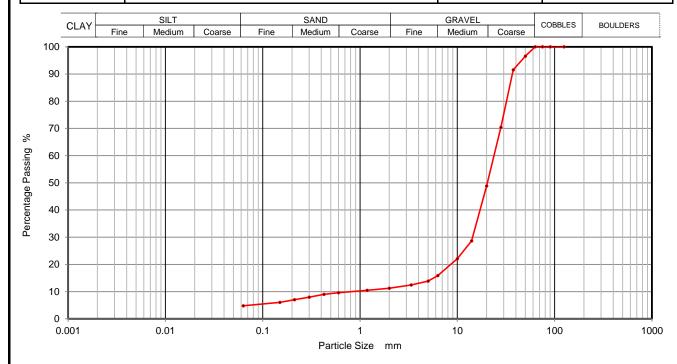
Siev	ring	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100			
90	39			
75	39			
63	39			
50	30			
37.5	22			
28	17			
20	11			
14	7			
10	6			
6.3	5			
5	4			
3.35	4			
2	4			
1.18	4			
0.6	3			
0.425	3	1		
0.3	3			
0.212	2	1		
0.15	2	1		
0.063	1			

Sample Proportions	% dry mass
Cobbles	61
Gravel	35
Sand	3
Silt and Clay	1

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	PARTICLE SIZE DISTRIBUTION		46882
GOIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	BH104
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown slightly silty/ clayey slightly fine to coarse sandy fine to coarse	Depth Top	1.20
Soil Description		Depth Base	2.00
Date Tested	10/01/2020	Sample Type	В



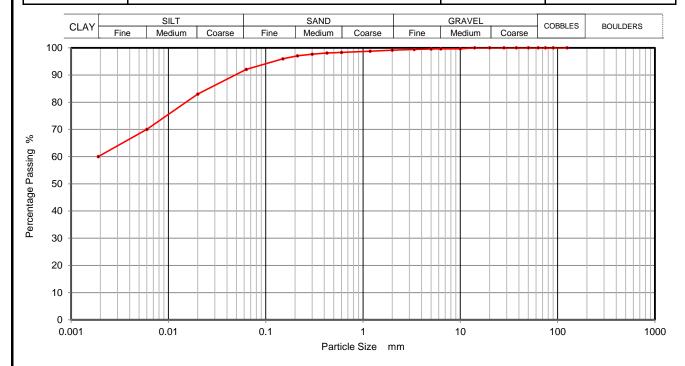
Siev	/ing	Sedime	entation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	97		
37.5	92		
28	70		
20	49		
14	29		
10	22		
6.3	16		
5	14		
3.35	12		
2	11		
1.18	10		
0.6	10		
0.425	9		
0.3	8	_	
0.212	7		
0.15	6		
0.063	5		

Sample Proportions	% dry mass
Cobbles	0
Gravel	89
Sand	6
Silt and Clay	5

Operators	Checked	19/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	20/01/2020	Paul Evans	2 P Grans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH104A
Site Name	Cwmcarn School	Sample No.	
Sail Description	Description Grey slightly fine gravelly slightly fine to coarse snady silty CLAY	Depth Top	6.50
Soil Description		Depth Base	6.95
Date Tested	10/01/2020	Sample Type	UT



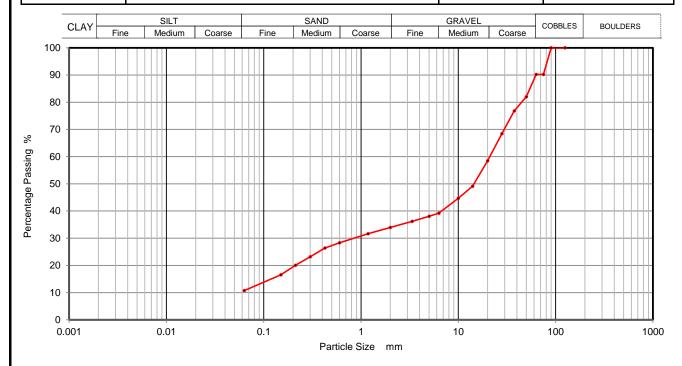
Siev	ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100	0.0200	83	
90	100	0.0060	70	
75	100	0.0020	60	
63	100			
50	100			
37.5	100			
28	100			
20	100			
14	100			
10	100			
6.3	100			
5	100			
3.35	99			
2	99			
1.18	99			
0.6	98			
0.425	98	1		
0.3	98			
0.212	97	1		
0.15	96	1		
0.063	92	1		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	7
Silt	32
Clay	60

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grans



CCTI	PARTICLE SIZE DISTRIBUTION		46882
GSIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	BH105
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown silty/ clayey fine to coarse sandy fine to coarse GRAVEL with some cobbles	Depth Top	0.90
Soil Description		Depth Base	1.20
Date Tested	10/01/2020	Sample Type	В



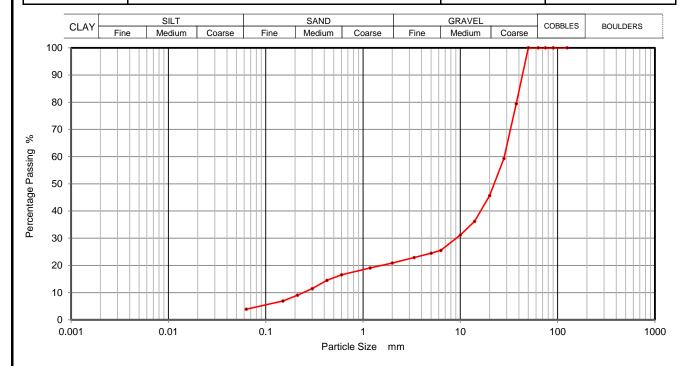
Siev	ing	Sedimentation		
Particle Size mm	% Passing	Particle Size mm	% Passing	
125	100			
90	100			
75	90			
63	90			
50	82			
37.5	77			
28	68			
20	58			
14	49			
10	45			
6.3	39			
5	38			
3.35	36			
2	34			
1.18	32			
0.6	28			
0.425	26			
0.3	23			
0.212	20			
0.15	17			
0.063	11			

Sample Proportions	% dry mass
Cobbles	10
Gravel	56
Sand	23
Silt and Clay	11

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	PARTICLE SIZE DISTRIBUTION		46882
GOIL	BS 1377 Part 2:1990 Wet Sieve, Clause 9.2	Borehole/Pit No.	BH106
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown slightly silty/ clayey fine to coarse sandy fine to coarse GRAVEL	Depth Top	0.40
Soil Description	brown slightly slity/ dayey line to coarse sarity line to coarse GRAVEL	Depth Base	1.20
Date Tested	10/01/2020	Sample Type	В



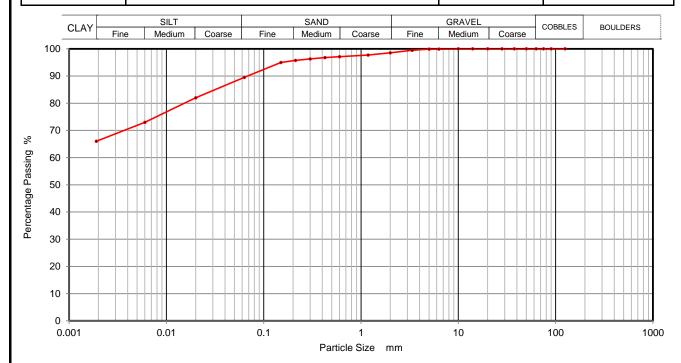
Siev	ring	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	79		
28	59		
20	46		
14	36		
10	31		
6.3	26		
5	24		
3.35	23		
2	21		
1.18	19		
0.6	17		
0.425	15		
0.3	11		
0.212	9	1	
0.15	7	1	
0.063	4	1	

Sample Proportions	% dry mass
Cobbles	0
Gravel	79
Sand	17
Silt and Clay	4

Operators	Checked	19/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	20/01/2020	Paul Evans	8 P Grans



CCTI	PARTICLE SIZE DISTRIBUTION	Contract Number	46882
GOIL	BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Borehole/Pit No.	BH106
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey/ brown slightly fine gravelly slightly fine to coarse sandy silty	Depth Top	3.20
Soil Description	CLAY	Depth Base	3.60
Date Tested	10/01/2020	Sample Type	UT



Siev	ing	Sedime	ntation
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	82
90	100	0.0060	73
75	100	0.0020	66
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	99		
1.18	98		
0.6	97		
0.425	97		
0.3	96		
0.212	96		
0.15	95		
0.063	90		

Sample Proportions	% dry mass
Cobbles	0
Gravel	1
Sand	9
Silt	24
Clay	66

Operators	Checked	20/01/2020	Wayne Honey	W. Honey
RO/MH	Approved	21/01/2020	Paul Evans	DP Grans



CCTI	Certificate of Chemical Analysis		46882
GSIL	(BRE BR 279)	Client Reference	A110489-4-1
Client	WYG	Date Received	
Site Name	Cwmcarn School	Date Started	13/01/2020
		Date Completed	20/01/2020
		No. of Samples	5

Hole Number	Sample Number	Sample Type	De	epth (i	m)	Acid Soluble Sulphate	Aqueous Extract Sulphate	Chloride Content	pH Value	Total Sulphur	Magnesium	Nitrate
BH101A		UT	8.20	1	8.60		0.02	NCP	8.00		<1	25-50
BH102		В	0.30	i	1.20		0.03	NCP	7.11		<1	25-50
BH103		В	0.30	ı	1.20		0.03	NCP	7.29		<1	10-25
BH104		В	1.20	-	2.00		0.03	NCP	7.51		<1	10-25
BH106		UT	3.20	-	3.60		0.03	NCP	7.69		<1	25-50
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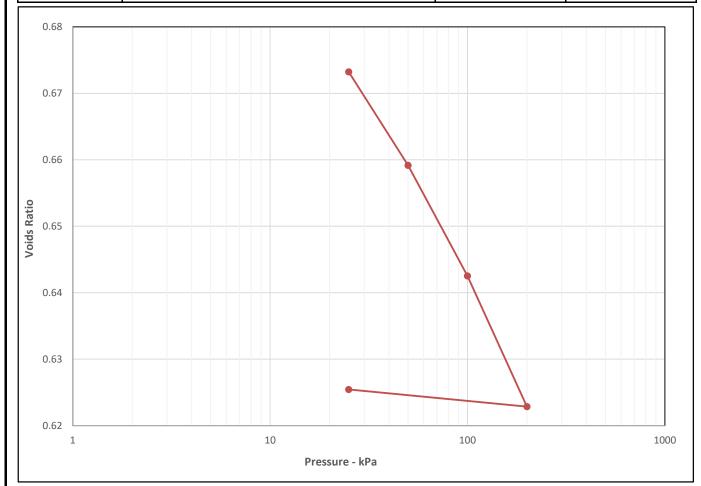
<u>Key</u> Reported As Acid Soluble Sulphate % SO₄ Aqueous Extract Sulphate g/I SO₄ Chloride Content (Semi) mg CI/I pH Value @ 25° Total Sulphur % S Magnesium g/I SO₄ Nitrate NO₃ mg/l

**Remarks** 

NCP = No Chloride Present

Test Operator	Checked and	Authorised by	Paul Evans	DP Gloss -
Darren Bourne	Date	20/01/2020	T aui Evails	90 1 944 <u>7</u> 5

CCTI	ONE DIMENSIONAL CONSOLIDATION TEST	Contract Number	46882
GOIL	BS1377:Part 5:1990, clause 3	Borehole/Trialpit No.	BH101A
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey sandy CLAY	Depth Top (m)	3.20
	Grey Sandy OLAT	Depth Base (m)	3.60
Lab Temperature	20°c	Sample Location	Middle
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	10/01/2020		

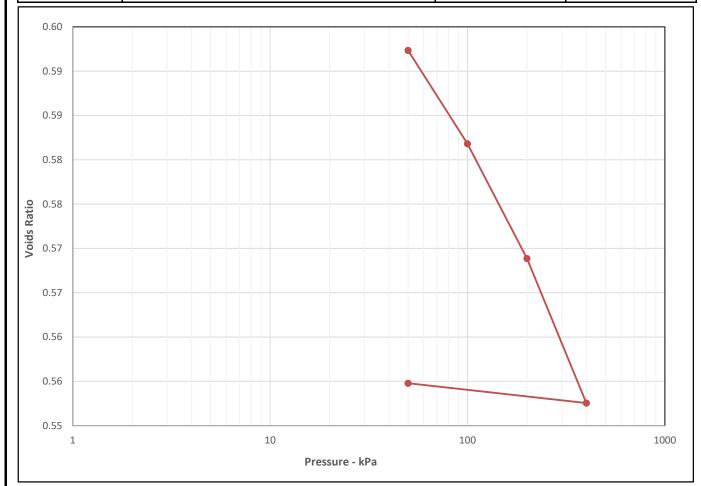


Initial Sample Condit	ions	Pres	sure F	Range	Mv m2/MN	Cv m2/yr	Pres	sure F	Range	Mv m2/MN	Cv m2/yr
Moisture Content (%)	22	0	-	25	0.74	8.9		-			
Bulk Density (Mg/m3)	1.89	25	-	50	0.34	10		-			
Dry Density (Mg/m3)	1.55	50	-	100	0.2	13		-			
Voids Ratio	0.7046	100	-	200	0.1	10		-			
Degree of saturation	81.6	200	-	25	0.0091	12		-			
Height (mm)	19.76		-					-			
Diameter (mm)	75.08		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operators	Checked	20/01/2020	Emma Sharp	-ELEX
LG	Approved	21/01/2020	Paul Evans	DP Grans



CCTI	ONE DIMENSIONAL CONSOLIDATION TEST	Contract Number	46882
GOIL	BS1377:Part 5:1990, clause 3	Borehole/Trialpit No.	BH101A
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey sandy CLAY	Depth Top (m)	5.20
	Grey Sandy OLAT	Depth Base (m)	5.60
Lab Temperature	20°c	Sample Location	Middle
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	10/01/2020		

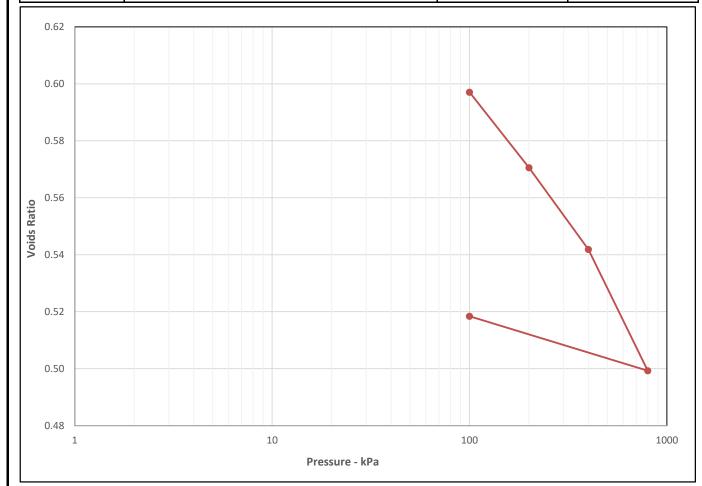


Initial Sample Condit	ions	Pres	sure F	Range	Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr	
Moisture Content (%)	22	0	-	50	0.37	20		-			
Bulk Density (Mg/m3)	2.14	50	-	100	0.13	7.8		-			
Dry Density (Mg/m3)	1.76	100	-	200	0.082	9.4		-			
Voids Ratio	0.6220	200	-	400	0.1	11		-			
Degree of saturation	99.7	400	-	50	0.0041	18		-			
Height (mm)	18.79		-					-			
Diameter (mm)	74.96		-					-			
Particle Density (Mg/m3)	2.85		-					-			

Operators	Checked	20/01/2020	Emma Sharp	-Euso
LG	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	ONE DIMENSIONAL CONSOLIDATION TEST	Contract Number	46882
GOIL	BS1377:Part 5:1990, clause 3	Borehole/Trialpit No.	BH101A
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey slightly fine gravelly sandy CLAY	Depth Top (m)	8.20
	Grey Slightly line gravelly Sandy CLAT	Depth Base (m)	8.60
Lab Temperature	20°c	Sample Location	Middle
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	10/01/2020		

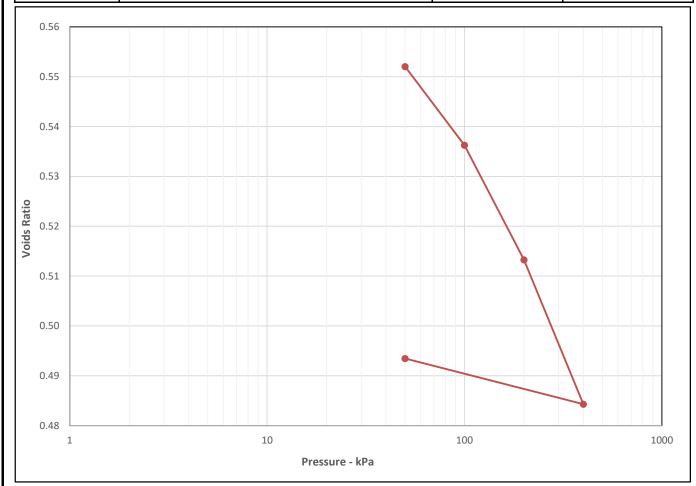


Initial Sample Condi	tions	Pres	sure F	Range	Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr	
Moisture Content (%)	23	0	-	100	0.5	9.8		-			
Bulk Density (Mg/m3)	1.94	100	-	200	0.17	14		-			
Dry Density (Mg/m3)	1.58	200	-	400	0.091	11		-			
Voids Ratio	0.6813	400	-	800	0.1	13		-			
Degree of saturation	89.0	800	-	100	0.018	10		-			
Height (mm)	19.77		-					-			
Diameter (mm)	74.9		-					-			
Particle Density (Mg/m3)	2.65		-					-			

Operators	Checked	20/01/2020	Emma Sharp	-Elico
LG	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	ONE DIMENSIONAL CONSOLIDATION TEST	Contract Number	46882
GOIL	BS1377:Part 5:1990, clause 3	Borehole/Trialpit No.	BH102
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey sandy CLAY	Depth Top (m)	4.00
	Grey Sandy OLAT	Depth Base (m)	4.40
Lab Temperature	20°c	Sample Location	Middle
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	11/01/2020		

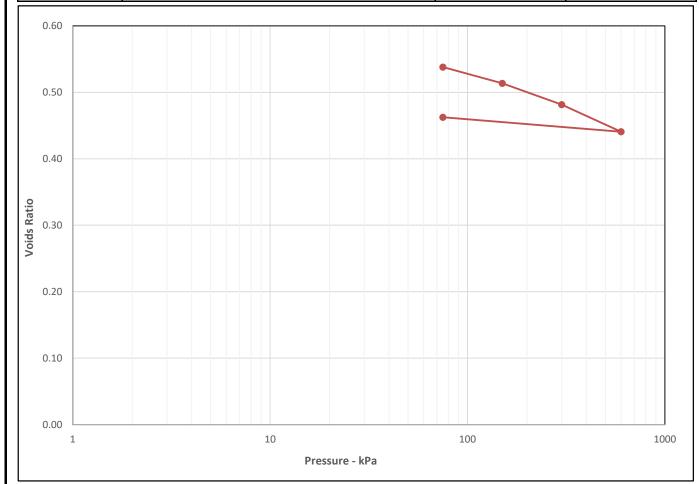


Initial Sample Condit	ions	Pres	sure R	Range	Mv m2/MN	Cv m2/yr	Pressure Range		Mv m2/MN	Cv m2/yr	
Moisture Content (%)	22	0	-	50	0.57	7.5		-			
Bulk Density (Mg/m3)	2.09	50	-	100	0.2	8.8		-			
Dry Density (Mg/m3)	1.72	100	-	200	0.15	8.6		-			
Voids Ratio	0.5973	200	-	400	0.1	13		-			
Degree of saturation	99.5	400	-	50	0.018	13		-			
Height (mm)	18.82		-					-			
Diameter (mm)	74.83		-					-			
Particle Density (Mg/m3)	2.75		-					-			

Operators	Checked	20/01/2020	Emma Sharp	-Euso
LG	Approved	21/01/2020	Paul Evans	DP Grons



CCTI	ONE DIMENSIONAL CONSOLIDATION TEST BS1377:Part 5:1990, clause 3		46882
GOIL			BH104A
Site Name	Cwmcarn School	Sample No.	
Soil Description	Grey sandy CLAY	Depth Top (m)	6.50
	Gley Sality CEAT	Depth Base (m)	6.95
Lab Temperature	20°c	Sample Location	Middle
Remarks	Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise	Sample Type	UT
Date Tested	11/01/2020		

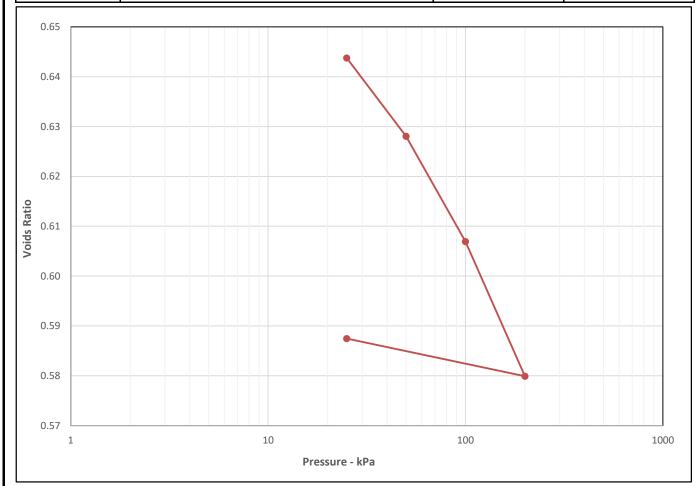


Initial Sample Condition	ons	Pres	sure F	Range	Mv m2/MN	Cv m2/yr	Pres	sure F	Range	Mv m2/MN	Cv m2/yr
Moisture Content (%)	21	0	-	75	0.36	6.3					
Bulk Density (Mg/m3)	2.09	75	-	150	0.21	8.4		-			
Dry Density (Mg/m3)	1.72	150	-	300	0.14	9.8		-			
Voids Ratio	0.5812	300	-	600	0.1	15		-			
Degree of saturation	99.8	600	-	75	0.029	7.1		-			
Height (mm)	19.73		-					-			
Diameter (mm)	74.79		-								
Particle Density (Mg/m3)	2.72		-					-			

Operators	Checked	20/01/2020	Emma Sharp	-Euse
LG	Approved	21/01/2020	Paul Evans	DP Grans



CCTI	ONE DIMENSIONAL CONSOLIDATION TEST	Contract Number	46882
GOIL	BS1377:Part 5:1990, clause 3	Borehole/Trialpit No.	BH106
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown sandy CLAY	Depth Top (m)	3.20
	Blown Sandy CLAT	Depth Base (m)	3.60
Lab Temperature	20°c	Sample Location	Middle
Remarks	Remarks Cv Calculated Using T90 Particle Density Assumed Unless Stated Otherwise		UT
Date Tested	11/01/2020		

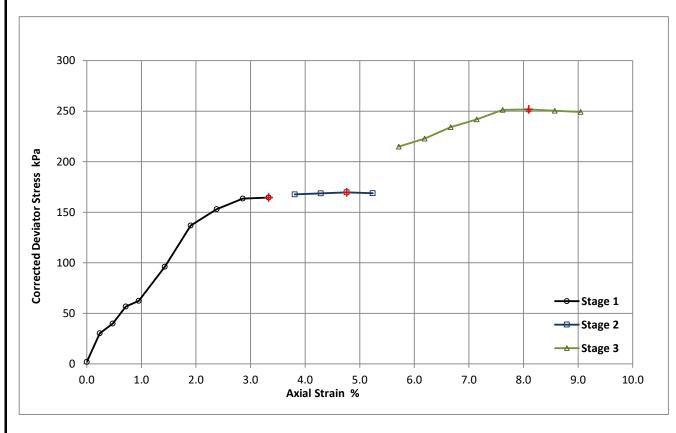


Initial Sample Condit	ions	Pres	sure F	Range	Mv m2/MN	Cv m2/yr	Pres	sure F	Range	Mv m2/MN	Cv m2/yr
Moisture Content (%)	25	0	-	25	0.91	15		-			
Bulk Density (Mg/m3)	1.96	25	-	50	0.38	14		-			
Dry Density (Mg/m3)	1.58	50	-	100	0.26	8.9		-			
Voids Ratio	0.6822	100	-	200	0.2	13		-			
Degree of saturation	95.7	200	-	25	0.027	10		-			
Height (mm)	18.73		-					-			
Diameter (mm)	74.87		-								
Particle Density (Mg/m3)	2.65		-					-			

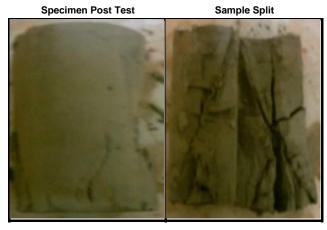
Operators	Checked	20/01/2020	Emma Sharp	-Euse
LG	Approved	21/01/2020	Paul Evans	DP Grons



GSTI	Multi Stage Unconsolidated-Undrained Triaxial Test	Contract Number	46882
GOIL	BS 1377 : 1990 Part 7 : 9	Borehole/Pit No.	BH101A
Site Name	Cwmcarn School	Sample No.	
Soil Description	Brown silty CLAY	Depth Top	3.20
Soil Description	DIOWIT SILLY CEAT	Depth Base	3.60
Date Tested	09/01/2020	Sample Type	UT



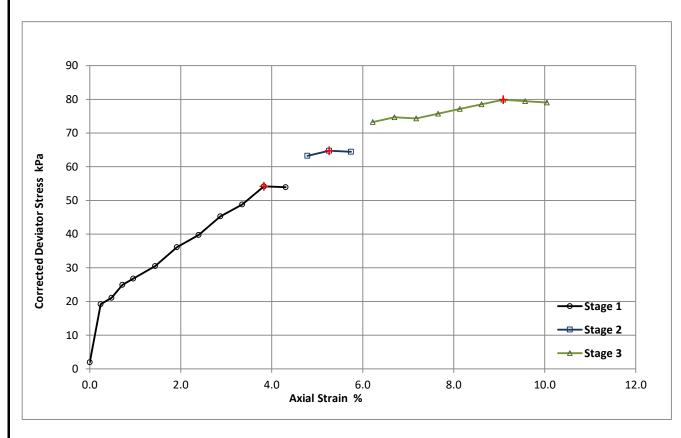
Moisture Content (%)	24		
Bulk Density (Mg/m ³ )	1.96		
Dry Density (Mg/m ³ )		1.58	
Specimen Length (mm)		210	
Specimen Diamteter (mm)	105		
Cell Pressures (kPa)	25	50	100
Deviator Stress (kPa)	165	170	252
Undrained Shear Strength (kPa)	82	85	126
Failure Strain (%)	3.3	4.8	8.1
Mode Of Failure	Compound		
Membrane Used/Thickness	Rubber/0.3mm		
Rate of Strain (%/min)	3.00		



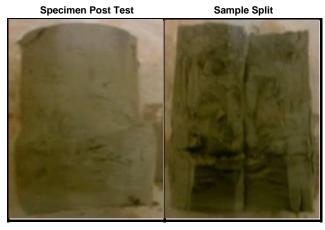
Checked	19/01/2020	Emma Sharp	Eud
Approved	20/01/2020	Paul Evans	DP GOOD



CCTI	Multi Stage Unconsolidated-Undrained Triaxial Test	Contract Number	46882
GOIL	BS 1377 : 1990 Part 7 : 9	Borehole/Pit No.	BH104A
Site Name	Cwmcarn School	Sample No.	
Sail Description	Brown silty CLAY	Depth Top	6.50
Soil Description	BIOWIT SILLY CLAT	Depth Base	6.95
Date Tested	09/01/2020	Sample Type	UT



Moisture Content (%)	20			
Bulk Density (Mg/m ³ )	1.97			
Dry Density (Mg/m³)		1.64		
Specimen Length (mm)		209		
Specimen Diamteter (mm)	104			
Cell Pressures (kPa)	60	120	240	
Deviator Stress (kPa)	54	65	80	
Undrained Shear Strength (kPa)	27	32	40	
Failure Strain (%)	3.8	5.3	9.1	
Mode Of Failure	Compound			
Membrane Used/Thickness	Rubber/0.3mm			
Rate of Strain (%/min)	3.00			



Checked	19/01/2020	Emma Sharp	Eud
Approved	20/01/2020	Paul Evans	DP Grans



# Former Cwmcarn High School



## **APPENDIX F – ENVIRONMENTAL LABORATORY TEST RESULTS**



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com

Website: www.alsenvironmental.co.uk

WYG Geo-Environment 5th Floor Longcross Court 47 Newport Road Cardiff CF24 0AD

Attention: Katy Woodhouse

### **CERTIFICATE OF ANALYSIS**

Date of report Generation: 09 April 2019 **Customer:** H WYG CDF 190402-103 Sample Delivery Group (SDG): Your Reference: A110489-4

Location: Cwmcarn High School

500420 Report No:

We received 26 samples on Tuesday April 02, 2019 and 10 of these samples were scheduled for analysis which was completed on Tuesday April 09, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

**Operations Manager** 





Validated

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG: 190402-103 Client Reference
Location: Cwmcarn High School Order Number:

Client Reference: A110489-4 Order Number: C19/333 Report Number: Superseded Report: 500420

## **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19683138	BH02	ES10	0.20 - 0.20	28/03/2019
19683143	BH02	ES11	0.90 - 0.90	28/03/2019
19683241	BH03		1.20	
19683230	CP01		0.40	
19697238	CPO3		0.50	01/04/2019
19683190	HP01	ES22	0.30 - 0.30	28/03/2019
19683194	HP02	ES23	0.25 - 0.25	28/03/2019
19683234	RP01		0.50	
19683203	SA01	ES4	0.20 - 0.20	25/03/2019
19683199	SA01	ES3	0.60 - 0.60	25/03/2019
19683207	SA02	ES5	0.70 - 0.70	25/03/2019
19683181	TP02	ES2	0.50 - 0.50	25/03/2019
19683226	TP03	ES9	0.60 - 0.60	25/03/2019
19683221	TP03	ES8	1.00 - 1.00	25/03/2019
19683212	TP04	ES6	0.30 - 0.30	25/03/2019
19683217	TP04	ES7	0.70 - 0.70	25/03/2019
19683133	TP01A	ES1	0.50 - 0.50	25/03/2019
19683147	WS01	ES12	0.40 - 0.40	28/03/2019
19683151	WS02	ES13	0.20 - 0.20	28/03/2019
19683156	WS02	ES14	0.80 - 0.80	28/03/2019
19683160	WS03	ES15	0.30 - 0.30	28/03/2019
19683165	WS03	ES16	1.00 - 1.00	28/03/2019
19683169	WS04	ES17	0.20 - 0.20	28/03/2019
19683173	WS04	ES18	0.50 - 0.50	29/03/2019
19683186	WS06	ES20	0.90 - 0.90	29/03/2019
19683177	WS05A	ES19	0.80 - 0.80	29/03/2019

Maximum Sample/Coolbox Temperature (°C) :

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

9.6

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG: A110489-4 190402-103 Client Reference: Report Number: 500420 Location: Cwmcarn High School Order Number: C19/333 Superseded Report: Results Legend 19683147 19683194 19683203 19683181 19683156 9683138 9683212 Lab Sample No(s) X Test No Determination Possible Customer WS02 BH02 SA01 WS01 HP02 TP02 TPQ4 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid ES10 **ES12 ES14** GW - Ground Water ES23 ES4 ES2 ES6 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.20 0.25-0.40-PR - Process Water 0.50 0.20 0.30 0.80 SA - Saline Water Depth (m) - 0.20 - 0.40 TE - Trade Effluent - 0.25 0.80 0.20 0.50 0.30 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 60g 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber J (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar DW - Drinking Water Non-regulatory (ALE210) 1kg TUB VOC (ALE215) UNL - Unspecified Liquid 1kg TUB 1kg TUB 1kg TUB 1kg TUB 1kg SL - Sludge Container **TUB** G - Gas OTH - Other Jar Sample Type S S S S S S S S S S S S S S S S S S S Alkalinity Filtered as CaCO3 All NDPs: 0 Tests: 4 X Χ Ammoniacal Nitrogen All NDPs: 0 Tests: 4 Χ Χ Anions by Kone (soil) All NDPs: 0 Tests: 10 Х Х Х Х Х Х Anions by Kone (w) ΔII NDPs: 0 Tests: 4 X X Ashestos ID in Solid Samples All NDPs: 0 Tests: 10 Х Χ Χ Χ Χ Х Χ Boron Water Soluble All NDPs: 0 Tests: 10 Χ X Х Х Χ Χ CEN Readings All NDPs: 0 Tests: 4 Х Χ Chromium III All NDPs: 0 Tests: 10 Χ X Х Х Χ Χ Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 14 X X Х X Χ X Х Χ Dissolved Metals by ICP-MS All NDPs: 0 Tests: 4 Х X Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 4 Х Х EPH CWG (Aliphatic) Filtered GC (W) All NDPs: 0 Tests: 4 Х Χ EPH CWG (Aliphatic) GC (S) All NDPs: 0 Tests: 10 Х X Х Х Χ Χ EPH CWG (Aromatic) Filtered GC (W) All NDPs: 0 Tests: 4 Χ Х EPH CWG (Aromatic) GC (S) All NDPs: 0 Tests: 10 X X X Χ X

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SDG: A110489-4 190402-103 Client Reference: Report Number: 500420 Cwmcarn High School Order Number: C19/333 Superseded Report: Location: **Results Legend** 19683138 19683194 19683181 19683212 19683147 19683156 Lab Sample No(s) X Test No Determination Possible Customer BH02 WS02 SA01 TP04 WS01 HP02 TP02 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid ES14 GW - Ground Water ES4 ES6 ES2 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.25-0.40-PR - Process Water 0.20 0.50 0.30 0.80 0.20 SA - Saline Water Depth (m) - 0.40 TE - Trade Effluent 0.20 - 0.25 0.20 0.50 0.30 0.80 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 60g VOC (ALE215) 60g 60g 60g 60g 60g 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory VOC (ALE215) VOC (ALE215) VOC (ALE215) VOC (ALE215) UNL - Unspecified Liquid VOC (ALE215) 1kg TUB 1kg TUB SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S S S S S S S S S S GRO by GC-FID (S) All NDPs: 0 Х X X Х Х Х GRO by GC-FID (W) All NDPs: 0 Tests: 4 Х Х All Hexavalent Chromium (s) NDPs: 0 Tests: 10 Х Х Χ Х Χ Х Mercury Dissolved All NDPs: 0 Tests: 4 Χ Х All Metals in solid samples by OES NDPs: 0 Tests: 10 Χ Χ Χ X Χ Χ Nitrite by Kone (w) All NDPs: 0 Tests: 4 X X PAH by GCMS All NDPs: 0 Tests: 10 X X X Х Χ X PAH in waters by GC-MS (diss.filt) All NDPs: 0 Tests: 4 Χ Х рΗ All NDPs: 0 Tests: 10 X X X X Χ Х nH Value of Filtered Water All NDPs: 0 Tests: 4 X Χ Phenols by HPLC (S) All NDPs: 0 Tests: 10 Х Х Х Х Χ Х Phenols by HPLC (W) All NDPs: 0 Tests: 4 Х Х Sample description NDPs: 0 Tests: 10 Χ X X Х Х Χ Total Organic Carbon All NDPs: 0 Tests: 10 X X X Χ Х Χ TPH CWG Filtered (W) All NDPs: 0 X X

	19683156			19683165			19683169			19683186
	WS02			WS03			WS04			WS06
	ES14			ES16			ES17			ES20
	0.80 - 0.80			1.00 - 1.00			0.20 - 0.20			0.90 - 0.90
250g Amber Jar (ALE210)	0.80 - 0.80   60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	1.00 - 1.00   60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	0.20 - 0.20   60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	0.90 - 0.90   60g VOC (ALE215)
S	S	S	S	S	S	S	S	S	S	S
	Х			X			X			X
		X						Х		
Х			Х			Х			Х	
		X						X		
Х			X			Х			х	
		X						X		
Х			Х			X			Х	
		X						Х		
						**				
Х			Х			X			Х	
		X						X		
v			v			v			v	
Х			X			X			X	
		X						X		
v			v			v			v	
Х			X			Х			Х	
Х			X			Х			Х	
		Х						Х		

ALS	5)

**CERTIFICATE OF ANALYSIS** SDG: A110489-4 500420 190402-103 Client Reference: Report Number: C19/333 Location: Cwmcarn High School Order Number: Superseded Report: **Results Legend** 19683138 19683194 19683203 19683181 19683212 19683147 19683156 Lab Sample No(s) X Test No Determination Possible Customer SA01 BH02 WS01 WS02 HP02 TP04 TP02 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid ES14 ES23 GW - Ground Water ES4 ES2 ES6 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.20-PR - Process Water 0.80-0.20 0.25 - 0.25 0.50 0.30 0.40 - 0.40 SA - Saline Water Depth (m) - 0.20 - 0.50 TE - Trade Effluent 0.20 0.30 0.80 TS - Treated Sewage US - Untreated Sewage RE - Recreational Water 60g 60g VOC (ALE215) 60g VOC (ALE215) 60g 60g 60g 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB 250g Amber Jar (ALE210) 1kg TUB DW - Drinking Water Non-regulatory VOC (ALE215) VOC (ALE215) VOC (ALE215) VOC (ALE215) UNL - Unspecified Liquid 1kg TUB 1kg TUB SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S S S S S S S S S S TPH CWG GC (S) All NDPs: 0 X X X X Х X VOC MS (S) All NDPs: 0 Tests: 10 Χ X Χ Χ X Х

X	S		250g Amber Jar (ALE210)				
	S		60g VOC (ALE215)	0.80 - 0.80	ES14	WS02	19683156
	S		1kg TUB				
Х	S		250g Amber Jar (ALE210)				
	ဟ		60g VOC (ALE215)	1.00 - 1.00	ES16	WS03	19683165
	S		1kg TUB				
Х	S	·	250g Amber Jar (ALE210)				
	တ		60g VOC (ALE215)	0.20 - 0.20	ES17	WS04	19683169
	S		1kg TUB				
X	S	·	250g Amber Jar (ALE210)				
	S		60g VOC (ALE215)	0.90 - 0.90	ES20	WS06	19683186





SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# **Sample Descriptions**

#### **Grain Sizes**

very fine	<0.063	3mm	fine	0.06	3mm - 0.1mm	me	edium	0.1mm	- 2mm	coar	se	2mm - 1	0mm	very coars	se >10mr	ım
Lab Sample	No(s)	Custon	ner Sample I	Ref.	Depth (m)		Co	lour	Descrip	tion	Inclu	sions	Incl	usions 2		
1968313	8		BH02		0.20 - 0.20		Dark	Brown	Sandy L	oam	Vege	etation	S	tones		
1968319	)4		HP02		0.25 - 0.25		Dark	Brown	Silt Loa	am	Sto	ones	Ve	getation		
1968320	13		SA01		0.20 - 0.20		Dark	Brown	Loamy S	Sand	Sto	ones	Ve	getation		
1968318	11		TP02		0.50 - 0.50		Dark	Brown	Loamy S	Sand	Sto	ones	Ve	getation		
1968321	2		TP04		0.30 - 0.30		Dark	Brown	Loamy S	Sand	Bı	rick	Veç	getation		
1968314	7		WS01		0.40 - 0.40		Dark	Brown	Sandy L	oam	Sto	ones	Veç	getation		
1968315	66		WS02		0.80 - 0.80		Dark	Brown	Loamy S	Sand	Sto	nes	Ve	getation		
1968316	55		WS03		1.00 - 1.00		Dark	Brown	Loamy S	Sand	Sto	ones	Veç	getation		
1968316	9		WS04		0.20 - 0.20		Dark	Brown	Silt Loa	am	Sto	ones	Veç	getation		
1968318	36		WS06		0.90 - 0.90		Dark	Brown	Loamy S	Sand	Sto	nes	Ve	getation		

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

# **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Location: Cwmcarn High

190402-103 Client Reference: Order Number:

e: A110489-4 C19/333 Report Number: Superseded Report: 500420

Results Legend		Customer Sample Ref.	BH02		HP02		SA01		TP02	TP04		WS01	
# ISO17025 accredited. M mCERTS accredited.		oustonier oumple itel.	BNUZ		HP02		SAUT		1702	11704		WSUI	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.20 - 0.20 Soil/Solid (S)		0.25 - 0.25 Soil/Solid (S)		0.20 - 0.20 Soil/Solid (S)		0.50 - 0.50 Soil/Solid (S)	0.30 - 0.30 Soil/Solid (		0.40 - 0.40 Soil/Solid (S)	
* Subcontracted - refer to subcontractor report accreditation status.		Date Sampled Sample Time	28/03/2019		28/03/2019		25/03/2019		25/03/2019	25/03/2019		28/03/2019	
** % recovery of the surrogate standard to check efficiency of the method. The results of indivic compounds within samples aren't corrected for	dual	Date Received	02/04/2019		02/04/2019		02/04/2019		02/04/2019	02/04/2019		02/04/2019	
recovery (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	190402-103 19683138		190402-103 19683194		190402-103 19683203		190402-103 19683181	190402-10 19683212		190402-103 19683147	
1-3+§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference Method	ES10		ES23		ES4		ES2	ES6		ES12	
Moisture Content Ratio (% of as received sample)	%	PM024	19		12		21		15	7		9.8	
Phenol	<0.01 mg/kg	g TM062 (S)	0.0123	М	<0.01	М	<0.01	M	<0.01 M	<0.01	М	<0.01	М
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0122	#	0.0153	#	0.0307	#	0.00774 #	0.0121	#	0.00622	#
рН	1 pH Units	TM133	7.45	М	8.33	М	7.03	M	6.75 N	8.56	М	7.66	M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#	<0.6	#	<0.6	#	<0.6 #	<0.6	#	<0.6	#
Cyanide, Easily liberatable (low level)	<0.5 mg/kg	TM153	<0.5		<0.5		<0.5		<0.5	<0.5		<0.5	
Chromium, Trivalent	<0.9 mg/kg	TM181	7.95		<0.9		8		4.59	7.38		4.32	
Arsenic	<0.6 mg/kg	TM181	9.16	М	9.08	М	13.4	M	7.25 N	21.8	М	6.93	M
Beryllium	<0.01 mg/kg	g TM181	0.31	М	0.343	М	0.313	M	0.295 M	0.263	М	0.254	M
Cadmium	<0.02 mg/kg	g TM181	0.134	М	0.71	М	0.284	M	0.143 N	0.541	М	0.225	M
Chromium	<0.9 mg/kg	TM181	7.95	М	<9	М	8	M	4.59 N	7.38	М	4.32	M
Copper	<1.4 mg/kg	TM181	9.98	М	<14	М	21.4	М	11.8 M	11.3	М	6.99	M
Lead	<0.7 mg/kg	TM181	19.5	М	22.1	М	30.8	M	11.5 M	81.1	М	11.7	M
Mercury	<0.14 mg/kg	g TM181	<0.14	М	<1.4	М	<0.14	M	<0.14 N	<0.14	М	<0.14	M
Nickel	<0.2 mg/kg	TM181	10.1	М	19.4	М	16.3	M	22.6 N	11	М	20.4	M
Selenium	<1 mg/kg	TM181	1.36	#	<10	#	2.38	#	1.39 #	<1 :	#	1.15	#
Vanadium	<0.2 mg/kg	TM181	20.1	#	19.7	#	21.8	#	14.9 #	9.27	#	14.2	#
Zinc	<1.9 mg/kg	TM181	46.3	М	68.8	М	77.1	M	72.9 N	253	М	59.9	M
Boron, water soluble	<1 mg/kg	TM222	<1	М	<1	М	<1	M	<1 N	<1	М	<1	M
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.0276	М	0.127	М	0.0161	M	0.0142 N	0.0166	М	0.0078	М



SDG: 190402-103 Location: Cwmcarn High School

Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

Results Legend # ISO17025 accredited.		Customer Sample Ref.	WS02		WS03		WS04		WS06		
M mCERTS accredited. aq Aqueous / settled sample.											
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.80 - 0.80		1.00 - 1.00		0.20 - 0.20 Soil/Solid (S)		0.90 - 0.90		
* Subcontracted - refer to subcontractor report f accreditation status.	for	Date Sampled	Soil/Solid (S) 28/03/2019		Soil/Solid (S) 28/03/2019		28/03/2019		Soil/Solid (S) 29/03/2019		
** % recovery of the surrogate standard to check	the	Sample Time									
efficiency of the method. The results of individ compounds within samples aren't corrected fo		Date Received SDG Ref	02/04/2019 190402-103		02/04/2019 190402-103		02/04/2019 190402-103		02/04/2019 190402-103		
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	19683156		19683165		19683169		19683186		
1-3+§@ Sample deviation (see appendix)		AGS Reference	ES14		ES16		ES17		ES20		
Component	LOD/Units	7									
Moisture Content Ratio (% of as	%	PM024	11		16		25		10		
received sample)								_		_	
Phenol	<0.01 mg/k	(g TM062 (S)	<0.01		<0.01		<0.01		<0.01		
				M		М		М		М	
Fraction Organic Carbon (FOC)	<0.002	TM132	0.00909	.,	0.011	.,	0.0492	,,	0.0331		
				#		#		#		#	
рH	1 pH Units	s TM133	7.72		6.87		6.87		8.05		
				M		М		М		М	
Chromium, Hexavalent	<0.6 mg/k	g TM151	<0.6		<0.6		<0.6		<0.6		
		=======================================		#		#		#		#	
Cyanide, Easily liberatable (low	<0.5 mg/kg	g TM153	<0.5		<0.5		<0.5		<0.5		
level)	0.0	<b></b>						+	0		
Chromium, Trivalent	<0.9 mg/kg	g TM181	5.5		5.53		9.49		6.52		
			_		_			+		_	
Arsenic	<0.6 mg/kg	g TM181	7.87		8.66		21.3		11.2		
- "				M	_	М		M		M	
Beryllium	<0.01 mg/k	(g TM181	0.3		0.318		0.472		0.375		
				M		М		М		М	
Cadmium	<0.02 mg/k	(g TM181	0.179		0.164		0.244		0.313		
				M		М		М		М	
Chromium	<0.9 mg/k	g TM181	5.5		5.53		9.49		6.52		
				M		М		М		M	
Copper	<1.4 mg/kg	g TM181	9.79		13.5		29		14.6		
				M		М		М		M	
Lead	<0.7 mg/kg	g TM181	13.3		13.8		52.5		26.5		
				M		М		M		M	
Mercury	<0.14 mg/k	kg TM181	<0.14		<0.14		<0.14		<0.14		
				М		M		M		M	
Nickel	<0.2 mg/kg	g TM181	24		22		20.5		15.7		
				М		M		M		M	
Selenium	<1 mg/kg	TM181	1.52		1.44		2.1		<1		
				#		#		#		#	
Vanadium	<0.2 mg/kg	g TM181	16.4		15.9		25		12		
				#		#		#		#	
Zinc	<1.9 mg/kg	g TM181	71.6		70.5		96.7		113		
				М		М		M		M	
Boron, water soluble	<1 mg/kg	TM222	<1		<1		<1		<1		
				M		М		М		М	
Water Soluble Sulphate as SO4	<0.004 g/l	I TM243	0.0049		0.0124		0.0146		0.0108		
2:1 Extract				M		М		M		М	
		+						+		_	
		+						+		-	
		+						+		-	
		+						+		-	
		+						+		-	
		+						+		-	
		+						+		_	
		+						+			
		+						+		_	
		+						-			
		+						+		_	

# **CERTIFICATE OF ANALYSIS**

190402-103 Cwmcarn High School A110489-4 C19/333 Report Number: Superseded Report: SDG: Client Reference: 500420 Order Number: Location:

PAH by GCMS													_
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	BH02		HP02		SA01		TP02	TP04		WS01	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.20 - 0.20		0.25 - 0.25		0.20 - 0.20		0.50 - 0.50	0.30 - 0.30		0.40 - 0.40	
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report	for	Sample Type Date Sampled	Soil/Solid (S) 28/03/2019		Soil/Solid (S) 28/03/2019		Soil/Solid (S) 25/03/2019		Soil/Solid (S) 25/03/2019	Soil/Solid (S) 25/03/2019		Soil/Solid (S) 28/03/2019	
accreditation status.  ** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi		Sample Time Date Received	02/04/2019		02/04/2019		02/04/2019		02/04/2019	02/04/2019		02/04/2019	
compounds within samples aren't corrected f	for the	SDG Ref	190402-103		190402-103		190402-103		190402-103	190402-103		190402-103	
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	19683138 ES10		19683194 ES23		19683203 ES4		19683181 ES2	19683212 ES6		19683147 ES12	
Component	LOD/Unit										_		
Naphthalene-d8 % recovery**	%	TM218	96.3		98.5		98.4		99	96.6		98.6	
Acenaphthene-d10 % recovery**	%	TM218	85.3		91.4		91.7		91.3	90.1		91.3	
Phenanthrene-d10 % recovery**	%	TM218	85.9		93.9		94.1		94.1	91		94.1	
Chrysene-d12 % recovery**	%	TM218	84.1		84.1		80.8		84.1	74.8		82.7	
Perylene-d12 % recovery**	%	TM218	80.3		86.6		77.5		81.4	71.1		82.3	
Naphthalene	<0.009 mg/kg	TM218	<0.009	М	0.0537	М	0.0148	М	<0.009 M	<0.009	М	<0.009	М
Acenaphthylene	<0.012 mg/kg	TM218	<0.012	М	0.0239	М	<0.012	М	<0.012 M	<0.012	М	<0.012	М
Acenaphthene	<0.008 mg/kg	TM218	<0.008	М	<0.008	М	<0.008	М	<0.008 M	<0.008	М	<0.008	М
Fluorene	<0.01 mg/	kg TM218	<0.01	М	0.0119	М	<0.01	М	<0.01 M	<0.01	М	<0.01	М
Phenanthrene	<0.015 mg/kg	TM218	<0.015	М	0.146	М	0.0496	М	<0.015	0.0182	М	<0.015	М
Anthracene	<0.016 mg/kg	TM218	<0.016	М	0.0342	М	<0.016	М	<0.016	<0.016	М	<0.016	М
Fluoranthene	<0.017 mg/kg	TM218	<0.017	М	0.311	М	0.0506	М	<0.017 M	0.0265	М	<0.017	М
Pyrene	<0.015 mg/kg	TM218	<0.015	М	0.271	М	0.0399	М	<0.015	0.0236	М	<0.015	М
Benz(a)anthracene	<0.014 mg/kg	TM218	<0.014	М	0.167	М	0.0213	М	<0.014 M	0.0161	М	<0.014	М
Chrysene	<0.01 mg/	kg TM218	0.0146	М	0.178	М	0.0378	М	<0.01 M	0.0235	М	<0.01	М
Benzo(b)fluoranthene	<0.015 mg/kg	TM218	0.0237	М	0.202	М	0.0312	М	<0.015 M	0.0231	М	<0.015	М
Benzo(k)fluoranthene	<0.014 mg/kg	TM218	<0.014	М	0.0755	М	<0.014	М	<0.014 M	<0.014	М	<0.014	М
Benzo(a)pyrene	<0.015 mg/kg	TM218	<0.015	М	0.19	М	0.0211	М	<0.015 M	0.0188	М	<0.015	М
Indeno(1,2,3-cd)pyrene	<0.018 mg/kg	TM218	<0.018	М	0.137	М	<0.018	М	<0.018 M	<0.018	М	<0.018	М
Dibenzo(a,h)anthracene	<0.023 mg/kg	TM218	<0.023	М	<0.023	М	<0.023	М	<0.023 M	<0.023	М	<0.023	М
Benzo(g,h,i)perylene	<0.024 mg/kg	TM218	<0.024	М	0.147	М	<0.024	М	<0.024 M	<0.024	М	<0.024	М
PAH, Total Detected USEPA 16	<0.118 mg/kg	TM218	<0.118		1.95		0.266		<0.118	0.15		<0.118	
						$\dashv$					$\dashv$		$\dashv$
						$\dashv$							$\dashv$
													$\neg$

# **CERTIFICATE OF ANALYSIS**

ALS

SDG:190402-103Client Reference:A110489-4Report Number:500420Location:Cwmcarn High SchoolOrder Number:C19/333Superseded Report:

PAH by GCMS							
Results Legend	(	Customer Sample Ref.	WS02	WS03	WS04	WS06	
# ISO17025 accredited.  M mCERTS accredited.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.80 - 0.80	1.00 - 1.00	0.20 - 0.20	0.90 - 0.90	
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report	for	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	
accreditation status.  ** % recovery of the surrogate standard to chec		Date Sampled Sample Time	28/03/2019	28/03/2019	28/03/2019	29/03/2019	
efficiency of the method. The results of indivi compounds within samples aren't corrected f	dual	Date Received	02/04/2019	02/04/2019	02/04/2019	02/04/2019	
recovery	or the	SDG Ref	190402-103 19683156	190402-103 19683165	190402-103 19683169	190402-103 19683186	
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	ES14	ES16	ES17	ES20	
Component	LOD/Units	Method					
Naphthalene-d8 % recovery**	%	TM218	94	98.8	97.6	97.3	
Assasshahana d10.0/	0/	TM218	86.9	00.4	93.5	90.8	
Acenaphthene-d10 % recovery**	%	11/12/10	00.9	90.4	93.5	90.0	
Phenanthrene-d10 % recovery**	%	TM218	90.7	93	97	92.8	
Thenantinene-dio 76 recovery	/0	11012 10	30.1	35	31	32.0	
Chrysene-d12 % recovery**	%	TM218	80.4	81.1	90.1	82.2	
, , , , , , , , , , , , , , , , , , , ,						-	
Perylene-d12 % recovery**	%	TM218	79.4	78.2	83.9	81.2	
Naphthalene	<0.009	TM218	<0.009	<0.009	0.0399	0.0206	
	mg/kg		M		M	М	
Acenaphthylene	<0.012	TM218	<0.012	<0.012	0.0672	0.0177	
	mg/kg	T-10/-	M		M	M	
Acenaphthene	<0.008	TM218	<0.008	<0.008	<0.008	<0.008	
5	mg/kg	T14040	M	+	M	M	
Fluorene	<0.01 mg/kg	TM218	<0.01	<0.01	<0.01	<0.01	
Phenanthrene	<0.015	TM218	<0.015	<0.015	0.178	0.158	
Friendituliene	mg/kg	11012 10	<0.013		0.176 M	0.136 M	
Anthracene	<0.016	TM218	<0.016	<0.016	0.0732	<0.016	
7 thundoone	mg/kg	1111210	-0.010 M		M	M	
Fluoranthene	<0.017	TM218	<0.017	<0.017	0.804	0.239	
	mg/kg		М		M	М	
Pyrene	<0.015	TM218	<0.015	<0.015	0.699	0.202	
	mg/kg		M	М	M	М	
Benz(a)anthracene	<0.014	TM218	<0.014	<0.014	0.481	0.0909	
	mg/kg		M		M	M	
Chrysene	<0.01 mg/kg	TM218	<0.01	<0.01	0.494	0.115	
D /b\f\	40.04E	TM040	M		M	M	
Benzo(b)fluoranthene	<0.015 mg/kg	TM218	<0.015 M	<0.015	0.783 M	0.111 M	
Benzo(k)fluoranthene	<0.014	TM218	<0.014	<0.014	0.295	0.0621	
Derizo(K)ndorantriene	mg/kg	11VIZ 10	10.014 M		0.235 M	0.0021 M	
Benzo(a)pyrene	<0.015	TM218	<0.015	<0.015	0.561	0.104	
	mg/kg		М			М	
Indeno(1,2,3-cd)pyrene	<0.018	TM218	<0.018	<0.018	0.324	0.0831	
	mg/kg		М			M	
Dibenzo(a,h)anthracene	<0.023	TM218	<0.023	<0.023	0.0662	<0.023	
- (18)	mg/kg		M		M	M	
Benzo(g,h,i)perylene	<0.024	TM218	<0.024	<0.024	0.337	0.0845	
PAH, Total Detected USEPA 16	mg/kg <0.118	TM218	<0.118	<0.118	5.2	1.29	
TATI, TOTAL DETECTED USEPA 10	<0.118 mg/kg	i IVI∠ 10	<b>~</b> U.110	V.110	ა.∠	1.23	
	9/1/9						
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# **CERTIFICATE OF ANALYSIS**

ALS

SDG: 190402-103 Location: Cwmcarn High School

2-103 Client Reference: arn High School Order Number: A110489-4 C19/333

Report Number: Superseded Report: 500420

Location.		zwincam riigi	Oction Order	i Number. Or	3/333	Ouperseded Ne	porti	
TPH CWG (S)								
Results Legend # ISO17025 accredited.	С	ustomer Sample Ref.	BH02	HP02	SA01	TP02	TP04	WS01
M mCERTS accredited. aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.20 - 0.20 Soil/Solid (S)	0.25 - 0.25 Soil/Solid (S)	0.20 - 0.20 Soil/Solid (S)	0.50 - 0.50 Soil/Solid (S)	0.30 - 0.30 Soil/Solid (S)	0.40 - 0.40 Soil/Solid (S)
* Subcontracted - refer to subcontractor report accreditation status.	t for	Date Sampled	28/03/2019	28/03/2019	25/03/2019	25/03/2019	25/03/2019	28/03/2019
** % recovery of the surrogate standard to che efficiency of the method. The results of indiv		Sample Time Date Received	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
compounds within samples aren't corrected recovery		SDG Ref	190402-103	190402-103	190402-103	190402-103	190402-103	190402-103
(F) Trigger breach confirmed  1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	19683138 ES10	19683194 ES23	19683203 ES4	19683181 ES2	19683212 ES6	19683147 ES12
Component	LOD/Units	Method	2010	L323	204	LOZ	200	L312
GRO Surrogate % recovery**	%	TM089	84.1	92.2	74.9	92	87.5	99.1
-								
GRO TOT (Moisture Corrected)	<0.1 mg/kg	TM089	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
			M	М	M	M	M	М
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	0.00342	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Alinhadian NOO O40	<0.01 mg/kg	TN4000	-0.04	40.04	-0.04	-0.04	-0.04	40.04
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7 iiiphatios - 3 13 3 12	10.01 mg/kg	1111000	-0.01	10.01	-0.01	-0.01	-0.01	10.01
Aliphatics >C12-C16	<0.1 mg/kg	TM173	0.278	<0.1	0.128	0.366	<0.1	0.551
<u>'</u>								
Aliphatics >C16-C21	<0.1 mg/kg	TM173	0.599	<0.1	<0.1	0.437	<0.1	0.623
Aliphatics >C21-C35	<0.1 mg/kg	TM173	1.39	4.73	<0.1	0.871	5.05	1.83
Aliphatics >C35-C44	<0.1 mg/kg	TM173	<0.1	0.975	1.1	0.125	<0.1	0.454
Total Aliabatics > C42 C44	<0.1 mm///m	TM472	0.07	E 74	1.23	1.8	E 0E	2.46
Total Aliphatics >C12-C44	<0.1 mg/kg	TM173	2.27	5.71	1.23	1.8	5.05	3.46
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
7.0110.00 - 200 207	10.01 mg/kg	1111000	-0.01	10.01	-0.01	-0.01	-0.01	10.01
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
A	.0.4 #	T14470	.0.4	.0.4	.0.4	.0.4	.0.4	.0.4
Aromatics >EC12-EC16	<0.1 mg/kg	TM173	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Aromatics >EC16-EC21	<0.1 mg/kg	TM173	<0.1	0.795	0.234	<0.1	<0.1	<0.1
7.0114.00 - 2010 2021	J. J. Highligh	1111110	-0.1	0.700	0.201	-0.1	-0.1	-0.1
Aromatics >EC21-EC35	<0.1 mg/kg	TM173	1.25	9.09	7.12	0.336	4.25	0.395
Aromatics >EC35-EC44	<0.1 mg/kg	TM173	0.879	9.77	7.22	0.448	5.56	0.456
Aromatics >EC40-EC44	<0.1 mg/kg	TM173	0.143	4.68	3.31	0.217	2.5	0.225
T. I.A	.0.4 #	T14470	0.40	40.7	14.6	0.705	0.04	0.054
Total Aromatics >EC12-EC44	<0.1 mg/kg	TM173	2.13	19.7	14.0	0.785	9.81	0.851
Total Aliphatics & Aromatics	<0.1 mg/kg	TM173	4.39	25.4	15.8	2.58	14.9	4.31
>C5-C44								
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# **CERTIFICATE OF ANALYSIS**

190402-103 Cwmcarn High School SDG: Location:

Client Reference: Order Number:

A110489-4 C19/333

Report Number: Superseded Report:

500420

TPH CWG (S)	
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TPH CWG (S)									
Results L # ISO17025 accredited.	.egend	С	ustomer Sample Ref.	WS02	WS03	WS04	WS06		
M mCERTS accredited.  aq Aqueous / settled sample	ı.								
diss.filt Dissolved / filtered sample tot.unfilt Total / unfiltered sample.			Depth (m) Sample Type	0.80 - 0.80 Soil/Solid (S)	1.00 - 1.00 Soil/Solid (S)	0.20 - 0.20 Soil/Solid (S)	0.90 - 0.90 Soil/Solid (S)		
* Subcontracted - refer to a accreditation status.	subcontractor report for		Date Sampled	28/03/2019	28/03/2019	28/03/2019	29/03/2019		
** % recovery of the surroge efficiency of the method.			Sample Time	02/04/2019	02/04/2019	02/04/2019	02/04/2019		
compounds within sample	les aren't corrected for the		Date Received SDG Ref	190402-103	190402-103	190402-103	190402-103		
recovery (F) Trigger breach confirmed	I		Lab Sample No.(s)	19683156 ES14	19683165 ES16	19683169	19683186		
1-3+§@ Sample deviation (see ap		Units	AGS Reference Method	E314	E310	ES17	ES20		
GRO Surrogate % recov		%	TM089	93.6	114	80.9	82.8		
GRO TOT (Moisture Cor	rected) <0.1	mg/kg	TM089	<0.1	<0.1	1.43	<0.1		
				M	M	M	M		
Aliphatics >C5-C6	<0.01	l mg/kg	TM089	<0.01	<0.01	0.0375	<0.01		
Aliphatics >C6-C8	<0.01	l mg/kg	TM089	<0.01	<0.01	0.0415	<0.01		
Aliphatics >C8-C10	<0.01	l mg/kg	TM089	<0.01	<0.01	0.598	<0.01		
Aliphatics >C10-C12	<0.01	l mg/kg	TM089	<0.01	<0.01	0.213	0		
Aliphatics >C12-C16	z0.1	mg/kg	TM173	<0.1	<0.1	0.257	0.632		
Aliphatics >C12-C10	V0.1	mg/kg	1101173	<b>\0.1</b>	<b>~</b> 0.1	0.237	0.032		
Aliphatics >C16-C21	<0.1	mg/kg	TM173	<0.1	<0.1	<0.1	1.06		
		ق…ق							
Aliphatics >C21-C35	<0.1	mg/kg	TM173	<0.1	<0.1	1.83	5.36		
Aliphatics >C35-C44	<0.1	mg/kg	TM173	0.106	<0.1	0.389	0.847		
Tatal Aliabatias > 040 O	14 -0.4		TM470	0.400	-0.4	0.47	7.04		
Total Aliphatics >C12-C4	14 <0.1	mg/kg	TM173	0.106	<0.1	2.47	7.91		
Aromatics >EC5-EC7	<0.01	l mg/kg	TM089	<0.01	<0.01	<0.01	<0.01		
						•••			
Aromatics >EC7-EC8	<0.01	l mg/kg	TM089	<0.01	<0.01	<0.01	<0.01		
Aromatics >EC8-EC10	<0.01	l mg/kg	TM089	<0.01	<0.01	0.399	<0.01		
A	10.04	//	TM000	-0.04	<b>40.04</b>	0.440	-0.04		
Aromatics >EC10-EC12	<0.01	l mg/kg	TM089	<0.01	<0.01	0.142	<0.01		
Aromatics >EC12-EC16	<0.1	mg/kg	TM173	<0.1	<0.1	0.147	0.687		
		3 3		-		·			
Aromatics >EC16-EC21	<0.1	mg/kg	TM173	<0.1	<0.1	12.8	3.92		
Aromatics >EC21-EC35	<0.1	mg/kg	TM173	0.276	<0.1	43	14		
Aromatics >EC35-EC44	<0.1	mg/kg	TM173	0.832	<0.1	14	4.47		
Alonatics > Lood-Lot4	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	ilig/kg	TWITTS	0.002	10.1	17	7.77		
Aromatics >EC40-EC44	<0.1	mg/kg	TM173	0.267	<0.1	4.58	1.46		
Total Aromatics >EC12-l	EC44 <0.1	mg/kg	TM173	1.11	<0.1	70.1	23.1		
Total Aliabatica 9 Arama	tion <0.1		TM173	1.21	<0.1	74	31		
Total Aliphatics & Aroma >C5-C44	lucs <0.1	mg/kg	1101173	1.21	<0.1	74	31		
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# **CERTIFICATE OF ANALYSIS**

ALS

SDG:190402-103Client Reference:A110489-4Report Number:500420Location:Cwmcarn High SchoolOrder Number:C19/333Superseded Report:

(ALS)		, , , , , , , , , , , , , , , , , , ,		. Italiibor.	0.000			
VOC MS (S)								
Results Legend # ISO17025 accredited.	С	ustomer Sample Ref.	BH02	HP02	SA01	TP02	TP04	WS01
M mCERTS accredited. aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample.		Depth (m)	0.20 - 0.20	0.25 - 0.25	0.20 - 0.20	0.50 - 0.50	0.30 - 0.30	0.40 - 0.40
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor rep	ort for	Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
accreditation status.		Date Sampled Sample Time	28/03/2019	28/03/2019	25/03/2019	25/03/2019	25/03/2019	28/03/2019
efficiency of the method. The results of inc	lividual	Date Received	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019	02/04/2019
compounds within samples aren't correcte recovery	d for the	SDG Ref	190402-103	190402-103	190402-103	190402-103	190402-103	190402-103
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	19683138 ES10	19683194 ES23	19683203 ES4	19683181 ES2	19683212 ES6	19683147 ES12
Component	LOD/Units	Method	2010	L023	204	LOZ	L30	L312
Dibromofluoromethane**	%	TM116	116	102	105	112	111	108
Distributionalismonth	,,	1111110	110	102	100	112	'''	100
Toluene-d8**	%	TM116	96.6	95.4	98.9	101	99.9	98.6
7 5145115 45	,~		55.5		55.5		00.0	
4-Bromofluorobenzene**	%	TM116	82.8	75.3	96.8	87.3	81.1	82.9
1 Bromondorobonzono	,,	1111110	02.0	70.0	00.0	01.0	011	02.0
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.01	<0.01	<0.2	<0.01	<0.01	<0.01
Metry Tertiary Butyr Etrier	<0.01 mg/kg	TIVITIO	<0.01 M	\ \ \ \ M	\\\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<b>₹0.01</b> M	~0.01 M	~0.01 M
Danmana	<0.009	TM116	<0.009	<0.009	<0.18	<0.009	<0.009	<0.009
Benzene	mg/kg	TIVITIO	<0.009 M		~0.16 M		<0.009 M	<0.009 M
Talvana		TM116				M ×0.007		
Toluene	<0.007	TM116	<0.007	<0.007	<0.14	<0.007	<0.007	<0.007
Ethydhanaan-	mg/kg	TAAAAA	M < 0.004	M = 0.004	M	M ×0.004	M <-0.004	M = 0.004
Ethylbenzene	<0.004	TM116	<0.004	<0.004	<0.08	<0.004	<0.004	<0.004
/ V /	mg/kg	T14440	M	M	M	M	M	M
p/m-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.2	<0.01	<0.01	<0.01
V 1			#	#	#	#	#	#
o-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.2	<0.01	<0.01	<0.01
			M	M	M	M	М	M
				<u></u>				
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# **CERTIFICATE OF ANALYSIS**

ALS

SDG:190402-103Client Reference:A110489-4Report Number:500420Location:Cwmcarn High SchoolOrder Number:C19/333Superseded Report:

VOC MS (S)							 
Results Legend	С	ustomer Sample Ref.	WS02	WS03	WS04	WS06	
# ISO17025 accredited.  M mCERTS accredited.  aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample.		Depth (m)	0.80 - 0.80	1.00 - 1.00	0.20 - 0.20	0.90 - 0.90	
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor repor	t for	Sample Type Date Sampled	Soil/Solid (S) 28/03/2019	Soil/Solid (S) 28/03/2019	Soil/Solid (S) 28/03/2019	Soil/Solid (S) 29/03/2019	
accreditation status.  ** % recovery of the surrogate standard to che	k the	Sample Time					
efficiency of the method. The results of indiv compounds within samples aren't corrected recovery	for the	Date Received SDG Ref	02/04/2019 190402-103	02/04/2019 190402-103	02/04/2019 190402-103	02/04/2019 190402-103	
(F) Trigger breach confirmed  1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	19683156 ES14	19683165 ES16	19683169 ES17	19683186 ES20	
Component	LOD/Units	Method	L314	2310	2011	L320	
Dibromofluoromethane**	%	TM116	122	117	111	104	
Toluene-d8**	%	TM116	95.5	93.2	99.2	99.1	
4-Bromofluorobenzene**	%	TM116	80.3	73	98.5	95.3	
4-Diomondocizene	/0	TIVITIO	00.5	73	30.3	33.3	
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.01	<0.01	<0.2	<0.2	
			M	M	М	M	
Benzene	<0.009	TM116	<0.009	<0.009	<0.18	<0.18	
	mg/kg	T1440	M	M	M	M	
Toluene	<0.007 mg/kg	TM116	<0.007 M	<0.007 M	<0.14 M	<0.14 M	
Ethylbenzene	<0.004	TM116	<0.004	<0.004	<0.08	<0.08	
	mg/kg		10.004 M	10.004 M	10.00 M	10.00 M	
p/m-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.2	<0.2	
			#	#	#	#	
o-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.2	<0.2	
			M	M	M	M	



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# **Asbestos Identification - Solid Samples**

# ISO17025 a								•			
M mCERTS ac  * Subcontrac  (F) Trigger brea  1-5&♦§@ Sample dev	ted test. ach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH02E510 0.20 - 0.20 SOLID 28/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683138 TM048	06/04/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	HP02ES23 0.25 - 0.25 SOLID 28/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683194 TM048	06/04/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	SA01ES4 0.20 - 0.20 SOLID 25/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683203 TM048	06/04/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	TP02ES2 0.50 - 0.50 SOLID 25/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683181 TM048	06/04/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	TP04ES6 0.30 - 0.30 SOLID 25/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683212 TM048	08/04/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS01ES12 0.40 - 0.40 SOLID 28/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683147 TM048	06/04/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS02ES14 0.80 - 0.80 SOLID 28/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683156 TM048	06/04/2019	Marcin Magdziarek	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS03ES16 1.00 - 1.00 SOLID 28/03/2019 00:00:00 02/04/2019 17:49:00 190402-103 19683165 TM048	06/04/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

# **CERTIFICATE OF ANALYSIS**

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SDG: 190402-103 A110489-4 500420 Client Reference: Report Number: C19/333 Location: Cwmcarn High School Order Number: Superseded Report: Chrysotile (White) Non-Ashestos Date of Analysis Analysed By Comments Crocidolite Fibrous Fibrous Fibrous (Blue) Asbestos Anthophyllite Tremolite (Brown) Actinolite Fibre Asbestos Asbesto Cust. Sample Ref. Depth (m) WS04ES17 0.20 - 0.20 06/04/19 Andrzej Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Ferfecki (#) (#) (#) (#) (#) (#) SOLID 28/03/2019 00:00:00 02/04/2019 17:49:00 Sample Type Date Sampled Date Receieved SDG Original Sample 190402-103 19683169 Method Number TM048 WS06ES20 0.90 - 0.90 Cust. Sample Ref. 06/04/19 Andrzej Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Depth (m) Ferfecki (#) (#) (#) (#) (#) (#) SOLID 29/03/2019 00:00:00 02/04/2019 17:49:00 Sample Type Date Sampled Date Receieved 190402-103 SDG Original Sample 19683186 Method Number TM048





SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS Client Reference

Mass Sample taken (kg)0.107Mass of dry sample (kg)0.090Particle Size <4mm</th>>95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)19Dry Matter Content (%)84

Case

 SDG
 190402-103

 Lab Sample Number(s)
 19683165

 Sampled Date
 28-Mar-2019

 Customer Sample Ref.
 WS03 ES16

 Depth (m)
 1.00 - 1.00

Eluate Analysis	ysis C ₂ Conc ⁿ in 10:1 eluate (mg/l) A ₂ 10:1 conc ⁿ leached (mg/kg)						
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO2	<0.05	< 0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	3.64	<3	36.4	<30	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	< 0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	< 0.005	-	-	-
Total Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.00005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.00189	<0.0002	0.0189	<0.002	-	-	-
Nitrate as NO3	0.807	<0.3	8.07	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000418	<0.00005	0.000418	< 0.00005	-	-	-
Anthracene (diss.filt)	0.0000104	<0.000005	0.000104	<0.00005	-	-	-
Boron	<0.01	<0.01	<0.1	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000476	<0.00005	0.000476	< 0.00005	-	-	-
Total Alkalinity Filtered as CaCO3	4.5	<2	45	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.00000688	<0.00005	0.0000688	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	7.76
Conductivity (µS/cm)	11.10
Temperature (°C)	18.00
Volume Leachant (Litres)	0.883



Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS Client Reference Site Location Cwmcarn High School Mass Sample taken (kg) 0.107 Mass of dry sample (kg) 0.090 Particle Size <4mm Particle Size <4mm REF: BS EN 12457/2 Cwmcarn High School Natural Moisture Content (%) 19 Dry Matter Content (%) 84

 Case

 SDG
 190402-103

 Lab Sample Number(s)
 19683165

 Sampled Date
 28-Mar-2019

 Customer Sample Ref.
 WS03 ES16

 Depth (m)
 1.00 - 1.00

Eluate Analysis	C ₂ Conc ⁿ in 1	l0:1 eluate (mg/l)	A2 10:1 conc	ⁿ leached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection	·		
Pyrene (diss.filt)	0.0000309	<0.000005	0.000309	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.00005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.00005	<0.000005	<0.00005	< 0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	< 0.0003	<0.0003	<0.003	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.00005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.000332	<0.0002	0.00332	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.00005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
Molybdenum	< 0.003	< 0.003	< 0.03	< 0.03		-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.000138	<0.000082	0.00138	<0.00082	-	-	-
Nickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	_	_
Zinc	0.0044	<0.001	0.044	<0.01	-	_	_
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	_	_
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	_	_
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	_	_
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	_	_	_
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	_	_
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	_	_
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	_	_	_
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	_	_
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	_	_
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	_	_
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	_	_
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	_	_	_
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	_	_	_
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	_	_	_
Sum of BTEX by GC	<0.011	<0.028	<0.28	<0.28	-		
<b>V</b>	3.323	5.020	3.23	3.23			

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	7.76
Conductivity (µS/cm)	11.10
Temperature (°C)	18.00
Volume Leachant (Litres)	0.883



#### **CERTIFICATE OF ANALYSIS**

 SDG:
 190402-103
 Client Reference:
 A110489-4

 Location:
 Cwmcarn High School
 Order Number:
 C19/333

10489-4 Report Number: 9/333 Superseded Report: 500420

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

#### **CEN ANALYTICAL RESULTS**

Client Reference

Mass Sample taken (kg) 0.100

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)11.1Dry Matter Content (%)90

Case

 SDG
 190402-103

 Lab Sample Number(s)
 19683186

 Sampled Date
 29-Mar-2019

 Customer Sample Ref.
 WS06 ES20

 Depth (m)
 0.90 - 0.90

Eluate Analysis	nalysis C2 Conc ⁿ in 10:1 eluate (mg/l) A2 10:1 conc ⁿ leached (mg/kg)						
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO2	<0.05	<0.05	<0.5	<0.5	-	-	_
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	3.88	<3	38.8	<30	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	< 0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	0.00557	<0.0005	0.0557	<0.005	-	-	-
Total Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.00005	<0.00005	<0.00005	<0.00005	-	-	-
Barium	0.014	<0.0002	0.14	<0.002	-	-	-
Nitrate as NO3	0.799	<0.3	7.99	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000358	<0.00005	0.000358	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000531	<0.000005	0.0000531	<0.00005	-	-	-
Boron	0.0105	<0.01	0.105	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000229	<0.00005	0.000229	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO3	50	<2	500	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	_	-
Fluorene (diss.filt)	<0.00005	<0.00005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	8.46
Conductivity (µS/cm)	84.80
Temperature (°C)	18.40
Volume Leachant (Litres)	0.890





SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS Client Reference Mass Sample taken (kg) 0.100 Natural Moisture Content (%) Particle Size <4mm Particle Size <4mm REF: BS E Cwmcarn High School Natural Moisture Content (%) Dry Matter Content (%) 90

 Case

 SDG
 190402-103

 Lab Sample Number(s)
 19683186

 Sampled Date
 29-Mar-2019

 Customer Sample Ref.
 WS06 ES20

 Depth (m)
 0.90 - 0.90

Benzo(a)anthracene (diss.filt) Chromium Benzo(b)fluoranthene (diss.filt) Benzo(k)fluoranthene (diss.filt) Benzo(a)pyrene (diss.filt) Copper Dibenzo(a,h)anthracene (diss.filt) Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum	Result  0.0000227  0.0000071  <0.001  <0.000005  <0.000005  <0.000002  <0.00003  <0.000005  <0.000005  0.00032  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  <0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.000005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005  0.00005	Limit of Detection	Result  0.000227  0.000071  <0.001  <0.00005  <0.00005  <0.00005  <0.00032  <0.00005  <0.00005  0.0032  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0.00005  <0	Limit of Detection  <0.00005 <0.00005 <0.001 <0.00005 <0.00005 <0.00002 <0.0003 <0.0002 <0.0005 <0.0005 <0.0002 <0.0005 <0.0002 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 <0.0005 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Benzo(a)anthracene (diss.filt) Chromium Benzo(b)fluoranthene (diss.filt) Benzo(k)fluoranthene (diss.filt) Benzo(a)pyrene (diss.filt) Copper Dibenzo(a,h)anthracene (diss.filt) Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	0.0000071 <0.001 <0.00005 <0.000005 <0.000002 <0.0003 <0.00005 0.00032 <0.00005 <0.00005 0.00716 0.0000938 0.000509 <0.001 <0.001	<0.000005 <0.0001 <0.00005 <0.000005 <0.000002 <0.000005 <0.000005 <0.000005 <0.000005 <0.000005 <0.000005 <0.000005 <0.000005 <0.000005 <0.000005 <0.0000000000	0.000071 <0.001 <0.00005 <0.00005 <0.00002 <0.0003 <0.00005 0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.00005 <0.001 <0.00005 <0.00005 <0.00002 <0.0003 <0.00005 <0.0002 <0.00005 <0.0002 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005		- - - - - - - - - - - -	
Chromium Benzo(b)fluoranthene (diss.filt) Benzo(k)fluoranthene (diss.filt) Benzo(a)pyrene (diss.filt) Copper Dibenzo(a,h)anthracene (diss.filt) Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	<0.001 <0.00005 <0.000005 <0.000002 <0.0003 <0.00005 0.00032 <0.00005 <0.00005 0.00716 0.0000938 0.000509 <0.001 <0.001	<0.001 <0.00005 <0.000005 <0.000002 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.000005 <0.000082 <0.00004 <0.001	<0.01 <0.00005 <0.00005 <0.00002 <0.0003 <0.00005 0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.01 <0.00005 <0.00005 <0.00002 <0.0003 <0.00005 <0.0002 <0.0002 <0.00005 <0.00005 <0.00005 <0.00005 <0.00005 <0.0004 <0.001		- - - - - - - - - - -	- - - - - - - - - - - - - - - - - - -
Benzo(b)fluoranthene (diss.filt) Benzo(k)fluoranthene (diss.filt) Benzo(a)pyrene (diss.filt) Copper Dibenzo(a,h)anthracene (diss.filt) Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	<0.000005 <0.000005 <0.000002 <0.0003 <0.00005 0.00032 <0.00005 <0.00005 0.00716 0.0000938 0.000509 <0.001 <0.001	<0.000005 <0.000005 <0.000002 <0.00003 <0.00005 <0.00005 <0.000005 <0.000005 <0.000005 <0.0003 <0.000082 <0.00004 <0.001	<0.00005 <0.00005 <0.00002 <0.0003 <0.00005 0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.00005 <0.00005 <0.00002 <0.0003 <0.00005 <0.0002 <0.00005 <0.00005 <0.00005 <0.00005 <0.00082 <0.0004 <0.01		- - - - - - - - - -	- - - - - - - - - - - - - - - - - - -
Benzo(k)fluoranthene (diss.filt) Benzo(a)pyrene (diss.filt) Copper Dibenzo(a,h)anthracene (diss.filt) Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	<0.000005 <0.000002 <0.0003 <0.00005 0.00032 <0.00005 <0.00005 <0.00005 0.00716 0.0000938 0.000509 <0.001 <0.001	<0.000005 <0.000002 <0.00003 <0.00005 <0.00005 <0.000005 <0.000005 <0.0003 <0.000082 <0.00004 <0.001	<0.00005 <0.00002 <0.0003 <0.00005 0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.00005 <0.00002 <0.0003 <0.00005 <0.0002 <0.00005 <0.00005 <0.00005 <0.00082 <0.0004 <0.01	- - - - - - - - -	- - - - - - - - -	
Benzo(a)pyrene (diss.filt) Copper Dibenzo(a,h)anthracene (diss.filt) Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	<0.000002 <0.0003 <0.00005 0.00032 <0.00005 <0.00005 <0.00005 0.00716 0.0000938 0.000509 <0.001 <0.001	<0.000002 <0.0003 <0.00005 <0.00005 <0.000005 <0.000005 <0.0003 <0.000082 <0.0004 <0.001	<0.00002 <0.003 <0.0005 0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.00002 <0.003 <0.0005 <0.002 <0.00005 <0.00005 <0.00005 <0.003 <0.00082 <0.004 <0.01	- - - - - - - -	- - - - - - - -	
Copper Dibenzo(a,h)anthracene (diss.filt) Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	<0.0003 <0.00005 0.00032 <0.000005 <0.000005 <0.000005 0.00716 0.0000938 0.000509 <0.001 <0.001	<0.0003 <0.00005 <0.0002 <0.00005 <0.00005 <0.0003 <0.00082 <0.0004 <0.001	<0.003 <0.00005 0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.003 <0.00005 <0.002 <0.00005 <0.00005 <0.003 <0.00082 <0.004 <0.01	- - - - - - -	- - - - - - -	
Dibenzo(a,h)anthracene (diss.filt)  Lead  Benzo(g,h,i)perylene (diss.filt)  Indeno(1,2,3-cd)pyrene (diss.filt)  Molybdenum  PAH 16 EPA Total by GCMS (diss.filt)  Nickel  Selenium  Zinc  TPH CWG (W)  Surrogate Recovery  GRO TOT (C5-C12)	<0.000005 0.00032 <0.000005 <0.000005 0.00716 0.0000938 0.000509 <0.001 <0.001	<0.000005 <0.0002 <0.00005 <0.00005 <0.0003 <0.000082 <0.0004 <0.001	<0.00005 0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.00005 <0.002 <0.00005 <0.00005 <0.003 <0.00082 <0.004 <0.01		- - - - - -	- - - - - -
Lead Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	0.00032 <0.000005 <0.000005 0.00716 0.0000938 0.000509 <0.001	<0.0002 <0.000005 <0.000005 <0.0003 <0.000082 <0.0004 <0.001	0.0032 <0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.002 <0.00005 <0.00005 <0.003 <0.00082 <0.004 <0.01	- - - - - -	- - - - -	- - - - -
Benzo(g,h,i)perylene (diss.filt) Indeno(1,2,3-cd)pyrene (diss.filt) Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	<0.000005 <0.000005 0.00716 0.0000938 0.000509 <0.001	<0.000005 <0.000005 <0.0003 <0.000082 <0.0004 <0.001 <0.001	<0.00005 <0.00005 0.0716 0.000938 0.00509 <0.01	<0.00005 <0.00005 <0.03 <0.00082 <0.004 <0.01	- - - - -	- - - - -	- - - -
Indeno(1,2,3-cd)pyrene (diss.filt)  Molybdenum  PAH 16 EPA Total by GCMS (diss.filt)  Nickel  Selenium  Zinc  TPH CWG (W)  Surrogate Recovery  GRO TOT (C5-C12)	<0.000005 0.00716 0.000938 0.000509 <0.001	<0.000005 <0.003 <0.000082 <0.0004 <0.001 <0.001	<0.00005 0.0716 0.000938 0.00509 <0.01	<0.00005 <0.03 <0.00082 <0.004 <0.01	- - - -	- - - -	- - - -
Molybdenum PAH 16 EPA Total by GCMS (diss.filt) Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	0.00716 0.0000938 0.000509 <0.001 <0.001	<0.003 <0.000082 <0.0004 <0.001 <0.001	0.0716 0.000938 0.00509 <0.01	<0.03 <0.00082 <0.004 <0.01		- - -	- - -
PAH 16 EPA Total by GCMS (diss.filt)  Nickel Selenium  Zinc  TPH CWG (W)  Surrogate Recovery  GRO TOT (C5-C12)	0.0000938 0.000509 <0.001 <0.001	<0.000082 <0.0004 <0.001 <0.001	0.000938 0.00509 <0.01	<0.00082 <0.004 <0.01		- - -	- - -
Nickel Selenium Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	0.000509 <0.001 <0.001	<0.0004 <0.001 <0.001	0.00509 <0.01	<0.004 <0.01	-	-	-
Selenium  Zinc  TPH CWG (W)  Surrogate Recovery  GRO TOT (C5-C12)	<0.001 <0.001	<0.001 <0.001	<0.01	<0.01	-	-	-
Zinc TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)	<0.001	<0.001				-	-
TPH CWG (W) Surrogate Recovery GRO TOT (C5-C12)			<0.01	<0.01	-	-	-
Surrogate Recovery GRO TOT (C5-C12)	-						
GRO TOT (C5-C12)	-						
		<0	-	<0	-	-	-
Aliphatica CE C6	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1		-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	< 0.003	< 0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07		-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	_	-

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	8.46
Conductivity (µS/cm)	84.80
Temperature (°C)	18.40
Volume Leachant (Litres)	0.890





SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS

Client Reference

Mass Sample taken (kg) 0.114

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)26.6Dry Matter Content (%)79

Case

 SDG
 190402-103

 Lab Sample Number(s)
 19683203

 Sampled Date
 25-Mar-2019

 Customer Sample Ref.
 SA01 ES4

 Depth (m)
 0.20 - 0.20

Eluate Analysis	C- Concil in 1	.0:1 eluate (mg/l)					
Liuate Allalysis	C ₂ Conc ⁿ in 1	.0:1 eluate (mg/l)	A ₂ 10:1 cond	c ⁿ leached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	_	_	_
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	_	_
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	_	_	_
TPH (Total Aliphatics + Total Aromatics)	0.023	<0.01	0.23	<0.1	-	_	_
>C5-C35							
Nitrite as NO2	<0.05	<0.05	<0.5	<0.5	-	_	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	5.73	<3	57.3	<30	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	< 0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Total Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.00603	<0.0002	0.0603	<0.002	-	-	-
Nitrate as NO3	2.65	<0.3	26.5	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000764	<0.00005	0.000764	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000791	<0.000005	0.0000791	<0.00005	-	-	-
Boron	<0.01	<0.01	<0.1	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000404	<0.00005	0.000404	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO3	17	<2	170	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	_	_
Fluorene (diss.filt)	0.00000542	<0.00005	0.0000542	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
	1	1	1	1			

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	8.29
Conductivity (µS/cm)	28.20
Temperature (°C)	18.40
Volume Leachant (Litres)	0.876



#### **CERTIFICATE OF ANALYSIS**

SDG: 190402-103 C Location: Cwmcarn High School C

Client Reference: A110489-4 Order Number: C19/333 Report Number: Superseded Report: 500420

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS

Client Reference

Mass Sample taken (kg) 0.114

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)26.6Dry Matter Content (%)79

Case

 SDG
 190402-103

 Lab Sample Number(s)
 19683203

 Sampled Date
 25-Mar-2019

 Customer Sample Ref.
 SA01 ES4

 Depth (m)
 0.20 - 0.20

Eluate Analysis	C ₂ Conc ⁿ in 1	0:1 eluate (mg/l)	A2 10:1 conc	n leached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection	•		
Pyrene (diss.filt)	0.000049	<0.000005	0.00049	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	_	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	< 0.0003	< 0.0003	<0.003	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	0.000605	<0.0002	0.00605	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	< 0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.000179	<0.000082	0.00179	<0.00082	-	-	-
Nickel	0.000668	<0.0004	0.00668	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00229	<0.001	0.0229	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	< 0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	_	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	0.021	<0.01	0.21	<0.1	-	-	-
MTBE GC-FID	< 0.003	<0.003	< 0.03	< 0.03	-	_	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	< 0.007	<0.007	<0.07	<0.07	-	_	-
Toluene by GC	0.021	<0.004	0.21	<0.04	-	-	-
Ethylbenzene by GC	< 0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	_	-
o Xylene by GC	< 0.003	< 0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	8.29
Conductivity (µS/cm)	28.20
Temperature (°C)	18.40
Volume Leachant (Litres)	0.876



#### **CERTIFICATE OF ANALYSIS**

 SDG:
 190402-103
 Clier

 Location:
 Cwmcarn High School
 Orde

Client Reference: A110489-4 Order Number: C19/333 Report Number: Superseded Report: 500420

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

#### **CEN ANALYTICAL RESULTS**

Client Reference

Mass Sample taken (kg) 0.097

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)7.53Dry Matter Content (%)93

Case

 SDG
 190402-103

 Lab Sample Number(s)
 19683212

 Sampled Date
 25-Mar-2019

 Customer Sample Ref.
 TP04 ES6

 Depth (m)
 0.30 - 0.30

Eluate Analysis	C ₂ Conc ⁿ in 1	0:1 eluate (mg/l)	<b>A</b> 2 10:1 cond	n leached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection	·		
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	_	_	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	_	_	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	_	_	_
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO2	<0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	5.5	<2	55	<20	-	-	-
Chloride	<2	<2	<20	<20	_	_	_
Dissolved Organic Carbon	4.18	<3	41.8	<30	_	_	_
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	_	_	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	_	_	-
Total Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.00005	<0.000005	<0.00005	<0.00005	_	_	_
Arsenic	0.00106	<0.0005	0.0106	<0.005	-	-	-
Total Ammonium as NH4	<0.3	<0.3	<3	<3	_	_	_
Acenaphthylene (diss.filt)	<0.00005	<0.000005	<0.00005	<0.00005	_	_	_
Barium	0.283	<0.0002	2.83	<0.002	_	_	_
Nitrate as NO3	0.64	<0.3	6.4	<3	_	_	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	_	_	_
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000229	<0.00005	0.000229	<0.00005	_	_	-
Anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	_	_	_
Boron	<0.01	<0.01	<0.1	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000195	<0.00005	0.000195	<0.00005	_	_	-
Total Alkalinity Filtered as CaCO3	50	<2	500	<20	_	_	_
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
	1	1	1	1			

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	7.76
Conductivity (µS/cm)	11.10
Temperature (°C)	18.00
Volume Leachant (Litres)	0.893

93



#### **CERTIFICATE OF ANALYSIS**

SDG: 190402-103 A110489-4 500420 Client Reference: Report Number: Location: Cwmcarn High School C19/333 Superseded Report: Order Number:

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

#### **CEN ANALYTICAL RESULTS REF: BS EN 12457/2 Client Reference Site Location** Cwmcarn High School Mass Sample taken (kg) 7.53 0.097 **Natural Moisture Content (%)**

**Dry Matter Content (%)** 

Mass of dry sample (kg) Particle Size <4mm >95%

Case

SDG 190402-103 Lab Sample Number(s) 19683212 **Sampled Date** 25-Mar-2019

0.090

**Customer Sample Ref. TP04 ES6** 

0.30 - 0.30 Depth (m)

Eluate Analysis	C ₂ Conc ⁿ in 1	l0:1 eluate (mg/l)	, H2				
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.0000155	<0.000005	0.000155	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	_
Copper	< 0.0003	<0.0003	<0.003	< 0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	_
.ead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
ndeno(1,2,3-cd)pyrene (diss.filt)	<0.00005	<0.00005	<0.00005	<0.00005	-	-	-
Molybdenum	< 0.003	< 0.003	< 0.03	< 0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
lickel	0.000574	<0.0004	0.00574	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	_
Zinc	<0.001	<0.001	<0.01	<0.01	-	-	-
PH CWG (W)							
Surrogate Recovery	_	<0	-	<0	-	_	_
GRO TOT (C5-C12)	< 0.05	<0.05	<0.5	<0.5	_	_	_
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	_	_
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	_	-	_
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	_	_	_
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	_	_
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	_	-	_
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	_	_
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	_	_	_
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	_	-	_
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	_	_	_
Benzene by GC	<0.007	<0.007	<0.07	<0.07	_	_	_
oluene by GC	<0.004	<0.004	<0.04	<0.04	_	_	_
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	_	_
n & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	_	_
Xylene by GC	< 0.003	<0.003	<0.03	<0.03	-	_	_
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	_	_
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28			-
	10.020	0.020	0.20	0.20			

#### **Leach Test Information**

Date Prepared	03-Apr-2019
pH (pH Units)	7.76
Conductivity (µS/cm)	11.10
Temperature (°C)	18.00
Volume Leachant (Litres)	0.893



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# **Table of Results - Appendix**

Method No	Reference	Description
PM001		Preparation of Samples for Metals Analysis
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

# **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# **Test Completion Dates**

	rest completion bates									
Lab Sample No(s)	19683138	19683194	19683203	19683181	19683212	19683147	19683156	19683165	19683169	19683186
Customer Sample Ref.	BH02	HP02	SA01	TP02	TP04	WS01	WS02	WS03	WS04	WS06
AGS Ref.	ES10	ES23	ES4	ES2	ES6	ES12	ES14	ES16	ES17	ES20
Depth	0.20 - 0.20	0.25 - 0.25	0.20 - 0.20	0.50 - 0.50	0.30 - 0.30	0.40 - 0.40	0.80 - 0.80	1.00 - 1.00	0.20 - 0.20	0.90 - 0.90
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkalinity Filtered as CaCO3			08-Apr-2019		05-Apr-2019			08-Apr-2019		05-Apr-2019
Ammoniacal Nitrogen			05-Apr-2019		05-Apr-2019			05-Apr-2019		05-Apr-2019
Anions by Kone (soil)	06-Apr-2019	08-Apr-2019	06-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019	08-Apr-2019
Anions by Kone (w)			09-Apr-2019		09-Apr-2019			09-Apr-2019		09-Apr-2019
Asbestos ID in Solid Samples	06-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019	08-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019
Boron Water Soluble	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	08-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019
CEN 10:1 Leachate (1 Stage)			03-Apr-2019		03-Apr-2019			03-Apr-2019		03-Apr-2019
CEN Readings			05-Apr-2019		05-Apr-2019			05-Apr-2019		05-Apr-2019
Chromium III	05-Apr-2019	08-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	08-Apr-2019	05-Apr-2019	05-Apr-2019	09-Apr-2019	05-Apr-2019
Cyanide Comp/Free/Total/Thiocyanate	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	09-Apr-2019	08-Apr-2019
Dissolved Metals by ICP-MS			09-Apr-2019		09-Apr-2019			09-Apr-2019		09-Apr-2019
Dissolved Organic/Inorganic Carbon			05-Apr-2019		05-Apr-2019			05-Apr-2019		05-Apr-2019
EPH CWG (Aliphatic) Filtered GC (W)			08-Apr-2019		08-Apr-2019			08-Apr-2019		08-Apr-2019
EPH CWG (Aliphatic) GC (S)	05-Apr-2019	05-Apr-2019	09-Apr-2019	05-Apr-2019	08-Apr-2019	05-Apr-2019	09-Apr-2019	08-Apr-2019	09-Apr-2019	05-Apr-2019
EPH CWG (Aromatic) Filtered GC (W)			08-Apr-2019		08-Apr-2019			08-Apr-2019		08-Apr-2019
EPH CWG (Aromatic) GC (S)	05-Apr-2019	05-Apr-2019	09-Apr-2019	05-Apr-2019	08-Apr-2019	05-Apr-2019	09-Apr-2019	08-Apr-2019	09-Apr-2019	05-Apr-2019
GRO by GC-FID (S)	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019
GRO by GC-FID (W)			08-Apr-2019		08-Apr-2019			08-Apr-2019		08-Apr-2019
Hexavalent Chromium (s)	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	09-Apr-2019	05-Apr-2019
Mercury Dissolved			05-Apr-2019		05-Apr-2019			05-Apr-2019		05-Apr-2019
Metals in solid samples by OES	05-Apr-2019	08-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	08-Apr-2019	05-Apr-2019	05-Apr-2019	04-Apr-2019	05-Apr-2019
Nitrite by Kone (w)			05-Apr-2019		05-Apr-2019			05-Apr-2019		05-Apr-2019
PAH by GCMS	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	09-Apr-2019	08-Apr-2019
PAH in waters by GC-MS (diss.filt)			08-Apr-2019		08-Apr-2019			08-Apr-2019		08-Apr-2019
pH	04-Apr-2019	04-Apr-2019	04-Apr-2019	05-Apr-2019	05-Apr-2019	04-Apr-2019	04-Apr-2019	04-Apr-2019	05-Apr-2019	04-Apr-2019
pH Value of Filtered Water			09-Apr-2019		05-Apr-2019			09-Apr-2019		05-Apr-2019
Phenols by HPLC (S)	08-Apr-2019	06-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	06-Apr-2019	08-Apr-2019	08-Apr-2019	06-Apr-2019	08-Apr-2019
Phenols by HPLC (W)			08-Apr-2019		08-Apr-2019			09-Apr-2019		09-Apr-2019
Sample description	02-Apr-2019	02-Apr-2019	02-Apr-2019	02-Apr-2019	03-Apr-2019	02-Apr-2019	02-Apr-2019	02-Apr-2019	02-Apr-2019	02-Apr-2019
Total Organic Carbon	05-Apr-2019	08-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	08-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019	05-Apr-2019
TPH CWG Filtered (W)			08-Apr-2019		08-Apr-2019			08-Apr-2019		08-Apr-2019
TPH CWG GC (S)	08-Apr-2019	08-Apr-2019	09-Apr-2019	08-Apr-2019	08-Apr-2019	08-Apr-2019	09-Apr-2019	08-Apr-2019	09-Apr-2019	08-Apr-2019
VOC MS (S)	06-Apr-2019	06-Apr-2019	09-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019	06-Apr-2019	09-Apr-2019	09-Apr-2019





SDG: 1900 Location: Cwr

190402-103 Client Reference:
Cwmcarn High School Order Number:

A110489-4 C19/333 Report Number: Superseded Report: 500420

# **ASSOCIATED AQC DATA**

# Alkalinity Filtered as CaCO3

Component	Method Code	QC 1915	QC 1952
Total Alkalinity Filtered as CaCO3	TM043	<b>101.01</b> 95.62 : 106.88	<b>107.5</b> 100.35 : 114.15

# Ammoniacal Nitrogen

Component	Method Code	QC 1913
Ammoniacal Nitrogen as N	TM099	<b>97.2</b> 93.14 : 108.60

# Anions by Kone (soil)

	Component	Method Code	QC 1999	QC 1953	QC 1933
I	Chloride (soluble)	TM243	90.0	96.19	
			78.01 : 122.19	78.01 : 122.19	78.01 : 122.19
	Water Soluble Sulphate as	TM243	94.97	111.06	
	SO4 2:1 Extract		75.60 : 131.10	75.60 : 131.10	75.60 : 131.10

# Anions by Kone (w)

Component	Method Code	QC 1907	QC 1992
Chloride	TM184	107.0	108.0
		92.93 : 115.43	92.93 : 115.43
Phosphate (Ortho as PO4)	TM184		
		96.40 : 108.40	96.40 : 108.40
Sulphate (soluble)	TM184	97.2	96.8
		90.53 : 113.03	90.53 : 113.03
TON as NO3	TM184	105.0	106.5
		96.26 : 111.21	96.26 : 111.21

# Boron Water Soluble

_	Component	Method Code	QC 1993	QC 1956	QC 1962
	Water Soluble Boron	TM222	99.5	103.5	99.5
			86.05 : 109.75	86.05 : 109.75	86.05 : 109.75

# Cyanide Comp/Free/Total/Thiocyanate



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1983	QC 1936	QC 1987	QC 1913	QC 1985
Free Cyanide	TM153	<b>98.0</b> 87.60 : 108.63	<b>105.0</b> 87.60 : 108.63	<b>99.0</b> 87.60 : 108.63		<b>100.0</b> 87.60 : 108.63
Free Cyanide (W)	TM227				<b>102.5</b> 93.25 : 112.75	
Thiocyanate	TM153	<b>92.22</b> 92.90 : 108.39	<b>98.2</b> 92.90 : 108.39	<b>91.62</b> 92.90 : 108.39		<b>92.81</b> 92.90 : 108.39
Thiocyanate (W)	TM227				<b>101.25</b> 96.25 : 111.25	
Total Cyanide	TM153	<b>104.29</b> 87.00 : 103.00	<b>110.0</b> 87.00 : 103.00	<b>102.86</b> 87.00 : 103.00		<b>106.43</b> 87.00 : 103.00
Total Cyanide (W)	TM227				<b>101.75</b> 92.25 : 111.75	

# Dissolved Metals by ICP-MS

Component	Method Code	QC 1925
Aluminium	TM152	101.33
		94.19 : 114.31
Antimony	TM152	105.67
		79.80 : 122.00
Arsenic	TM152	104.0
		90.42 : 111.32
Barium	TM152	108.17
		90.79 : 113.16
Beryllium	TM152	96.83
		93.25 : 120.04
Bismuth	TM152	105.0
2	T14450	94.65 : 117.05
Borate	TM152	94.44
Boron	TM152	88.00 : 112.00
DOIOII	1101132	<b>94.33</b> 86.68 : 117.67
Cadmium	TM152	
Gadillaill	111102	<b>106.67</b> 94.60 : 112.40
Calcium	TM152	106.0
		83.40 : 121.11
Chromium	TM152	101.67
		93.28 : 110.91
Cobalt	TM152	102.67
		84.39 : 114.26
Copper	TM152	102.67
		88.86 : 118.72
Iron	TM152	103.33
		92.00 : 113.00
Lead	TM152	104.5
		89.25 : 115.12
Lithium	TM152	99.0
		89.26 : 119.04
Magnesium	TM152	104.67
Man	Th4450	86.35 : 113.36
Manganese	TM152	103.67
Mobiledenses	TMACO	94.24 : 112.74
Molybdenum	TM152	102.83
		87.00 : 108.89

#### **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# Dissolved Metals by ICP-MS

	1	
		QC 1925
Nickel	TM152	103.83
		92.11 : 110.56
Phosphorus	TM152	104.17
·		90.52 : 115.47
Potassium	TM152	
Fotassium	1101132	104.67
		98.63 : 110.48
Selenium	TM152	105.17
		88.44 : 113.86
Silver	TM152	105.67
		94.40 : 114.74
Sodium	TM152	104.0
	52	97.63 : 110.31
O: "	71450	
Strontium	TM152	105.67
		90.72 : 114.82
Tellurium	TM152	107.5
		90.72 : 112.62
Thallium	TM152	105.5
		86.08 : 122.48
Tin	TM152	
****	111102	105.17
		91.00 : 109.00
Titanium	TM152	95.83
		91.87 : 102.47
Tungsten	TM152	103.0
		78.12 : 132.82
Uranium	TM152	102.67
		90.58 : 113.28
Vanadium	TM450	
Vanadium	TM152	104.5
		88.43 : 114.30
Zinc	TM152	105.67
		86.52 : 115.27

# Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1907
Dissolved Inorganic Carbon	TM090	<b>101.33</b> 91.15 : 111.35
Dissolved Organic Carbon	TM090	<b>104.5</b> 97.18 : 109.58

# EPH CWG (Aliphatic) GC (S)

Component	Method Code	QC 1991	QC 1940	QC 1991	QC 1996
Total Aliphatics >C12-C35	TM173	85.63	86.46	92.71	96.25
		71.82 : 103.92	70.76 : 104.69	66.17 : 105.28	70.71 : 106.26

# EPH CWG (Aromatic) Filtered GC (W)

ALS

SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

Validated

# EPH CWG (Aromatic) Filtered GC (W)

Component	Method Code	QC 1941
Total Aromatics >EC10-EC40	TM174	<b>111.22</b> 73.75 : 120.32

#### EPH CWG (Aromatic) GC (S)

Component	Method Code	QC 1991	QC 1940	QC 1991	QC 1996
Total Aromatics >EC12-EC35	TM173	<b>71.33</b> 68.32 : 103.07	<b>87.33</b> 68.16 : 102.29	<b>88.67</b> 65.78 : 102.90	<b>90.0</b> 65.82 : 105.00

# GRO by GC-FID (S)

Component	Method Code	QC 1984
QC	TM089	85.96
		70.34 : 111.95

# GRO by GC-FID (W)

Component	Method Code	QC 1966
Benzene by GC	TM245	<b>95.0</b> 81.54 : 119.70
Ethylbenzene by GC	TM245	<b>99.5</b> 80.99 : 121.09
m & p Xylene by GC	TM245	<b>97.75</b> 82.77 : 123.19
MTBE GC-FID	TM245	<b>94.5</b> 80.06 : 123.27
o Xylene by GC	TM245	<b>100.0</b> 84.26 : 121.50
QC	TM245	<b>142.42</b> 76.13 : 145.89
Toluene by GC	TM245	<b>97.0</b> 82.78 : 121.99

# Hexavalent Chromium (s)

Component	Method Code	QC 1945	QC 1961	QC 1937
Hexavalent Chromium	TM151	98.0	96.0	98.0
		90.20 : 107.00	90.20 : 107.00	90.20 : 107.00

# Mercury Dissolved

# **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# Mercury Dissolved

	Component	Method Code	QC 1993
1	Mercury Dissolved (CVAF)	TM183	98.8
			75.00 : 111.00

#### Metals in solid samples by OES

Component	Method Code	QC 1987	QC 1964	QC 1938	QC 1902
Aluminium	TM181	<b>101.77</b> 77.84 : 119.01	<b>93.81</b> 77.84 : 119.01	<b>93.81</b> 77.84 : 119.01	<b>97.35</b> 77.84 : 119.01
Antimony	TM181	<b>98.78</b> 84.28 : 107.67	<b>94.31</b> 84.28 : 107.67	<b>92.28</b> 84.28 : 107.67	<b>98.37</b> 84.28 : 107.67
Arsenic	TM181	<b>103.2</b> 87.05 : 109.36	<b>94.19</b> 87.05 : 109.36	<b>94.48</b> 87.05 : 109.36	<b>103.2</b> 87.05 : 109.36
Barium	TM181	<b>102.75</b> 82.49 : 109.34	<b>94.5</b> 82.49 : 109.34	<b>87.8</b> 82.49 : 109.34	<b>98.17</b> 82.49 : 109.34
Beryllium	TM181	<b>103.73</b> 85.44 : 109.61	<b>96.27</b> 85.44 : 109.61	<b>91.79</b> 85.44 : 109.61	<b>98.51</b> 85.44 : 109.61
Boron	TM181	<b>94.84</b> 73.51 : 104.66	<b>79.37</b> 73.51 : 104.66	<b>87.97</b> 73.51 : 104.66	<b>92.26</b> 73.51 : 104.66
Cadmium	TM181	<b>100.41</b> 81.46 : 106.43	<b>88.07</b> 81.46 : 106.43	<b>89.71</b> 81.46 : 106.43	<b>94.24</b> 81.46 : 106.43
Chromium	TM181	<b>96.55</b> 79.78 : 102.80	<b>91.48</b> 79.78 : 102.80	<b>89.25</b> 79.78 : 102.80	<b>95.94</b> 79.78 : 102.80
Cobalt	TM181	<b>94.03</b> 80.74 : 99.26	<b>87.42</b> 80.74 : 99.26	<b>86.48</b> 80.74 : 99.26	<b>89.94</b> 80.74 : 99.26
Copper	TM181	<b>101.41</b> 82.40 : 105.45	<b>94.72</b> 82.40 : 105.45	<b>91.55</b> 82.40 : 105.45	<b>97.71</b> 82.40 : 105.45
Iron	TM181	<b>102.38</b> 82.95 : 110.58	<b>96.03</b> 82.95 : 110.58	<b>88.89</b> 82.95 : 110.58	<b>96.03</b> 82.95 : 110.58
Lead	TM181	<b>92.79</b> 78.24 : 104.05	<b>86.04</b> 78.24 : 104.05	<b>86.26</b> 78.24 : 104.05	<b>93.24</b> 78.24 : 104.05
Manganese	TM181	<b>115.0</b> 94.29 : 119.51	<b>104.72</b> 94.29 : 119.51	<b>100.83</b> 94.29 : 119.51	<b>109.44</b> 94.29 : 119.51
Mercury	TM181	<b>97.34</b> 83.74 : 105.34	<b>93.48</b> 83.74 : 105.34	<b>91.06</b> 83.74 : 105.34	<b>95.89</b> 83.74 : 105.34
Molybdenum	TM181	<b>101.65</b> 87.11 : 106.87	<b>93.0</b> 87.11 : 106.87	<b>91.77</b> 87.11 : 106.87	<b>97.12</b> 87.11 : 106.87
Nickel	TM181	<b>96.58</b> 81.92 : 102.18	<b>86.8</b> 81.92 : 102.18	<b>87.53</b> 81.92 : 102.18	<b>92.42</b> 81.92 : 102.18
Phosphorus	TM181	<b>115.35</b> 94.56 : 124.28	<b>108.08</b> 94.56 : 124.28	<b>105.05</b> 94.56 : 124.28	<b>113.94</b> 94.56 : 124.28
Selenium	TM181	<b>105.1</b> 86.28 : 110.48	<b>96.08</b> 86.28 : 110.48	<b>97.65</b> 86.28 : 110.48	<b>101.18</b> 86.28 : 110.48
Strontium	TM181	<b>97.55</b> 79.13 : 102.79	<b>86.86</b> 79.13 : 102.79	<b>87.53</b> 79.13 : 102.79	<b>95.1</b> 79.13 : 102.79
Thallium	TM181	<b>100.44</b> 82.94 : 111.86	<b>94.25</b> 82.94 : 111.86	<b>93.36</b> 82.94 : 111.86	<b>101.33</b> 82.94 : 111.86
Tin	TM181	<b>101.9</b> 90.25 : 108.86	<b>96.58</b> 90.25 : 108.86	<b>93.54</b> 90.25 : 108.86	<b>99.24</b> 90.25 : 108.86
Titanium	TM181	<b>90.84</b> 66.23 : 102.06	<b>75.42</b> 66.23 : 102.06	<b>90.84</b> 66.23 : 102.06	<b>84.73</b> 66.23 : 102.06

#### **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# Metals in solid samples by OES

	'	QC 1987	QC 1964	QC 1938	QC 1902
Vanadium	TM181	<b>98.9</b> 86.37 : 107.94	<b>91.58</b> 86.37 : 107.94	<b>91.58</b> 86.37 : 107.94	<b>98.17</b> 86.37 : 107.94
Zinc	TM181	<b>103.7</b> 84.68 : 113.99	<b>91.79</b> 84.68 : 113.99	<b>93.84</b> 84.68 : 113.99	<b>100.21</b> 84.68 : 113.99

# PAH by GCMS

Component	Method Code	QC 1944	QC 1949	QC 1902
Acenaphthene	TM218	104.0	94.0	103.5
		70.00 : 130.00	76.79 : 103.90	76.82 : 113.72
Acenaphthylene	TM218	102.5	93.0	102.5
		70.00 : 130.00	78.40 : 108.66	75.95 : 108.85
Anthracene	TM218	105.5	98.0	104.0
		70.00 : 130.00	76.15 : 110.07	76.67 : 109.58
Benz(a)anthracene	TM218	97.5	104.0	109.0
		68.12 : 118.39	73.77 : 119.26	70.05 : 119.30
Benzo(a)pyrene	TM218	101.5	103.5	107.0
		71.72 : 115.31	73.20 : 114.18	68.22 : 116.60
Benzo(b)fluoranthene	TM218	94.0	105.5	101.0
		66.89 : 120.40	75.36 : 117.58	75.44 : 113.45
Benzo(ghi)perylene	TM218	101.0	107.0	102.5
		67.82 : 118.49	70.73 : 116.12	70.79 : 114.76
Benzo(k)fluoranthene	TM218	105.5	106.5	105.0
		73.10 : 117.03	75.98 : 116.59	81.43 : 115.17
Chrysene	TM218	103.0	104.0	107.5
		69.58 : 115.47	74.82 : 114.18	75.94 : 114.39
Dibenzo(ah)anthracene	TM218	102.0	98.0	98.0
		67.32 : 121.35	69.17 : 115.30	71.87 : 118.97
Fluoranthene	TM218	104.0	107.5	106.0
		75.16 : 117.28	75.88 : 112.84	77.92 : 113.69
Fluorene	TM218	105.5	100.0	99.5
		70.00 : 130.00	78.50 : 114.02	82.02 : 108.34
Indeno(123cd)pyrene	TM218	99.0	88.5	100.0
		70.00 : 130.00	70.26 : 117.95	67.80 : 113.60
Naphthalene	TM218	105.0	100.5	111.0
		70.00 : 130.00	75.24 : 111.26	88.41 : 116.04
Phenanthrene	TM218	106.5	98.5	107.0
		70.00 : 130.00	77.07 : 107.43	78.26 : 113.22
Pyrene	TM218	106.0	107.5	109.0
		75.68 : 119.23	78.74 : 112.56	74.86 : 116.81

# PAH in waters by GC-MS (diss.filt)

Component	Method Code	QC 1919
Acenaphthene (diss.filt)	TM178	<b>110.0</b> 94.00 : 120.40
Acenaphthylene (diss.filt)	TM178	<b>95.2</b> 91.20 : 117.60
Anthracene (diss.filt)	TM178	<b>99.6</b> 91.20 : 112.80
Benzo(a)anthracene (diss.filt)	TM178	<b>92.0</b> 86.80 : 115.60
Benzo(a)pyrene (diss.filt)	TM178	<b>94.4</b> 90.40 : 116.80

#### **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/333 Report Number: Superseded Report: 500420

# PAH in waters by GC-MS (diss.filt)

		QC 1919
Benzo(b)fluoranthene (diss.filt)	TM178	<b>106.4</b> 86.40 : 117.60
Benzo(g,h,i)perylene (diss.filt)	TM178	<b>111.6</b> 87.60 : 121.20
Benzo(k)fluoranthene (diss.filt)	TM178	<b>112.8</b> 91.20 : 124.80
Chrysene (diss.filt)	TM178	<b>111.6</b> 95.20 : 124.00
Dibenzo(a,h)anthracene (diss.filt)	TM178	<b>107.2</b> 84.80 : 118.40
Fluoranthene (diss.filt)	TM178	<b>108.0</b> 91.20 : 120.00
Fluorene (diss.filt)	TM178	<b>111.6</b> 93.20 : 119.60
Indeno(1,2,3-cd)pyrene (diss.filt)	TM178	<b>96.0</b> 86.80 : 115.60
Naphthalene (diss.filt)	TM178	<b>106.8</b> 90.40 : 126.40
Phenanthrene (diss.filt)	TM178	<b>110.4</b> 94.40 : 118.40
Pyrene (diss.filt)	TM178	<b>108.4</b> 93.60 : 120.00

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Component	Method Code	QC 1915	QC 1977
рН	TM133	<b>98.95</b> 97.57 : 101.94	<b>101.51</b> 97.57 : 101.94

# pH Value of Filtered Water

	Component	Method Code	QC 1974
Ī	pH Value of Filtered Water	TM256	101.35
ı			99.73 : 102.16

# Phenols by HPLC (S)

Component	Method Code	QC 1911	QC 1939
2.3.5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	<b>97.4</b> 70.10 : 89.90	<b>99.35</b> 83.23 : 109.71
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	<b>89.47</b> 93.33 : 105.33	<b>84.21</b> 76.34 : 104.11
Catechol by HPLC (S)	TM062 (S)	<b>81.9</b> 47.70 : 158.70	<b>76.19</b> 22.43 : 157.02
Cresols by HPLC (S)	TM062 (S)	<b>104.8</b> 95.80 : 107.80	<b>107.31</b> 89.80 : 112.60
Napthol by HPLC (S)	TM062 (S)	<b>130.0</b> 71.00 : 98.00	<b>123.57</b> 75.62 : 124.38

#### **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Client Reference: Location: Cwmcarn High School Order Number:

A110489-4 C19/333 Report Number: Superseded Report: 500420

# Phenols by HPLC (S)

	Ï	QC 1911	QC 1939
Phenol by HPLC (S)	TM062 (S)	108.61	107.95
		84.00 : 124.00	79.53 : 120.47
Resorcinol HPLC (S)	TM062 (S)	94.34	95.6
		80.00 : 160.00	71.43 : 129.59
Xylenols by HPLC (S)	TM062 (S)	96.77	95.1
		88.20 : 96.60	89.90 : 107.23

# Phenols by HPLC (W)

Component	Method Code	QC 1979	QC 1967
2.3.5 Trimethyl-Phenol by HPLC (W)	TM259	<b>102.0</b> 84.40 : 108.40	<b>101.0</b> 93.10 : 108.70
2-Isopropyl Phenol by HPLC (W)	TM259	<b>105.0</b> 84.00 : 138.00	<b>102.0</b> 83.72 : 106.28
Cresols by HPLC (W)	TM259	<b>107.67</b> 93.98 : 117.98	<b>114.33</b> 90.02 : 130.15
Napthol by HPLC (W)	TM259	<b>107.0</b> 92.60 : 116.60	<b>112.0</b> 101.61 : 116.04
Phenol by HPLC (W)	TM259	<b>113.0</b> 94.53 : 118.53	<b>114.0</b> 95.00 : 119.00
Xylenols by HPLC (W)	TM259	<b>100.5</b> 90.50 : 113.50	<b>102.0</b> 98.67 : 108.67

# Total Organic Carbon

	Component	Method Code	QC 1968	QC 1909	QC 1937
Ì	Total Organic Carbon	TM132	93.75	101.17	96.88
			88.47 : 112.82	88.47 : 112.82	88.47 : 112.82

# VOC MS (S)

Component	Method Code	QC 1947	QC 1986
1,1,1,2-tetrachloroethane	TM116	<b>99.4</b> 77.56 : 115.55	<b>103.8</b> 79.10 : 119.66
1,1,1-Trichloroethane	TM116	<b>96.2</b> 73.73 : 118.05	<b>103.0</b> 88.88 : 119.66
1,1,2-Trichloroethane	TM116	<b>93.0</b> 77.12 : 116.04	<b>97.2</b> 75.16 : 112.70
1,1-Dichloroethane	TM116	<b>100.4</b> 74.46 : 129.15	<b>106.6</b> 77.84 : 124.12
1,2-Dichloroethane	TM116	<b>103.8</b> 87.98 : 127.86	<b>109.0</b> 86.58 : 129.62
1,4-Dichlorobenzene	TM116	<b>98.0</b> 72.76 : 126.34	<b>100.0</b> 71.61 : 124.63
2-Chlorotoluene	TM116	<b>90.8</b> 72.40 : 116.20	<b>91.2</b> 66.81 : 118.43
4-Chlorotoluene	TM116	<b>87.8</b> 66.90 : 112.46	<b>89.2</b> 65.88 : 114.76
Benzene	TM116	<b>96.6</b> 91.01 : 117.67	<b>103.4</b> 93.16 : 123.63
Carbon Disulphide	TM116	<b>92.4</b> 74.91 : 122.14	<b>112.8</b> 75.11 : 124.81

500420

#### **CERTIFICATE OF ANALYSIS**



SDG: 190402-103 Client Reference: A110489-4 Report Number: Location: Cwmcarn High School Order Number: C19/333 Superseded Report:

VOC MS (S)

	,		
		QC 1947	QC 1986
Carbontetrachloride	TM116	99.4	100.8
		80.31 : 124.50	82.35 : 126.46
Chlorobenzene	TM116	103.2	102.6
		75.00 : 115.53	82.88 : 122.42
Chloroform	TM116	100.4	105.6
		87.40 : 122.49	82.52 : 123.25
Chloromethane	TM116	98.0	122.4
		65.05 : 142.63	55.37 : 133.35
Cis-1,2-Dichloroethene	TM116	99.0	107.0
		80.67 : 126.72	78.27 : 128.90
Dibromomethane	TM116	90.4	89.0
		67.80 : 121.75	71.69 : 119.43
Dichloromethane	TM116	109.0	116.2
		81.11 : 133.25	81.68 : 125.21
Ethylbenzene	TM116	89.0	90.8
		75.92 : 110.41	83.56 : 122.99
Hexachlorobutadiene	TM116	46.6	64.0
		12.82 : 152.73	7.32 : 139.00
Isopropylbenzene	TM116	81.6	86.0
1 17		54.21 : 117.17	52.15 : 132.52
Naphthalene	TM116	99.6	99.8
,		80.86 : 128.81	79.29 : 125.59
o-Xylene	TM116	89.0	91.8
·		82.80 : 107.93	68.16 : 107.61
p/m-Xylene	TM116	85.7	90.0
F 3.4		68.32 : 108.91	77.41 : 112.71
Sec-Butylbenzene	TM116		
200 24()1801120110		<b>62.8</b> 44.91 : 118.40	<b>70.0</b> 44.71 : 117.87
Tetrachloroethene	TM116		
Tottaomoroothono	111110	<b>97.8</b> 76.95 : 121.02	<b>98.6</b> 81.43 : 126.65
Toluene	TM116		***************************************
roluene	TWITTO	<b>87.8</b> 74.24 : 107.42	<b>92.0</b> 87.82 : 116.21
Trichloroethene	TM116	-	
monordettiene	TM116	94.2	98.2
Trioblaroflyaramathana	TM446	77.61 : 111.54	79.80 : 112.33
Trichlorofluoromethane	TM116	95.4	110.2
Vin d Oblasida	TMAAC	71.31 : 128.41	80.52 : 132.12
Vinyl Chloride	TM116	93.4	115.6
		68.26 : 133.45	64.90 : 133.10

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



SDG: 190402-103 Cwmcarn High School Location:

Client Reference: Order Number:

A110489-4 C19/333

Report Number: Superseded Report: 500420

# Appendix

# General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
- 9. NDP No determination possible due to insufficient/unsuitable sample.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately
- 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

- calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

#### Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis		
2	Incorrect container received		
3 Deviation from method			
§	Sampled on date not provided		
•	Sample holding time exceeded in laboratory		
@	Sample holding time exceeded due to late arrival of instructions or samples		

#### Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name	
Chrysof le	WhiteAsbesbs	
Amosite	Brow n Asbestos	
Cro d dolite	Blue Asbe stos	
Fibrous Act nolite	-	
Fibrous Anthop hyll ite	-	
Fibrous Tremolite	-	

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



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WYG Geo-Environment 5th Floor Longcross Court 47 Newport Road Cardiff CF24 0AD

Attention: Katy Woodhouse

# **CERTIFICATE OF ANALYSIS**

Date of report Generation:18 April 2019Customer:H_WYG_CDFSample Delivery Group (SDG):190410-7Your Reference:A110489-4

Location: Cwmcarn High School

**Report No:** 501691

We received 5 samples on Wednesday April 10, 2019 and 5 of these samples were scheduled for analysis which was completed on Thursday April 18, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager







Validated Validated

SDG: 190410-7 Client Reference: Location: Cwmcarn High School Order Number:

A110489-4 C19/398 Report Number: Superseded Report: 501691

## **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
19746700	BH01	EW4	0.00 - 0.00	08/04/2019
19746691	BH02	EW3	0.00 - 0.00	08/04/2019
19746673	BH03A	EW1	0.00 - 0.00	08/04/2019
19746682	WS02	EW2	0.00 - 0.00	08/04/2019
19746709	WS03	EW5	0.00 - 0.00	08/04/2019

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

5.2

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

ALS

SDG: A110489-4 190410-7 Client Reference: Report Number: 501691 Location: Cwmcarn High School Order Number: C19/398 Superseded Report: Results Legend 1974669 19746682 19746700 19746673 Lab Sample No(s) X Test No Determination Possible Customer BH03A BH02 BH01 WS02 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid EW2 GW - Ground Water EW4 EW3 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.00 PR - Process Water 0.00-0.00 - 0.00 0.00 - 0.00 SA - Saline Water Depth (m) - 0.00 TE - Trade Effluent - 0.00 TS - Treated Sewage US - Untreated Sewage (ALE208)
250ml Amber GI.
PTFE/PE (ALE219) 500ml Plastic (ALE208) 250ml Amber Gl. PTFE/PE (ALE219) RE - Recreational Water 250ml Amber GI. PTFE/PE (ALE219) 250ml Amber Gl. PTFE/PE (ALE219) H2SO4 (ALE244) H2SO4 (ALE244) NaOH (ALE245) H2SO4 (ALE244) NaOH (ALE245) H2SO4 (ALE244) NaOH (ALE245) 500ml Plastic (ALE208) NaOH (ALE245) DW - Drinking Water Non-regulatory 500ml Plastic (ALE208) 500ml Plastic ۷ial Vial (ALE297) Vial (ALE297) UNL - Unspecified Liquid (ALE297) SL - Sludge Container G - Gas OTH - Other GW GW GW GW GΜ GW GW GW Sample Type GW GW GΜ GΜ GW GW G۷ GW GW G۷ G۷ Alkalinity as CaCO3 All NDPs: 0 Tests: 5 X X X Ammoniacal Nitrogen All NDPs: 0 Tests: 5 Χ X Χ Χ Anions by Kone (w) All NDPs: 0 Tests: 5 Х Х Х Х Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 5 Х X Х Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 5 Χ Х X X Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 5 X X Χ Х EPH CWG (Aliphatic) Aqueous GC (W) All NDPs: 0 Tests: 5 X Х Χ Χ EPH CWG (Aromatic) Aqueous GC (W) All NDPs: 0 Tests: 5 Χ X X Χ GRO by GC-FID (W) All NDPs: 0 Tests: 5 X Χ X Mercury Dissolved All NDPs: 0 Tests: 5 Х Х X X Nitrite by Kone (w) All NDPs: 0 Tests: 5 Х Х Х Х PAH Spec MS - Aqueous (W) All NDPs: 0 Tests: 5 Х X Х Х pH Value All NDPs: 0 Tests: 5 Х Х X Χ Phenols by HPLC (W) All NDPs: 0 Tests: 5 Χ Χ Х Х TPH CWG (W) All NDPs: 0 Tests: 5 X X Χ

					Х										>	9	0.00 - 0.00 Vial (ALE297) GW	0.00 - 0.00	EW2	WS02	19746682
X		X				Х	Х	Х	X						>	3I. G\ (19)	250ml Amber Gl. GW PTFE/PE (ALE219)				
	X			X						X		X		^	X	GW	500ml Plastic (ALE208)				
	X												X		>	14) GW	H2SO4 (ALE244)				
			X								Х				~	.5) GW	NaOH (ALE245)				
					X										>	) 6\	0.00 - 0.00 Vial (ALE297) GW	0.00 - 0.00	EW5	WS03	19746709



SDG: 190410-7 Location: Cwmcarn High School

Client Reference:
Order Number:

A110489-4 C19/398 Report Number: Superseded Report: 501691

Describe Lawrench								_					
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH01		BH02		BH03A		WS02		WS03		
M mCERTS accredited. aq Aqueous / settled sample.													
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m)	0.00 - 0.00		0.00 - 0.00	140	0.00 - 0.00		0.00 - 0.00	NAO.	0.00 - 0.00	140	
* Subcontracted - refer to subcontractor report	for	Sample Type Date Sampled	Ground Water (GW) 08/04/2019	)	Ground Water (G 08/04/2019	VV)	Ground Water (GW) 08/04/2019	Gr	ound Water (G 08/04/2019	iVV)	Ground Water (G' 08/04/2019	W)	
accreditation status.  ** % recovery of the surrogate standard to check	k the	Sample Time											
efficiency of the method. The results of individ compounds within samples aren't corrected for		Date Received	10/04/2019 190410-7		10/04/2019 190410-7		10/04/2019 190410-7		10/04/2019 190410-7		10/04/2019 190410-7		
recovery (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	19746700		19746691		19746673		19746682		19746709		
1-3+§@ Sample deviation (see appendix)		AGS Reference	EW4		EW3		EW1		EW2		EW5		
Component	LOD/Units	Method											
Alkalinity, Total as CaCO3	<2 mg/l	TM043	95		100		195		100		100		
				#		#		#		#		#	
Carbon, Organic (diss.filt)	<3 mg/l	TM090	<3		<3		<3		<3		<3		
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2		<0.2		<0.2		< 0.2		<0.2		
				#		#		#		#		#	
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	<0.3		<0.3		<0.3		< 0.3		<0.3		
				#		#		#		#		#	
Antimony (diss.filt)	<1 µg/l	TM152	<1		<1		<1		<1		<1		
				2		2		2		2		2	
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5		<0.5		<0.5		<0.5		<0.5		
, ,				2#		2#	2	2#		2#		2#	
Barium (diss.filt)	<0.2 µg/l	TM152	23.4		41.6		99.3		39.5		21.3		
, , ,				2#		2#		2#	=	2#	****	2#	l
Beryllium (diss.filt)	<0.1 µg/l	TM152	<0.1		<0.1		<0.1		<0.1		<0.1		
	J., Ma,	102		2#		2#		2#	J. 1	2#	-0.1	2#	
Boron (diss.filt)	<10 µg/l	TM152	28.3	- iT	27.8	- π	25.2		30.3	- π	29	- π	
Doron (also.ilit)	, το μg/ι	1101132		2#	21.0	2#		2#	50.5	2#	23	2#	
Cadmium (dies filt)	<0.08 µg/l	TM152	<0.08	Δπ	<0.08	Δπ	<0.08	. π	<0.08	Δπ	<0.08	Δπ	
Cadmium (diss.filt)	~υ.υο μg/l	1101132		2#	<b>\</b> U.U0	2#		2#	~0.00	2#	<b>\</b> U.U0	2#	
Chromium (diag filt)	-1 · · ~//	TM4FO		Z #	-1	Z #	<1	#	-1	Z #	-1	Z #	
Chromium (diss.filt)	<1 µg/l	TM152	<1	ОЩ	<1	οщ		, "	<1	о 4	<1	о 4	
0 (1: 511)	.0.0 #	T14450		2#	0.004	2#		2#	0.404	2#	-0.0	2#	
Copper (diss.filt)	<0.3 µg/l	TM152	<0.3	۰.,	0.661	٥.,	0.519	. ,,	0.424	۰.,	<0.3	0.11	
				2#		2#		2 #		2#		2#	
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2		<0.2		<0.2		<0.2		<0.2		
				2#		2#		2#		2#		2#	
Molybdenum (diss.filt)	<3 µg/l	TM152	<3		<3		<3		<3		<3		
				2#		2#		2 #		2#		2#	
Nickel (diss.filt)	<0.4 µg/l	TM152	<0.4		0.715		1.42		0.708		<0.4		
				2#		2#		2#		2#		2#	
Selenium (diss.filt)	<1 µg/l	TM152	2.39		1.17		2.9		1.6		1.84		
				2#		2#	2	2#		2#		2#	
Zinc (diss.filt)	<1 µg/l	TM152	<1		<1		3.98		<1		<1		
				2#		2#	2	2 #		2#		2#	
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01		<0.01		<0.01		<0.01		<0.01		
				2#		2#	2	2#		2#		2#	
Nitrite as NO2	<0.05 mg/l	TM184	<0.05		<0.05		0.051		<0.05		<0.05		
				#		#		#		#		#	
Sulphate	<2 mg/l	TM184	30.8		33		35.3		26.2		25.9		
		<u> </u>		#		#		#		#		#	
Chloride	<2 mg/l	TM184	35.2		37.2		14.2		42.7		40.4		
	<u>_</u>	<u>                                      </u>		#		#		#		#		#	
Nitrate as NO3	<0.3 mg/l	TM184	6.05		6.44		5.06		8.85		8.07		
Cyanide, Total	<0.05 mg/l	TM227	<0.05		<0.05		<0.05		<0.05		<0.05		
				#		#		#		#		#	
pH	<1 pH Units	TM256	7.04		7.46		7.55		7.9		7.34		
ľ	"			#		#	- <del>-</del>	#		#		#	
Phenol	<0.002 mg/l	TM259	<0.002		<0.002		<0.002		<0.002		<0.002		
				#		#		#		#	3.002	#	
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A110489-4 C19/398 Report Number: Superseded Report: SDG: 190410-7 Client Reference: 501691 Cwmcarn High School Order Number: Location:

PAH Spec MS - Aqueous	s (W)							
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH01	BH02	BH03A	WS02	WS03	
M mCERTs accredited. aq Aqueous / settled sample. diss.filit Dissolved / filtered sample. tot.unfilit Total / unfiltered sample. * Subcontracted - refer to subcontractor report is accreditation status.	for	Depth (m) Sample Type Date Sampled	0.00 - 0.00 Ground Water (GW) 08/04/2019	0.00 - 0.00 Ground Water (GW) 08/04/2019	0.00 - 0.00 Ground Water (GW) 08/04/2019	0.00 - 0.00 Ground Water (GW) 08/04/2019	0.00 - 0.00 Ground Water (GW) 08/04/2019	
** % recovery of the surrogate standard to check efficiency of the method. The results of individence compounds within samples aren't corrected for recovery  (F) Trigger breach confirmed	lual	Sample Time Date Received SDG Ref Lab Sample No.(s)	10/04/2019 190410-7 19746700	10/04/2019 190410-7 19746691	10/04/2019 190410-7 19746673	10/04/2019 190410-7 19746682	10/04/2019 190410-7 19746709	
1-3+§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference	EW4	EW3	EW1	EW2	EW5	
Naphthalene (aq)	<0.01 µg/		<0.01 #	<0.01	<0.01 #	<0.01	<0.01 #	
Acenaphthene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Acenaphthylene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Fluoranthene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Anthracene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Phenanthrene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Fluorene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Chrysene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Pyrene (aq)	<0.005 µg		<0.005 #	<0.005 #	0.00746 #	<0.005 #	<0.005 #	
Benzo(a)anthracene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Benzo(b)fluoranthene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Benzo(k)fluoranthene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Benzo(a)pyrene (aq)	<0.002 µg	ŋ/l TM178	<0.002 #	<0.002 #	<0.002 #	<0.002 #	<0.002 #	
Dibenzo(a,h)anthracene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Benzo(g,h,i)perylene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg		<0.005 #	<0.005 #	<0.005 #	<0.005 #	<0.005 #	
PAH, Total Detected USEPA 16 (aq)	<0.082 µg	ŋ/I TM178	<0.082 #	<0.082 #	<0.082 #	<0.082 #	<0.082 #	

ALS

SDG: 190410-7 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/398 Report Number: Superseded Report: 501691

TPŀ	1 CV	VG (	W)
175	1 UV	VG (	VV)

TPH CWG (W)								
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	BH01	BH02	BH03A	WS02	WS03	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report	for	Sample Type Date Sampled	Ground Water (GW) 08/04/2019	Ground Water (GW) 08/04/2019	Ground Water (GW) 08/04/2019	Ground Water (GW) 08/04/2019	Ground Water (GW) 08/04/2019	
accreditation status.  ** % recovery of the surrogate standard to check	the	Sample Time	00/04/2019					
efficiency of the method. The results of individ compounds within samples aren't corrected for	lual	Date Received	10/04/2019	10/04/2019	10/04/2019	10/04/2019	10/04/2019	
recovery (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	190410-7 19746700	190410-7 19746691	190410-7 19746673	190410-7 19746682	190410-7 19746709	
1-3+§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference  Method	EW4	EW3	EW1	EW2	EW5	
GRO Surrogate % recovery**	%	TM245	114	108	114	110	113	
GRO >C5-C12	<50 μg/l	TM245	<50 #	<50 #	<50 #	<50 #	<50 #	
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3	<3	<3	<3	<3	
Benzene	<7 μg/l	TM245	<7	<7	<7	<7	<7	
Toluene	<4 µg/l	TM245	<4	<4	<4	<4	<4	
Ethylbenzene	<5 µg/l	TM245	<5	<5	<b>&lt;</b> 5	<b>&lt;</b> 5	<b>&lt;</b> 5	
m,p-Xylene	<8 µg/l	TM245	<8	<8	<8	<8	<8	
o-Xylene	<3 µg/l	TM245	<3	<3	<3	<3	<3	
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11	<11	<11	<11	
Sum of detected BTEX	<28 µg/l	TM245	<28	<28	<28	<28	<28	
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10	<10	<10	<10	
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	<10	<10	<10	<10	<10	
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174	<10	<10	<10	<10	<10	



#### **CERTIFICATE OF ANALYSIS**

 SDG:
 190410-7
 Client Reference:
 A110489-4
 Report Number:
 501691

 Location:
 Cwmcarn High School
 Order Number:
 C19/398
 Superseded Report:

### **Table of Results - Appendix**

Method No	Reference	Description
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

#### **CERTIFICATE OF ANALYSIS**



SDG: 190410-7 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/398 Report Number: Superseded Report: 501691

## **Test Completion Dates**

				•	
Lab Sample No(s)	19746700	19746691	19746673	19746682	19746709
Customer Sample Ref.	BH01	BH02	BH03A	WS02	WS03
AGS Ref.	EW4	EW3	EW1	EW2	EW5
Depth	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00	0.00 - 0.00
Туре	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Alkalinity as CaCO3	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
Ammoniacal Nitrogen	11-Apr-2019	11-Apr-2019	11-Apr-2019	11-Apr-2019	11-Apr-2019
Anions by Kone (w)	16-Apr-2019	16-Apr-2019	16-Apr-2019	16-Apr-2019	16-Apr-2019
Cyanide Comp/Free/Total/Thiocyanate	16-Apr-2019	16-Apr-2019	16-Apr-2019	16-Apr-2019	16-Apr-2019
Dissolved Metals by ICP-MS	18-Apr-2019	18-Apr-2019	18-Apr-2019	18-Apr-2019	18-Apr-2019
Dissolved Organic/Inorganic Carbon	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
EPH CWG (Aliphatic) Aqueous GC (W)	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019
EPH CWG (Aromatic) Aqueous GC (W)	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019
GRO by GC-FID (W)	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019
Mercury Dissolved	11-Apr-2019	12-Apr-2019	11-Apr-2019	11-Apr-2019	11-Apr-2019
Nitrite by Kone (w)	11-Apr-2019	11-Apr-2019	11-Apr-2019	11-Apr-2019	11-Apr-2019
PAH Spec MS - Aqueous (W)	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019
pH Value	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019	12-Apr-2019
Phenois by HPLC (W)	16-Apr-2019	16-Apr-2019	16-Apr-2019	16-Apr-2019	16-Apr-2019
TPH CWG (W)	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019	15-Apr-2019



SDG: 190410-7 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C19/398 Report Number: Superseded Report: 501691

### **ASSOCIATED AQC DATA**

#### Alkalinity as CaCO3

	Component	Method Code	QC 1995
1	Total Alkalinity as CaCO3	TM043	101.01
ı			96.56 : 106.57

#### Ammoniacal Nitrogen

Component	Method Code	QC 1950
Ammoniacal Nitrogen as N	TM099	<b>98.8</b> 93.14 : 108.60

#### Anions by Kone (w)

Component	Method Code	QC 1923
Chloride	TM184	101.0
		94.04 : 108.61
Phosphate (Ortho as PO4)	TM184	
		95.74 : 105.80
Sulphate (soluble)	TM184	100.8
		96.38 : 107.58
TON as NO3	TM184	96.5
		92.98 : 109.90

#### Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 1928	QC 1964
Free Cyanide (W)	TM227	<b>100.5</b> 92.00 : 113.00	<b>103.25</b> 92.00 : 113.00
Thiocyanate (W)	TM227	<b>102.75</b> 95.50 : 107.50	<b>104.25</b> 95.50 : 107.50
Total Cyanide (W)	TM227	<b>102.75</b> 95.50 : 110.50	<b>106.0</b> 95.50 : 110.50

#### Dissolved Metals by ICP-MS

Component	Method Code	QC 1923	QC 1946
Aluminium	TM152	<b>102.67</b> 94.19 : 114.31	<b>101.67</b> 94.19 : 114.31
Antimony	TM152	<b>104.0</b> 79.80 : 122.00	<b>106.0</b> 79.80 : 122.00
Arsenic	TM152	<b>99.17</b> 90.42 : 111.32	<b>106.0</b> 90.42 : 111.32
Barium	TM152	<b>104.33</b> 90.79 : 113.16	<b>108.83</b> 90.79 : 113.16
Beryllium	TM152	<b>91.17</b> 93.25 : 120.04	<b>97.83</b> 93.25 : 120.04
Bismuth	TM152	<b>101.67</b> 94.65 : 117.05	<b>102.67</b> 94.65 : 117.05

501691

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG: 190410-7 Client Reference: A110489-4 Report Number:
Location: Cwmcarn High School Order Number: C19/398 Superseded Report:

Dissolved Metals by ICP-MS

•			
		QC 1923	QC 1946
Borate	TM152	<b>98.15</b> 88.00 : 112.00	<b>98.77</b> 88.00 : 112.00
Boron	TM152	<b>98.0</b> 86.68 : 117.67	<b>99.0</b> 86.68 : 117.67
Cadmium	TM152	<b>104.0</b> 94.60 : 112.40	<b>104.17</b> 94.60 : 112.40
Calcium	TM152	<b>99.33</b> 83.40 : 121.11	<b>106.0</b> 83.40 : 121.11
Chromium	TM152	<b>98.33</b> 93.28 : 110.91	<b>100.17</b> 93.28 : 110.91
Cobalt	TM152	<b>95.67</b> 84.39 : 114.26	<b>100.5</b> 84.39 : 114.26
Copper	TM152	<b>95.83</b> 88.86 : 118.72	<b>101.83</b> 88.86 : 118.72
Iron	TM152	<b>98.67</b> 92.00 : 113.00	<b>102.0</b> 92.00 : 113.00
Lead	TM152	<b>101.5</b> 89.25 : 115.12	<b>102.67</b> 89.25 : 115.12
Lithium	TM152	<b>92.67</b> 89.26 : 119.04	<b>96.33</b> 89.26 : 119.04
Magnesium	TM152	<b>96.0</b> 86.35 : 113.36	<b>102.0</b> 86.35 : 113.36
Manganese	TM152	<b>100.67</b> 94.24 : 112.74	<b>101.83</b> 94.24 : 112.74
Molybdenum	TM152	<b>98.33</b> 87.00 : 108.89	<b>96.33</b> 87.00 : 108.89
Nickel	TM152	<b>94.17</b> 92.11 : 110.56	<b>101.17</b> 92.11 : 110.56
Phosphorus	TM152	<b>96.67</b> 90.52 : 115.47	<b>105.67</b> 90.52 : 115.47
Potassium	TM152	<b>101.33</b> 98.63 : 110.48	<b>108.0</b> 98.63 : 110.48
Selenium	TM152	<b>103.0</b> 88.44 : 113.86	<b>105.17</b> 88.44 : 113.86
Silver	TM152	<b>101.83</b> 94.40 : 114.74	<b>103.17</b> 94.40 : 114.74
Sodium	TM152	<b>96.0</b> 97.63 : 110.31	<b>102.0</b> 97.63 : 110.31
Strontium	TM152	<b>105.33</b> 90.72 : 114.82	<b>105.0</b> 90.72 : 114.82
Tellurium	TM152	<b>101.83</b> 90.72 : 112.62	<b>105.17</b> 90.72 : 112.62
Thallium	TM152	<b>103.67</b> 86.08 : 122.48	<b>103.67</b> 86.08 : 122.48
Tin	TM152	<b>102.67</b> 91.00 : 109.00	<b>105.33</b> 91.00 : 109.00
Titanium	TM152	<b>96.17</b> 91.87 : 102.47	<b>96.0</b> 91.87 : 102.47
Tungsten	TM152	<b>97.33</b> 78.12 : 132.82	<b>97.0</b> 78.12 : 132.82
Uranium	TM152	<b>100.67</b> 90.58 : 113.28	<b>99.17</b> 90.58 : 113.28
Vanadium	TM152	<b>101.17</b> 88.43 : 114.30	<b>99.83</b> 88.43 : 114.30



SDG: 190410-7 Cwmcarn High School Location:

Client Reference: Order Number:

A110489-4 C19/398

Report Number: Superseded Report: 501691

Validated

#### Dissolved Metals by ICP-MS

	'	QC 1923	QC 1946
Zinc	TM152	100.33	106.0
		86.52 : 115.27	86.52 : 115.27

#### Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 1929
Dissolved Inorganic Carbon	TM090	<b>107.33</b> 91.15 : 111.35
Dissolved Organic Carbon	TM090	<b>107.33</b> 97.18 : 109.58

#### EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 1955
Total Aliphatics >C10-C40	TM174	<b>100.83</b> 68.59 : 134.82

#### EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 1958
Total Aromatics >EC10-EC40	TM174	<b>93.41</b> 60.75 : 129.09

#### GRO by GC-FID (W)

Component	Method Code	QC 1921
Benzene by GC	TM245	<b>103.0</b> 77.76 : 121.54
		11.10 . 121.34
Ethylbenzene by GC	TM245	103.5
		76.04 : 121.93
m & p Xylene by GC	TM245	102.0
		75.79 : 121.81
MTBE GC-FID	TM245	103.5
		78.56 : 122.20
o Xylene by GC	TM245	103.0
		76.38 : 121.51
QC	TM245	104.31
		66.08 : 129.83
Toluene by GC	TM245	102.5
		76.66 : 123.55

#### Mercury Dissolved

Validated

ALS

 SDG:
 190410-7
 Client Reference:
 A110489-4
 Report Number:
 501691

 Location:
 Cwmcarn High School
 Order Number:
 C19/398
 Superseded Report:

Mercury Dissolved

Component	Method Code	QC 1929	QC 1932
Mercury Dissolved (CVAF)	TM183	<b>87.1</b> 75.00 : 111.00	<b>78.4</b> 75.00 : 111.00

### PAH Spec MS - Aqueous (W)

Component	Method Code	QC 1959
Acenaphthene by GCMS	TM178	108.4
		88.80 : 117.60
Acenaphthylene by GCMS	TM178	96.0
		91.66 : 114.36
Anthracene by GCMS	TM178	99.6
		97.60 : 107.20
Benz(a)anthracene by GCMS	TM178	94.8
		87.31 : 114.17
Benzo(a)pyrene by GCMS	TM178	97.2
		90.00 : 114.00
Benzo(b)fluoranthene by	TM178	104.4
GCMS		88.00 : 114.40
Benzo(ghi)perylene by GCMS	TM178	107.6
		96.80 : 113.60
Benzo(k)fluoranthene by	TM178	113.2
GCMS		92.80 : 116.80
Chrysene by GCMS	TM178	108.8
		100.00 : 121.60
Dibenzo(ah)anthracene by	TM178	102.4
GCMS		88.00 : 114.40
Fluoranthene by GCMS	TM178	112.4
		93.49 : 118.20
Fluorene by GCMS	TM178	111.2
		94.39 : 118.66
Indeno(123cd)pyrene by	TM178	95.6
GCMS		90.40 : 114.40
Naphthalene by GCMS	TM178	112.4
		99.60 : 121.20
Phenanthrene by GCMS	TM178	109.6
		99.20 : 116.00
Pyrene by GCMS	TM178	112.0
		96.40 : 115.60

#### pH Value

Component	Method Code	QC 1953
рН	TM256	<b>101.08</b> 99.73 : 102.16

#### Phenols by HPLC (W)

#### **CERTIFICATE OF ANALYSIS**

ALS

 SDG:
 190410-7
 Client Reference:
 A110489-4
 Report Number:
 501691

 Location:
 Cwmcarn High School
 Order Number:
 C19/398
 Superseded Report:

Phenols by HPLC (W)

Component	Method Code	QC 1952	QC 1938
2.3.5 Trimethyl-Phenol by HPLC (W)	TM259	<b>95.0</b> 84.40 : 108.40	<b>99.0</b> 93.10 : 108.70
2-Isopropyl Phenol by HPLC (W)	TM259	<b>98.0</b> 84.00 : 138.00	<b>100.0</b> 83.72 : 106.28
Cresols by HPLC (W)	TM259	<b>102.67</b> 93.98 : 117.98	<b>111.33</b> 90.02 : 130.15
Napthol by HPLC (W)	TM259	<b>116.0</b> 92.60 : 116.60	<b>119.0</b> 101.61 : 116.04
Phenol by HPLC (W)	TM259	<b>110.0</b> 94.53 : 118.53	<b>112.0</b> 95.00 : 119.00
Xylenols by HPLC (W)	TM259	<b>98.5</b> 90.50 : 113.50	<b>101.67</b> 98.67 : 108.67

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.

190410-7 SDG: Cwmcarn High School Location:

Client Reference: Order Number:

A110489-4 C19/398

Report Number: Superseded Report: 501691

## Appendix

#### General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except 21. For the BSEN 12457-3 two batch process to allow the cumulative release to be for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
- 3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised
- 6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.
- 7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
- 9. NDP No determination possible due to insufficient/unsuitable sample.
- 10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately
- 11. Results relate only to the items tested.
- 12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected
- 13. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect
- 14. Product analyses Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors
- 15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
- 16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).
- Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

- calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
- 23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised
- 24. Tentatively Identified Compounds (TICs) are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

#### Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

#### Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name				
Chrysofile	WhiteAsbesbs				
Amosite	Brown Asbestos				
Cro a dolite	Blue Asbe stos				
Fibrous Act nolite	-				
Fibro us Anthop hyll ite	-				
Fibrous Tremolite	-				

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

Tel: (01244) 528700 Fax: (01244) 528701

email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

WYG Geo-Environment 5th Floor Longcross Court 47 Newport Road Cardiff CF24 0AD

Attention: Sarah Roberts

#### **CERTIFICATE OF ANALYSIS**

Date of report Generation: 28 December 2019

Customer: WYG Geo-Environment

Sample Delivery Group (SDG): 191210-82
Your Reference: A110489-4-1

Location: Cwmcarn High School

Report No: 535551

We received 16 samples on Tuesday December 10, 2019 and 3 of these samples were scheduled for analysis which was completed on Saturday December 28, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

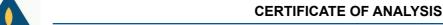
Approved By:

Sonia McWhan
Operations Manager









ALS

 SDG:
 191210-82
 Client Reference:
 A110489-4-1
 Report Number:
 535551

 Location:
 Cwmcarn High School
 Order Number:
 C12/1273
 Superseded Report:

## **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21329440	SA101	ES1	0.00 - 0.05	26/11/2019
21329514	SA101	ES2	0.60 - 0.70	26/11/2019
21329544	SA102	ES1	0.10 - 0.20	26/11/2019
21329554	SA102	ES2	0.60 - 0.70	26/11/2019
21329524	SA103	ES1	0.10 - 0.20	26/11/2019
21329533	SA103	ES2	1.20 - 1.30	26/11/2019
21329565	SA104	ES1	0.10 - 0.20	26/11/2019
21329573	SA104	ES2	0.60 - 0.70	26/11/2019
21329582	WS101	ES1	0.20	26/11/2019
21329449	WS101	ES2	0.50	26/12/2019
21329461	WS102	ES1	0.20	26/12/2019
21329468	WS102	ES2	0.50	26/12/2019
21329505	WS104	ES1	0.20	26/12/2019
21329591	WS104		0.50 - 0.50	
21329485	WS107	ES1	0.20	26/12/2019
21329496	WS107	ES2	0.50	26/12/2019

Maximum Sample/Coolbox Temperature (°C):

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

9.5

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

535551

#### **CERTIFICATE OF ANALYSIS**

Client Reference:

A110489-4-1

Report Number:

Superseded Report:

ALS

SDG:

191210-82

Location: Cwmcarn High School Order Number: C12/1273 Results Legend 21329461 21329514 Lab Sample No(s) X Test No Determination Possible Customer SA101 SA102 WS102 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ES2 ES1 ES1 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.10-PR - Process Water 0.60 SA - Saline Water 0.20 Depth (m) - 0.20 TE - Trade Effluent - 0.70 TS - Treated Sewage US - Untreated Sewage 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S Alkalinity Filtered as CaCO3 All NDPs: 0 Tests: 3 X X Х Ammoniacal Nitrogen All NDPs: 0 Tests: 3 Χ Х Х Anions by Kone (soil) All NDPs: 0 Tests: 3 Х Х Х All Anions by Kone (w) NDPs: 0 Tests: 3 X X X Ashestos ID in Solid Samples All NDPs: 0 Tests: 3 Χ Х Χ Boron Water Soluble All NDPs: 0 Tests: 3 Х Х Х CEN Readings All NDPs: 0 Tests: 3 Χ Х Х Chromium III All NDPs: 0 Tests: 3 X Х Х Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 6 X X X X Х Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 3 X X X Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 3 Х Х Х EPH CWG (Aliphatic) Filtered GC (W) All NDPs: 0 Tests: 3 Х Х X EPH CWG (Aromatic) Filtered GC (W) All NDPs: 0 Tests: 3 Χ Χ Х EPH CWG GC (S) All NDPs: 0 Tests: 3 Х Х Х GRO by GC-FID (S) All NDPs: 0 Tests: 3 Χ

535551

#### **CERTIFICATE OF ANALYSIS**

Client Reference:

A110489-4-1

Report Number:

Superseded Report:

ALS

SDG:

191210-82

Location: Cwmcarn High School Order Number: C12/1273 **Results Legend** 21329514 21329544 21329461 Lab Sample No(s) X Test No Determination Possible Customer WS102 SA101 SA102 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ES1 ES1 ES2 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.60 0.10 - 0.20 SA - Saline Water 0.20 Depth (m) TE - Trade Effluent - 0.70 TS - Treated Sewage US - Untreated Sewage 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 60g 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory VOC (ALE215) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S GRO by GC-FID (W) All NDPs: 0 Х X Х All Hexavalent Chromium (s) NDPs: 0 Tests: 3 Х Х Х Mercury Dissolved All NDPs: 0 Tests: 3 X X Х Metals in solid samples by OES All NDPs: 0 Tests: 3 Χ Х Х Nitrite by Kone (w) All NDPs: 0 Tests: 3 Х X X PAH by GCMS All NDPs: 0 Tests: 3 X X Х PAH in waters by GC-MS (diss.filt) All NDPs: 0 Tests: 3 Χ X Х рΗ All NDPs: 0 Tests: 3 Х Х Х pH Value of Filtered Water All NDPs: 0 Tests: 3 X X X Phenols by HPLC (S) All NDPs: 0 Tests: 3 Χ X Χ Phenols by HPLC (W) All NDPs: 0 Tests: 3 Х Х Х All Sample description NDPs: 0 Tests: 3 X Χ Χ Total Organic Carbon All NDPs: 0 Tests: 3 Х X Х TPH CWG Filtered (W) All NDPs: 0 Tests: 3 X X Х TPH CWG GC (S) All NDPs: 0 Χ X X

535551

Report Number:

Superseded Report:

#### **CERTIFICATE OF ANALYSIS**

(LS)

A110489-4-1 SDG: 191210-82 Client Reference: C12/1273 Location: Cwmcarn High School Order Number: **Results Legend** 21329544 21329461 21329514 Lab Sample No(s) X Test No Determination Possible Customer WS102 SA101 SA102 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ES1 ES2 ES1 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.60-0.10 - 0.20 SA - Saline Water 0.20 Depth (m) - 0.70 TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S VOC MS (S) All NDPs: 0 Χ X Χ

ALS

SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

Validated

## **Sample Descriptions**

#### **Grain Sizes**

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2	mm coa	arse	2mm - 1	0mm	very coa	rse	>10mm
Lab Sample No(	s) Custon	ner Sample Re	f. Depth (m)	Colo	ur	Description	Ir	clusions	Inclus	sions 2		
21329514		SA101	0.60 - 0.70	Dark B	rown	Loamy Sand		Stones	No	one		
21329544		SA102	0.10 - 0.20	Dark B	rown	Sandy Loam		Stones	Vege	etation		
21329461		WS102	0.20	Dark B	rown	Loamy Sand		Stones	Vege	etation		

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



A110489-4-1 C12/1273 SDG: 191210-82 Client Reference: Location: Cwmcarn High School Order Number:

Report Number: Superseded Report:

535551

Results Legend # ISO17025 accredited.		Customer Sample Ref.	SA101	SA102	WS102		
M mCERTS accredited. aq Aqueous / settled sample.		Design (co)					
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.60 - 0.70 Soil/Solid (S)	0.10 - 0.20 Soil/Solid (S)	0.20 Soil/Solid (S)		
* Subcontracted - refer to subcontractor report accreditation status.		Date Sampled	26/11/2019	26/11/2019	26/12/2019		
** % recovery of the surrogate standard to check efficiency of the method. The results of individ	dual	Sample Time Date Received	10/12/2019	10/12/2019	10/12/2019		
compounds within samples aren't corrected for recovery	or the	SDG Ref	191210-82	191210-82	191210-82		
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21329514 ES2	21329544 ES1	21329461 ES1		
Component	LOD/Units	Method					
Moisture Content Ratio (% of as received sample)	%	PM024	11	19	19		
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 @ M	<0.01 @ M	<0.01		
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0102	0.183	0.0414 #		
рН	1 pH Units	TM133	8.07 M	5.49 M	5.68 M		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	<1.2 #	<0.6		
Cyanide, Easily liberatable (low level)	<0.5 mg/kg	TM153	<0.5	<0.5	<0.5		
Chromium, Trivalent	<0.9 mg/kg	TM181	7.94	7.46	7.14		
Arsenic	<0.6 mg/kg	TM181	4.81 M	19.6 M	16.3 M		
Beryllium	<0.01 mg/kg		0.37 M	0.474 M	0.711 M		
Cadmium	<0.02 mg/kg		0.279 M	0.543 M	0.317 M		
Chromium	<0.9 mg/kg		7.94 M	7.46 M	7.14 M		
Copper	<1.4 mg/kg		7.42 M	22.4 M	19.8 M		
Lead	<0.7 mg/kg		6.92 M	67.9 M	41.2 M		
Mercury	<0.14 mg/kg		<0.14 M	<0.14 M	<0.14 M		
Nickel	<0.2 mg/kg		17 M	13.6 M	15.4 M		
Selenium	<1 mg/kg	TM181	<1 #	1.88 #	1.16 #		
Vanadium	<0.2 mg/kg		12.3 #	21.8 #	20.1 #		
Zinc	<1.9 mg/kg		47.9 M <1		77.1 M <1		
Boron, water soluble  Water Soluble Sulphate as SO4	<1 mg/kg <0.004 g/l	TM222 TM243	0.0099	<1 M 0.011	0.0097		
2:1 Extract	<0.004 g/I	1101243	0.0099 M		0.0097 M		

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG:191210-82Client Reference:A110489-4-1Report Number:535551Location:Cwmcarn High SchoolOrder Number:C12/1273Superseded Report:

PAH by GCMS								
Results Legend		Customer Sample Ref.	SA101	SA102	WS102			
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.60 - 0.70	0.10 - 0.20	0.20			
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report	rt for	Sample Type Date Sampled	Soil/Solid (S) 26/11/2019	Soil/Solid (S) 26/11/2019	Soil/Solid (S) 26/12/2019			
accreditation status.  ** % recovery of the surrogate standard to che		Sample Time	20/11/2019	,				
efficiency of the method. The results of indiv compounds within samples aren't corrected		Date Received SDG Ref	10/12/2019 191210-82	10/12/2019 191210-82	10/12/2019 191210-82			
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21329514	21329544	21329461			
1-3+§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference Method	ES2	ES1	ES1			
Naphthalene-d8 % recovery**	%	TM218	85.4	91.5	88.2			
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,								
Acenaphthene-d10 %	%	TM218	94.1	92.5	89.8			
recovery**								
Phenanthrene-d10 % recovery**	%	TM218	82.5	89.8	81.8			
Christian d12 0/ receiver **	%	TM040	70	78.2	60.0			
Chrysene-d12 % recovery**	70	TM218	70	10.2	68.8			
Perylene-d12 % recovery**	%	TM218	71.3	70.2	59.7			
,	,,,							
Naphthalene	<0.009	TM218	<0.009	0.0248	0.0184			
	mg/kg		@ M	@ M	M			
Acenaphthylene	<0.012	TM218	<0.012	0.0175	0.0158			
Assessability	mg/kg	T14040	@ M	@ M	M		-	
Acenaphthene	<0.008 mg/kg	TM218	<0.008 @ M	<0.008 @ M	<0.008 M			
Fluorene	<0.01 mg/kg	TM218	<0.01	€ WI	<0.01			
i idolette	VO.OT IIIg/Kg	11/12/10	(0.01 @ M	₹0.01 @ M	V0.01			
Phenanthrene	<0.015	TM218	<0.015	0.126	0.079			
	mg/kg		@ M	@ M	М			
Anthracene	<0.016	TM218	<0.016	0.0517	<0.016			
	mg/kg		@ M	@ M	M			
Fluoranthene	<0.017	TM218	<0.017	0.316	0.171			
Durono	mg/kg <0.015	TM218	@ M <0.015	@ M 0.245	0.139			
Pyrene	mg/kg	TIVIZ TO	<0.015 @ M	0.245 @ M	0.139 M			
Benz(a)anthracene	<0.014	TM218	<0.014	0.181	0.1			
( )	mg/kg		@ M	@ M	М			
Chrysene	<0.01 mg/kg	TM218	<0.01	0.187	0.108			
			@ M	@ M	M			
Benzo(b)fluoranthene	<0.015	TM218	<0.015	0.289	0.216			
Ponzo/k)fluoranthono	mg/kg <0.014	TM218	@ M <0.014	@ M 0.0913	0.0495			
Benzo(k)fluoranthene	mg/kg	1101210	~0.014 @ M	0.0913 @ M	0.0495 M			
Benzo(a)pyrene	<0.015	TM218	<0.015	0.136	0.106			
	mg/kg		@ M	@ M	М			
Indeno(1,2,3-cd)pyrene	<0.018	TM218	<0.018	0.107	0.105			
	mg/kg		@ M	@ M	M			
Dibenzo(a,h)anthracene	<0.023	TM218	<0.023	<0.023	<0.023			
Benzo(g,h,i)perylene	mg/kg <0.024	TM218	@ M <0.024	@ M 0.0949	0.0713		<del>                                     </del>	
23.120(3,11,1/201)10110	mg/kg	I IVIZ IU	~0.024 @ M	0.0949 @ M	0.0713 M			
PAH, Total Detected USEPA 16	<0.118	TM218	<0.118	1.87	1.18			
	mg/kg	1						
							-	
				l			<u> </u>	
	-						-	
							-	
						<u> </u>		

#### **CERTIFICATE OF ANALYSIS**

SDG: 191210-82 Cwmcarn High School Location:

Client Reference: A110489-4-1 Order Number:

Report Number: Superseded Report: C12/1273

535551

TPH CWG (S)							
Results Legend	C	ustomer Sample Ref.	SA101	SA102	WS102		
# ISO17025 accredited. M mCERTS accredited.							
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.60 - 0.70	0.10 - 0.20	0.20		
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report	t for	Sample Type Date Sampled	Soil/Solid (S) 26/11/2019	Soil/Solid (S) 26/11/2019	Soil/Solid (S) 26/12/2019		
accreditation status.  ** % recovery of the surrogate standard to check		Sample Time					
efficiency of the method. The results of indiv compounds within samples aren't corrected		Date Received SDG Ref	10/12/2019 191210-82	10/12/2019 191210-82	10/12/2019 191210-82		
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21329514	21329544	21329461		
1-3+§@ Sample deviation (see appendix)	LOD/Units	AGS Reference Method	ES2	ES1	ES1		
GRO Surrogate % recovery**	%	TM089	75	93	90		
Onto danogato // rodotory	,,,	1111000	@	@	00		
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01		
			@	@			
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01		
			@	@			
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01		
Ali-la-ti > O40 O40	44 //	TMAAA	@	@ <1	-41		
Aliphatics >C10-C12	<1 mg/kg	TM414	<1	<1	<1		
Aliphatics >C12-C16	<1 mg/kg	TM414	<1	<1	<1		
7 Hipfidates + 0 12 0 10	1 mg/kg	TIWITIT	-1	-1	`'		
Aliphatics >C16-C21	<1 mg/kg	TM414	<1	<1	<1		
·		<u>                                       </u>				 <u> </u>	
Aliphatics >C21-C35	<1 mg/kg	TM414	<1	6.99	3.2		
Aliphatics >C35-C44	<1 mg/kg	TM414	<1	1.25	<1		
			_		_		
Total Aliphatics >C10-C44	<5 mg/kg	TM414	<5	9.15	<5		
Total Aliabatica & Aramatica	<10 mg/kg	TM414	<10	21.3	<10		
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	1101414	<10	۷۱.۵	×10		
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01		
7 101101100 - 200 201	-o.or mg/kg	1111000	@	@	-0.01		
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01		
			@	@			
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01		
			@	@			
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1	<1	<1		
A	44 //	TMAAA	-4		-41		
Aromatics > EC12-EC16	<1 mg/kg	TM414	<1	<1	<1		
Aromatics > EC16-EC21	<1 mg/kg	TM414	<1	<1	<1		
7.10.11.00.10			·		· ·		
Aromatics > EC21-EC35	<1 mg/kg	TM414	<1	10.3	2.21		
Aromatics >EC35-EC44	<1 mg/kg	TM414	<1	1.1	<1		
Aromatics > EC40-EC44	<1 mg/kg	TM414	<1	<1	<1		
T. I. I	.5 //	T1444	.5	40.0	.5		
Total Aromatics > EC10-EC44	<5 mg/kg	TM414	<5	12.2	<5		
Total Aliphatics & Aromatics	<10 mg/kg	TM414	<10	21.3	<10	<del>                                     </del>	
>C5-C44							
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05		
			@	@			
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05		
			@	@			
GRO >C5-C10	<0.02 mg/kg	TM089	<0.02	<0.02	<0.02		
			@	@			
						+	
						-	

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG:191210-82Client Reference:A110489-4-1Report Number:535551Location:Cwmcarn High SchoolOrder Number:C12/1273Superseded Report:

ALS)				Trumbon. 5.				
VOC MS (S)								
Results Legend # IS017025 accredited.	- C	Customer Sample Ref.	SA101	SA102	WS102			
M mCERTS accredited. aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample.		Depth (m)	0.60 - 0.70	0.10 - 0.20	0.20			
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report	for	Sample Type Date Sampled	Soil/Solid (S) 26/11/2019	Soil/Solid (S) 26/11/2019	Soil/Solid (S) 26/12/2019			
accreditation status.  ** % recovery of the surrogate standard to check	k the	Sample Time	20/11/2015	20/11/2019	20/12/2019			
efficiency of the method. The results of individ compounds within samples aren't corrected for	dual	Date Received	10/12/2019	10/12/2019	10/12/2019			
recovery (F) Trigger breach confirmed		SDG Ref Lab Sample No.(s)	191210-82 21329514	191210-82 21329544	191210-82 21329461			
1-3+§@ Sample deviation (see appendix)		AGS Reference	ES2	ES1	ES1			
Component	LOD/Units	Method						
Dibromofluoromethane**	%	TM116	103	97.6	113			
			@	@				
Toluene-d8**	%	TM116	95.2	89.9	94.9			
			@	@				
4-Bromofluorobenzene**	%	TM116	80.3	71.9	76			
			@	@				
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.01	<0.01	<0.01			
_			@ M	@ M				
Benzene	<0.009	TM116	<0.009	<0.009	<0.009			
	mg/kg		@ M	@ M	М			
Toluene	<0.007	TM116	<0.007	<0.007	<0.007			
	mg/kg	T14440	@ M	@ M	M	-	-	
Ethylbenzene	<0.004	TM116	<0.004	<0.004	<0.004			
/ V/	mg/kg		@ M	@ M	M			
p/m-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.01			
V.I	.0.04 "	T11110	@#	@#	#			
o-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.01			
			@ M	@ M	M			
						-	-	
						-	-	
							-	
						1		
						1		
						1	<del> </del>	
						<del> </del>		
						+	<del>                                     </del>	
						<del>                                     </del>	<del>                                     </del>	
				<u> </u>				





 SDG:
 191210-82
 Client Reference:
 A110489-4-1
 Report Number:
 535551

 Location:
 Cwmcarn High School
 Order Number:
 C12/1273
 Superseded Report:

## **Asbestos Identification - Solid Samples**

	1100	dits Legeria										
_		accredited.										
		accredited. acted test.	Date of Analysis	Analysed By	Comments	Amosite	Chrysotile	Crocidolite	Fibrous	Fibrous	Fibrous	Non-Asbestos
		reach confirmed				(Brown)	(White)	(Blue) Asbestos	Actinolite	Anthophyllite	Tremolite	Fibre
_		eviation (see appendix)				Asbestos	Asbestos					
'	Cust. Sample Ref.		12/12/19	Andrzej	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Depth (m) Sample Type	0.60 - 0.70 SOLID		Ferfecki		(#)	(#)	(#)	(#)	(#)	(#)	
	Date Sampled	26/11/2019 00:00:00										
	Date Receieved	10/12/2019 14:10:00										
	SDG	191210-82										
	Original Sample	21329514										
	Method Number	TM048										
	Cust. Sample Ref.	SA102ES1	12/12/19	Andrzej	-	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Depth (m)	0.10 - 0.20	1 ' '	Ferfecki		(#)	(#)	(#)	(#)	(#)	(#)	
	Sample Type	SOLID				( )	` ′	` ′	,	` ′	. ,	
	Date Sampled	26/11/2019 00:00:00										
	Date Receieved SDG	10/12/2019 14:10:00 191210-82										
	Original Sample	21329544										
	Method Number	TM048										
-	Cust. Sample Ref.	WS102ES1	16/12/10	A d i	_	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected	Not Detected
	Depth (m)	0.20	16/12/19	Andrzej Ferfecki	-							Not Detected
	Sample Type	SOLID		reflecki		(#)	(#)	(#)	(#)	(#)	(#)	
	Date Sampled	26/12/2019 00:00:00										
	Date Receieved	10/12/2019 14:10:00										
	SDG	191210-82										
	Original Sample Method Number	21329461 TM048										
	mediou Number	114040										
				I	1	1	1	1	I	I	1	1

**REF: BS EN 12457/2** 





SDG: 191210-82 Location: Cwmcarn High School

Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS

Client Reference

Mass Sample taken (kg) 0.118

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)32Dry Matter Content (%)75.7

Case

 SDG
 191210-82

 Lab Sample Number(s)
 21329461

 Sampled Date
 26-Dec-2019

 Customer Sample Ref.
 WS102 ES1

**Depth (m)** 0.20

Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	<b>A</b> 2 10:1 conc ⁿ le	eached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
otal Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	_
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
otal Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	=.	-	-
PH (Total Aliphatics + Total Aromatics) •C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
litrite as NO2	< 0.05	<0.05	<0.5	<0.5	-	_	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	6.03	<3	60.3	<30	-	_	-
Mercury Dissolved (CVAF)	0.0000148	<0.00001	0.000148	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
laphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	_	-
otal Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
otal Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	_	-
Arsenic	0.00055	<0.0005	0.0055	<0.005	-	-	-
otal Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	_	_	-
Barium	0.0698	<0.0002	0.698	<0.002	-	-	-
litrate as NO3	2.36	<0.3	23.6	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	=.	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000206	<0.000005	0.000206	<0.00005	-	-	-
Anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	_	_	-
Boron	0.0862	<0.01	0.862	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000224	<0.000005	0.000224	<0.00005	-	-	_
otal Alkalinity Filtered as CaCO3	4	<2	40	<20	-	-	_
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.00000547	<0.000005	0.0000547	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

#### **Leach Test Information**

Date Prepared	13-Dec-2019
pH (pH Units)	6.20
Conductivity (µS/cm)	12.50
Temperature (°C)	18.40
Volume Leachant (Litres)	0.872





SDG 191210-82 Cwmcarn High School Location:

Client Reference: Order Number:

Δ110489-4-1 C12/1273

Report Number: Superseded Report: 535551

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

#### **CEN ANALYTICAL RESULTS REF: BS EN 12457/2** Cwmcarn High School **Client Reference** Site Location Mass Sample taken (kg) 0.118 **Natural Moisture Content (%)** 0.090 **Dry Matter Content (%)** 75.7 Mass of dry sample (kg) Particle Size <4mm >95% Case 191210-82 SDG Lab Sample Number(s) 21329461 Sampled Date 26-Dec-2019 WS102 ES1 **Customer Sample Ref.** Depth (m) 0.20 **Eluate Analysis** C₂ Concⁿ in 10:1 eluate (mg/l) 10:1 concⁿ leached (mg/kg) Limit of Detection **Limit of Detection** Result Result Pyrene (diss.filt) 0.0000152 <0.00005 0.000152 <0.00005 Benzo(a)anthracene (diss.filt) < 0.000005 < 0.000005 < 0.00005 < 0.00005 Chromium <0.001 <0.001 <0.01 <0.01 Benzo(b)fluoranthene (diss.filt) < 0.000005 < 0.000005 < 0.00005 < 0.00005 Benzo(k)fluoranthene (diss.filt) < 0.000005 < 0.000005 <0.00005 <0.00005 Benzo(a)pyrene (diss.filt) < 0.000002 < 0.000002 <0.00002 <0.00002 Copper 0.00248 <0.0003 0.0248 < 0.003 Dibenzo(a,h)anthracene (diss.filt) < 0.000005 < 0.000005 < 0.00005 < 0.00005 Lead 0.000987 < 0.0002 0.00987 < 0.002 Benzo(g,h,i)perylene (diss.filt) < 0.000005 < 0.000005 <0.00005 < 0.00005 Indeno(1,2,3-cd)pyrene (diss.filt) < 0.000005 < 0.000005 <0.00005 < 0.00005 Molybdenum < 0.003 < 0.003 < 0.03 < 0.03 PAH 16 EPA Total by GCMS (diss.filt) < 0.000082 < 0.000082 < 0.00082 < 0.00082 Nickel 0.00119 <0.0004 0.0119 < 0.004 Selenium <0.001 <0.001 <0.01 <0.01 <0.001 0.311 <0.01 Zinc 0.0311 TPH CWG (W) Surrogate Recovery <0 <0 GRO TOT (C5-C12) < 0.05 < 0.05 < 0.5 < 0.5 Aliphatics C5-C6 < 0.01 <0.01 <0.1 <0.1 Aliphatics >C6-C8 < 0.01 < 0.01 < 0.1 < 0.1 Aliphatics >C8-C10 < 0.01 < 0.01 <0.1 <0.1 Aliphatics >C10-C12 <0.01 <0.01 <0.1 <0.1 Aromatics C6-C7 <0.01 <0.01 <0.1 <0.1 Aromatics >C7-C8 < 0.01 <0.01 <0.1 <0.1 MTBE GC-FID < 0.003 < 0.003 < 0.03 < 0.03 Aromatics >EC8 -EC10 <0.01 <0.01 <0.1 <0.1 Aromatics >EC10-EC12 < 0.01 < 0.01 <0.1 < 0.1 Benzene by GC <0.007 <0.007 <0.07 <0.07 Toluene by GC < 0.004 < 0.004 <0.04 < 0.04 Ethylbenzene by GC <0.005 < 0.005 <0.05 < 0.05 m & p Xylene by GC <0.008 <0.008 <0.08 <0.08 o Xylene by GC < 0.003 < 0.003 < 0.03 < 0.03 Sum m&p and o Xylene by GC <0.011 <0.011 <0.11 <0.11

#### **Leach Test Information**

Sum of BTEX by GC

Date Prepared	13-Dec-2019
pH (pH Units)	6.20
Conductivity (µS/cm)	12.50
Temperature (°C)	18.40
Volume Leachant (Litres)	0.872

< 0.028

< 0.028

Mcerts Certification does not apply to leachates 28/12/2019 12:12:04

< 0.28

< 0.28

**REF: BS EN 12457/2** 



ALS

**CEN ANALYTICAL RESULTS** 

SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

Client Reference Site Location
Mass Sample taken (kg) 0.102 Natural Moistu
Mass of dry sample (kg) 0.090 Dry Matter Cor
Particle Size <4mm >95%

Site Location Cwmcarn High School

Natural Moisture Content (%) 13.4

Dry Matter Content (%) 88.2

Case

 SDG
 191210-82

 Lab Sample Number(s)
 21329514

 Sampled Date
 26-Nov-2019

 Customer Sample Ref.
 SA101 ES2

 Depth (m)
 0.60 - 0.70

Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	Δ ₂ 10:1 conc ⁿ le	eached (mg/kg)			
•	<b>U</b> 2		A2	. 5. 57	<del> </del>		
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	_
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	_
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	_
TPH (Total Aliphatics + Total Aromatics)	<0.01	<0.01	<0.1	<0.1	-	-	-
>C5-C35							
Nitrite as NO2	<0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	4.04	<3	40.4	<30	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Total Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	0.0000149	<0.00005	0.000149	<0.00005	-	-	-
Arsenic	<0.0005	<0.0005	<0.005	<0.005	-	-	-
Total Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
Barium	0.226	<0.0002	2.26	<0.002	-	-	-
Nitrate as NO3	0.332	<0.3	3.32	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.000235	<0.00005	0.00235	<0.00005	-	-	-
Anthracene (diss.filt)	0.0000187	<0.00005	0.000187	<0.00005	-	-	-
Boron	0.0368	<0.01	0.368	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000901	<0.00005	0.000901	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO3	60	<2	600	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	_	-
Fluorene (diss.filt)	0.0000252	<0.00005	0.000252	<0.00005	-	-	-
Chrysene (diss.filt)	0.0000924	<0.000005	0.000924	<0.00005	-	-	-
- , ,							
	1	1	1	1			

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	8.06
Conductivity (µS/cm)	86.30
Temperature (°C)	20.70
Volume Leachant (Litres)	0.888





**Sampled Date** 

**Customer Sample Ref.** 

SDG: 191210-82 Location: Cwmcarn High School

26-Nov-2019

SA101 ES2

Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

CEN ANALYTICAL RESU	JLTS		REF : BS E
Client Reference		Site Location	Cwmcarn High School
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.4
Mass of dry sample (kg)	0.090	Dry Matter Content (%)	88.2
Particle Size <4mm	>95%		
Case			
SDG	191210-82		
Lab Sample Number(s)	21329514		

Depth (m)	0.60 - 0.70						
Eluate Analysis	C ₂ Conc ⁿ in 10:1 eluate (mg/l)		A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection	•		
Pyrene (diss.filt)	0.000195	<0.000005	0.00195	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	0.0000744	<0.00005	0.000744	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	0.0000403	<0.00005	0.000403	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	0.0000199	<0.00005	0.000199	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.00118	< 0.0003	0.0118	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
₋ead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
ndeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	0.0037	< 0.003	0.037	< 0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.000806	<0.000082	0.00806	<0.00082	-	-	-
lickel	<0.0004	<0.0004	<0.004	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.00267	<0.001	0.0267	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	_	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	_	_	_
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Foluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	_
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	_
n & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	_
Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	_
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	_

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	8.06
Conductivity (µS/cm)	86.30
Temperature (°C)	20.70
Volume Leachant (Litres)	0.888

**REF: BS EN 12457/2** 



SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS Client Reference

Mass Sample taken (kg) 0.117

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)30.7Dry Matter Content (%)76.5

Case

 SDG
 191210-82

 Lab Sample Number(s)
 21329544

 Sampled Date
 26-Nov-2019

 Customer Sample Ref.
 SA102 ES1

 Depth (m)
 0.10 - 0.20

Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	<b>A</b> 2 10:1 conc ⁿ le	eached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	_
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	_
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO2	<0.05	<0.05	<0.5	<0.5		-	-
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	4.24	<3	42.4	<30		-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	0.0000102	<0.00001	0.000102	<0.0001	-	_	_
Total Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	0.0000182	<0.000005	0.000182	<0.00005	-	_	_
Arsenic	0.000569	<0.0005	0.00569	<0.005	-	-	-
Total Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	_	_
Barium	0.00273	<0.0002	0.0273	<0.002	-	-	-
Nitrate as NO3	2.39	<0.3	23.9	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02		-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000491	<0.000005	0.000491	<0.00005	-	_	_
Anthracene (diss.filt)	0.00000861	<0.000005	0.0000861	<0.00005	-	_	_
Boron	<0.01	<0.01	<0.1	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000306	<0.000005	0.000306	<0.00005	-	_	_
Total Alkalinity Filtered as CaCO3	3	<2	30	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.0000233	<0.000005	0.000233	<0.00005	-	_	_
Chrysene (diss.filt)	<0.00005	<0.000005	<0.0005	<0.00005	-	_	_
•							

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	7.54
Conductivity (µS/cm)	10.10
Temperature (°C)	20.07
Volume Leachant (Litres)	0.873





SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

CEN ANALYTICAL RESU	JLTS		REF : BS EN 1
Client Reference		Site Location	Cwmcarn High School
Mass Sample taken (kg)	0.117	Natural Moisture Content (%)	30.7
Mass of dry sample (kg)	0.090	<b>Dry Matter Content (%)</b>	76.5
Particle Size <4mm	>95%		

 Case

 SDG
 191210-82

 Lab Sample Number(s)
 21329544

 Sampled Date
 26-Nov-2019

 Customer Sample Ref.
 SA102 ES1

 Depth (m)
 0.10 - 0.20

Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	A ₂ 10:1 conc ⁿ le	ached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.0000336	<0.000005	0.000336	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	< 0.00005	-	-	_
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	_
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	< 0.00005	-	-	_
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	_
Copper	0.00305	<0.0003	0.0305	< 0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	_
Lead	0.000976	<0.0002	0.00976	<0.002	-	-	_
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005		-	-
Molybdenum	< 0.003	< 0.003	<0.03	< 0.03	-	-	_
PAH 16 EPA Total by GCMS (diss.filt)	0.000174	<0.000082	0.00174	<0.00082	-	-	-
Nickel	0.000646	<0.0004	0.00646	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01		-	-
Zinc	0.0038	<0.001	0.038	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	_	_
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	_	_
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	_	_
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	_	_
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	_	_
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	_	_	_
MTBE GC-FID	< 0.003	<0.003	<0.03	<0.03	_	_	_
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	_	_
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	_	_	_
Benzene by GC	<0.007	<0.007	<0.07	<0.07	_	_	_
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	_	_
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	_	_
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	_	_
Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	_	_
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	_
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	_	_

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	7.54
Conductivity (µS/cm)	10.10
Temperature (°C)	20.07
Volume Leachant (Litres)	0.873



 SDG:
 191210-82
 Client Reference:
 A110489-4-1
 Report Number:
 535551

 Location:
 Cwmcarn High School
 Order Number:
 C12/1273
 Superseded Report:

#### **Table of Results - Appendix**

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

#### **CERTIFICATE OF ANALYSIS**



SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

## **Test Completion Dates**

1631 6011					
Lab Sample No(s)	21329514	21329544	21329461		
Customer Sample Ref.	SA101	SA102	WS102		
AGS Ref.	ES2	ES1	ES1		
Depth	0.60 - 0.70	0.10 - 0.20	0.20		
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)		
Alkalinity Filtered as CaCO3	17-Dec-2019	17-Dec-2019	17-Dec-2019		
Ammoniacal Nitrogen	17-Dec-2019	17-Dec-2019	17-Dec-2019		
Anions by Kone (soil)	14-Dec-2019	17-Dec-2019	16-Dec-2019		
Anions by Kone (w)	17-Dec-2019	17-Dec-2019	17-Dec-2019		
Asbestos ID in Solid Samples	12-Dec-2019	12-Dec-2019	16-Dec-2019		
Boron Water Soluble	13-Dec-2019	13-Dec-2019	16-Dec-2019		
CEN 10:1 Leachate (1 Stage)	12-Dec-2019	12-Dec-2019	13-Dec-2019		
CEN Readings	17-Dec-2019	17-Dec-2019	17-Dec-2019		
Chromium III	16-Dec-2019	16-Dec-2019	16-Dec-2019		
Cyanide Comp/Free/Total/Thiocyanate	18-Dec-2019	18-Dec-2019	18-Dec-2019		
Dissolved Metals by ICP-MS	17-Dec-2019	17-Dec-2019	17-Dec-2019		
Dissolved Organic/Inorganic Carbon	18-Dec-2019	18-Dec-2019	18-Dec-2019		
EPH CWG (Aliphatic) Filtered GC (W)	28-Dec-2019	28-Dec-2019	28-Dec-2019		
EPH CWG (Aromatic) Filtered GC (W)	28-Dec-2019	28-Dec-2019	28-Dec-2019		
EPH CWG GC (S)	16-Dec-2019	16-Dec-2019	20-Dec-2019		
GRO by GC-FID (S)	13-Dec-2019	13-Dec-2019	16-Dec-2019		
GRO by GC-FID (W)	17-Dec-2019	17-Dec-2019	17-Dec-2019		
Hexavalent Chromium (s)	16-Dec-2019	16-Dec-2019	16-Dec-2019		
Mercury Dissolved	17-Dec-2019	17-Dec-2019	23-Dec-2019		
Metals in solid samples by OES	16-Dec-2019	16-Dec-2019	16-Dec-2019		
Nitrite by Kone (w)	17-Dec-2019	17-Dec-2019	17-Dec-2019		
PAH by GCMS	17-Dec-2019	13-Dec-2019	18-Dec-2019		
PAH in waters by GC-MS (diss.filt)	24-Dec-2019	24-Dec-2019	24-Dec-2019		
pH	17-Dec-2019	17-Dec-2019	17-Dec-2019		
pH Value of Filtered Water	17-Dec-2019	17-Dec-2019	17-Dec-2019		
Phenols by HPLC (S)	13-Dec-2019	13-Dec-2019	16-Dec-2019		
Phenols by HPLC (W)	18-Dec-2019	18-Dec-2019	18-Dec-2019		
Sample description	11-Dec-2019	11-Dec-2019	12-Dec-2019		
Total Organic Carbon	13-Dec-2019	17-Dec-2019	16-Dec-2019		
TPH CWG Filtered (W)	28-Dec-2019	28-Dec-2019	28-Dec-2019		
TPH CWG GC (S)	16-Dec-2019	16-Dec-2019	20-Dec-2019		
VOC MS (S)	12-Dec-2019	12-Dec-2019	13-Dec-2019		

ALS

SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

Validated

### **ASSOCIATED AQC DATA**

#### Alkalinity Filtered as CaCO3

Component	Method Code	QC 2103	QC 2123
Total Alkalinity Filtered as CaCO3	TM043	<b>101.01</b> 95.62 : 106.88	<b>107.5</b> 100.35 : 114.15

#### Ammoniacal Nitrogen

Component	Method Code	QC 2124
Ammoniacal Nitrogen as N	TM099	<b>101.2</b> 93.14 : 108.60

#### Anions by Kone (w)

Component	Method Code	QC 2100
Chloride	TM184	103.0
		92.93 : 115.43
Sulphate (soluble)	TM184	100.8
		90.53 : 113.03
TON as NO3	TM184	100.5
		96.26 : 111.21

#### Boron Water Soluble

Component	Method Code	QC 2190	QC 2152	QC 2103
Water Soluble Boron	TM222	104.0	105.0	94.0
		85.80 : 112.50	85.80 : 112.50	85.80 : 112.50

#### Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2128	QC 2104	QC 2178
Free Cyanide	TM153	88.4	95.7	
		83.05 : 112.74	83.05 : 112.74	
Free Cyanide (W)	TM227			98.5
				93.25 : 112.75
Thiocyanate	TM153	83.83	90.42	
		89.81 : 110.19	89.81 : 110.19	
Thiocyanate (W)	TM227			99.25
				94.00 : 112.00
Total Cyanide	TM153	91.43	98.57	
		88.29 : 111.43	88.29 : 111.43	
Total Cyanide (W)	TM227			99.0
				92.25 : 111.75

#### Dissolved Metals by ICP-MS



 SDG:
 191210-82
 Client Reference:
 A110489-4-1
 Report Number:
 535551

 Location:
 Cwmcarn High School
 Order Number:
 C12/1273
 Superseded Report:

#### Dissolved Metals by ICP-MS

Component	Method Code	QC 2149
Aluminium	TM152	<b>106.0</b> 95.37 : 118.13
Antimony	TM152	<b>103.17</b> 88.37 : 130.57
Arsenic	TM152	<b>100.5</b> 92.62 : 113.52
Barium	TM152	<b>104.5</b> 93.15 : 115.52
Beryllium	TM152	103.17
Bismuth	TM152	89.98 : 116.88 <b>100.67</b>
	T14450	92.62 : 115.02
Boron	TM152	<b>106.33</b> 86.31 : 120.88
Cadmium	TM152	<b>103.0</b> 93.85 : 111.65
Calcium	TM152	<b>105.33</b> 89.20 : 126.91
Chromium	TM152	<b>100.5</b> 92.22 : 109.85
Cobalt	TM152	<b>99.33</b> 85.01 : 114.87
Copper	TM152	<b>102.0</b> 89.87 : 119.73
Iron	TM152	<b>102.0</b> 93.02 : 113.86
Lead	TM152	<b>104.0</b> 91.11 : 116.98
Lithium	TM152	<b>105.0</b> 91.30 : 123.00
Magnesium	TM152	<b>104.67</b> 89.60 : 116.61
Manganese	TM152	<b>101.5</b> 93.97 : 112.46
Molybdenum	TM152	<b>99.67</b> 89.07 : 110.96
Nickel	TM152	<b>99.0</b> 93.70 : 112.15
Phosphorus	TM152	<b>101.0</b> 89.24 : 114.18
Potassium	TM152	<b>106.0</b> 97.98 : 117.40
Selenium	TM152	<b>103.83</b> 91.69 : 117.12
Silver	TM152	<b>99.83</b> 96.95 : 117.30
Sodium	TM152	<b>104.0</b> 92.42 : 113.24
Strontium	TM152	<b>102.67</b> 92.14 : 116.24
Tellurium	TM152	<b>96.5</b> 89.88 : 111.78
Thallium	TM152	<b>98.5</b> 86.08 : 122.48

#### **CERTIFICATE OF ANALYSIS**



SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

#### Dissolved Metals by ICP-MS

		QC 2149
Tin	TM152	<b>103.83</b> 91.00 : 109.00
Titanium	TM152	<b>106.17</b> 88.23 : 109.83
Tungsten	TM152	<b>99.83</b> 77.61 : 132.31
Uranium	TM152	<b>99.83</b> 86.97 : 115.76
Vanadium	TM152	<b>104.83</b> 89.61 : 115.48
Zinc	TM152	<b>101.67</b> 87.51 : 116.26

#### Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2107	QC 2166
Dissolved Inorganic Carbon	TM090	<b>111.0</b> 93.58 : 112.28	<b>101.67</b> 93.58 : 112.28
Dissolved Organic Carbon	TM090	<b>104.5</b> 96.28 : 110.58	<b>101.83</b> 96.28 : 110.58

#### EPH CWG GC (S)

Component	Method Code	QC 2113	QC 2197
EPH >C8-C40 Raw	TM414	<b>80.14</b> 77.66 : 104.66	<b>85.62</b> 56.39 : 129.94
Total Aliphatics Raw	TM414	<b>85.77</b> 84.39 : 115.61	<b>92.37</b> 62.55 : 133.12
Total Aromatics Raw	TM414	<b>84.82</b> 57.00 : 150.27	<b>85.14</b> 57.00 : 150.27

#### GRO by GC-FID (S)

Component	Method Code	QC 2165
QC	TM089	<b>95.78</b> 72.28 : 114.54

#### GRO by GC-FID (W)

Component	Method Code	QC 2190
Benzene by GC	TM245	<b>91.0</b> 83.48 : 117.21
Ethylbenzene by GC	TM245	<b>93.0</b> 84.11 : 114.89
m & p Xylene by GC	TM245	<b>92.5</b> 83.73 : 116.33
MTBE GC-FID	TM245	<b>89.5</b> 84.42 : 117.50
o Xylene by GC	TM245	<b>93.5</b> 85.03 : 117.59

535551

### **CERTIFICATE OF ANALYSIS**



SDG: 191210-82 Client Reference: A110489-4-1 Report Number:
Location: Cwmcarn High School Order Number: C12/1273 Superseded Report:

GRO by GC-FID (W)

	'	QC 2190
QC	TM245	<b>91.18</b> 60.71 : 137.65
Toluene by GC	TM245	<b>90.5</b> 84.73 : 116.85

### Hexavalent Chromium (s)

Component	Method Code	QC 2187	QC 2172
Hexavalent Chromium	TM151	104.0	100.0
		90.20 : 107.00	90.20 : 107.00

### Mercury Dissolved

	Component	Method Code	QC 2159	QC 2162
1	Mercury Dissolved (CVAF)	TM183	<b>109.0</b> 76.80 : 117.12	<b>85.8</b> 76.80 : 117.12

### Metals in solid samples by OES

Component	Method Code	QC 2167	QC 2134	QC 2192
Aluminium	TM181	80.44	76.64	84.78
		77.84 : 119.01	77.84 : 119.01	77.84 : 119.01
Antimony	TM181	95.12	84.55	95.93
		84.28 : 107.67	84.28 : 107.67	84.28 : 107.67
Arsenic	TM181	98.26	96.51	98.84
		87.05 : 109.36	87.05 : 109.36	87.05 : 109.36
Barium	TM181	86.79	85.5	88.07
		82.49 : 109.34	82.49 : 109.34	82.49 : 109.34
Beryllium	TM181	100.37	100.0	98.13
		85.44 : 109.61	85.44 : 109.61	85.44 : 109.61
Boron	TM181	87.11	84.24	87.68
		73.51 : 104.66	73.51 : 104.66	73.51 : 104.66
Cadmium	TM181	91.77	93.42	89.3
		81.46 : 106.43	81.46 : 106.43	81.46 : 106.43
Chromium	TM181	92.9	93.31	91.68
		82.26 : 104.55	82.26 : 104.55	82.26 : 104.55
Cobalt	TM181	88.99	88.05	88.99
		86.54 : 106.87	86.54 : 106.87	86.54 : 106.87
Copper	TM181	94.54	94.01	92.61
		82.40 : 105.45	82.40 : 105.45	82.40 : 105.45
Iron	TM181	79.37	80.16	102.38
		82.95 : 110.58	82.95 : 110.58	82.95 : 110.58
Lead	TM181	91.89	89.41	90.32
		78.24 : 104.05	78.24 : 104.05	78.24 : 104.05
Manganese	TM181	109.44	108.61	106.94
		94.29 : 119.51	94.29 : 119.51	94.29 : 119.51
Mercury	TM181	94.93	93.72	93.72
		83.74 : 105.34	83.74 : 105.34	83.74 : 105.34

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SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

### Metals in solid samples by OES

	i	QC 2167	QC 2134	QC 2192
Molybdenum	TM181	98.77	100.41	94.24
		87.11 : 106.87	87.11 : 106.87	87.11 : 106.87
Nickel	TM181	92.42	92.67	90.46
		81.92 : 102.18	81.92 : 102.18	81.92 : 102.18
Phosphorus	TM181	104.44	104.85	106.87
		94.56 : 124.28	94.56 : 124.28	94.56 : 124.28
Selenium	TM181	101.18	101.96	99.22
		86.28 : 110.48	86.28 : 110.48	86.28 : 110.48
Strontium	TM181	85.75	84.63	85.75
		79.13 : 102.79	79.13 : 102.79	79.13 : 102.79
Thallium	TM181	95.58	94.25	93.81
		82.94 : 111.86	82.94 : 111.86	82.94 : 111.86
Tin	TM181	100.38	101.9	98.86
		90.25 : 108.86	90.25 : 108.86	90.25 : 108.86
Titanium	TM181	78.63	79.39	75.88
		66.23 : 102.06	66.23 : 102.06	66.23 : 102.06
Vanadium	TM181	93.41	90.84	90.11
		86.37 : 107.94	86.37 : 107.94	86.37 : 107.94
Zinc	TM181	97.74	96.92	98.15
		84.68 : 113.99	84.68 : 113.99	84.68 : 113.99

# PAH by GCMS

Component	Method Code	QC 2196	QC 2156	QC 2111
Acenaphthene	TM218	<b>98.5</b> 80.97 : 105.99	<b>96.5</b> 70.00 : 130.00	<b>93.5</b> 76.79 : 103.90
Acenaphthylene	TM218	<b>96.5</b> 80.24 : 105.29	<b>94.0</b> 70.00 : 130.00	<b>91.5</b> 78.40 : 108.66
Anthracene	TM218	<b>93.0</b> 73.72 : 109.23	<b>94.0</b> 70.00 : 130.00	<b>98.0</b> 76.15 : 110.07
Benz(a)anthracene	TM218	<b>97.0</b> 79.72 : 116.84	<b>91.0</b> 68.12 : 118.39	<b>105.0</b> 73.77 : 119.26
Benzo(a)pyrene	TM218	<b>100.5</b> 69.58 : 110.26	<b>87.5</b> 71.72 : 115.31	<b>98.5</b> 73.20 : 114.18
Benzo(b)fluoranthene	TM218	<b>93.5</b> 77.35 : 112.97	<b>80.5</b> 66.89 : 120.40	<b>83.5</b> 75.36 : 117.58
Benzo(ghi)perylene	TM218	<b>94.0</b> 77.68 : 107.38	<b>87.0</b> 67.82 : 118.49	<b>89.5</b> 70.73 : 116.12
Benzo(k)fluoranthene	TM218	<b>94.0</b> 82.61 : 111.93	<b>90.0</b> 73.10 : 117.03	<b>82.0</b> 75.98 : 116.59
Chrysene	TM218	<b>95.5</b> 80.28 : 111.42	<b>86.5</b> 69.58 : 115.47	<b>99.0</b> 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	<b>92.5</b> 79.17 : 106.41	<b>85.5</b> 67.32 : 121.35	<b>99.0</b> 69.17 : 115.30
Fluoranthene	TM218	<b>101.0</b> 79.07 : 112.75	<b>87.5</b> 75.16 : 117.28	<b>105.0</b> 75.88 : 112.84
Fluorene	TM218	<b>97.5</b> 80.52 : 110.90	<b>96.5</b> 70.00 : 130.00	<b>95.0</b> 78.50 : 114.02
Indeno(123cd)pyrene	TM218	<b>93.5</b> 76.97 : 113.36	<b>85.0</b> 68.91 : 117.62	<b>86.5</b> 70.26 : 117.95
Naphthalene	TM218	<b>96.5</b> 83.50 : 110.02	<b>95.5</b> 70.00 : 130.00	<b>89.0</b> 75.24 : 111.26
Phenanthrene	TM218	<b>94.5</b> 79.34 : 111.91	<b>93.0</b> 70.00 : 130.00	<b>100.5</b> 77.07 : 107.43

**CERTIFICATE OF ANALYSIS** Client Reference:

SDG: 191210-82 Location:

Cwmcarn High School Order Number: A110489-4-1 C12/1273

Report Number: Superseded Report: 535551

Validated

PAH by GCMS

			QC 2156	QC 2111
Pyrene	TM218	100.0	90.5	105.5
		74.43 : 114.36	75.68 : 119.23	78.74 : 112.56

### PAH in waters by GC-MS (diss.filt)

Component	Method Code	QC 2131
Acenaphthene (diss.filt)	TM178	<b>106.8</b> 93.20 : 119.60
Acenaphthylene (diss.filt)	TM178	<b>105.2</b> 92.00 : 118.40
Anthracene (diss.filt)	TM178	<b>104.8</b> 90.80 : 114.80
Benzo(a)anthracene (diss.filt)	TM178	<b>98.0</b> 91.60 : 115.60
Benzo(a)pyrene (diss.filt)	TM178	<b>100.0</b> 91.20 : 120.00
Benzo(b)fluoranthene (diss.filt)	TM178	<b>105.6</b> 86.80 : 120.40
Benzo(g,h,i)perylene (diss.filt)	TM178	<b>100.0</b> 89.20 : 118.00
Benzo(k)fluoranthene (diss.filt)	TM178	<b>103.2</b> 94.40 : 125.60
Chrysene (diss.filt)	TM178	<b>101.6</b> 96.40 : 122.80
Dibenzo(a,h)anthracene (diss.filt)	TM178	<b>100.8</b> 93.60 : 132.00
Fluoranthene (diss.filt)	TM178	<b>104.4</b> 92.80 : 121.60
Fluorene (diss.filt)	TM178	<b>106.8</b> 93.60 : 120.00
Indeno(1,2,3-cd)pyrene (diss.filt)	TM178	<b>103.2</b> 82.40 : 120.80
Naphthalene (diss.filt)	TM178	<b>108.4</b> 88.40 : 126.80
Phenanthrene (diss.filt)	TM178	<b>104.8</b> 92.40 : 118.80
Pyrene (diss.filt)	TM178	<b>102.0</b> 90.40 : 124.00

### рΗ

Component	Method Code	QC 2192	QC 2198
рН	TM133	<b>98.49</b> 97.44 : 100.93	<b>99.65</b> 97.44 : 100.93

### pH Value of Filtered Water





SDG: 191210-82 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C12/1273 Report Number: Superseded Report: 535551

### pH Value of Filtered Water

Component	Method Code	QC 2117
pH Value of Filtered Water	TM256	<b>100.94</b> 99.73 : 102.16

### Phenols by HPLC (S)

Component	Method Code	QC 2184	QC 2189
2.3.5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	<b>92.21</b> 65.50 : 89.50	<b>101.3</b> 65.50 : 89.50
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	<b>82.46</b> 86.25 : 116.25	<b>90.06</b> 86.25 : 116.25
Catechol by HPLC (S)	TM062 (S)	<b>74.29</b> 19.39 : 135.70	<b>80.0</b> 19.39 : 135.70
Cresols by HPLC (S)	TM062 (S)	<b>87.47</b> 81.00 : 112.20	<b>94.99</b> 81.00 : 112.20
Napthol by HPLC (S)	TM062 (S)	<b>112.14</b> 57.50 : 102.50	<b>112.14</b> 57.50 : 102.50
Phenol by HPLC (S)	TM062 (S)	<b>98.68</b> 88.67 : 124.67	<b>105.3</b> 88.67 : 124.67
Resorcinol HPLC (S)	TM062 (S)	<b>89.94</b> 69.99 : 127.22	<b>94.97</b> 69.99 : 127.22
Xylenols by HPLC (S)	TM062 (S)	<b>92.81</b> 90.22 : 114.22	<b>97.08</b> 90.22 : 114.22

### Phenols by HPLC (W)

Component	Method Code	QC 2159
2.3.5 Trimethyl-Phenol by HPLC (W)	TM259	<b>100.0</b> 91.00 : 109.00
2-Isopropyl Phenol by HPLC (W)	TM259	<b>96.0</b> 90.00 : 114.00
Cresols by HPLC (W)	TM259	<b>108.33</b> 90.02 : 130.15
Napthol by HPLC (W)	TM259	<b>96.0</b> 86.00 : 128.00
Phenol by HPLC (W)	TM259	<b>101.0</b> 85.89 : 109.89
Xylenols by HPLC (W)	TM259	<b>102.17</b> 93.33 : 107.33

### Total Organic Carbon

	Component	Method Code	QC 2135	QC 2111	QC 2142
I	Total Organic Carbon	TM132	100.39	101.17	100.39
ı			84.82 : 117.61	84.82 : 117.61	84.82 : 117.61

# VOC MS (S)

535551

### **CERTIFICATE OF ANALYSIS**



SDG: 191210-82 Client Reference: A110489-4-1 Report Number:
Location: Cwmcarn High School Order Number: C12/1273 Superseded Report:

VOC MS (S)

VOC INIS (3)		
Component	Method Code	QC 2135
1,1,1,2-tetrachloroethane	TM116	<b>106.0</b> 77.56 : 115.55
1,1,1-Trichloroethane	TM116	<b>109.6</b> 73.73 : 118.05
1,1,2-Trichloroethane	TM116	<b>103.8</b> 77.12 : 116.04
1,1-Dichloroethane	TM116	<b>112.0</b> 74.46 : 129.15
1,2-Dichloroethane	TM116	<b>111.8</b> 92.38 : 131.65
1,4-Dichlorobenzene	TM116	<b>97.0</b> 72.76 : 126.34
2-Chlorotoluene	TM116	<b>89.4</b> 81.66 : 118.02
4-Chlorotoluene	TM116	<b>86.2</b> 66.90 : 112.46
Benzene	TM116	<b>104.0</b> 89.71 : 111.93
Carbon Disulphide	TM116	<b>98.8</b> 74.91 : 122.14
Carbontetrachloride	TM116	<b>117.0</b> 80.31 : 124.50
Chlorobenzene	TM116	<b>101.0</b> 86.73 : 118.34
Chloroform	TM116	<b>113.2</b> 87.40 : 122.49
Chloromethane	TM116	<b>113.2</b> 65.05 : 142.63
Cis-1,2-Dichloroethene	TM116	<b>111.8</b> 80.67 : 126.72
Dibromomethane	TM116	<b>111.8</b> 67.80 : 121.75
Dichloromethane	TM116	<b>119.2</b> 81.11 : 133.25
Ethylbenzene	TM116	<b>94.6</b> 75.92 : 110.41
Hexachlorobutadiene	TM116	<b>88.8</b> 12.82 : 152.73
Isopropylbenzene	TM116	<b>84.0</b> 54.21 : 117.17
Naphthalene	TM116	<b>95.8</b> 80.86 : 128.81
o-Xylene	TM116	<b>89.6</b> 69.99 : 108.74
p/m-Xylene	TM116	<b>89.7</b> 68.32 : 108.91
Sec-Butylbenzene	TM116	<b>90.2</b> 44.91 : 118.40
Tetrachloroethene	TM116	<b>106.4</b> 76.95 : 121.02
Toluene	TM116	<b>96.4</b> 74.24 : 107.42
Trichloroethene	TM116	<b>102.0</b> 77.61 : 111.54

#### **CERTIFICATE OF ANALYSIS**



 SDG:
 191210-82
 Client Reference:
 A110489-4-1
 Report Number:
 535551

 Location:
 Cwmcarn High School
 Order Number:
 C12/1273
 Superseded Report:

VOC MS (S)

	,	QC 2135
Trichlorofluoromethane	TM116	<b>111.2</b> 84.55 : 133.27
Vinyl Chloride	TM116	<b>103.2</b> 70.29 : 138.58

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



 SDG:
 191210-82
 Client Reference:
 A110489-4-1
 Report Number:

 Location:
 Cwmcarn High School
 Order Number:
 C12/1273
 Superseded Report:

**Appendix** 

### General

- 1. Results are expressed on a dry weight basis (dried at  $35^{\circ}$ C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 6. NDP No determination possible due to insufficient/unsuitable sample.
- 7. Results relate only to the items tested
- 8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.
- 9. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.
- 10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.
- 14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

535551

#### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

#### 19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name
Chrysofile	White Asbests
Amosite	Brow n Asbestos
Cro d dolite	Blue Asbe stos
Fibrous Act nolite	-
Fib to us Anthop hyll ite	-
Fibrous Tremolite	-

### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3  $\mu$ m diameter, longer than 5  $\mu$ m and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, The Quantification of Asbestos in Soil (2107).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

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Website: www.alsenvironmental.co.uk

WYG Geo-Environment 5th Floor Longcross Court 47 Newport Road Cardiff CF24 0AD

Attention: Sarah Roberts

### **CERTIFICATE OF ANALYSIS**

Date of report Generation:28 December 2019Customer:WYG Geo-Environment

Sample Delivery Group (SDG): 191210-86
Your Reference: A110489-4-1

Location: Cwmcarn High School

Report No: 535552

This report has been revised and directly supersedes 535249 in its entirety.

We received 42 samples on Tuesday December 10, 2019 and 27 of these samples were scheduled for analysis which was completed on Saturday December 28, 2019. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan
Operations Manager







ALS

 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

## **Received Sample Overview**

ab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21330138	BH102	ES1	0.20	02/12/2019
21330149	BH102	ES2	0.50	02/12/2019
21330116	BH103	ES1	0.20	02/12/2019
21330134	BH103	ES2	0.50	02/12/2019
21330104	BH104	ES1	0.20	02/12/2019
21330110	BH104	ES2	0.50	02/12/2019
21330072	BH105	ES1	0.00 - 0.90	02/12/2019
21330100	BH105	ES2	0.90 - 1.20	02/12/2019
21330064	BH106	ES1	0.30	02/12/2019
21330068	BH106	ES2	0.60	02/12/2019
21329834	S1	ES1	0.40	28/11/2019
21329979	S2	ES1	0.10	02/12/2019
21329992	S2	ES2	0.50	02/12/2019
21329997	S3	ES1	0.30	02/12/2019
21330059	S4	ES1	0.10	02/12/2019
21330026	S5	ES1	0.30	02/12/2019
21330020	S6	ES1	0.10	02/12/2019
21330010	S7	ES1	0.20	02/12/2019
21330014	S8	ES1	0.50	02/12/2019
21329966	S9	ES1	0.30	29/11/2019
21329972	S10	ES1	0.20	29/11/2019
21329920	S11	ES1	0.30	29/11/2019
21329936	S12	ES1	0.30	29/11/2019
21329797	SA105	ES1	0.10 - 0.20	27/11/2019
21329929	SA105	ES1	0.50 - 0.60	27/11/2019
21330052	TP101	ES1	0.10 - 0.20	27/11/2019
21330144	TP101	ES2	0.40 - 0.50	27/11/2019
21330187	TP102	ES1	0.20	28/11/2019
21330195	TP102	ES2	0.50	28/11/2019
21329801	TP104	ES1	0.50	28/11/2019
21329807	TP104	ES2	1.00	28/11/2019
21329841	TP105	ES1	0.30	29/11/2019
21329885	TP106	ES1	0.10	29/11/2019
21329912	TP106	ES2	0.50	29/11/2019
21329817	TP108	ES1	0.20	28/11/2019
21329825	TP108	ES2	0.60	28/11/2019
21329829	TP107A	ES1	1.50 - 2.50	28/11/2019
21329791	WS103		0.50 - 0.50	
21330173	WS105	ES1	0.50	27/11/2019
21329795	WS106		0.50 - 0.50	
21330159	WS108	ES1	0.20	27/11/2019
21330165	WS108	ES2	0.50	27/11/2019

 $\label{lem:maximum Sample/Coolbox Temperature (°C):} \end{substitute}$ 

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

3.8

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

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SDG: A110489-4-1 191210-86 Client Reference: Report Number: 535552 Cwmcarn High School Order Number: C19/1273 Superseded Report: 535249 Location: Results Legend 21330116 21330072 21330064 21330138 21330104 21330068 21329834 Lab Sample No(s) X Test No Determination Possible Customer BH104 BH102 BH103 BH105 BH106 BH106  $S_{2}$ Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ES1 ËS ES1 ES1 ES1 ES2 ES1 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.00 PR - Process Water SA - Saline Water 0.20 0.30 0.60 0.40 0.20 0.20 Depth (m) TE - Trade Effluent - 0.90 TS - Treated Sewage US - Untreated Sewage 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 250g Amber Jar (ALE210) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar DW - Drinking Water Non-regulatory UNL - Unspecified Liquid (ALE210) SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S S S S S S S S S S Alkalinity Filtered as CaCO3 All NDPs: 0 Tests: 4 Χ Ammoniacal Nitrogen All NDPs: 0 Tests: 4 Χ Anions by Kone (soil) All NDPs: 0 Tests: 15 Х Х Х Х Х Х Anions by Kone (w) ΔII NDPs: 0 Tests: 4 X Ashestos ID in Solid Samples All NDPs: 0 Tests: 27 Х Χ Х Χ X Х Х Asbestos Quantification - Full All NDPs: 0 Tests: 2 Boron Water Soluble All NDPs: 0 Tests: 15 Χ X Χ Χ Χ Χ CEN Readings All NDPs: 0 Tests: 4 Χ Chromium III All NDPs: 0 Tests: 15 X X X X Χ Χ Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 19 Х X Х Х X Х X Dissolved Metals by ICP-MS All NDPs: 0 Tests: 4 Χ Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 4 X EPH CWG (Aliphatic) Filtered GC (W) All NDPs: 0 Tests: 4 Χ EPH CWG (Aromatic) Filtered GC (W) All NDPs: 0 Tests: 4 Χ EPH CWG GC (S) All NDPs: 0 Tests: 15 X X X Χ X

21329979	21329997	21330059	21330026	21330020	21330010	21330014	21329966	21329972	21329920	21329936			21330052			21330144			21330195	21329801
S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12			TP101			TP101			TP102	TP104
ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1			ES1			ES2			ES2	ES1
0.10	0.30	0.10	0.30	0.10	0.20	0.50	0.30	0.20	0.30	0.30			0.10 - 0.20			0.40 - 0.50			0.50	0.50
1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)
σ	o	σ	o	S	σ	σ	σ	σ	σ	o	σ	σ	σ	ω	σ	σ	σ	o	o	S
																				X
																				X
												X			Х			X		
																				Х
v	Х	Х	Х	X	Х	Х	Х	X	X	Х	Х			Х			X			Х
Х	^	^	^	^	^	^	^	^	^		^			^			^			^
										Х										
												X			X			X		
																				X
												X			X			X		
												X			X			X		X
																				X
																				Х
																				Х
																				Х
												X			X			X		

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SDG: A110489-4-1 191210-86 Client Reference: Report Number: 535552 Cwmcarn High School Order Number: C19/1273 Superseded Report: 535249 Location: **Results Legend** 21330138 21330116 21330104 21330072 21330064 21330068 21329834 Lab Sample No(s) X Test No Determination Possible Customer BH102 BH103 BH104 BH105 BH106 BH106  $\underline{S}$ Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ËS ËS Š ES1 ËS ES2 ES1 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water 0.00 SA - Saline Water 0.20 0.20 0.20 0.30 0.60 0.40 Depth (m) TE - Trade Effluent 0.90 TS - Treated Sewage US - Untreated Sewage 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 60g 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g 1kg TUB with Handle (ALE260) 60g 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory VOC (ALE215) UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S ഗ S S S S S S S S S GRO by GC-FID (S) All NDPs: 0 Х X X Х Х Х GRO by GC-FID (W) All NDPs: 0 Tests: 4 Х All Hexavalent Chromium (s) NDPs: 0 Tests: 15 Х Х Х Х Χ Х All Mercury Dissolved NDPs: 0 Tests: 4 Χ All Metals in solid samples by OES NDPs: 0 Tests: 15 Χ Χ Χ X Χ Χ Nitrite by Kone (w) All NDPs: 0 Tests: 4 X PAH by GCMS All NDPs: 0 Tests: 14 X X X X Χ X PAH in waters by GC-MS (diss.filt) All NDPs: 0 Tests: 4 Х рΗ All NDPs: 0 Tests: 15 Х Х X X Χ Х nH Value of Filtered Water All NDPs: 0 Tests: 4 Χ Phenols by HPLC (S) All NDPs: 0 Tests: 15 Х Х Х Χ Х Х Phenols by HPLC (W) All NDPs: 0 Tests: 4 Χ Sample description NDPs: 0 Tests: 15 Χ X Х Х Χ Χ Total Organic Carbon All NDPs: 0 Tests: 15 X X X Χ Χ Χ TPH CWG Filtered (W) All NDPs: 0 X

21329979	21329997	21330059	21330026	21330020	21330010	21330014	21329966	21329972	21329920	21329936			21330052			21330144			21330195	21329801
S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12			TP101			TP101			TP102	TP104
ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1			ES1			ES2			ES2	ES1
0.10	0.30	0.10	0.30	0.10	0.20	0.50	0.30	0.20	0.30	0.30			0.10 - 0.20			0.40 - 0.50			0.50	0.50
1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)
σ	တ	တ	တ	ဟ	ဟ	တ	S	တ	ဟ	ဟ	ဟ	o	S	ဟ	ဟ	S	တ	o	S	S
												X	X		x	X		X	X	x x x
												x			x			x		x

### CERTIFICATE OF ANALYSIS

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			С	ERT	IFIC	AT	ΕO	F AI	NAL	_YS	IS											
ALS	SDG: Location:	191210-86 Cwmcarn High	School																			
Results Legend  X Test  N No Detei	rmination	Lab Sample N	Client Remcarn High School  Sample No(s)  Customer ple Reference  S Reference  Depth (m)  Container  Container		21330138			21330116			21330104			21330072			21330064			21330068	21329834	
Possible  Sample Types -	3					nber: C19/1273 Superseded Report: 535249																
UNS - Unspecified S GW - Ground Water SW - Surface Water LE - Land Leachate		AGS Refere	nce			ES1			ES1			ES1			ES1			ES1			ES2	ES1
S - Soil/Solid UNS - Unspecified Solid GW - Ground Water SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage RE - Recreational Water DW - Drinking Water Non-regulatory	e	Depth (m	)			0.20			0.20			0.20			0.00 - 0.90			0.30			0.60	0.40
RE - Recreational W	/ater lon-regulatory	Containe	r	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB with Handle (ALE260)
		Sample Ty	ре	တ	S	S	S	S	ဟ	S	S	S	S	S	S	S	S	S	S	တ	S	S
TPH CWG GC (S)		All			Х			Х			Х			Х			Х			Х		
VOC MS (S)		All				X			Х			X			X			X			Х	

			Handle (ALE260)				
		S	1kg TUB with	0.10	ES1	S2	21329979
		S	1kg TUB with Handle (ALE260)	0.30	ES1	S3	21329997
		S	1kg TUB with Handle (ALE260)	0.10	ES1	84	21330059
		S	1kg TUB with Handle (ALE260)	0.30	ES1	S5	21330026
		တ	1kg TUB with Handle (ALE260)	0.10	ES1	S6	21330020
		S	1kg TUB with Handle (ALE260)	0.20	ES1	S7	21330010
		ဟ	1kg TUB with Handle (ALE260)	0.50	ES1	S8	21330014
		တ	1kg TUB with Handle (ALE260)	0.30	ES1	S9	21329966
		တ	1kg TUB with Handle (ALE260)	0.20	ES1	S10	21329972
		တ	1kg TUB with Handle (ALE260)	0.30	ES1	S11	21329920
		တ	1kg TUB with Handle (ALE260)	0.30	ES1	\$12	21329936
		တ	1kg TUB with Handle (ALE260)				
	X	တ	250g Amber Jar (ALE210)				
Х		S	60g VOC (ALE215)	0.10 - 0.20	ES1	TP101	21330052
		S	1kg TUB with Handle (ALE260)				
	Х	တ	250g Amber Jar (ALE210)				
X		S	60g VOC (ALE215)	0.40 - 0.50	ES2	TP101	21330144
		S	1kg TUB with Handle (ALE260)				
	Х	S	250g Amber Jar (ALE210)				
X		S	60g VOC (ALE215)	0.50	ES2	TP102	21330195
		တ	1kg TUB with Handle (ALE260)	0.50	ES1	TP104	21329801

118	

SDG: A110489-4-1 191210-86 Client Reference: Report Number: 535552 Cwmcarn High School Order Number: C19/1273 Superseded Report: 535249 Location: **Results Legend** 21329801 21329807 21329841 21329885 21330173 21330159 Lab Sample No(s) X Test No Determination Possible Customer WS105 WS108 TP104 TP104 TP105 **TP106** Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ËS ËS Š ES1 ES2 Ë **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water 0.20 0.50 0.30 0.10 0.50 1.00 Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 60g VOC (ALE215) 60g VOC (ALE215) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S ഗ S S S S S S Alkalinity Filtered as CaCO3 All NDPs: 0 Х Х All Ammoniacal Nitrogen NDPs: 0 Tests: 4 Х Х All Anions by Kone (soil) NDPs: 0 Tests: 15 Х Χ Х Х Х Х All Anions by Kone (w) NDPs: 0 Tests: 4 Х Х Asbestos ID in Solid Samples All NDPs: 0 Tests: 27 Χ Χ X X Х Asbestos Quantification - Full All NDPs: 0 Tests: 2 X Boron Water Soluble All NDPs: 0 Tests: 15 Χ Χ X X Χ Χ **CEN Readings** All NDPs: 0 Tests: 4 Х Х Chromium III All NDPs: 0 Tests: 15 Х X Х Х X Х Cvanide Comp/Free/Total/Thiocvanate All NDPs: 0 Tests: 19 Х Χ X Х Х Χ X Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 4 Х Χ Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 4 Χ Х EPH CWG (Aliphatic) Filtered GC (W) NDPs: 0 Tests: 4 Х Χ EPH CWG (Aromatic) Filtered GC (W) All NDPs: 0 Tests: 4 Χ Χ EPH CWG GC (S) All NDPs: 0 X X X X X X

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SDG: A110489-4-1 191210-86 Client Reference: Report Number: 535552 Cwmcarn High School Order Number: C19/1273 Superseded Report: 535249 Location: **Results Legend** 21329801 21329807 21329841 21329885 21330173 21330159 Lab Sample No(s) X Test No Determination Possible Customer WS105 WS108 TP104 TP104 TP105 **TP106** Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ES1 ËS ËS Š Š ES2 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water 0.20 0.50 0.30 0.10 0.50 1.00 Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 60g VOC (ALE215) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S S S S S S S S GRO by GC-FID (S) All NDPs: 0 Х Х Х Х Х Х GRO by GC-FID (W) All NDPs: 0 Tests: 4 Х Х All Hexavalent Chromium (s) NDPs: 0 Tests: 15 Х Χ Х Х Х Х Mercury Dissolved All NDPs: 0 Tests: 4 Х Х All Metals in solid samples by OES NDPs: 0 Tests: 15 Х X Х Χ Χ Х Nitrite by Kone (w) All NDPs: 0 Tests: 4 X X PAH by GCMS All NDPs: 0 Tests: 14 Χ Χ X X Χ PAH in waters by GC-MS (diss.filt) All NDPs: 0 Tests: 4 Х Х рΗ All NDPs: 0 Tests: 15 Х X Х Х X Х nH Value of Filtered Water All NDPs: 0 Tests: 4 Х Χ Phenols by HPLC (S) All NDPs: 0 Tests: 15 Χ Х Х Х Χ Х Phenols by HPLC (W) All NDPs: 0 Tests: 4 X Х Sample description NDPs: 0 Tests: 15 Χ X X Χ Χ X Total Organic Carbon All NDPs: 0 Tests: 15 X X X Χ X X TPH CWG Filtered (W) All NDPs: 0 X X

### **CERTIFICATE OF ANALYSIS**

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SDG: A110489-4-1 535552 191210-86 Client Reference: Report Number: 535249 Location: Cwmcarn High School Order Number: C19/1273 Superseded Report: **Results Legend** 21329807 21329841 21330159 21329801 21329885 21330173 Lab Sample No(s) X Test No Determination Possible Customer WS108 WS105 TP104 TP104 **TP105 TP106** Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid GW - Ground Water ES1 ES1 ES2 ES1 ES1 ES1 **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate PR - Process Water SA - Saline Water 0.30 0.10 0.20 0.50 0.50 1.00 Depth (m) TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 250g Amber Jar (ALE210) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 60g VOC (ALE215) RE - Recreational Water 60g VOC (ALE215) 60g VOC (ALE215) 1kg TUB with Handle (ALE260) 250g Amber Jar (ALE210) DW - Drinking Water Non-regulatory UNL - Unspecified Liquid SL - Sludge Container G - Gas OTH - Other Sample Type S S S S S S S S S S S S S S S S S TPH CWG GC (S) All NDPs: 0 Х X X Х Χ X VOC MS (S) All NDPs: 0 Tests: 15 X X Χ Χ Χ Χ

ALS

SDG: 191210-86 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249 Validated

>10mm

# **Sample Descriptions**

#### **Grain Sizes**

very fine	<0.0	)63mm	fine	0.0	63mm - 0.1mm	m	edium	0.1mm	n - 2mm	coai	rse	2mm -	10mm	very coars										
Lab Sample N	lo(s)	Custom	ner Sample I	Ref.	Depth (m)		Co	lour	Descrip	tion	I	nclusions	Inclu	isions 2										
21330138			BH102		0.20		Dark	Brown	Loamy S	Sand	١	/egetation	St	tones										
21330116			BH103		0.20		Dark	Brown	Silt Lo	am		Stones	Veg	etation										
21330104			BH104		0.20		Darl	Brown	Silt Lo	am		Stones	Veg	etation										
21330072			BH105		0.00 - 0.90		Dark	Brown	San	d		Stones	N	lone										
21330064			BH106		0.30		Dark	Brown	San	d		Stones	N	lone										
21330068			BH106		0.60		Ligh	t Brown	Loamy S	Sand		Stones	N	lone										
21330052			TP101		0.10 - 0.20		Dark	Brown	Loamy S	Sand		Stones	Veg	etation										
21330144			TP101		0.40 - 0.50		Dark Brown		Loamy Sand			Stones	Veg	etation										
21330195			TP102		0.50		Dark Brown		Loamy Sand		Vegetation		St	tones										
21329801			TP104		0.50		Dark Brown		Sandy Loam		Stones		Veg	etation										
21329807		TP104		TP104		TP104		TP104		TP104		TP104			Dark	Brown	Sandy L	.oam		Stones	N	lone		
21329841		TP105		TP105		TP105		TP105		TP105		TP105		TP105			E	lack	Sand		Stones		N	lone
21329885		TP106 0.10		0.10		Dark	Brown	San	d		Stones	N	lone											
21330173			WS105		0.50		Dark	Brown	Sandy L	oam		Stones	Veg	etation										
21330159			WS108		0.20		Dark	Brown	Sandy L	oam		Stones	Veg	etation										

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.



SDG: 191210-86 Location: Cwmcarn High School

Client Reference: A110489-4-1 Order Number: C19/1273 Report Number: Superseded Report: 535552 535249

Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	BH102	BH103	BH104	BH105	BH106	BH106
aq Aqueous / settled sample.		Depth (m)	0.20	0.20	0.20	0.00 - 0.90	0.20	0.00
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type	0.20 Soil/Solid (S)	0.20 Soil/Solid (S)	0.20 Soil/Solid (S)	Soil/Solid (S)	0.30 Soil/Solid (S)	0.60 Soil/Solid (S)
<ul> <li>Subcontracted - refer to subcontractor report accreditation status.</li> </ul>		Date Sampled	02/12/2019	02/12/2019	02/12/2019	02/12/2019	02/12/2019	02/12/2019
** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi	idual	Sample Time Date Received	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019
compounds within samples aren't corrected f recovery	for the	SDG Ref	191210-86	191210-86	191210-86	191210-86	191210-86	191210-86
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21330138 ES1	21330116 ES1	21330104 ES1	21330072 ES1	21330064 ES1	21330068 ES2
Component	LOD/Units							
Moisture Content Ratio (% of as received sample)	%	PM024	24	14	9.5	13	6	7.7
Phenol	<0.01 mg/k	g TM062 (S)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
			М	М	M	M	M	M
Fraction Organic Carbon (FOC)	<0.002	TM132	0.0465 #	0.0267 #	0.0117 #	0.00922 #	0.00722 #	0.00278 #
pH	1 pH Units	s TM133	5.45	6.53	6.18	8.26	9.15	10.3
Chromium, Hexavalent	<0.6 mg/kg	g TM151	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
·	-0.0 mg/ng	ĭ l	#	#	#	#	#	#
Cyanide, Easily liberatable (low level)	<0.5 mg/kg	g TM153	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium, Trivalent	<0.9 mg/kg	g TM181	7.05	6.21	7.54	2.82	3.35	3.77
Arsenic	<0.6 mg/kg	g TM181	16.5	10.7	10.6	5.14	5.14	6.15
		, i	M	М	М	M	M	M
Beryllium	<0.01 mg/k	g TM181	0.666 M	0.508 M	0.421 M	0.354 M	0.428 M	0.575 M
Cadmium	<0.02 mg/k	rg TM181	0.177 M	0.568 M	0.488 M	<0.02 M	3.24 M	0.942 M
Chromium	<0.9 mg/kg	g TM181	7.05	6.21	7.54	2.82	3.35	3.77
Copper	<1.4 mg/kg	g TM181	18.7	12.5	10.5	5.89	7.34	M 4.94
		Ĭ I	M	М	M	М	M	M
Lead	<0.7 mg/kg	g TM181	45.8 M	26.2 M	23.7 M	10.7 M	27.1 M	11.8 M
Mercury	<0.14 mg/k	g TM181	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Nickel	<0.2 mg/kg	g TM181	13.2	21.7	18.3	10.1	14.8	23.8
Selenium	<1 mg/kg	TM181	1.27	1.18	<1 M	<1 M	M <1	M <1
			#		#	#	#	#
Vanadium	<0.2 mg/kg	g TM181	20.3 #	18.4 #	13 #	9.91 #	8.34 #	10.3 #
Zinc	<1.9 mg/kg	g TM181	69.2 M	72.9 M	62.5 M	48.1 M	1400 M	130 M
Boron, water soluble	<1 mg/kg	TM222	<1	<1	<1	<1	<1	<1
Water Soluble Sulphate as SO4	<0.004 g/l	I TM243	0.0096	0.0072	0.0081	0.0166	0.0189	0.0237
2:1 Extract			M	М	М	М	M	M
	-							
	<u>L</u>							
					-	-		



SDG:191210-86Client Reference:A110489-4-1Report Number:535552Location:Cwmcarn High SchoolOrder Number:C19/1273Superseded Report:535249

Results Legend # ISO17025 accredited.		Customer Sample Ref.	S12	TP101	TP101	TP102	TP104	TP104
M mCERTS accredited. aq Aqueous / settled sample.								
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m)	0.30	0.10 - 0.20	0.40 - 0.50	0.50	0.50	1.00
* Subcontracted - refer to subcontractor report accreditation status.	for	Sample Type Date Sampled	Soil/Solid (S) 29/11/2019	Soil/Solid (S) 27/11/2019	Soil/Solid (S) 27/11/2019	Soil/Solid (S) 28/11/2019	Soil/Solid (S) 28/11/2019	Soil/Solid (S) 28/11/2019
** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi	k the	Sample Time						
compounds within samples aren't corrected f		Date Received SDG Ref	10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21329936	21330052	21330144	21330195	21329801	21329807
1-3+§@ Sample deviation (see appendix)		AGS Reference	ES1	ES1	ES2	ES2	ES1	ES2
Moisture Content Ratio (% of as	LOD/Units %	Method PM024		16	7	20	9.6	12
received sample)	/0	1 101024		10	'	20	5.0	12
Phenol	<0.01 mg/k	g TM062 (S)		<0.01	<0.01	<0.01	<0.01	<0.01
	0.01g/	9602 (6)		@ M	@ M	@ M	@ M	@ M
Fraction Organic Carbon (FOC)	<0.002	TM132		0.02	0.00308	0.00868	0.0293	0.012
, , ,				#	#	#	#	#
pH	1 pH Units	TM133		6.04	6.8	6.85	8.22	7.79
	, i			М	М	M	М	М
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6	<0.6	<0.6	<0.6	<0.6
				#	#	#	#	#
Cyanide, Easily liberatable (low	<0.5 mg/kg	TM153		<0.5	<0.5	<0.5	<0.5	<0.5
level)								
Chromium, Trivalent	<0.9 mg/kg	TM181		7.12	3.73	6.81	5.15	4.36
Arsenic	<0.6 mg/kg	TM181		12.2	6.05	7.97	6.24	10
				M	М	M	М	M
Beryllium	<0.01 mg/kg	g TM181		0.535	0.655	0.374	0.369	1.03
				M	М	M	M	M
Cadmium	<0.02 mg/k	g TM181		0.615	0.64	0.513	0.399	0.105
				M	M	M	M	M
Chromium	<0.9 mg/kg	TM181		7.12	3.73	6.81	5.15	4.36
_				M	M	M	M	M
Copper	<1.4 mg/kg	g TM181		14.7	9.87	9.4	8.37	11.6
		=======================================		M	M	M	M	М
Lead	<0.7 mg/kg	g TM181		30.5	9.81	19.5	17.1	20.3
	0.44 "	T1404		M	M	M	M	M
Mercury	<0.14 mg/kg	g TM181		<0.14	<0.14	<0.14	<0.14	<0.14
Ministrat	40.0 //	TN404		M 24.0	M	M	M	M
Nickel	<0.2 mg/kg	TM181		21.2	30.3	8.83	12.2	20.8
Selenium	<1 may//cm	TM404		1.29	1.0F	2.12	M <1	<1 M
Selenium	<1 mg/kg	TM181		1.29	1.05 #	2.12	×1 #	<u>`</u> '
Vanadium	<0.2 mg/kg	TM181		18.3	14	19.8	9.49	12.9
variadium	VU.Z IIIg/Kg	j liviloi		10.3	"#	19.6	9.49	12.9
Zinc	<1.9 mg/kg	TM181		71.6	83.5	49.1	134	62.8
ZIIIC	\1.5 IIIg/kg	j liviloi		/1.0 M	l	49.1 M		02.0 M
Boron, water soluble	<1 mg/kg	TM222		<1	<1	<1	<1	<1
Boron, water soluble	\1 mg/kg	TIVIZZZ		M	М	M	, M	M
Water Soluble Sulphate as SO4	<0.004 g/l	TM243		0.0099	0.0068	0.012	0.0095	0.0101
2:1 Extract	-0.001 g/1	11112 10		M	M	0.012 M	0.0000 M	M
Asbestos Quantification -	<0.001 %	TM304	0.003					
Gravimetric - %	0.001 /0		#					
Asbestos Quantification - PCOM	<0.001 %	TM304	<0.001					
Evaluation - %			#					
Additional Asbestos		TM304	None					
Components (Using TM048)			#					
Analysts Comments		TM304	N/C					
Asbestos Quantification - Total -	<0.001 %	TM304	0.0034					
%			#					
		1						
		1						
		1						
		1						
		1						
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		1						
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		1						
		1						



SDG:191210-86Client Reference:A110489-4-1Report Number:535552Location:Cwmcarn High SchoolOrder Number:C19/1273Superseded Report:535249

Results Legend # ISO17025 accredited.		Customer Sample Ref.	TP105		TP106	WS105	WS108		
M mCERTS accredited. aq Aqueous / settled sample.									
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.30 Soil/Solid (S)		0.10 Soil/Solid (S)	0.50 Soil/Solid (S)	0.20 Soil/Solid (S)		
* Subcontracted - refer to subcontractor report accreditation status.	for	Date Sampled	29/11/2019		29/11/2019	27/11/2019	27/11/2019		
** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi		Sample Time Date Received	10/12/2019		. 10/12/2019	10/12/2019	10/12/2019		
compounds within samples aren't corrected for recovery		SDG Ref	191210-86		191210-86	191210-86	191210-86		
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21329841 ES1		21329885 ES1	21330173 ES1	21330159 ES1		
Component	LOD/Units	Method				·			
Moisture Content Ratio (% of as	%	PM024	25		6.4	9	14		
received sample)	.0.04 #	Th 4000 (0)	-0.04	_	-0.04	-0.04	-0.04		
Phenol	<0.01 mg/kg	TM062 (S)	<0.01 @ I	М	<0.01 @ M	<0.01 @ M	<0.01 @ M		
Fraction Organic Carbon (FOC)	<0.002	TM132	0.279	IVI	0.00544	0.00586	0.0265		
Tradition organic darbon (1 00)	-0.002	111102		#	#	#	#		
pН	1 pH Units	TM133	8.6		9.22	8.2	6.77		
			I	М	M	М	М		
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6		<0.6	<0.6	<0.6		
Cuanida Facily liberatable /law	40 E malles	TM452		#	# -0.5	# *0.5	# -0.5		
Cyanide, Easily liberatable (low level)	<0.5 mg/kg	TM153	<0.5		<0.5	<0.5	<0.5		
Chromium, Trivalent	<0.9 mg/kg	TM181	5.2	+	4.66	8.95	3.23		
Arsenic	<0.6 mg/kg	TM181	16.2		5.23	9.29	20.4		
				М	M	M	M		
Beryllium	<0.01 mg/kg	TM181	1.16	,	0.531	0.633	0.583		
Cadmium	<0.02 mg/kg	TM181	0.0273	М	0.143	0.521	1.92		+
Gaaman	~0.02 mg/kg	1 10 1 10 1		М	0.143 M	0.521 M	1.92 M		
Chromium	<0.9 mg/kg	TM181	5.2	-	4.66	8.95	3.23		
			I	М	M	М	М		
Copper	<1.4 mg/kg	TM181	44.4		6.85	9.24	24.1		
		=======================================		М	M	M	M		
Lead	<0.7 mg/kg	TM181	12.7	М	12.3 M	13.2 M	39.1 M		
Mercury	<0.14 mg/kg	TM181	<0.14	IVI	<0.14	<0.14	<0.14		<del>                                     </del>
Moroury	10.14 mg/kg	1101		М	M	M	M		
Nickel	<0.2 mg/kg	TM181	30.6		19.4	26.6	20		
			I	М	M	М	М		
Selenium	<1 mg/kg	TM181	<1		<1	<1	1.24		
Vanadium	<0.0 maller	TM404	24.4	#	9.16	44.0	20.7		
Vanadium	<0.2 mg/kg	TM181		#	9.10	14.9 #	20.7		
Zinc	<1.9 mg/kg	TM181	25.8		57.9	76.3	347		
				М	M	М	М		
Boron, water soluble	<1 mg/kg	TM222	<1		<1	<1	<1		
W	0.004 #	T14040		М	M	M	M		
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243	0.013	М	0.0401 M	0.0736 M	0.0085 M		
Asbestos Quantification -	<0.001 %	TM304		IVI	IVI	<0.001	IVI		
Gravimetric - %	3.331 /3	,				40.001			
Asbestos Quantification - PCOM	<0.001 %	TM304				<0.001			
Evaluation - %						#			
Additional Asbestos		TM304				None #			
Components (Using TM048)  Analysts Comments		TM304				# N/C			+
aryoto confinionto		1 IVIOUT				14/0			
Asbestos Quantification - Total -	<0.001 %	TM304				<0.001			
%						#			
				+					<del>                                     </del>
				+					
				-				<u> </u>	
				+					
				$\top$					

535552 535249 Report Number: Superseded Report: SDG: 191210-86 Client Reference: A110489-4-1 Cwmcarn High School Order Number: C19/1273 Location:

PAH by GCMS											_
Results Legend # ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	BH102		BH103	BH104		BH105	BH106	BH106	
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted - refer to subcontractor report	for	Depth (m) Sample Type Date Sampled	0.20 Soil/Solid (S) 02/12/2019		0.20 Soil/Solid (S) 02/12/2019	0.20 Soil/Solid (S) 02/12/2019		0.00 - 0.90 Soil/Solid (S) 02/12/2019	0.30 Soil/Solid (S) 02/12/2019	0.60 Soil/Solid (S) 02/12/2019	
accreditation status.  ** % recovery of the surrogate standard to check		Sample Time									
efficiency of the method. The results of indivi- compounds within samples aren't corrected for		Date Received SDG Ref	10/12/2019 191210-86		10/12/2019 191210-86	10/12/2019 191210-86		10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86	
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21330138		21330116	21330104		21330072	21330064	21330068	
1-3+§@ Sample deviation (see appendix)	L OD/Unite	AGS Reference	ES1		ES1	ES1		ES1	ES1	ES2	
Naphthalene-d8 % recovery**	LOD/Units %	Method TM218	95.2		97.2	94.3		97	97.9	99.2	┪
Acenaphthene-d10 %	%	TM218	98.3		97.1	95.3		98.4	97.7	97	$\dashv$
recovery**											4
Phenanthrene-d10 % recovery**	%	TM218	99.2		99	94.4		96.7	95.4	96.2	╛
Chrysene-d12 % recovery**	%	TM218	90.3		88.4	81.3		76	73	88.3	
Perylene-d12 % recovery**	%	TM218	84.2		93.6	76.4		78.3	74.5	95.7	٦
Naphthalene	<0.009 mg/kg	TM218	0.0237	М	0.0222 M	<0.009	М	<0.009 M	<0.009 M	<0.009	М
Acenaphthylene	<0.012 mg/kg	TM218	<0.012	М	0.0276 M	<0.012	М	<0.012 M	<0.012 M	<0.012	М
Acenaphthene	<0.008	TM218	<0.008	М	<0.008	<0.008	М	<0.008	<0.008	<0.008	М
Fluorene	mg/kg <0.01 mg/kg	g TM218	<0.01		<0.01	<0.01		<0.01	<0.01	<0.01	
Phenanthrene	<0.015	TM218	0.0979	M	0.142	0.0395	M	<0.015	<0.015	<0.015	М
Anthracene	mg/kg <0.016	TM218	<0.016	M	0.0249	<0.016	M	<0.016	<0.016	<0.016	M
Fluoranthene	mg/kg <0.017	TM218	0.0916	М	0.239	0.069	M	<0.017	0.0326	<0.017	M
	mg/kg			М	М		М	М	M		М
Pyrene	<0.015 mg/kg	TM218	0.0714	М	0.193 M	0.0563	М	<0.015 M	0.0276 M	<0.015	М
Benz(a)anthracene	<0.014 mg/kg	TM218	0.0515	М	0.116 M	0.0427	М	<0.014 M	0.0188 M	<0.014	М
Chrysene	<0.01 mg/k	g TM218	0.0984	М	0.139 M	0.0479	М	<0.01 M	0.0224 M	<0.01	М
Benzo(b)fluoranthene	<0.015 mg/kg	TM218	0.122	М	0.178 M	0.0888	М	<0.015 M	0.0285 M	<0.015	М
Benzo(k)fluoranthene	<0.014 mg/kg	TM218	0.0236	М	0.0544 M	0.0272	М	<0.014 M	<0.014 M	<0.014	М
Benzo(a)pyrene	<0.015 mg/kg	TM218	0.0472	М	0.0951 M	0.0403	М	<0.015 M	0.0189 M	<0.015	М
Indeno(1,2,3-cd)pyrene	<0.018	TM218	0.0419		0.0675	0.0363		<0.018	<0.018	<0.018	
Dibenzo(a,h)anthracene	mg/kg <0.023	TM218	<0.023	M	<0.023	<0.023	M	<0.023	<0.023	<0.023	M
Benzo(g,h,i)perylene	mg/kg <0.024	TM218	0.0357	М	0.062	0.0338	M	<0.024	<0.024	<0.024	M
PAH, Total Detected USEPA 16	mg/kg <0.118	TM218	0.705	М	<0.118	0.482	M	<0.118	0.149	<0.118	M
, 100. 200000 002.71.10	mg/kg		0.1.00		3.1.10	002		35	00	<b>33</b>	$\dashv$
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Report Number: Superseded Report: 535552 535249 SDG: 191210-86 Client Reference: A110489-4-1 Cwmcarn High School Order Number: C19/1273 Location:

PAH by GCMS								
Results Legend # ISO17025 accredited.		Customer Sample Ref.	TP101	TP101	TP102	TP104	TP104	TP105
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.10 - 0.20	0.40 - 0.50	0.50	0.50	1.00	0.30
tot.unfilt Total / unfiltered sample.		Sample Type	0.10 - 0.20 Soil/Solid (S)	0.40 - 0.50 Soil/Solid (S)	0.50 Soil/Solid (S)	Soil/Solid (S)	1.00 Soil/Solid (S)	0.30 Soil/Solid (S)
* Subcontracted - refer to subcontractor report accreditation status.		Date Sampled Sample Time	27/11/2019	27/11/2019	28/11/2019	28/11/2019	28/11/2019	29/11/2019
efficiency of the method. The results of individ	dual	Date Received	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019
compounds within samples aren't corrected for	or the	SDG Ref	191210-86	191210-86	191210-86	191210-86	191210-86	191210-86
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21330052 ES1	21330144 ES2	21330195 ES2	21329801 ES1	21329807 ES2	21329841 ES1
Component	LOD/Units	Method						
Naphthalene-d8 % recovery**	%	TM218	95.4	975	89.4	92.8	82.3	80.3
Acenaphthene-d10 % recovery**	%	TM218	93.9	966	88.7	92.3	83.1	82.6
Phenanthrene-d10 % recovery**	%	TM218	94.6	939	88.4	92.6	78.2	74.3
Chrysene-d12 % recovery**	%	TM218	84.6	742	74.8	79.5	67.8	59
Perylene-d12 % recovery**	%	TM218	86.9	757	73.8	75.6	66.3	53.6
Naphthalene	<0.009 mg/kg	TM218	0.0221 @ M	<0.09 @ M	<0.009 @ M	0.0154 @ M	<0.009 @ M	0.114 @ M
Acenaphthylene	<0.012	TM218	<0.012	<0.12	<0.012	0.0172	<0.012	<0.012
Aconomhthors	mg/kg	TMO40	@ M	@ M	@ M	@ M	@ M	@ M
Acenaphthene	<0.008 mg/kg	TM218	<0.008 @ M	<0.08 @ M	<0.008 @ M	<0.008 @ M	<0.008 @ M	<0.008 @ M
Fluorene	<0.01 mg/kg	TM218	<0.01	<0.1	<0.01	0.012	<0.01	0.0257
			@ M	@ M	@ M	@ M	@ M	@ M
Phenanthrene	<0.015 mg/kg	TM218	0.0653 @ M	<0.15 @ M	<0.015 @ M	0.109 @ M	0.0457 @ M	0.226 @ M
Anthracene	<0.016 mg/kg	TM218	<0.016 @ M	<0.16 @ M	<0.016 @ M	0.0285 @ M	<0.016 @ M	<0.016 @ M
Fluoranthene	<0.017	TM218	0.0574	<0.17	<0.017	0.222	0.0637	0.0545
Pyrene	mg/kg <0.015	TM218	@ M 0.0443	@ M <0.15	@ M <0.015	0.173	@ M 0.0463	@ M 0.0497
Ponz/a)anthracono	mg/kg <0.014	TM218	@ M 0.0302	@ M <0.14	@ M <0.014	@ M 0.127	@ M 0.0376	@ M 0.0424
Benz(a)anthracene	mg/kg	1 IVIZ 10	0.0302 @ M	<0.14 @ M	<0.014 @ M	0.127 @ M	0.0376 @ M	0.0424 @ M
Chrysene	<0.01 mg/kg	TM218	0.0434 @ M	<0.1 @ M	<0.01 @ M	0.132 @ M	0.047 @ M	0.0689 @ M
Benzo(b)fluoranthene	<0.015 mg/kg	TM218	0.0651 @ M	<0.15 @ M	<0.015 @ M	0.238 @ M	0.0758 @ M	0.0853 @ M
Benzo(k)fluoranthene	<0.014 mg/kg	TM218	<0.014 @ M	<0.14 @ M	<0.014 @ M	0.0647 @ M	<0.014 @ M	<0.014 @ M
Benzo(a)pyrene	<0.015 mg/kg	TM218	0.0279 @ M	<0.15 @ M	<0.015 @ M	0.126 @ M	0.0334 @ M	0.0281 @ M
Indeno(1,2,3-cd)pyrene	<0.018	TM218	0.024	<0.18	<0.018	0.114	0.0354	0.0329
Dibenzo(a,h)anthracene	mg/kg <0.023	TM218	@ M <0.023	@ M <0.23	@ M <0.023	@ M <0.023	@ M <0.023	@ M <0.023
=	mg/kg	1111210	₹0.020 @ M	₹0.23 @ M	(0.023 @ M	₹0.025 @ M	₹0.023 @ M	₹0.025 @ M
Benzo(g,h,i)perylene	<0.024	TM218	<0.024	<0.24	<0.024	0.109	<0.024	0.0356
PAH, Total Detected USEPA 16	mg/kg <0.118	TM218	@ M 2.43	@ M <1.18	@ M <0.118	@ M 1.49	@ M 0.385	@ M 0.764
	mg/kg							

### **CERTIFICATE OF ANALYSIS**

ALS

SDG:191210-86Client Reference:A110489-4-1Report Number:535552Location:Cwmcarn High SchoolOrder Number:C19/1273Superseded Report:535249

(ALS)		o minoam mg.		riumbon o .		
PAH by GCMS						
Results Legend		Customer Sample Ref.	TP106	WS105		
# ISO17025 accredited.			11 100	110100		
M mCERTS accredited. aq Aqueous / settled sample.						
diss.filt Dissolved / filtered sample.		Depth (m)	0.10	0.50		
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report	t for	Sample Type	Soil/Solid (S)	Soil/Solid (S)		
accreditation status.		Date Sampled	29/11/2019	27/11/2019		
** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi	ck the	Sample Time Date Received	10/12/2019	10/12/2019		
compounds within samples aren't corrected to		SDG Ref	191210-86	191210-86		
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21329885	21330173		
1-3+§@ Sample deviation (see appendix)		AGS Reference	ES1	ES1		
Component	LOD/Units	Method				
Naphthalene-d8 % recovery**	%	TM218	90	92.2		
Traphilations do 70 recording	,,	2.0	• • • • • • • • • • • • • • • • • • • •	V		
	0/	T14040	22.5	00.7		
Acenaphthene-d10 %	%	TM218	90.5	93.7		
recovery**						
Phenanthrene-d10 % recovery**	%	TM218	91	94.3		
,						
Ob**	0/	TM040	70.0	00.0		
Chrysene-d12 % recovery**	%	TM218	73.3	83.8		
Perylene-d12 % recovery**	%	TM218	74.6	81.7		
Naphthalene	<0.009	TM218	<0.009	<0.009		
ιταρπιπαισπο		1 IVIZ 10				
	mg/kg		@ M	@ M		
Acenaphthylene	<0.012	TM218	<0.012	<0.012		
	mg/kg	1	@ M	@ M		
Acenaphthene	<0.008	TM218	<0.008	<0.008		
ποσπαριτιποπο		1 IVIZ 10				
	mg/kg		@ M	@ M		
Fluorene	<0.01 mg/kg	g TM218	<0.01	<0.01		
	1	1	@ M	@ M		
Phenanthrene	<0.015	TM218	0.0824	0.0508		
1 Honditalione	1	1141210				
	mg/kg		@ M	@ M		
Anthracene	<0.016	TM218	0.0176	<0.016		
	mg/kg		@ M	@ M		
Fluoranthene	<0.017	TM218	0.674	0.0849		
T ladianations		1111210	@ M	@ M		
_	mg/kg					
Pyrene	<0.015	TM218	0.623	0.073		
	mg/kg		@ M	@ M		
Benz(a)anthracene	< 0.014	TM218	0.259	0.105		
Bonz(a)ananaoono	mg/kg	1111210				
			@ M	@ M		
Chrysene	<0.01 mg/kg	g TM218	0.323	0.102		
			@ M	@ M		
Benzo(b)fluoranthene	<0.015	TM218	0.203	0.182		
	mg/kg		@ M	@ M		
D (1)(1 1)		T14040				
Benzo(k)fluoranthene	<0.014	TM218	0.0661	0.0541		
	mg/kg		@ M	@ M		
Benzo(a)pyrene	< 0.015	TM218	0.112	0.0832		
( // /	mg/kg		@ M	@ M		
Indeno(1,2,3-cd)pyrene	<0.018	TM218	0.0598	0.0709		
indeno(1,2,3-cd)pyrene		1101210				
	mg/kg		@ M	@ M		
Dibenzo(a,h)anthracene	<0.023	TM218	<0.023	<0.023		
	mg/kg	1	@ M	@ M		
Benzo(g,h,i)perylene	<0.024	TM218	0.0497	0.0713		
25.120(g,11,1/por front	mg/kg	11412 10		0.0713 @ M		
B.U. T. J.B			@ M		<del>                                     </del>	
PAH, Total Detected USEPA 16	<0.118	TM218	2.47	0.876		
	mg/kg					
		1				
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535552 535249 SDG: Report Number: Superseded Report: 191210-86 Client Reference: A110489-4-1 Cwmcarn High School Order Number: C19/1273 Location:

TPH CWG (S)								
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH102	BH103	BH104	BH105	BH106	BH106
M mCERTS accredited.  aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.  Subcontracted - refer to subcontractor repor accreditation status.  " ** recovery of the surrogate standard to che efficiency of the method. The results of indiv compounds within samples aren't corrected recovery  (F) Trigger breach confirmed	ck the ridual	Depth (m) Sample Type Date Sampled Sample Time Date Received SDG Ref Lab Sample No.(s)	0.20 Soil/Solid (S) 02/12/2019 10/12/2019 191210-86 21330138	0.20 Soil/Solid (S) 02/12/2019 	0.20 Soil/Solid (S) 02/12/2019 10/12/2019 191210-86 21330104	0.00 - 0.90 Soil/Solid (S) 02/12/2019 . 10/12/2019 191210-86 21330072	0.30 Soil/Solid (S) 02/12/2019  10/12/2019 191210-86 21330064	0.60 Soil/Solid (S) 02/12/2019 10/12/2019 191210-86 21330068
1-3+§@ Sample deviation (see appendix)	I OD/Unite	AGS Reference	ES1	ES1	ES1	ES1	ES1	ES2
GRO Surrogate % recovery**	LOD/Units %	Method TM089	70.9	77.7	76.7	81.9	96.5	98
Aliphatics >C5-C6	<0.01 mg/kg	g TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	<0.01 mg/kg	g TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aliphatics >C12-C16	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aliphatics >C16-C21	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aliphatics >C21-C35	<1 mg/kg	TM414	6.85	4.75	6.83	<1	<1	<1
Aliphatics >C35-C44	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Total Aliphatics >C10-C44	<5 mg/kg	TM414	7.45	6.18	8.65	<5	<5	<5
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	TM414	11.6	10.8	13.2	<10	<10	<10
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aromatics > EC12-EC16	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aromatics > EC16-EC21	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aromatics > EC21-EC35	<1 mg/kg	TM414	2.96	2.72	2.95	<1	<1	<1
Aromatics >EC35-EC44	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Aromatics > EC40-EC44	<1 mg/kg	TM414	<1	<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44	<5 mg/kg	TM414	<5	<5	<5	<5	<5	<5
Total Aliphatics & Aromatics >C5-C44	<10 mg/kg	TM414	<10	<10	<10	<10	<10	<10
Total Aliphatics >C5-C10	<0.05 mg/kg		<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
GRO >C5-C10	<0.02 mg/kç	TM089	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02

### **CERTIFICATE OF ANALYSIS**

ALS

SDG:191210-86Client Reference:A110489-4-1Report Number:535552Location:Cwmcarn High SchoolOrder Number:C19/1273Superseded Report:535249

TPH CWG (S)									
Results Legend # ISO17025 accredited.	С	ustomer Sample Ref.	TP101		TP101	TP102	TP104	TP104	TP105
M mCERTS accredited. aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. Subcontracted - refer to subcontractor rep	ort for	Depth (m) Sample Type	0.10 - 0.20 Soil/Solid (S)		0.40 - 0.50 Soil/Solid (S)	0.50 Soil/Solid (S)	0.50 Soil/Solid (S)	1.00 Soil/Solid (S)	0.30 Soil/Solid (S)
accreditation status.  ** % recovery of the surrogate standard to ch		Date Sampled Sample Time	27/11/2019		27/11/2019	28/11/2019	28/11/2019	28/11/2019	29/11/2019
efficiency of the method. The results of ind compounds within samples aren't correcte		Date Received SDG Ref	10/12/2019 191210-86		10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21330052		21330144	21330195	21329801	21329807	21329841
1-3+§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference Method	ES1		ES2	ES2	ES1	ES2	ES1
GRO Surrogate % recovery**	%	TM089	72	@	119 @	86	98	76	38.1 3 @
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	@	<0.01	<0.01	<0.01	<0.01	<0.01 3 @
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01	@	<0.01 @	<0.01	<0.01	<0.01	<0.01 3 @
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	@	<0.01 @	<0.01	<0.01	<0.01	<0.01 3 @
Aliphatics >C10-C12	<1 mg/kg	TM414	<1		<1	<1	<1	<1	<1
Aliphatics >C12-C16	<1 mg/kg	TM414	<1		<1	<1	<1	<1	1.59
Aliphatics >C16-C21	<1 mg/kg	TM414	<1		<1	<1	<1	<1	1.31
Aliphatics >C21-C35	<1 mg/kg	TM414	4.03		<1	<1	4.56	14	<1
Aliphatics >C35-C44	<1 mg/kg	TM414	<1		<1	<1	<1	4.72	<1
Total Aliphatics >C10-C44	<5 mg/kg	TM414	<5		<5	<5	5.87	18.9	<5
Total Aliphatics & Aromatics >C10-C44	<10 mg/kg	TM414	13		<10	<10	17.3	20.9	<10
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	@	<0.01 @	<0.01	<0.01	<0.01	<0.01 3 @
Aromatics >EC7-EC8	<0.01 mg/kg	TM089		@	<0.01 @	<0.01	<0.01	<0.01	<0.01 3 @
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	@	<0.01 @	<0.01	<0.01	<0.01	<0.01 3 @
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1		<1	<1	<1	<1	<1
Aromatics > EC12-EC16	<1 mg/kg	TM414	<1		<1	<1	<1	<1	1.33
Aromatics > EC16-EC21	<1 mg/kg	TM414	<1		<1	<1	1.15	<1	1.49
Aromatics > EC21-EC35	<1 mg/kg	TM414	6.92		1.38	<1	9.16	<1	2.5
Aromatics >EC35-EC44	<1 mg/kg	TM414	<1		<1	<1	1.04	<1	<1
Aromatics > EC40-EC44	<1 mg/kg	TM414	<1		<1	<1	<1	<1	<1
Total Aromatics > EC10-EC44	<5 mg/kg	TM414	8.16		<5	<5	11.4	<5	6.32
Total Aliphatics & Aromatics >C5-C44	<10 mg/kg	TM414	<10		<10	<10	17.3	18.9	<10
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089	<0.05	@	<0.05 @	<0.05	<0.05	<0.05	<0.05 3 @
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089		@	<0.05 @	<0.05	<0.05	<0.05	<0.05 3 @
GRO >C5-C10	<0.02 mg/kg	TM089	<0.02	@	<0.02 @	<0.02	<0.02	<0.02	<0.02 3 @

### **CERTIFICATE OF ANALYSIS**

ALS

 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

TPH CWG (S)								
Results Legend		Customer Sample Ref.	TP106	WS105	WS108			
# ISO17025 accredited.  M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.10	0.50	0.20			
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor repo	ort for	Sample Type Date Sampled	Soil/Solid (S) 29/11/2019	Soil/Solid (S) 27/11/2019	Soil/Solid (S) 27/11/2019			
accreditation status.  ** % recovery of the surrogate standard to che		Sample Time						
efficiency of the method. The results of indi compounds within samples aren't corrected		Date Received SDG Ref	10/12/2019 191210-86	10/12/2019 191210-86	10/12/2019 191210-86			
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21329885	21330173	21330159			
1-3+§@ Sample deviation (see appendix)	LOD/Units	AGS Reference Method	ES1	ES1	ES1			
GRO Surrogate % recovery**	%	TM089	110	97	82.1			
Cite duringula // receivery	,,,	1111000	@	(a	1	@		
Aliphatics >C5-C6	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	Ŭ		
			@	@	!	@		
Aliphatics >C6-C8	<0.01 mg/kg	TM089	<0.01	<0.01	0.0199			
			@	@		@		
Aliphatics >C8-C10	<0.01 mg/kg	TM089	<0.01	<0.01	0.0269	_		
Aliahadiaa > 040,040	44	TNAAAA	@	(0)		@		
Aliphatics >C10-C12	<1 mg/kg	TM414	<1	<1	<1			
Aliphatics >C12-C16	<1 mg/kg	TM414	<1	<1	<1			
7 iiipiiatio5 7 0 12 0 10	1 mg/kg	1101414	''	1	1			
Aliphatics >C16-C21	<1 mg/kg	TM414	<1	<1	<1			
					<u> </u>		 	
Aliphatics >C21-C35	<1 mg/kg	TM414	2.5	1.28	4.1			
Aliphatics >C35-C44	<1 mg/kg	TM414	<1	<1	<1			
			_	_				
Total Aliphatics >C10-C44	<5 mg/kg	TM414	<5	<5	5.32			
Total Aliphatics & Aromatics	<10 mg/kg	TM414	10.6	<10	37.3			
>C10-C44	< 10 mg/kg	1101414	10.0	<10	37.3			
Aromatics >EC5-EC7	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01			
7 II O I I I I I I I I I I I I I I I I I	-0.01 mg/ng	1111000	@	@	1	@		
Aromatics >EC7-EC8	<0.01 mg/kg	TM089	<0.01	<0.01	<0.01	Ŭ		
			@	@	!	@		
Aromatics >EC8-EC10	<0.01 mg/kg	TM089	<0.01	<0.01	0.0176			
			@	@		@		
Aromatics > EC10-EC12	<1 mg/kg	TM414	<1	<1	<1			
A " - F040 F040	.4 //	T1444	.4		- 4			
Aromatics > EC12-EC16	<1 mg/kg	TM414	<1	<1	<1			
Aromatics > EC16-EC21	<1 mg/kg	TM414	1.76	<1	5.9			
711011101100 · E010 E021	- mg/kg		1.70	''	0.0			
Aromatics > EC21-EC35	<1 mg/kg	TM414	4.46	5.42	24.2			
Aromatics >EC35-EC44	<1 mg/kg	TM414	<1	<1	1.66			
Aromatics > EC40-EC44	<1 mg/kg	TM414	<1	<1	<1			
Total Aromatics > EC10-EC44	∠E man/lea	TMAAA	7.2	7.46	20			
Total Aromatics > EC 10-EC44	<5 mg/kg	TM414	7.3	7.46	32			
Total Aliphatics & Aromatics	<10 mg/kg	TM414	<10	<10	37.4			
>C5-C44	1							
Total Aliphatics >C5-C10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05			
			@	@	!	@		
Total Aromatics >EC5-EC10	<0.05 mg/kg	TM089	<0.05	<0.05	<0.05			
			@	@		@		
GRO >C5-C10	<0.02 mg/kg	TM089	<0.02	<0.02	<0.02	_		
	1		@	@	!	@		

### **CERTIFICATE OF ANALYSIS**

535552 535249 SDG: Report Number: Superseded Report: 191210-86 Client Reference: A110489-4-1 Cwmcarn High School Order Number: C19/1273 Location:

VOC MS (S)								
Results Legend	C	Customer Sample Ref.	BH102	BH103	BH104	BH105	BH106	BH106
# ISO17025 accredited. M mCERTS accredited.								
aq Aqueous / settled sample. diss.filt Dissolved / filtered sample.		Depth (m)	0.20	0.20	0.20	0.00 - 0.90	0.30	0.60
tot.unfilt Total / unfiltered sample.		Sample Type	Soil/Solid (S)					
<ul> <li>Subcontracted - refer to subcontractor repo accreditation status.</li> </ul>	ort for	Date Sampled	02/12/2019	02/12/2019	02/12/2019	02/12/2019	02/12/2019	02/12/2019
** % recovery of the surrogate standard to che	eck the	Sample Time			,			
efficiency of the method. The results of indi- compounds within samples aren't corrected		Date Received	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019	10/12/2019
recovery	Tior the	SDG Ref	191210-86	191210-86	191210-86	191210-86	191210-86	191210-86
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21330138 ES1	21330116 ES1	21330104 ES1	21330072 ES1	21330064 ES1	21330068 ES2
	LOD/Units	Method	LOI	201	LOI	LOT	LOI	L02
Component Dibromofluoromethane**			404	407	404	404	400	400
Dibromofiuoromethane	%	TM116	104	107	104	104	108	108
Toluene-d8**	%	TM116	98.1	91.9	97.6	95.9	95.9	96.6
4-Bromofluorobenzene**	%	TM116	93.8	75.7	93.2	88	87.2	91.2
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.2	<0.01	<0.2	<0.01	<0.01	<0.01
Mounty Fordary Butyl Euror	-o.or mg/ng	110	М	М	M	.0.01 M	.0.01 M	M
D	40,000	TM44C						
Benzene	<0.009	TM116	<0.18	<0.009	<0.18	<0.009	<0.009	<0.009
	mg/kg		M	M	M	M	М	М
Toluene	<0.007	TM116	<0.14	<0.007	<0.14	<0.007	<0.007	<0.007
	mg/kg	<u>                                       </u>	М	М	М	M	М	М
Ethylbenzene	<0.004	TM116	<0.08	<0.004	<0.08	<0.004	<0.004	<0.004
* * * * * * * * * * * * * * * * * * *	mg/kg	"	M	М	M	M	М	M
n/m Yylono		TM116	<0.2	<0.01	<0.2	<0.01		<0.01
p/m-Xylene	<0.01 mg/kg	UNITE					<0.01	
	1		#	#	#	#	#	#
o-Xylene	<0.01 mg/kg	TM116	<0.2	<0.01	<0.2	<0.01	<0.01	<0.01
			М	М	M	M	М	M
	+							
	<u></u>		<u></u>	<u> </u>				
	-							
	1							
	+							

### **CERTIFICATE OF ANALYSIS**

Report Number: Superseded Report: 535552 535249 SDG: 191210-86 Client Reference: A110489-4-1 Cwmcarn High School Order Number: C19/1273 Location:

VOC MS (S)														
Results Legend # IS017025 accredited.		Customer Sample Ref.	TP101		TP101		TP102		TP104		TP104		TP105	
M mCERTS accredited. aq Aqueous / settled sample.														
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.10 - 0.20		0.40 - 0.50		0.50		0.50		1.00		0.30	,
* Subcontracted - refer to subcontractor report accreditation status.	for	Date Sampled	Soil/Solid (S) 27/11/2019		Soil/Solid (S) 27/11/2019		Soil/Solid (S) 28/11/2019		Soil/Solid (S) 28/11/2019		Soil/Solid (S) 28/11/2019		Soil/Solid (S) 29/11/2019	
** % recovery of the surrogate standard to check efficiency of the method. The results of individ	k the	Sample Time	10/12/2019		10/12/2019		10/12/2019		10/12/2019		40/40/0040		10/12/2019	
compounds within samples aren't corrected for	or the	Date Received SDG Ref	191210-86		191210-86		191210-86		191210-86		10/12/2019 191210-86		191210-86	
(F) Trigger breach confirmed		Lab Sample No.(s)	21330052		21330144		21330195		21329801		21329807		21329841	
1-3+§@ Sample deviation (see appendix)  Component	LOD/Units	AGS Reference Method	ES1		ES2		ES2		ES1		ES2		ES1	
Dibromofluoromethane**	%	TM116	104		105		107		104		105		104	$\neg$
				@		@				@		@		@
Toluene-d8**	%	TM116	95.9		95.1		91.5		96.7		96.6		92.2	
				@		@		4		@		@		@
4-Bromofluorobenzene**	%	TM116	94.6		82		75.4		94.2	_	93.8		75.5	
Mothed Testions Duted Ether	<0.01 mg/kg	TM116	<0.1	@	<0.01	@	<0.01		<0.1	@	<0.1	@	<0.2	@
Methyl Tertiary Butyl Ether	<0.01 mg/kg	INITIO		M	<0.01	@ M		М	<0.1	@ M		@ M	<0.2	@ M
Benzene	<0.009	TM116	<0.09	į IVI	<0.009	W IVI	<0.009	IVI	<0.09	W IVI	<0.09	W IVI	<0.18	W IVI
Bonzono	mg/kg	110		M		@ M		М	-0.00	@ M		@ M	-0.10	@ M
Toluene	<0.007	TM116	<0.07	Ť	<0.007	<u> </u>	<0.007	$\top$	<0.07	<u> </u>	<0.07	<u> </u>	<0.14	
	mg/kg			) M		@ M		М		@ M		@ M		@ M
Ethylbenzene	<0.004	TM116	<0.04		<0.004		<0.004	T	<0.04		<0.04		<0.08	
	mg/kg			) M		@ M		М		@ M		@ M		@ M
p/m-Xylene	<0.01 mg/kg	TM116	<0.1		<0.01	O "	<0.01	_	<0.1	o "	<0.1		<0.2	
- Volene	40.04//	TMAAC		2)#	-0.04	@#		#	-0.1	@#		@#	-0.0	@#
o-Xylene	<0.01 mg/kg	TM116	<0.1	M	<0.01	@ M	<0.01	М	<0.1	@ M	<0.1	@ M	<0.2	@ M
			@	į IVI		W IVI		IVI		W IVI	(	W IVI		W IVI
				$\neg$				$\top$						
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				$\dashv$				+						-
				$\neg$				$\top$						$\neg$
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				$\dashv$				+						
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				4				+						
		+		$\dashv$				+						-
				$\dashv$				$\top$						$\neg$
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		+		$\dashv$				+						-
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### **CERTIFICATE OF ANALYSIS**

535552 535249 Report Number: Superseded Report: SDG: 191210-86 Client Reference: A110489-4-1 Cwmcarn High School Order Number: C19/1273 Location:

VOC MS (S)							
Results Legend # ISO17025 accredited.	(	Customer Sample Ref.	TP106	WS105	WS108		
M mCERTS accredited. aq Aqueous / settled sample.							
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	0.10 Soil/Solid (S)	0.50	0.20 Soil/Solid (S)		
* Subcontracted - refer to subcontractor report accreditation status.	for	Date Sampled	29/11/2019	Soil/Solid (S) 27/11/2019	27/11/2019		
** % recovery of the surrogate standard to check efficiency of the method. The results of individ	k the	Sample Time Date Received	10/12/2019	10/12/2019	10/12/2019		
compounds within samples aren't corrected for recovery	or the	SDG Ref	191210-86	191210-86	191210-86		
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21329885 ES1	21330173 ES1	21330159 ES1		
Component	LOD/Units	Method	201	201	201		
Dibromofluoromethane**	%	TM116	104	107	103		
				@	@		
Toluene-d8**	%	TM116	92.6	94.4	95.6		
4 Dramafiliarahannana**	0/	TM116	80.1	<u>@</u> 85.7	<u>@</u> 91.8		
4-Bromofluorobenzene**	%	TIVITIO	00.1	65.7 @	91.6		
Methyl Tertiary Butyl Ether	<0.01 mg/kg	TM116	<0.01	<0.01	<0.1		
, , ,			М	@ M	@ M		
Benzene	<0.009	TM116	<0.009	<0.009	<0.09		
	mg/kg		M	@ M	@ M		
Toluene	<0.007	TM116	<0.007 M	0.00919	<0.07		
Ethylbenzene	mg/kg <0.004	TM116	<0.004	@ M <0.004	@ M <0.04		
	mg/kg	110	10.004 M	© M	(0.04 @ M		
p/m-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.1		
			#	@#	@#		
o-Xylene	<0.01 mg/kg	TM116	<0.01	<0.01	<0.1		
			M	@ M	@ M		
	•					•	



SDG:191210-86Client Reference:A110489-4-1Report Number:535552Location:Cwmcarn High SchoolOrder Number:C19/1273Superseded Report:535249

# **Asbestos Identification - Solid Samples**

# ISO17025 ad								.p. 33			
M mCERTS ac  * Subcontract  (F) Trigger brea  1-5&♦§@ Sample dev	ted test. ach confirmed	Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH102ES1 0.20 SOLID 02/12/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330138 TM048	16/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH103ES1 0.20 SOLID 02/12/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330116 TM048	16/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH104ES1 0.20 SOLID 02/12/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330104 TM048	16/12/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH105ES1 0.00 - 0.90 SOLID 02/12/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330072 TM048	16/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH106ES1 0.30 SOLID 02/12/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330064 TM048	16/12/2019	James Richards	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH106ES2 0.60 SOLID 02/12/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330068 TM048	16/12/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	S1ES1 0.40 SOLID 28/11/2019 00:00:00 10/12/2019 14:28:00 191210-86 21329834 TM048	16/12/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	S2ES1 0.10 SOLID 02/12/2019 00:00:00 10/12/2019 14:28:00 191210-86 21329979 TM048	16/12/2019	Lucy Caroe	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Detected

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SDG: Δ110489-4-1 191210-86 Client Reference: Report Number: 535552 Cwmcarn High School Order Number: C19/1273 Superseded Report: 535249 Location: Date of Analysis Analysed By Comments Amosite Chrysotile Crocidolite Fibrous Fibrous Fibrous Non-Achectos (White) (Blue) Asbestos Anthophyllite Tremolite (Brown) Actinolite Fibre Ashestos Ashesto Cust. Sample Ref. S3FS1 16/12/19 Andrzej Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 0.30 Depth (m) Ferfecki (#) (#) (#) (#) (#) (#) Sample Type SOLID 02/12/2019 00:00:00 Date Sampled 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21329997 Method Number TM048 Cust. Sample Ref. S4FS1 12/12/2019 James Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 0.10 Depth (m) Richards (#) (#) (#) (#) (#) (#) Sample Type SOLID Date Sampled 02/12/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21330059 Method Number TM048 Cust. Sample Ref. S5ES1 16/12/2019 Not Detected Not Detected Not Detected Not Detected Not Detected Lucy Caroe Not Detected Detected Depth (m) 0.30 (#) (#) (#) (#) (#) (#) SOLID Date Sampled 02/12/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21330026 Method Number TM048 Cust. Sample Ref. S6FS1 16/12/2019 Lucy Caroe Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 0.10 Depth (m) (#) (#) (#) (#) (#) (#) Sample Type SOLID Date Sampled 02/12/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21330020 Method Number TM048 Cust. Sample Ref. S7ES1 16/12/2019 Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Depth (m) 0.20 Magdziarek (#) (#) (#) (#) (#) (#) SOLID Sample Type Date Sampled 02/12/2019 00:00:00 10/12/2019 14:28:00 SDG 191210-86 21330010 Original Sample Method Number TM048 Cust. Sample Ref. S8ES1 16/12/2019 Marcin Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 0.50 Magdziarek Depth (m) (#) (#) (#) (#) (#) (#) SOLID Sample Type 02/12/2019 00:00:00 Date Sampled 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21330014 Method Number TM048 Cust. Sample Ref. S9ES1 16/12/2019 Lucy Caroe Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Detected Depth (m) 0.30 (#) (#) (#) (#) (#) (#) SOLID Sample Type Date Sampled 29/11/2019 00:00:00 Date Receieved 10/12/2019 14:28:00 SDG 191210-86 21329966 Original Sample Method Number TM048 Cust. Sample Ref. S10ES1 12/12/2019 Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Depth (m) 0.20 Richards (#) (#) (#) (#) (#) (#) SOLID Sample Type 29/11/2019 00:00:00 Date Sampled 10/12/2019 14:28:00 SDG 191210-86 21329972 Original Sample Method Number TM048 Cust. Sample Ref. S11ES1 16/12/2019 Lucy Caroe Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Detected Depth (m) 0.30 (#) (#) (#) (#) (#) (#) SOLID Sample Type Date Sampled 29/11/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21329920 Method Number TM048

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SDG: Δ110489-4-1 191210-86 Client Reference: Report Number: 535552 Cwmcarn High School Order Number: C19/1273 Superseded Report: 535249 Location: Date of Analysis Analysed By Comments Amosite Chrysotile Crocidolite Fibrous Fibrous Fibrous Non-Achectos (White) (Blue) Asbestos Anthophyllite Tremolite (Brown) Actinolite Fibre Ashestos Ashesto Cust. Sample Ref. S12FS1 16/12/2019 James Loose fibres Detected (#) Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 0.30 Depth (m) Richards (#) (#) (#) (#) (#) Sample Type SOLID 29/11/2019 00:00:00 Date Sampled 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21329936 Method Number TM048 Cust. Sample Ref. TP101FS1 12/12/19 Andrzei Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 0.10 - 0.20 Depth (m) Ferfecki (#) (#) (#) (#) (#) (#) Sample Type SOLID Date Sampled 27/11/2019 00:00:00 10/12/2019 14:28:00 SDG 191210-86 Original Sample 21330052 Method Number TM048 Cust. Sample Ref. TP101ES2 12/12/2019 Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Barbara Depth (m) 0.40 - 0.50 Urbanek-Wals (#) (#) (#) (#) (#) (#) SOLID Date Sampled 27/11/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21330144 Method Number TM048 Cust. Sample Ref. TP102FS2 12/12/2019 Barbara Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 0.50 Depth (m) Urbanek-Wals (#) (#) (#) (#) (#) (#) Sample Type SOLID h Date Sampled 28/11/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21330195 Method Number TM048 Cust. Sample Ref. TP104ES1 12/12/2019 Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Depth (m) 0.50 Urbanek-Wals (#) (#) (#) (#) (#) (#) SOLID Sample Type h Date Sampled 28/11/2019 00:00:00 10/12/2019 14:28:00 SDG 191210-86 Original Sample 21329801 Method Number TM048 Cust. Sample Ref. TP104ES2 12/12/2019 Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected 1.00 Depth (m) Richards (#) (#) (#) (#) (#) (#) SOLID Sample Type 28/11/2019 00:00:00 Date Sampled 10/12/2019 14:28:00 Date Receieved SDG 191210-86 21329807 Original Sample Method Number TM048 Cust. Sample Ref. TP105FS1 16/12/2019 Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Depth (m) 0.30 Richards (#) (#) (#) (#) (#) (#) SOLID Sample Type Date Sampled 29/11/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 21329841 Original Sample Method Number TM048 Cust. Sample Ref. TP106ES1 16/12/2019 Lucy Caroe Not Detected Not Detected Not Detected Not Detected Not Detected Not Detected Detected Depth (m) 0.10 (#) (#) (#) (#) (#) (#) SOLID Sample Type 29/11/2019 00:00:00 Date Sampled 10/12/2019 14:28:00 SDG 191210-86 21329885 Original Sample Method Number TM048 Cust. Sample Ref. WS105ES1 12/12/2019 Lucy Caroe Loose fibres Detected (#) Not Detected Not Detected Not Detected Not Detected Not Detected Depth (m) 0.50 in soil (#) (#) (#) (#) (#) SOLID Sample Type Date Sampled 27/11/2019 00:00:00 10/12/2019 14:28:00 Date Receieved SDG 191210-86 Original Sample 21330173 Method Number TM048

### **CERTIFICATE OF ANALYSIS**

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	SDG:	191210-	-86	Client I	Reference:	A110489-4-1		Report Nur	nber:	535552	
ALS	Location:	Cwmcar	n High School	Order I	Number:	C19/1273		Superseded	Report:	535249	
		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS108ES1 0.20 SOLID 27/11/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330159 TM048	16/12/19	Andrzej Ferfecki	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

### **CERTIFICATE OF ANALYSIS**



 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

# **Asbestos Quantification - Full**

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Resu	Its Legend					
# ISO17025 a						
		Additional Asbestos Components	Analysts Comments	Asbestos Quantification - Gravimetric - %	Asbestos Quantification - PCOM	Asbestos Quantification - Total - %
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	\$12E51 0.30 \$OLID 29/11/2019 00:00:00 10/12/2019 14:28:00 191210-86 21329936 TM304	None (#)	N/C	0.0030 (#)	<0.001 (#)	0.0034 (#)
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	WS105ES1 0.50 SOLID 27/11/2019 00:00:00 10/12/2019 14:28:00 191210-86 21330173 TM304	None (#)	N/C	<0.001 (#)	<0.001 (#)	<0.001 (#)

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#### **CERTIFICATE OF ANALYSIS**

 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS Client Reference Site Location Mass Sample taken (kg) 0.101 Natural Moisture Content (%) 12.9

**Dry Matter Content (%)** 

Mass of dry sample (kg) 0.090
Particle Size <4mm >95%

Particle Size <4mm >95%

**Case SDG** 191210-86

Lab Sample Number(s) 21329801 Sampled Date 28-Nov-2019

Customer Sample Ref. TP104 ES1

Eluate Analysis	C. Complin 404	-books (m (l)	A 40-4	and the district			
Eluate Allalysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	A ₂ 10:1 conc ⁿ le	eached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	_	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) >C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Nitrite as NO2	<0.05	<0.05	<0.5	<0.5			
Sulphate (soluble)	2.4	<2	24	<20	-		
Chloride	<2	<2	<20	<20		-	
Dissolved Organic Carbon	3.4	<3	34	<30	-	-	
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-		
Antimony	<0.001	<0.0001	<0.001	<0.001	_		
Naphthalene (diss.filt)	0.0001	<0.0001	0.0001	<0.001	-	-	
Total Ammonia as NH3	<0.2	<0.00001	<2	<2	-		-
Total Cyanide (W)	<0.25	<0.2	<0.5	<0.5	-	-	
Acenaphthene (diss.filt)	0.0000446	<0.000005	0.000446	<0.00005			
Arsenic	0.000583	<0.00005	0.00583	<0.005	-		
Total Ammonium as NH4	<0.3	<0.3	<3	<3	_		
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	<u> </u>	
Barium	0.0977	<0.0000	0.977	<0.002	-		
Nitrate as NO3	0.0977	<0.0002	7.1	<3	-	<u> </u>	
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	<u> </u>	
Beryllium	<0.002	<0.002	<0.02	<0.02	-	-	
Fluoranthene (diss.filt)		†		1	-		
Anthracene (diss.filt)	0.0000426	<0.000005	0.000426	<0.00005	-		
· · · · · · · · · · · · · · · · · · ·	0.0000167	<0.000005	0.000167	<0.00005		-	-
Boron Phenanthrene (diss.filt)	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Alkalinity Filtered as CaCO3	0.000152	<0.000005 <2	0.00152	<0.00005			
•	55		550	<20	-	-	-
Cadmium Eluoropo (digo filt)	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.0000607	<0.000005	0.000607	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	7.99
Conductivity (µS/cm)	91.00
Temperature (°C)	20.20
Volume Leachant (Litres)	0.889





**Sampled Date** 

**Customer Sample Ref.** 

SDG: 191210-86 Location: Cwmcarn High School

28-Nov-2019

TP104 ES1

Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

#### **CEN ANALYTICAL RESULTS REF: BS EN 12457/2 Client Reference Site Location** Cwmcarn High School Mass Sample taken (kg) 0.101 **Natural Moisture Content (%)** 12.9 0.090 **Dry Matter Content (%)** 88.6 Mass of dry sample (kg) Particle Size <4mm >95% Case SDG 191210-86 Lab Sample Number(s) 21329801

Customer Sample Rei.	11 104 231						
Depth (m)	0.50						
Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection	·		
Pyrene (diss.filt)	0.0000249	<0.000005	0.000249	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
Chromium	<0.001	<0.001	<0.01	<0.01	-	-	-
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.00241	< 0.0003	0.0241	< 0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	_
Benzo(g,h,i)perylene (diss.filt)	<0.00005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	_
Molybdenum	0.00302	<0.003	0.0302	<0.03	_	_	_
PAH 16 EPA Total by GCMS (diss.filt)	0.000351	<0.000082	0.00351	<0.00082	-	-	_
Nickel	<0.0004	<0.0004	<0.004	<0.004	_	_	_
Selenium	<0.001	<0.001	<0.01	<0.01	_	_	_
Zinc	0.0015	<0.001	0.015	<0.01	-	-	_
TPH CWG (W)							
Surrogate Recovery	_	<0	_	<0	_	_	_
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	_		_
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	_		
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	_		_
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	_		
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	_		_
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	_		
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	_		
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	_	_	_
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	_	_
Toluene by GC	<0.007	<0.007	<0.04	<0.04	_	_	_
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08			-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03			
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	_		
Sum of BTEX by GC	<0.011	<0.011	<0.28	<0.28		-	
Sam S. B. Ex by So	<b>\0.020</b>	\0.020	\0.20	<b>\0.20</b>	_	-	-
	1	I	I				

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	7.99
Conductivity (µS/cm)	91.00
Temperature (°C)	20.20
Volume Leachant (Litres)	0.889

88.3



#### **CERTIFICATE OF ANALYSIS**

SDG: 191210-86 A110489-4-1 535552 Client Reference: Report Number: Location: Cwmcarn High School Superseded Report: 535249 Order Number: C19/1273

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

#### **CEN ANALYTICAL RESULTS REF: BS EN 12457/2 Client Reference Site Location** Cwmcarn High School Mass Sample taken (kg) 0.102 **Natural Moisture Content (%)** 13.2

**Dry Matter Content (%)** 

0.090 Mass of dry sample (kg) Particle Size <4mm >95%

Case

SDG 191210-86

**Sampled Date** 29-Nov-2019

21329885

TP106 ES1 **Customer Sample Ref.** 

0.10 Depth (m)

Lab Sample Number(s)

Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	<b>A</b> 2 10:1 conc ⁿ le	eached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection	•		
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1		-	-
Fotal Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	_
TPH (Total Aliphatics + Total Aromatics) ◆C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
litrite as NO2	< 0.05	<0.05	<0.5	<0.5	-	-	-
Sulphate (soluble)	20.9	<2	209	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	6.33	<3	63.3	<30	-	-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
otal Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
otal Cyanide (W)	<0.05	< 0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	0.0000218	<0.000005	0.000218	<0.00005	-	-	-
Arsenic	0.00241	<0.0005	0.0241	<0.005	-	-	-
Total Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Barium	0.155	<0.0002	1.55	<0.002	-	-	-
Nitrate as NO3	1.73	<0.3	17.3	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000691	<0.000005	0.000691	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000802	<0.000005	0.0000802	<0.00005	-	-	-
Boron	0.0375	<0.01	0.375	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000494	<0.00005	0.000494	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO3	36.5	<2	365	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.0000301	<0.00005	0.000301	<0.00005	-	-	-
Chrysene (diss.filt)	0.00000797	<0.000005	0.0000797	<0.00005	_		

#### **Leach Test Information**

Date Prepared	12-Dec-2019
pH (pH Units)	9.49
Conductivity (µS/cm)	106.00
Temperature (°C)	20.10
Volume Leachant (Litres)	0.888





SDG: 191210-86 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

CEN ANALYTICAL RESI	ULTS		REF : BS EN 12457/2
Client Reference		Site Location	Cwmcarn High School
Mass Sample taken (kg)	0.102	Natural Moisture Content (%)	13.2
Mass of dry sample (kg)	0.090	<b>Dry Matter Content (%)</b>	88.3
Particle Size <4mm	>95%		

 Case

 SDG
 191210-86

 Lab Sample Number(s)
 21329885

 Sampled Date
 29-Nov-2019

 Customer Sample Ref.
 TP106 ES1

 Depth (m)
 0.10

Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	A ₂ 10:1 conc ⁿ le	eached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Pyrene (diss.filt)	0.0000493	<0.000005	0.000493	<0.00005	-	-	-
Benzo(a)anthracene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	_
Chromium	0.00232	<0.001	0.0232	<0.01	-	-	_
Benzo(b)fluoranthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Benzo(k)fluoranthene (diss.filt)	<0.000005	<0.00005	<0.00005	<0.00005	-	-	-
Benzo(a)pyrene (diss.filt)	<0.000002	<0.000002	<0.00002	<0.00002	-	-	-
Copper	0.003	<0.0003	0.03	<0.003	-	-	-
Dibenzo(a,h)anthracene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Lead	<0.0002	<0.0002	<0.002	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
ndeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	< 0.003	<0.003	< 0.03	<0.03		-	-
PAH 16 EPA Total by GCMS (diss.filt)	0.000236	<0.000082	0.00236	<0.00082	-	-	-
Nickel	0.000416	<0.0004	0.00416	<0.004	-	_	_
Selenium	0.00164	<0.001	0.0164	<0.01	-	_	_
Zinc	0.00105	<0.001	0.0105	<0.01	-	_	_
TPH CWG (W)							
Surrogate Recovery	_	<0	_	<0	-	_	_
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	_	_	_
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	_
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	_	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	_	_	_
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	_	_	_
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	_	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	_	_	_
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	_	_	_
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	_
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	_	_	_
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	_	_
Toluene by GC	<0.004	<0.004	<0.04	<0.04	_	_	_
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	_	_
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	_	_	_
O Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	
Sum m&p and o Xylene by GC	<0.011	<0.003	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28			
<b>-</b>		0.020	0.20	.0.20			

#### **Leach Test Information**

Date Prepared	12-Dec-2019
pH (pH Units)	9.49
Conductivity (µS/cm)	106.00
Temperature (°C)	20.10
Volume Leachant (Litres)	0.888

**REF: BS EN 12457/2** 





SDG: 191210-86 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS Client Reference

Mass Sample taken (kg) 0.098

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)9.17Dry Matter Content (%)91.6

Case

 SDG
 191210-86

 Lab Sample Number(s)
 21330064

 Sampled Date
 02-Dec-2019

 Customer Sample Ref.
 BH106 ES1

**Depth (m)** 0.30

Eluate Analysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	A ₂ 10:1 conc ⁿ leached (mg/kg)				
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
otal Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
otal Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
PH (Total Aliphatics + Total Aromatics) C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
litrite as NO2	0.064	<0.05	0.64	<0.5	-	-	-
Sulphate (soluble)	7.9	<2	79	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	5.34	<3	53.4	<30		-	-
Mercury Dissolved (CVAF)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	0.0000152	<0.00001	0.000152	<0.0001	-	_	-
otal Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
otal Cyanide (W)	<0.05	<0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	0.0000397	<0.000005	0.000397	<0.00005	-	_	-
Arsenic	0.000935	<0.0005	0.00935	<0.005	-	-	-
otal Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	_	_	-
Barium	0.105	<0.0002	1.05	<0.002	-	-	-
litrate as NO3	0.921	<0.3	9.21	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02		-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000315	<0.000005	0.000315	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000869	<0.000005	0.0000869	<0.00005	_	_	-
Boron	0.0127	<0.01	0.127	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000516	<0.000005	0.000516	<0.00005	-	-	-
otal Alkalinity Filtered as CaCO3	60	<2	600	<20	-	-	-
Cadmium	<0.00008	<0.00008	<0.0008	<0.0008	-	-	-
Fluorene (diss.filt)	0.0000485	<0.000005	0.000485	<0.00005	-	-	_
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

#### **Leach Test Information**

Date Prepared	12-Dec-2019
pH (pH Units)	9.06
Conductivity (µS/cm)	94.70
Temperature (°C)	14.60
Volume Leachant (Litres)	0.892

535552

535249



SDG: 191210-86 Client Reference: A110489-4-1 Report Number:
Location: Cwmcarn High School Order Number: C19/1273 Superseded Report:

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST CEN ANALYTICAL RESULTS REF: BS EN 12457/2** Cwmcarn High School **Client Reference** Site Location Mass Sample taken (kg) 0.098 **Natural Moisture Content (%)** 9.17 0.090 **Dry Matter Content (%)** 91.6 Mass of dry sample (kg) Particle Size <4mm >95% Case SDG 191210-86 Lab Sample Number(s) 21330064 Sampled Date 02-Dec-2019 BH106 ES1 **Customer Sample Ref.** 0.30 Depth (m) **Eluate Analysis** C₂ Concⁿ in 10:1 eluate (mg/l) 10:1 concⁿ leached (mg/kg) Limit of Detection **Limit of Detection** Result Result Pyrene (diss.filt) 0.0000194 <0.00005 0.000194 <0.00005 Benzo(a)anthracene (diss.filt) < 0.000005 < 0.000005 < 0.00005 < 0.00005 Chromium <0.001 <0.001 <0.01 <0.01 Benzo(b)fluoranthene (diss.filt) < 0.000005 < 0.000005 < 0.00005 < 0.00005 Benzo(k)fluoranthene (diss.filt) < 0.000005 < 0.000005 <0.00005 <0.00005 Benzo(a)pyrene (diss.filt) < 0.000002 < 0.000002 <0.00002 <0.00002 Copper 0.00194 <0.0003 0.0194 < 0.003 Dibenzo(a,h)anthracene (diss.filt) < 0.000005 < 0.000005 < 0.00005 < 0.00005 Lead < 0.0002 < 0.0002 < 0.002 < 0.002 Benzo(g,h,i)perylene (diss.filt) < 0.000005 < 0.000005 <0.00005 < 0.00005 Indeno(1,2,3-cd)pyrene (diss.filt) < 0.000005 < 0.000005 <0.00005 < 0.00005 Molybdenum < 0.003 < 0.003 < 0.03 <0.03 PAH 16 EPA Total by GCMS (diss.filt) 0.000215 < 0.000082 0.00215 < 0.00082 Nickel < 0.0004 <0.0004 < 0.004 < 0.004 Selenium 0.00166 <0.001 0.0166 <0.01 0.0017 <0.001 0.017 <0.01 Zinc TPH CWG (W) Surrogate Recovery <0 <0 GRO TOT (C5-C12) < 0.05 < 0.05 < 0.5 < 0.5 Aliphatics C5-C6 < 0.01 <0.01 <0.1 <0.1 Aliphatics >C6-C8 < 0.01 < 0.01 < 0.1 < 0.1

<0.1

<0.1

<0.1

<0.1

< 0.03

<0.1

<0.1

<0.07

<0.04

<0.05

<0.08

< 0.03

<0.11

< 0.28

<0.1

<0.1

<0.1

<0.1

< 0.03

<0.1

< 0.1

<0.07

< 0.04

< 0.05

<0.08

< 0.03

<0.11

< 0.28

Loach	Toct	Informati	n

Sum m&p and o Xylene by GC

Aliphatics >C8-C10

Aliphatics >C10-C12

Aromatics C6-C7

MTBE GC-FID

Benzene by GC

Toluene by GC

o Xylene by GC

Ethylbenzene by GC

m & p Xylene by GC

Sum of BTEX by GC

Aromatics >C7-C8

Aromatics >EC8 -EC10

Aromatics >EC10-EC12

Date Prepared	12-Dec-2019
pH (pH Units)	9.06
Conductivity (µS/cm)	94.70
Temperature (°C)	14.60
Volume Leachant (Litres)	0.892

< 0.01

<0.01

<0.01

< 0.01

< 0.003

<0.01

< 0.01

<0.007

< 0.004

<0.005

<0.008

< 0.003

<0.011

< 0.028

<0.01

<0.01

<0.01

<0.01

< 0.003

<0.01

< 0.01

<0.007

< 0.004

< 0.005

<0.008

< 0.003

<0.011

< 0.028

**REF: BS EN 12457/2** 





SDG: 191210-86 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST**

# CEN ANALYTICAL RESULTS Client Reference

Mass Sample taken (kg) 0.105

Mass of dry sample (kg) 0.090

Particle Size <4mm >95%

Site LocationCwmcarn High SchoolNatural Moisture Content (%)16.9Dry Matter Content (%)85.6

Case

 SDG
 191210-86

 Lab Sample Number(s)
 21330159

 Sampled Date
 27-Nov-2019

 Customer Sample Ref.
 WS108 ES1

**Depth (m)** 0.20

Eluate Analysis	ashed (mar/les)						
Eluate Alialysis	C ₂ Conc ⁿ in 10:1	eluate (mg/l)	A ₂ 10:1 conc ⁿ le	ached (mg/kg)			
	Result	Limit of Detection	Result	Limit of Detection			
Aliphatics >C12-C16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C16-C21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C21-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aliphatics >C12-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC12-EC16	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC21	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC21-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC16-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
Total Aromatics >EC12-EC35	<0.01	<0.01	<0.1	<0.1	-	-	-
TPH (Total Aliphatics + Total Aromatics) → C5-C35	<0.01	<0.01	<0.1	<0.1	-	-	-
litrite as NO2	<0.05	< 0.05	<0.5	<0.5		-	
Sulphate (soluble)	<2	<2	<20	<20	-	-	-
Chloride	<2	<2	<20	<20	-	-	-
Dissolved Organic Carbon	4.04	<3	40.4	<30		-	-
Mercury Dissolved (CVAF)	0.0000134	<0.00001	0.000134	<0.0001	-	-	-
Antimony	<0.001	<0.001	<0.01	<0.01	-	-	-
Naphthalene (diss.filt)	<0.00001	<0.00001	<0.0001	<0.0001	-	-	_
otal Ammonia as NH3	<0.2	<0.2	<2	<2	-	-	-
Total Cyanide (W)	<0.05	< 0.05	<0.5	<0.5	-	-	-
Acenaphthene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005		-	-
Arsenic	0.000614	< 0.0005	0.00614	<0.005	-	-	-
otal Ammonium as NH4	<0.3	<0.3	<3	<3	-	-	-
Acenaphthylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005		-	-
Barium	0.0241	<0.0002	0.241	<0.002	-	-	-
Nitrate as NO3	3.17	<0.3	31.7	<3	-	-	-
Phenol by HPLC (W)	<0.002	<0.002	<0.02	<0.02	-	-	-
Beryllium	<0.0001	<0.0001	<0.001	<0.001	-	-	-
Fluoranthene (diss.filt)	0.0000276	<0.000005	0.000276	<0.00005	-	-	-
Anthracene (diss.filt)	0.00000505	<0.000005	0.0000505	<0.00005		-	-
Boron	0.115	<0.01	1.15	<0.1	-	-	-
Phenanthrene (diss.filt)	0.0000233	<0.000005	0.000233	<0.00005	-	-	-
Total Alkalinity Filtered as CaCO3	5.5	<2	55	<20	-	-	-
Cadmium	0.0000817	<0.00008	0.000817	<0.0008	-	-	-
Fluorene (diss.filt)	<0.00005	<0.00005	<0.00005	<0.00005	-	-	-
Chrysene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	5.96
Conductivity (µS/cm)	13.70
Temperature (°C)	18.20
Volume Leachant (Litres)	0.885



 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Order Number:
 C19/1273
 Superseded Report:
 535249

#### **CEN 10:1 SINGLE STAGE LEACHATE TEST CEN ANALYTICAL RESULTS REF: BS EN 12457/2 Client Reference** Cwmcarn High School Site Location 0.105 Mass Sample taken (kg) **Natural Moisture Content (%)** 16.9 85.6 Mass of dry sample (kg) 0.090 **Dry Matter Content (%)** Particle Size <4mm >95% Case SDG 191210-86 Lab Sample Number(s) 21330159 27-Nov-2019 Sampled Date WS108 ES1 Customer Sample Ref. 0.20 Depth (m) **Eluate Analysis** C₂ Concⁿ in 10:1 eluate (mg/l) Δ₂ 10:1 concⁿ leached (mg/kg) **Limit of Detection Limit of Detection** Result Result Pyrene (diss.filt) <0.000005 0.000222 <0.00005 0.0000222 Benzo(a)anthracene (diss.filt) <0.000005 <0.000005 <0.00005 <0.00005 Chromium <0.001 <0.001 <0.01 <0.01 Benzo(b)fluoranthene (diss.filt) <0.00005 < 0.000005 < 0.000005 < 0.00005 Benzo(k)fluoranthene (diss.filt) <0.00005 <0.00005 <0.00005 <0.00005 Benzo(a)pyrene (diss.filt) <0.00002 <0.000002 <0.000002 <0.00002 Copper 0.00416 <0.0003 0.0416 < 0.003 Dibenzo(a,h)anthracene (diss.filt) <0.000005 <0.000005 <0.00005 <0.00005

Lead	0.00132	<0.0002	0.0132	<0.002	-	-	-
Benzo(g,h,i)perylene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Indeno(1,2,3-cd)pyrene (diss.filt)	<0.000005	<0.000005	<0.00005	<0.00005	-	-	-
Molybdenum	<0.003	<0.003	<0.03	<0.03	-	-	-
PAH 16 EPA Total by GCMS (diss.filt)	<0.000082	<0.000082	<0.00082	<0.00082	-	-	-
Nickel	0.00129	<0.0004	0.0129	<0.004	-	-	-
Selenium	<0.001	<0.001	<0.01	<0.01	-	-	-
Zinc	0.053	<0.001	0.53	<0.01	-	-	-
TPH CWG (W)							
Surrogate Recovery	-	<0	-	<0	-	-	-
GRO TOT (C5-C12)	<0.05	<0.05	<0.5	<0.5	-	-	-
Aliphatics C5-C6	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C6-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C8-C10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aliphatics >C10-C12	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics C6-C7	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >C7-C8	<0.01	<0.01	<0.1	<0.1	-	-	-
MTBE GC-FID	<0.003	<0.003	<0.03	<0.03	-	-	-
Aromatics >EC8 -EC10	<0.01	<0.01	<0.1	<0.1	-	-	-
Aromatics >EC10-EC12	<0.01	<0.01	<0.1	<0.1	-	-	-
Benzene by GC	<0.007	<0.007	<0.07	<0.07	-	-	-
Toluene by GC	<0.004	<0.004	<0.04	<0.04	-	-	-
Ethylbenzene by GC	<0.005	<0.005	<0.05	<0.05	-	-	-
m & p Xylene by GC	<0.008	<0.008	<0.08	<0.08	-	-	-
o Xylene by GC	<0.003	<0.003	<0.03	<0.03	-	-	-
Sum m&p and o Xylene by GC	<0.011	<0.011	<0.11	<0.11	-	-	-
Sum of BTEX by GC	<0.028	<0.028	<0.28	<0.28	-	-	-

#### **Leach Test Information**

Date Prepared	11-Dec-2019
pH (pH Units)	5.96
Conductivity (µS/cm)	13.70
Temperature (°C)	18.20
Volume Leachant (Litres)	0.885

# SDG:

#### **CERTIFICATE OF ANALYSIS**

 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

# **Table of Results - Appendix**

Method No	Reference	Description
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material
PM115		Leaching Procedure for CEN One Stage Leach Test 2:1 & 10:1 1 Step
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) by Headspace GC-FID (C4-C12)
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM116	Modified: US EPA Method 8260, 8120, 8020, 624, 610 & 602	Determination of Volatile Organic Compounds by Headspace / GC-MS
TM132	In - house Method	ELTRA CS800 Operators Guide
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM218	Shaker extraction - EPA method 3546.	The determination of PAH in soil samples by GC-MS
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM243		Mixed Anions In Soils By Kone
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC
TM304	HSE Contract research Report no 83/1996	Asbestos Quantification in Soil: Fibres identified by morphology only
TM414	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GCxGC-FID

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

#### **CERTIFICATE OF ANALYSIS**



SDG: 191210-86 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

# **Test Completion Dates**

		162	t Com	pietioi	Dates	>				
Lab Sample No(s)	21330138	21330116	21330104	21330072	21330064	21330068	21329834	21329979	21329997	21330059
Customer Sample Ref.	BH102	BH103	BH104	BH105	BH106	BH106	S1	S2	S3	\$4
AGS Ref.	ES1	ES1	ES1	ES1	ES1	ES2	ES1	ES1	ES1	ES1
Depth	0.20	0.20	0.20	0.00 - 0.90	0.30	0.60	0.40	0.10	0.30	0.10
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)					
Alkalinity Filtered as CaCO3					17-Dec-2019					
Ammoniacal Nitrogen					17-Dec-2019					
Anions by Kone (soil)	17-Dec-2019	17-Dec-2019	17-Dec-2019	16-Dec-2019	16-Dec-2019	17-Dec-2019				
Anions by Kone (w)					17-Dec-2019					
Asbestos ID in Solid Samples	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	12-Dec-2019
Boron Water Soluble	13-Dec-2019	13-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	13-Dec-2019				
CEN 10:1 Leachate (1 Stage)					12-Dec-2019					
CEN Readings	40.0	40.0 0040	10.0	47.0 0040	16-Dec-2019	40.0 0040				
Chromium III	16-Dec-2019	16-Dec-2019	16-Dec-2019	17-Dec-2019	17-Dec-2019	16-Dec-2019				
Cyanide Comp/Free/Total/Thiocyanate  Dissolved Metals by ICP-MS	16-Dec-2019	13-Dec-2019	13-Dec-2019	16-Dec-2019	18-Dec-2019 17-Dec-2019	16-Dec-2019				
Dissolved Organic/Inorganic Carbon					17-Dec-2019 17-Dec-2019					
EPH CWG (Aliphatic) Filtered GC (W)					28-Dec-2019					
EPH CWG (Aromatic) Filtered GC (W)					28-Dec-2019					
EPH CWG GC (S)	20-Dec-2019	18-Dec-2019	18-Dec-2019	20-Dec-2019	18-Dec-2019	18-Dec-2019				
GRO by GC-FID (S)	13-Dec-2019	13-Dec-2019	13-Dec-2019	13-Dec-2019	13-Dec-2019	13-Dec-2019				
GRO by GC-FID (W)					17-Dec-2019					
Hexavalent Chromium (s)	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019				
Mercury Dissolved					17-Dec-2019					
Metals in solid samples by OES	16-Dec-2019	16-Dec-2019	16-Dec-2019	17-Dec-2019	17-Dec-2019	16-Dec-2019				
Nitrite by Kone (w)					17-Dec-2019					
PAH by GCMS	17-Dec-2019	17-Dec-2019	13-Dec-2019	17-Dec-2019	17-Dec-2019	17-Dec-2019				
PAH in waters by GC-MS (diss.filt)					24-Dec-2019					
pH	17-Dec-2019	17-Dec-2019	17-Dec-2019	17-Dec-2019	17-Dec-2019	17-Dec-2019				
pH Value of Filtered Water					17-Dec-2019					
Phenols by HPLC (S)	16-Dec-2019	13-Dec-2019	13-Dec-2019	16-Dec-2019	16-Dec-2019	13-Dec-2019				
Phenois by HPLC (W)	10 Dec 2010	11 Dec 2010	11 Dec 2010	10 Dec 2010	18-Dec-2019	11 Dec 2010				
Sample description  Total Organic Carbon	12-Dec-2019 17-Dec-2019	11-Dec-2019 16-Dec-2019	11-Dec-2019 16-Dec-2019	12-Dec-2019 16-Dec-2019	12-Dec-2019 16-Dec-2019	11-Dec-2019 17-Dec-2019				
TPH CWG Filtered (W)	17-Dec-2019	10-Dec-2019	10-Dec-2019	10-Dec-2019	28-Dec-2019	17-Dec-2019				
TPH CWG GC (S)	20-Dec-2019	18-Dec-2019	18-Dec-2019	20-Dec-2019	18-Dec-2019	18-Dec-2019				
VOC MS (S)	13-Dec-2019	12-Dec-2019	13-Dec-2019	13-Dec-2019	13-Dec-2019	12-Dec-2019				
```										
Lab Sample No(s)	21330026	21330020	21330010	21330014	21329966	21329972	21329920	21329936	21330052	21330144
Customer Sample Ref.	S5	S6	\$7	S8	S9	S10	S11	S12	TP101	TP101
AGS Ref.	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES1	ES2
Depth	0.30	0.10	0.20	0.50	0.30	0.20	0.30	0.30	0.10 - 0.20	0.40 - 0.50
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)					
Anions by Kone (soil)									13-Dec-2019	14-Dec-2019
Asbestos ID in Solid Samples	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	12-Dec-2019	16-Dec-2019	16-Dec-2019	12-Dec-2019	12-Dec-2019
Asbestos Quantification - Full								24-Dec-2019		
Boron Water Soluble									13-Dec-2019	13-Dec-2019
Chromium III									16-Dec-2019	16-Dec-2019
Cyanide Comp/Free/Total/Thiocyanate									16-Dec-2019	13-Dec-2019
EPH CWG GC (S)									16-Dec-2019	16-Dec-2019
GRO by GC-FID (S)									12-Dec-2019	12-Dec-2019
Hexavalent Chromium (s)									16-Dec-2019	16-Dec-2019
Metals in solid samples by OES									16-Dec-2019	16-Dec-2019
PAH by GCMS									17-Dec-2019	17-Dec-2019
pH Phenols by HPLC (S)									17-Dec-2019 13-Dec-2019	17-Dec-2019 13-Dec-2019
Sample description									13-Dec-2019 11-Dec-2019	13-Dec-2019 11-Dec-2019
Total Organic Carbon									16-Dec-2019	16-Dec-2019
TPH CWG GC (S)									16-Dec-2019	16-Dec-2019 16-Dec-2019
VOC MS (S)									12-Dec-2019	12-Dec-2019
(0)									12 200-2013	12 200-2019

## **CERTIFICATE OF ANALYSIS**

ALS

 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

(ALS) Location:	wmcarn High	School (	Order Numbe	r: C19/	12/3	Sup	perseded Repor
Lab Sample No(s)	21330195	21329801	21329807	21329841	21329885	21330173	21330159
Customer Sample Ref.	TP102	TP104	TP104	TP105	TP106	WS105	WS108
AGS Ref.	ES2	ES1	ES2	ES1	ES1	ES1	ES1
Depth	0.50	0.50	1.00	0.30	0.10	0.50	0.20
Туре	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Alkalinity Filtered as CaCO3		17-Dec-2019			17-Dec-2019		17-Dec-2019
Ammoniacal Nitrogen		17-Dec-2019			17-Dec-2019		17-Dec-2019
Anions by Kone (soil)	14-Dec-2019	14-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	14-Dec-2019	16-Dec-2019
Anions by Kone (w)		17-Dec-2019			17-Dec-2019		17-Dec-2019
Asbestos ID in Solid Samples	12-Dec-2019	12-Dec-2019	12-Dec-2019	16-Dec-2019	16-Dec-2019	12-Dec-2019	16-Dec-2019
Asbestos Quantification - Full						23-Dec-2019	
Boron Water Soluble	13-Dec-2019	17-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	13-Dec-2019	13-Dec-2019
CEN 10:1 Leachate (1 Stage)		12-Dec-2019			12-Dec-2019		13-Dec-2019
CEN Readings		17-Dec-2019			17-Dec-2019		17-Dec-2019
Chromium III	16-Dec-2019						
Cyanide Comp/Free/Total/Thiocyanate	13-Dec-2019	18-Dec-2019	16-Dec-2019	16-Dec-2019	18-Dec-2019	16-Dec-2019	18-Dec-2019
Dissolved Metals by ICP-MS		17-Dec-2019			17-Dec-2019		17-Dec-2019
Dissolved Organic/Inorganic Carbon		18-Dec-2019			18-Dec-2019		18-Dec-2019
EPH CWG (Aliphatic) Filtered GC (W)		28-Dec-2019			28-Dec-2019		28-Dec-2019
EPH CWG (Aromatic) Filtered GC (W)		28-Dec-2019			28-Dec-2019		28-Dec-2019
EPH CWG GC (S)	16-Dec-2019	16-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019	16-Dec-2019	16-Dec-2019
GRO by GC-FID (S)	12-Dec-2019	12-Dec-2019	17-Dec-2019	16-Dec-2019	16-Dec-2019	12-Dec-2019	13-Dec-2019
GRO by GC-FID (W)		17-Dec-2019			17-Dec-2019		17-Dec-2019
Hexavalent Chromium (s)	16-Dec-2019						
Mercury Dissolved		17-Dec-2019			17-Dec-2019		18-Dec-2019
Metals in solid samples by OES	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	13-Dec-2019
Nitrite by Kone (w)		17-Dec-2019			17-Dec-2019		17-Dec-2019
PAH by GCMS	17-Dec-2019	13-Dec-2019	18-Dec-2019	18-Dec-2019	16-Dec-2019	13-Dec-2019	
PAH in waters by GC-MS (diss.filt)		24-Dec-2019			24-Dec-2019		24-Dec-2019
pH	17-Dec-2019						
pH Value of Filtered Water		17-Dec-2019			17-Dec-2019		17-Dec-2019
Phenols by HPLC (S)	13-Dec-2019	13-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	13-Dec-2019	13-Dec-2019
Phenols by HPLC (W)		18-Dec-2019			18-Dec-2019		18-Dec-2019
Sample description	11-Dec-2019	11-Dec-2019	12-Dec-2019	12-Dec-2019	12-Dec-2019	11-Dec-2019	11-Dec-2019
Total Organic Carbon	16-Dec-2019	13-Dec-2019	17-Dec-2019	17-Dec-2019	16-Dec-2019	16-Dec-2019	13-Dec-2019
TPH CWG Filtered (W)		28-Dec-2019			28-Dec-2019		28-Dec-2019
TPH CWG GC (S)	16-Dec-2019	16-Dec-2019	20-Dec-2019	20-Dec-2019	20-Dec-2019	16-Dec-2019	16-Dec-2019
VOC MS (S)	12-Dec-2019	12-Dec-2019	16-Dec-2019	13-Dec-2019	13-Dec-2019	12-Dec-2019	12-Dec-2019

SDG: 191210-86 Client Reference:

A110489-4-1 C19/1273 Order Number:

Report Number: Superseded Report: 535552 535249 Validated

# **ASSOCIATED AQC DATA**

## Alkalinity Filtered as CaCO3

Location:

	Component	Method Code	QC 2103	QC 2123	QC 2140
Tot	tal Alkalinity Filtered as CaCO3	TM043	<b>101.01</b> 95.62 : 106.88	<b>107.5</b> 100.35 : 114.15	<b>107.5</b> 100.35 : 114.15

Cwmcarn High School

## Ammoniacal Nitrogen

Component	Method Code	QC 2124	QC 2157
Ammoniacal Nitrogen as N	TM099	<b>101.2</b> 93.14 : 108.60	<b>100.4</b> 93.14 : 108.60

#### Anions by Kone (soil)

Component	Method Code	QC 2123	QC 2190
Chloride (soluble)	TM243	<b>148.7</b> 77.23 : 120.97	<b>94.82</b> 77.23 : 120.97
Water Soluble Sulphate as SO4 2:1 Extract	TM243	<b>108.41</b> 75.60 : 131.10	<b>101.87</b> 75.60 : 131.10

## Anions by Kone (w)

Component	Method Code	QC 2100
Chloride	TM184	<b>103.0</b> 92.93 : 115.43
Sulphate (soluble)	TM184	<b>100.8</b> 90.53 : 113.03
TON as NO3	TM184	<b>100.5</b> 96.26 : 111.21

## **Boron Water Soluble**

Component	Method Code	QC 2190	QC 2152	QC 2103	QC 2106
Water Soluble Boron	TM222	<b>104.0</b> 85.80 : 112.50	<b>105.0</b> 85.80 : 112.50	<b>94.0</b> 85.80 : 112.50	<b>99.0</b> 85.80 : 112.50

## Cyanide Comp/Free/Total/Thiocyanate

 Component	Method Code	QC 2128	QC 2165	QC 2104	QC 2178
Free Cyanide	TM153	<b>88.4</b> 83.05 : 112.74	<b>96.1</b> 83.05 : 112.74	<b>95.7</b> 83.05 : 112.74	
Free Cyanide (W)	TM227				<b>98.5</b> 93.25 : 112.75
Thiocyanate	TM153	<b>83.83</b> 89.81 : 110.19	<b>91.02</b> 89.81 : 110.19	<b>90.42</b> 89.81 : 110.19	

#### **CERTIFICATE OF ANALYSIS**



SDG: 191210-86 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

## Cyanide Comp/Free/Total/Thiocyanate

	,	QC 2128	QC 2165	QC 2104	QC 2178
Thiocyanate (W)	TM227				<b>99.25</b> 94.00 : 112.00
Total Cyanide	TM153	<b>91.43</b> 88.29 : 111.43	<b>98.57</b> 88.29 : 111.43	<b>98.57</b> 88.29 : 111.43	
Total Cyanide (W)	TM227				<b>99.0</b> 92.25 : 111.75

## Dissolved Metals by ICP-MS

Component	Method Code	QC 2136	QC 2149	QC 2142
Aluminium	TM152	101.33	106.0	106.0
		90.78 : 110.89	95.37 : 118.13	95.37 : 118.13
Antimony	TM152	99.5	103.17	102.33
•		77.22 : 119.42	88.37 : 130.57	88.37 : 130.57
Arsenic	TM152	99.0	100.5	102.33
		86.77 : 107.67	92.62 : 113.52	92.62 : 113.52
Barium	TM152	99.0	104.5	104.5
		87.86 : 110.23	93.15 : 115.52	93.15 : 115.52
Beryllium	TM152	99.17	103.17	101.33
		86.19 : 112.98	89.98 : 116.88	89.98 : 116.88
Bismuth	TM152	98.5	100.67	101.17
		84.06 : 106.46	92.62 : 115.02	92.62 : 115.02
Borate	TM152	101.23		
		88.00 : 112.00		
Boron	TM152	101.0	106.33	105.0
		83.92 : 114.90	86.31 : 120.88	86.31 : 120.88
Cadmium	TM152	99.5	103.0	102.5
0.1.	T14450	88.89 : 106.69	93.85 : 111.65	93.85 : 111.65
Calcium	TM152	105.33	105.33	105.33
Chromium	TM450	80.24 : 117.95	89.20 : 126.91	89.20 : 126.91
Chromium	TM152	99.33	100.5	101.67
Cobalt	TM152	83.22 : 110.16	92.22 : 109.85	92.22 : 109.85
Oobait	1111132	<b>99.5</b> 82.49 : 112.36	<b>99.33</b> 85.01 : 114.87	<b>100.5</b> 85.01 : 114.87
Copper	TM152		_	102.83
23462	2	<b>100.67</b> 83.14 : 113.00	<b>102.0</b> 89.87 : 119.73	89.87 : 119.73
Iron	TM152	102.0	102.0	102.0
		88.40 : 109.24	93.02 : 113.86	93.02 : 113.86
Lead	TM152	101.67	104.0	104.0
		83.71 : 109.58	91.11 : 116.98	91.11 : 116.98
Lithium	TM152	98.5	105.0	103.17
		84.50 : 114.28	91.30 : 123.00	91.30 : 123.00
Magnesium	TM152	102.67	104.67	106.0
		87.56 : 114.57	89.60 : 116.61	89.60 : 116.61
Manganese	TM152	101.67	101.5	102.0
		88.63 : 107.13	93.97 : 112.46	93.97 : 112.46
Molybdenum	TM152	98.5	99.67	101.0
		85.53 : 107.42	89.07 : 110.96	89.07 : 110.96
Nickel	TM152	98.67	99.0	100.33
DI I	T11/55	88.05 : 106.42	93.70 : 112.15	93.70 : 112.15
Phosphorus	TM152	96.67	101.0	99.67
Potoscium	TM150	82.76 : 107.72	89.24 : 114.18	89.24 : 114.18
Potassium	TM152	102.67	106.0	106.0



 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

## Dissolved Metals by ICP-MS

		QC 2136	QC 2149	QC 2142
Selenium	TM152	<b>101.5</b> 85.61 : 111.03	<b>103.83</b> 91.69 : 117.12	<b>101.83</b> 91.69 : 117.12
Silver	TM152	<b>98.0</b> 86.73 : 107.07	<b>99.83</b> 96.95 : 117.30	<b>102.33</b> 96.95 : 117.30
Sodium	TM152	<b>102.67</b> 91.84 : 109.17	<b>104.0</b> 92.42 : 113.24	<b>106.0</b> 92.42 : 113.24
Strontium	TM152	<b>98.33</b> 83.77 : 107.87	<b>102.67</b> 92.14 : 116.24	<b>101.33</b> 92.14 : 116.24
Tellurium	TM152	<b>93.83</b> 82.83 : 104.73	<b>96.5</b> 89.88 : 111.78	<b>96.67</b> 89.88 : 111.78
Thallium	TM152	<b>92.0</b> 77.47 : 113.87	<b>98.5</b> 86.08 : 122.48	<b>97.83</b> 86.08 : 122.48
Tin	TM152	<b>102.33</b> 91.00 : 109.00	<b>103.83</b> 91.00 : 109.00	<b>103.67</b> 91.00 : 109.00
Titanium	TM152	<b>98.0</b> 87.29 : 108.31	<b>106.17</b> 88.23 : 109.83	<b>106.17</b> 88.23 : 109.83
Tungsten	TM152	<b>97.5</b> 68.27 : 122.97	<b>99.83</b> 77.61 : 132.31	<b>101.0</b> 77.61 : 132.31
Uranium	TM152	<b>98.17</b> 82.46 : 105.16	<b>99.83</b> 86.97 : 115.76	<b>100.83</b> 86.97 : 115.76
Vanadium	TM152	<b>98.33</b> 88.43 : 114.30	<b>104.83</b> 89.61 : 115.48	<b>96.0</b> 89.61 : 115.48
Zinc	TM152	<b>106.0</b> 85.57 : 114.31	<b>101.67</b> 87.51 : 116.26	<b>102.67</b> 87.51 : 116.26

## Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2180	QC 2107
Dissolved Inorganic Carbon	TM090	<b>100.33</b> 91.27 : 109.87	<b>111.0</b> 93.58 : 112.28
Dissolved Organic Carbon	TM090	<b>100.0</b> 97.87 : 108.77	<b>104.5</b> 96.28 : 110.58

## EPH CWG GC (S)

Component	Method Code	QC 2113	QC 2198	QC 2158
EPH >C8-C40 Raw	TM414	<b>80.14</b> 77.66 : 104.66	<b>103.47</b> 77.66 : 104.66	<b>87.37</b> 77.66 : 104.66
Total Aliphatics Raw	TM414	<b>85.77</b> 84.39 : 115.61	<b>111.55</b> 84.39 : 115.61	<b>92.39</b> 84.39 : 115.61
Total Aromatics Raw	TM414	<b>84.82</b> 57.00 : 150.27	<b>103.43</b> 57.00 : 150.27	<b>100.71</b> 57.00 : 150.27

# GRO by GC-FID (S)

Component	Method Code	QC 2126	QC 2121	QC 2148	QC 2149
QC	TM089	<b>98.36</b> 72.28 : 114.54	<b>104.17</b> 70.75 : 114.19	<b>94.71</b> 70.75 : 114.19	<b>100.75</b> 70.75 : 114.19

#### GRO by GC-FID (W)

#### **CERTIFICATE OF ANALYSIS**



SDG: 191210-86 Client Reference: Location: Cwmcarn High School Order Number:

A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

## GRO by GC-FID (W)

Component	Method Code	QC 2190
Benzene by GC	TM245	<b>91.0</b> 83.48 : 117.21
Ethylbenzene by GC	TM245	<b>93.0</b> 84.11 : 114.89
m & p Xylene by GC	TM245	<b>92.5</b> 83.73 : 116.33
MTBE GC-FID	TM245	<b>89.5</b> 84.42 : 117.50
o Xylene by GC	TM245	<b>93.5</b> 85.03 : 117.59
QC	TM245	<b>91.18</b> 60.71 : 137.65
Toluene by GC	TM245	<b>90.5</b> 84.73 : 116.85

#### Hexavalent Chromium (s)

Component	Method Code	QC 2154	QC 2187	QC 2172	QC 2187	QC 2196
Hexavalent Chromium	TM151	<b>98.0</b> 90.20 : 107.00	<b>104.0</b> 90.20 : 107.00	<b>100.0</b> 90.20 : 107.00	<b>100.0</b> 90.20 : 107.00	<b>102.0</b> 90.20 : 107.00

# Mercury Dissolved

_	Component	Method Code	QC 2161	QC 2159	QC 2103
	Mercury Dissolved (CVAF)	TM183	105.0	109.0	97.9
			76.80 : 117.12	76.80 : 117.12	76.80 : 117.12

## Metals in solid samples by OES

Component	Method Code	QC 2120	QC 2167	QC 2134	QC 2183	QC 2192	QC 2101
Aluminium	TM181	<b>94.69</b> 77.84 : 119.01	<b>80.44</b> 77.84 : 119.01	<b>76.64</b> 77.84 : 119.01	<b>94.69</b> 77.84 : 119.01	<b>84.78</b> 77.84 : 119.01	<b>89.38</b> 77.84 : 119.01
Antimony	TM181	<b>97.15</b> 84.28 : 107.67	<b>95.12</b> 84.28 : 107.67	<b>84.55</b> 84.28 : 107.67	<b>95.93</b> 84.28 : 107.67	<b>95.93</b> 84.28 : 107.67	<b>93.09</b> 84.28 : 107.67
Arsenic	TM181	<b>107.85</b> 87.05 : 109.36	<b>98.26</b> 87.05 : 109.36	<b>96.51</b> 87.05 : 109.36	<b>102.62</b> 87.05 : 109.36	<b>98.84</b> 87.05 : 109.36	<b>97.09</b> 87.05 : 109.36
Barium	TM181	<b>102.75</b> 82.49 : 109.34	<b>86.79</b> 82.49 : 109.34	<b>85.5</b> 82.49 : 109.34	<b>91.01</b> 82.49 : 109.34	<b>88.07</b> 82.49 : 109.34	<b>88.99</b> 82.49 : 109.34
Beryllium	TM181	<b>105.6</b> 85.44 : 109.61	<b>100.37</b> 85.44 : 109.61	<b>100.0</b> 85.44 : 109.61	<b>102.99</b> 85.44 : 109.61	<b>98.13</b> 85.44 : 109.61	<b>95.9</b> 85.44 : 109.61
Boron	TM181	<b>92.55</b> 73.51 : 104.66	<b>87.11</b> 73.51 : 104.66	<b>84.24</b> 73.51 : 104.66	<b>93.7</b> 73.51 : 104.66	<b>87.68</b> 73.51 : 104.66	<b>87.11</b> 73.51 : 104.66
Cadmium	TM181	<b>99.18</b> 81.46 : 106.43	<b>91.77</b> 81.46 : 106.43	<b>93.42</b> 81.46 : 106.43	<b>94.65</b> 81.46 : 106.43	<b>89.3</b> 81.46 : 106.43	<b>86.01</b> 81.46 : 106.43
Chromium	TM181	<b>99.8</b> 82.26 : 104.55	<b>92.9</b> 82.26 : 104.55	<b>93.31</b> 82.26 : 104.55	<b>95.74</b> 82.26 : 104.55	<b>91.68</b> 82.26 : 104.55	<b>93.71</b> 82.26 : 104.55
Cobalt	TM181	<b>96.54</b> 86.54 : 106.87	<b>88.99</b> 86.54 : 106.87	<b>88.05</b> 86.54 : 106.87	<b>91.82</b> 86.54 : 106.87	<b>88.99</b> 86.54 : 106.87	<b>87.42</b> 86.54 : 106.87

ALS

SDG: 191210-86 Location: Cwmcarn High School Client Reference: Order Number: A110489-4-1 C19/1273 Report Number: Superseded Report: 535552 535249

Metals in solid samples by OES

		QC 2120	QC 2167	QC 2134	QC 2183	QC 2192	QC 2101
Copper	TM181	103.7	94.54	94.01	94.37	92.61	93.49
		82.40 : 105.45	82.40 : 105.45	82.40 : 105.45	82.40 : 105.45	82.40 : 105.45	82.40 : 105.45
Iron	TM181	97.62	79.37	80.16	96.03	102.38	90.48
		82.95 : 110.58	82.95 : 110.58	82.95 : 110.58	82.95 : 110.58	82.95 : 110.58	82.95 : 110.58
Lead	TM181	95.95	91.89	89.41	93.47	90.32	95.72
		78.24 : 104.05	78.24 : 104.05	78.24 : 104.05	78.24 : 104.05	78.24 : 104.05	78.24 : 104.0
Manganese	TM181	116.11	109.44	108.61	108.06	106.94	103.06
		94.29 : 119.51	94.29 : 119.51	94.29 : 119.51	94.29 : 119.51	94.29 : 119.51	94.29 : 119.5
Mercury	TM181	102.9	94.93	93.72	97.34	93.72	95.17
		83.74 : 105.34	83.74 : 105.34	83.74 : 105.34	83.74 : 105.34	83.74 : 105.34	83.74 : 105.3
Molybdenum	TM181	104.53	98.77	100.41	97.94	94.24	90.53
		87.11 : 106.87	87.11 : 106.87	87.11 : 106.87	87.11 : 106.87	87.11 : 106.87	87.11 : 106.8
Nickel	TM181	97.56	92.42	92.67	94.13	90.46	87.53
		81.92 : 102.18	81.92 : 102.18	81.92 : 102.18	81.92 : 102.18	81.92 : 102.18	81.92 : 102.1
Phosphorus	TM181	117.58	104.44	104.85	110.51	106.87	107.88
		94.56 : 124.28	94.56 : 124.28	94.56 : 124.28	94.56 : 124.28	94.56 : 124.28	94.56 : 124.2
Selenium	TM181	108.24	101.18	101.96	103.14	99.22	96.47
		86.28 : 110.48	86.28 : 110.48	86.28 : 110.48	86.28 : 110.48	86.28 : 110.48	86.28 : 110.4
Strontium	TM181	94.88	85.75	84.63	89.98	85.75	87.08
		79.13 : 102.79	79.13 : 102.79	79.13 : 102.79	79.13 : 102.79	79.13 : 102.79	79.13 : 102.7
Thallium	TM181	102.65	95.58	94.25	96.9	93.81	95.13
		82.94 : 111.86	82.94 : 111.86	82.94 : 111.86	82.94 : 111.86	82.94 : 111.86	82.94 : 111.8
Tin	TM181	106.08	100.38	101.9	101.52	98.86	96.2
		90.25 : 108.86	90.25 : 108.86	90.25 : 108.86	90.25 : 108.86	90.25 : 108.86	90.25 : 108.8
Titanium	TM181	83.97	78.63	79.39	83.97	75.88	73.66
		66.23 : 102.06	66.23 : 102.06	66.23 : 102.06	66.23 : 102.06	66.23 : 102.06	66.23 : 102.0
Vanadium	TM181	100.37	93.41	90.84	95.6	90.11	90.84
		86.37 : 107.94	86.37 : 107.94	86.37 : 107.94	86.37 : 107.94	86.37 : 107.94	86.37 : 107.9
Zinc	TM181	105.95	97.74	96.92	102.67	98.15	94.66
		84.68 : 113.99	84.68 : 113.99	84.68 : 113.99	84.68 : 113.99	84.68 : 113.99	84.68 : 113.9

## PAH by GCMS

Component	Method Code	QC 2196	QC 2156	QC 2129	QC 2173	QC 2196	QC 2111
Acenaphthene	TM218	<b>98.5</b> 80.97 : 105.99	<b>96.5</b> 70.00 : 130.00	<b>100.5</b> 80.97 : 105.99	<b>92.5</b> 80.97 : 105.99	<b>101.0</b> 70.00 : 130.00	<b>93.5</b> 76.79 : 103.90
Acenaphthylene	TM218	<b>96.5</b> 80.24 : 105.29	<b>94.0</b> 70.00 : 130.00	<b>98.0</b> 80.24 : 105.29	<b>92.0</b> 80.24 : 105.29	<b>101.5</b> 70.00 : 130.00	<b>91.5</b> 78.40 : 108.66
Anthracene	TM218	<b>93.0</b> 73.72 : 109.23	<b>94.0</b> 70.00 : 130.00	<b>93.0</b> 73.72 : 109.23	<b>86.5</b> 73.72 : 109.23	<b>101.0</b> 70.00 : 130.00	<b>98.0</b> 76.15 : 110.07
Benz(a)anthracene	TM218	<b>97.0</b> 79.72 : 116.84	<b>91.0</b> 68.12 : 118.39	<b>87.5</b> 79.72 : 116.84	<b>84.5</b> 79.72 : 116.84	<b>105.0</b> 68.12 : 118.39	<b>105.0</b> 73.77 : 119.26
Benzo(a)pyrene	TM218	<b>100.5</b> 69.58 : 110.26	<b>87.5</b> 71.72 : 115.31	<b>85.0</b> 69.58 : 110.26	<b>87.0</b> 69.58 : 110.26	<b>109.5</b> 71.72 : 115.31	<b>98.5</b> 73.20 : 114.18
Benzo(b)fluoranthene	TM218	<b>93.5</b> 77.35 : 112.97	<b>80.5</b> 66.89 : 120.40	<b>83.5</b> 77.35 : 112.97	<b>82.0</b> 77.35 : 112.97	<b>75.5</b> 66.89 : 120.40	<b>83.5</b> 75.36 : 117.58
Benzo(ghi)perylene	TM218	<b>94.0</b> 77.68 : 107.38	<b>87.0</b> 67.82 : 118.49	<b>79.0</b> 77.68 : 107.38	<b>84.5</b> 77.68 : 107.38	<b>95.5</b> 67.82 : 118.49	<b>89.5</b> 70.73 : 116.12
Benzo(k)fluoranthene	TM218	<b>94.0</b> 82.61 : 111.93	<b>90.0</b> 73.10 : 117.03	<b>84.5</b> 82.61 : 111.93	<b>83.0</b> 82.61 : 111.93	<b>93.0</b> 73.10 : 117.03	<b>82.0</b> 75.98 : 116.59
Chrysene	TM218	<b>95.5</b> 80.28 : 111.42	<b>86.5</b> 69.58 : 115.47	<b>84.5</b> 80.28 : 111.42	<b>80.5</b> 80.28 : 111.42	<b>100.5</b> 69.58 : 115.47	<b>99.0</b> 74.82 : 114.18
Dibenzo(ah)anthracene	TM218	<b>92.5</b> 79.17 : 106.41	<b>85.5</b> 67.32 : 121.35	<b>81.0</b> 79.17 : 106.41	<b>86.5</b> 79.17 : 106.41	<b>100.0</b> 67.32 : 121.35	<b>99.0</b> 69.17 : 115.30



 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

PAH by GCMS

		QC 2196	QC 2156	QC 2129	QC 2173	QC 2196	QC 2111
Fluoranthene	TM218	<b>101.0</b> 79.07 : 112.75	<b>87.5</b> 75.16 : 117.28	<b>88.5</b> 79.07 : 112.75	<b>82.0</b> 79.07 : 112.75	<b>104.5</b> 75.16 : 117.28	<b>105.0</b> 75.88 : 112.84
Fluorene	TM218	<b>97.5</b> 80.52 : 110.90	<b>96.5</b> 70.00 : 130.00	<b>99.0</b> 80.52 : 110.90	<b>90.5</b> 80.52 : 110.90	<b>102.5</b> 70.00 : 130.00	<b>95.0</b> 78.50 : 114.02
Indeno(123cd)pyrene	TM218	<b>93.5</b> 76.97 : 113.36	<b>85.0</b> 68.91 : 117.62	<b>77.0</b> 76.97 : 113.36	<b>91.5</b> 76.97 : 113.36	<b>97.0</b> 68.91 : 117.62	<b>86.5</b> 70.26 : 117.95
Naphthalene	TM218	<b>96.5</b> 83.50 : 110.02	<b>95.5</b> 70.00 : 130.00	<b>102.0</b> 83.50 : 110.02	<b>91.5</b> 83.50 : 110.02	<b>98.0</b> 70.00 : 130.00	<b>89.0</b> 75.24 : 111.26
Phenanthrene	TM218	<b>94.5</b> 79.34 : 111.91	<b>93.0</b> 70.00 : 130.00	<b>95.0</b> 79.34 : 111.91	<b>82.5</b> 79.34 : 111.91	<b>102.0</b> 70.00 : 130.00	<b>100.5</b> 77.07 : 107.43
Pyrene	TM218	<b>100.0</b> 74.43 : 114.36	<b>90.5</b> 75.68 : 119.23	<b>88.5</b> 74.43 : 114.36	<b>84.5</b> 74.43 : 114.36	<b>108.0</b> 75.68 : 119.23	<b>105.5</b> 78.74 : 112.56

## PAH in waters by GC-MS (diss.filt)

Component	Method Code	QC 2131
Acenaphthene (diss.filt)	TM178	106.8
		93.20 : 119.60
Acenaphthylene (diss.filt)	TM178	105.2
		92.00 : 118.40
Anthracene (diss.filt)	TM178	104.8
		90.80 : 114.80
Benzo(a)anthracene (diss.filt)	TM178	98.0
		91.60 : 115.60
Benzo(a)pyrene (diss.filt)	TM178	100.0
		91.20 : 120.00
Benzo(b)fluoranthene (diss.filt)	TM178	105.6
		86.80 : 120.40
Benzo(g,h,i)perylene (diss.filt)	TM178	100.0
		89.20 : 118.00
Benzo(k)fluoranthene (diss.filt)	TM178	103.2
		94.40 : 125.60
Chrysene (diss.filt)	TM178	101.6
		96.40 : 122.80
Dibenzo(a,h)anthracene	TM178	100.8
(diss.filt)		93.60 : 132.00
Fluoranthene (diss.filt)	TM178	104.4
		92.80 : 121.60
Fluorene (diss.filt)	TM178	106.8
		93.60 : 120.00
Indeno(1,2,3-cd)pyrene	TM178	103.2
(diss.filt)		82.40 : 120.80
Naphthalene (diss.filt)	TM178	108.4
		88.40 : 126.80
Phenanthrene (diss.filt)	TM178	104.8
		92.40 : 118.80
Pyrene (diss.filt)	TM178	102.0
		90.40 : 124.00

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535552

535249

#### **CERTIFICATE OF ANALYSIS**



SDG: 191210-86 Client Reference: A110489-4-1 Report Number:
Location: Cwmcarn High School Order Number: C19/1273 Superseded Report:

pН

_	Component	Method Code	QC 2192	QC 2198	QC 2149
	рН	TM133	<b>98.49</b> 97.44 : 100.93	<b>99.65</b> 97.44 : 100.93	<b>98.26</b> 97.44 : 100.93

# pH Value of Filtered Water

Component	Method Code	QC 2117
pH Value of Filtered Water	TM256	<b>100.94</b> 99.73 : 102.16

## Phenols by HPLC (S)

Component	Method Code	QC 2182	QC 2184	QC 2189
2.3.5 Trimethyl-Phenol by HPLC (S)	TM062 (S)	<b>92.86</b> 65.50 : 89.50	<b>92.21</b> 65.50 : 89.50	<b>101.3</b> 65.50 : 89.50
2-Isopropyl Phenol by HPLC (S)	TM062 (S)	<b>88.3</b> 86.25 : 116.25	<b>82.46</b> 86.25 : 116.25	<b>90.06</b> 86.25 : 116.25
Catechol by HPLC (S)	TM062 (S)	<b>83.81</b> 19.39 : 135.70	<b>74.29</b> 19.39 : 135.70	<b>80.0</b> 19.39 : 135.70
Cresols by HPLC (S)	TM062 (S)	<b>88.31</b> 81.00 : 112.20	<b>87.47</b> 81.00 : 112.20	<b>94.99</b> 81.00 : 112.20
Napthol by HPLC (S)	TM062 (S)	<b>114.29</b> 57.50 : 102.50	<b>112.14</b> 57.50 : 102.50	<b>112.14</b> 57.50 : 102.50
Phenol by HPLC (S)	TM062 (S)	<b>100.66</b> 88.67 : 124.67	<b>98.68</b> 88.67 : 124.67	<b>105.3</b> 88.67 : 124.67
Resorcinol HPLC (S)	TM062 (S)	<b>91.19</b> 69.99 : 127.22	<b>89.94</b> 69.99 : 127.22	<b>94.97</b> 69.99 : 127.22
Xylenols by HPLC (S)	TM062 (S)	<b>94.79</b> 90.22 : 114.22	<b>92.81</b> 90.22 : 114.22	<b>97.08</b> 90.22 : 114.22

## Phenols by HPLC (W)

Component	Method Code	QC 2159
2.3.5 Trimethyl-Phenol by HPLC (W)	TM259	<b>100.0</b> 91.00 : 109.00
2-Isopropyl Phenol by HPLC (W)	TM259	<b>96.0</b> 90.00 : 114.00
Cresols by HPLC (W)	TM259	<b>108.33</b> 90.02 : 130.15
Napthol by HPLC (W)	TM259	<b>96.0</b> 86.00 : 128.00
Phenol by HPLC (W)	TM259	<b>101.0</b> 85.89 : 109.89
Xylenols by HPLC (W)	TM259	<b>102.17</b> 93.33 : 107.33

#### **Total Organic Carbon**

#### **CERTIFICATE OF ANALYSIS**



 SDG:
 191210-86
 Client Reference:
 A110489-4-1

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273

0489-4-1 Report Number: 0/1273 Superseded Report:

r: 535552 ort: 535249

**Total Organic Carbon** 

Component	Method Code	QC 2135	QC 2111	QC 2119	QC 2153	QC 2142	QC 2144
Total Organic Carbon	TM132	<b>100.39</b> 84.82 : 117.61	<b>101.17</b> 84.82 : 117.61	<b>102.73</b> 84.82 : 117.61	<b>99.22</b> 84.82 : 117.61	<b>100.39</b> 84.82 : 117.61	<b>101.17</b> 84.82 : 117.61

# VOC MS (S)

Component	Method Code	QC 2144	QC 2181	QC 2178	QC 2143
1,1,1,2-tetrachloroethane	TM116	<b>109.4</b> 77.56 : 115.55	<b>109.6</b> 77.56 : 115.55	<b>101.0</b> 79.10 : 119.66	<b>108.2</b> 77.47 : 121.29
1,1,1-Trichloroethane	TM116	<b>111.6</b> 73.73 : 118.05	<b>110.4</b> 73.73 : 118.05	<b>95.6</b> 87.51 : 115.37	<b>97.2</b> 86.26 : 117.53
1,1,2-Trichloroethane	TM116	<b>106.8</b> 77.12 : 116.04	<b>108.0</b> 77.12 : 116.04	<b>94.6</b> 75.16 : 112.70	<b>99.8</b> 75.16 : 112.70
1,1-Dichloroethane	TM116	<b>113.2</b> 74.46 : 129.15	<b>111.2</b> 74.46 : 129.15	<b>99.2</b> 89.44 : 121.71	<b>99.8</b> 83.27 : 122.16
1,2-Dichloroethane	TM116	<b>115.6</b> 92.38 : 131.65	<b>118.8</b> 92.38 : 131.65	<b>104.4</b> 86.58 : 129.62	<b>113.6</b> 86.58 : 129.62
1,4-Dichlorobenzene	TM116	<b>107.0</b> 72.76 : 126.34	<b>109.2</b> 72.76 : 126.34	<b>96.8</b> 84.04 : 124.40	<b>112.2</b> 82.59 : 123.23
2-Chlorotoluene	TM116	<b>94.8</b> 81.66 : 118.02	<b>96.8</b> 81.66 : 118.02	<b>87.8</b> 80.02 : 116.73	<b>95.6</b> 66.81 : 118.43
4-Chlorotoluene	TM116	<b>92.6</b> 66.90 : 112.46	<b>96.4</b> 66.90 : 112.46	<b>81.0</b> 77.52 : 111.38	<b>92.0</b> 65.88 : 114.76
Benzene	TM116	<b>106.4</b> 89.71 : 111.93	<b>106.4</b> 89.71 : 111.93	<b>95.2</b> 85.63 : 110.10	<b>102.4</b> 93.16 : 123.63
Carbon Disulphide	TM116	<b>99.6</b> 74.91 : 122.14	<b>96.4</b> 74.91 : 122.14	<b>90.6</b> 75.11 : 124.81	<b>91.4</b> 75.11 : 124.81
Carbontetrachloride	TM116	<b>119.2</b> 80.31 : 124.50	<b>118.8</b> 80.31 : 124.50	<b>108.4</b> 82.35 : 126.46	<b>100.8</b> 82.35 : 126.46
Chlorobenzene	TM116	<b>103.2</b> 86.73 : 118.34	<b>104.0</b> 86.73 : 118.34	<b>93.4</b> 82.88 : 122.42	<b>102.8</b> 85.07 : 118.13
Chloroform	TM116	<b>113.6</b> 87.40 : 122.49	<b>114.0</b> 87.40 : 122.49	<b>102.6</b> 91.34 : 123.04	<b>102.0</b> 88.13 : 122.71
Chloromethane	TM116	<b>100.8</b> 65.05 : 142.63	<b>99.6</b> 65.05 : 142.63	<b>94.2</b> 52.88 : 131.36	<b>88.2</b> 55.37 : 133.35
Cis-1,2-Dichloroethene	TM116	<b>111.0</b> 80.67 : 126.72	<b>110.8</b> 80.67 : 126.72	<b>98.4</b> 78.27 : 128.90	<b>99.6</b> 78.27 : 128.90
Dibromomethane	TM116	<b>114.8</b> 67.80 : 121.75	<b>120.6</b> 67.80 : 121.75	<b>104.4</b> 71.69 : 119.43	<b>95.8</b> 77.47 : 121.29
Dichloromethane	TM116	<b>119.0</b> 81.11 : 133.25	<b>122.8</b> 81.11 : 133.25	<b>107.6</b> 89.49 : 128.89	<b>109.4</b> 81.68 : 125.21
Ethylbenzene	TM116	<b>98.0</b> 75.92 : 110.41	<b>98.4</b> 75.92 : 110.41	<b>87.2</b> 70.95 : 113.07	<b>98.4</b> 83.56 : 122.99
Hexachlorobutadiene	TM116	<b>81.2</b> 12.82 : 152.73	<b>88.8</b> 12.82 : 152.73	<b>89.0</b> 7.32 : 139.00	<b>101.0</b> 7.32 : 139.00
Isopropylbenzene	TM116	<b>85.8</b> 54.21 : 117.17	<b>91.2</b> 54.21 : 117.17	<b>74.4</b> 52.15 : 132.52	<b>90.4</b> 69.92 : 116.39
Naphthalene	TM116	<b>96.0</b> 80.86 : 128.81	<b>99.2</b> 80.86 : 128.81	<b>85.4</b> 80.29 : 135.77	<b>112.8</b> 79.29 : 125.59
o-Xylene	TM116	<b>93.8</b> 69.99 : 108.74	<b>94.8</b> 69.99 : 108.74	<b>83.0</b> 68.16 : 107.61	<b>93.8</b> 74.57 : 112.73

#### **CERTIFICATE OF ANALYSIS**



 SDG:
 191210-86
 Client Reference:
 A110489-4-1
 Report Number:
 535552

 Location:
 Cwmcarn High School
 Order Number:
 C19/1273
 Superseded Report:
 535249

VOC MS (S)

	'	QC 2144	QC 2181	QC 2178	QC 2143
p/m-Xylene	TM116	<b>94.3</b> 68.32 : 108.91	<b>94.7</b> 68.32 : 108.91	<b>84.6</b> 73.52 : 108.71	<b>93.7</b> 77.41 : 112.71
Sec-Butylbenzene	TM116	<b>83.2</b> 44.91 : 118.40	<b>91.6</b> 44.91 : 118.40	<b>76.0</b> 49.79 : 125.67	<b>91.2</b> 44.71 : 117.87
Tetrachloroethene	TM116	<b>110.6</b> 76.95 : 121.02	<b>110.4</b> 76.95 : 121.02	<b>100.8</b> 81.43 : 126.65	<b>108.4</b> 81.43 : 126.65
Toluene	TM116	<b>98.6</b> 74.24 : 107.42	<b>97.4</b> 74.24 : 107.42	<b>88.4</b> 79.59 : 101.35	<b>94.0</b> 87.82 : 116.21
Trichloroethene	TM116	<b>105.2</b> 77.61 : 111.54	<b>107.0</b> 77.61 : 111.54	<b>94.2</b> 79.80 : 112.33	<b>101.4</b> 79.80 : 112.33
Trichlorofluoromethane	TM116	<b>107.6</b> 84.55 : 133.27	<b>107.0</b> 84.55 : 133.27	<b>98.8</b> 88.86 : 128.82	<b>97.6</b> 80.52 : 132.12
Vinyl Chloride	TM116	<b>94.2</b> 70.29 : 138.58	<b>91.2</b> 70.29 : 138.58	<b>88.2</b> 69.66 : 136.55	<b>94.2</b> 58.08 : 128.58

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



 SDG:
 191210-86
 Client Reference:
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# **Appendix**

## General

- 1. Results are expressed on a dry weight basis (dried at  $35^{\circ}$ C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.
- 2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 6. NDP No determination possible due to insufficient/unsuitable sample.
- 7. Results relate only to the items tested
- 8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.
- 9. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.
- 10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.
- 14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

#### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

#### 19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name		
Chrysofile	White Asbests		
Amosite	Brow n Asbestos		
Cro d dolite	Blue Asbe stos		
Fibrous Act nolite	-		
Fib to us Anthop hyll ite	-		
Fibrous Tremolite	-		

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3  $\mu$ m diameter, longer than 5  $\mu$ m and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, The Quantification of Asbestos in Soil (2107).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Unit 7-8 Hawarden Business Park Manor Road (off Manor Lane) Hawarden Deeside CH5 3US

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email: hawardencustomerservices@alsglobal.com Website: www.alsenvironmental.co.uk

WYG Geo-Environment 5th Floor Longcross Court 47 Newport Road Cardiff

CF24 0AD

Attention: Katy Woodhouse

# **CERTIFICATE OF ANALYSIS**

Date of report Generation:27 January 2020

Customer: WYG Geo-Environment

Sample Delivery Group (SDG): 200115-46
Your Reference: A110489-4

Location: Cwmcarn High School

**Report No:** 538469

We received 2 samples on Wednesday January 15, 2020 and 2 of these samples were scheduled for analysis which was completed on Monday January 27, 2020. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

All sample data is provided by the customer. The reported results relate to the sample supplied, and on the basis that this data is correct.

Incorrect sampling dates and/or sample information will affect the validity of results.

The customer is not permitted to reproduce this report except in full without the approval of the laboratory.

Approved By:

Sonia McWhan

**Operations Manager** 







SDG: 200115-46 Location: Cwmcarn High School Client Reference: Order Number:

A110489-4 Report Number: C20/020

538469 Superseded Report:

Validated

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
21488217	BH104	EW2	1.85	14/01/2020
21488207	BH105	EW1	0.45 - 4.50	14/01/2020

Maximum Sample/Coolbox Temperature (°C):

6.8

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

a temperature of (5±3)°C.

Only received samples which have had analysis scheduled will be shown on the following pages.

538469

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG: A110489-4 200115-46 Client Reference: Report Number: Location: Cwmcarn High School Order Number: C20/020 Superseded Report: Results Legend 21488217 21488207 Lab Sample No(s) X Test No Determination Possible Customer BH104 BH105 Sample Reference Sample Types -S - Soil/Solid UNS - Unspecified Solid EW2 GW - Ground Water **AGS Reference** SW - Surface Water LE - Land Leachate PL - Prepared Leachate 0.45-PR - Process Water SA - Saline Water Depth (m) 1.85 - 4.50 TE - Trade Effluent TS - Treated Sewage US - Untreated Sewage 1000ml glass bottle (ALE220) Vial (ALE297) RE - Recreational Water HNO3 Filtered (ALE204) H2SO4 (ALE244) 1000ml glass bottle (ALE220) 1lplastic (ALE221) 1lplastic (ALE221) H2SO4 (ALE244) HNO3 Filtered (ALE204) NaOH (ALE245) NaOH (ALE245) DW - Drinking Water Non-regulatory Vial UNL - Unspecified Liquid (ALE297) SL - Sludge Container G - Gas OTH - Other GW GW GW GW GW GW GW GW GΜ GW Sample Type GW GW Alkalinity as CaCO3 All NDPs: 0 Tests: 2 Χ X Ammoniacal Nitrogen All NDPs: 0 Tests: 2 Χ X Anions by Kone (w) All NDPs: 0 Х Х Cyanide Comp/Free/Total/Thiocyanate All NDPs: 0 Tests: 2 Х Х Dissolved Metals by ICP-MS All NDPs: 0 Tests: 2 X Х Dissolved Organic/Inorganic Carbon All NDPs: 0 Tests: 2 Х Х EPH CWG (Aliphatic) Aqueous GC (W) All NDPs: 0 Tests: 2 Χ Х EPH CWG (Aromatic) Aqueous GC (W) All NDPs: 0 Tests: 2 Χ Х GRO by GC-FID (W) All NDPs: 0 Tests: 2 X Χ Mercury Dissolved All NDPs: 0 Tests: 2 X X Nitrite by Kone (w) All NDPs: 0 Tests: 2 Х Х PAH Spec MS - Aqueous (W) All NDPs: 0 Tests: 2 Χ Х pH Value All NDPs: 0 Tests: 2 Χ Х Phenols by HPLC (W) All NDPs: 0 Tests: 2 Х Х TPH CWG (W) All NDPs: 0 Tests: 2 Χ X



SDG:200115-46Client Reference:A110489-4Report Number:538469Location:Cwmcarn High SchoolOrder Number:C20/020Superseded Report:

Results Legend		0				<del>i</del>		
# ISO17025 accredited. M mCERTS accredited.		Customer Sample Ref.	BH104	BH105				
aq Aqueous / settled sample.  diss.filt Dissolved / filtered sample.		Depth (m)	1.85	0.45 - 4.50				
tot.unfilt Total / unfiltered sample.  * Subcontracted - refer to subcontractor report		Sample Type	Ground Water (GW)	Ground Water (GW)				
accreditation status.		Date Sampled	14/01/2020	14/01/2020				
** % recovery of the surrogate standard to chec efficiency of the method. The results of indivi	idual	Sample Time Date Received	15/01/2020	15/01/2020				
compounds within samples aren't corrected f recovery	for the	SDG Ref	200115-46	200115-46				
(F) Trigger breach confirmed 1-3+§@ Sample deviation (see appendix)		Lab Sample No.(s) AGS Reference	21488217 EW2	21488207 EW1				
Component	LOD/Units	Method						
Alkalinity, Total as CaCO3	<2 mg/l	TM043	63 #	145	#			
Carbon, Organic (diss.filt)	<3 mg/l	TM090	<3	3.29	"			
Ammoniacal Nitrogen as NH3	<0.2 mg/l	TM099	<0.2	0.346	#			
Ammoniacal Nitrogen as NH4	<0.3 mg/l	TM099	<0.3	0.366	#			
Antimony (diss.filt)	<1 µg/l	TM152	<1 #	<1	#			
Arsenic (diss.filt)	<0.5 µg/l	TM152	<0.5	0.739	#			
Barium (diss.filt)	<0.2 µg/l	TM152	14.4	40.4	#			
Beryllium (diss.filt)	<0.1 µg/l	TM152	<0.1	<0.1	#			
Boron (diss.filt)	<10 µg/l	TM152	16.6	39.4	#			
Cadmium (diss.filt)	<0.08 µg/l	TM152	<0.08	<0.08	#			
Chromium (diss.filt)	<1 µg/l	TM152	<1 #	<1	#			
Copper (diss.filt)	<0.3 µg/l	TM152	0.696 #	1.38	#			
Lead (diss.filt)	<0.2 µg/l	TM152	<0.2 #	<0.2	#			
Molybdenum (diss.filt)	<3 µg/l	TM152	<3 #	<3	#			
Nickel (diss.filt)	<0.4 µg/l	TM152	<0.4 #	2.78	#			
Selenium (diss.filt)	<1 µg/l	TM152	<1 #	<1	#			
Zinc (diss.filt)	<1 µg/l	TM152	7.78 #	2.86	#			
Mercury (diss.filt)	<0.01 µg/l	TM183	<0.01 #		#			
Nitrite as NO2	<0.05 mg/l		<0.05 #		#			
Sulphate	<2 mg/l	TM184	16.4		#			
Chloride	<2 mg/l	TM184	13.5		#			
Nitrate as NO3	<0.3 mg/l	TM184	2.63	<0.3				
Cyanide, Total	<0.05 mg/l		<0.05		#			
pH	<1 pH Units		6.89		#			
Phenol	<0.002 mg/l	TM259	<0.002	<0.002	#			

## **CERTIFICATE OF ANALYSIS**

ALS

SDG:200115-46Client Reference:A110489-4Report Number:538469Location:Cwmcarn High SchoolOrder Number:C20/020Superseded Report:

PALLS) LOCALION							
PAH Spec MS - Aqueous Results Legend	S (VV)	Customer Sample Ref.	DUIAGA	DUMOS	i		
# ISO17025 accredited.		ustomer Sample Kei.	BH104	BH105			
M mCERTS accredited. aq Aqueous / settled sample.		<b>5</b>					
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Depth (m) Sample Type	1.85 Ground Water (GW)	0.45 - 4.50 Ground Water (GW)			
* Subcontracted - refer to subcontractor report accreditation status.	for	Date Sampled	14/01/2020	14/01/2020			
** % recovery of the surrogate standard to check		Sample Time					
efficiency of the method. The results of indivi compounds within samples aren't corrected f		Date Received SDG Ref	15/01/2020 200115-46	15/01/2020 200115-46			
recovery (F) Trigger breach confirmed		Lab Sample No.(s)	21488217	21488207			
1-3+§@ Sample deviation (see appendix)		AGS Reference	EW2	EW1			
Nonhithelens (cs)	LOD/Units	Method	0.0407	0.0124			
Naphthalene (aq)	<0.01 µg/l	TM178	0.0127 #	0.0134 #			
Acenaphthene (aq)	<0.005 µg/l	TM178	<0.005	<0.005			
Acertaprititierie (aq)	-0.005 μg/ι	TIVITTO	~0.005 #	~0.005 #			
Acenaphthylene (aq)	<0.005 µg/l	TM178	0.011	<0.005			
Aceriapititiyierie (aq)	<0.005 μg/i	1101170	0.011 #	\0.005 #			
Fluoranthene (aq)	<0.005 µg/l	TM178	0.0198	<0.005			
i idorantinene (aq)	-0.005 μg/ι	TIVITTO	0.0190	~0.005 #			
Anthracene (aq)	<0.005 µg/l	TM178	0.00559	<0.005			
Allandoche (dq)	10.000 μg/1	1111170	#	4.000			
Phenanthrene (aq)	<0.005 µg/l	TM178	0.0157	<0.005			
i nonananono (aq)	J 0.000 pg/		#	#			
Fluorene (aq)	<0.005 µg/l	TM178	<0.005	<0.005			
(44)	J		#	#			
Chrysene (aq)	<0.005 µg/l	TM178	0.0129	<0.005			
			#	#			
Pyrene (aq)	<0.005 µg/l	TM178	0.0235	<0.005			
7 - 10			#	#			
Benzo(a)anthracene (aq)	<0.005 µg/l	TM178	0.0155	<0.005			
	'		#	#			
Benzo(b)fluoranthene (aq)	<0.005 µg/l	TM178	0.0162	<0.005			
			#	#			
Benzo(k)fluoranthene (aq)	<0.005 µg/l	TM178	0.00795	<0.005			
			#	#			
Benzo(a)pyrene (aq)	<0.002 µg/l	TM178	0.0114	<0.002			
			#	#			
Dibenzo(a,h)anthracene (aq)	<0.005 µg/l	TM178	<0.005	<0.005			
			#	#			
Benzo(g,h,i)perylene (aq)	<0.005 µg/l	TM178	0.0145	<0.005			
			#	#			
Indeno(1,2,3-cd)pyrene (aq)	<0.005 µg/l	TM178	0.00791	<0.005			
			#	#			
PAH, Total Detected USEPA 16	<0.082 µg/l	TM178	0.175	<0.082			
(aq)			#	#			
					-		

## **CERTIFICATE OF ANALYSIS**

200115-46 Cwmcarn High School Report Number: Superseded Report: SDG: Client Reference: A110489-4 538469 Order Number: C20/020 Location:

TPH CWG (W)						
Results Legend # ISO17025 accredited.		Customer Sample Ref.	BH104	BH105		
M mCERTS accredited.  aq Aqueous / settled sample. diss.filt Dissolved / filtered sample. tot.unfilt ' Total / unfiltered sample. ' Subcontracted - refer to subcontractor repo accreditation status.	ort for	Depth (m) Sample Type Date Sampled	1.85 Ground Water (GW) 14/01/2020	0.45 - 4.50 Ground Water (GW) 14/01/2020		
** % recovery of the surrogate standard to che efficiency of the method. The results of indi- compounds within samples aren't corrected recovery	vidual	Sample Time Date Received SDG Ref Lab Sample No.(s)	 15/01/2020 200115-46 21488217	15/01/2020 200115-46 21488207		
(F) Trigger breach confirmed  1-3+§@ Sample deviation (see appendix)	1	AGS Reference	EW2	EW1		
GRO Surrogate % recovery**	LOD/Units %	Method TM245	93	94		
000 : 05 040	.50 //	TN 10.15	.50	-50		
GRO >C5-C12	<50 µg/l	TM245	<50 #	<50 #		
Methyl tertiary butyl ether (MTBE)	<3 μg/l	TM245	<3	<3		
Benzene	<7 μg/l	TM245	<7	<7		
Toluene	<4 µg/l	TM245	<4	<4		
Ethylbenzene	<5 μg/l	TM245	<5	<5		
m,p-Xylene	<8 µg/l	TM245	<8	<8		
o-Xylene	<3 µg/l	TM245	<3	<3		
Sum of detected Xylenes	<11 µg/l	TM245	<11	<11		
Sum of detected BTEX	<28 µg/l	TM245	<28	<28		
Aliphatics >C5-C6	<10 µg/l	TM245	<10	<10		
Aliphatics >C6-C8	<10 µg/l	TM245	<10	<10		
Aliphatics >C8-C10	<10 µg/l	TM245	<10	<10		
Aliphatics >C10-C12	<10 µg/l	TM245	<10	<10		
Aliphatics >C12-C16 (aq)	<10 µg/l	TM174	<10	<10		
Aliphatics >C16-C21 (aq)	<10 µg/l	TM174	<10	<10		
Aliphatics >C21-C35 (aq)	<10 µg/l	TM174	<10	<10		
Total Aliphatics >C12-C35 (aq)	<10 µg/l	TM174	<10	<10		
Aromatics >EC5-EC7	<10 µg/l	TM245	<10	<10		
Aromatics >EC7-EC8	<10 µg/l	TM245	<10	<10		
Aromatics >EC8-EC10	<10 µg/l	TM245	<10	<10		
Aromatics >EC10-EC12	<10 µg/l	TM245	<10	<10		
Aromatics >EC12-EC16 (aq)	<10 µg/l	TM174	<10	<10		
Aromatics >EC16-EC21 (aq)	<10 µg/l	TM174	<10	<10		
Aromatics >EC21-EC35 (aq)	<10 µg/l	TM174	<10	<10		
Total Aromatics >EC12-EC35 (aq)	<10 µg/l	TM174	<10	<10		
Total Aliphatics & Aromatics >C5-35 (aq)	<10 µg/l	TM174	<10	<10		
Aliphatics >C16-C35 Aqueous	<10 µg/l	TM174	<10	<10		



## **CERTIFICATE OF ANALYSIS**

SDG: 200115-46 Client Reference: A110489-4 Report Number: 538469
Location: Cwmcarn High School Order Number: C20/020 Superseded Report:

# **Table of Results - Appendix**

Method No	Reference	Description
TM043	Method 2320B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part109 1984	Determination of alkalinity in aqueous samples
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water
TM099	BS 2690: Part 7:1968 / BS 6068: Part2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS
TM174	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Waters by GC-FID
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry
TM184	EPA Methods 325.1 & 325.2,	The Determination of Anions in Aqueous Matrices using the Kone Spectrophotometric Analysers
TM227	Standard methods for the examination of waters and wastewaters 20th Edition, AWWA/APHA Method 4500.	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate
TM245	By GC-FID	Determination of GRO by Headspace in waters
TM256	The measurement of Electrical Conductivity and the Laboratory determination of pH Value of Natural, Treated and Wastewaters. HMSO, 1978. ISBN 011 751428 4.	Determination of pH in Water and Leachate using the GLpH pH Meter
TM259	by HPLC	Determination of Phenols in Waters and Leachates by HPLC

NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Life Sciences Ltd Hawarden (Method codes TM) or ALS Life Sciences Ltd Aberdeen (Method codes S).

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG: 200115-46 Location: Cwmcarn High School Client Reference: A11
Order Number: C20

A110489-4 Report Number: C20/020 Superseded Report:

538469

# **Test Completion Dates**

Lab Sample No(s)	21488217	21488207
Customer Sample Ref.	BH104	BH105
AGS Ref.	EW2	EW1
Depth	1.85	0.45 - 4.50
Туре	Ground Water	Ground Water
Alkalinity as CaCO3	21-Jan-2020	17-Jan-2020
Ammoniacal Nitrogen	15-Jan-2020	15-Jan-2020
Anions by Kone (w)	16-Jan-2020	16-Jan-2020
Cyanide Comp/Free/Total/Thiocyanate	21-Jan-2020	21-Jan-2020
Dissolved Metals by ICP-MS	21-Jan-2020	21-Jan-2020
Dissolved Organic/Inorganic Carbon	17-Jan-2020	17-Jan-2020
EPH CWG (Aliphatic) Aqueous GC (W)	22-Jan-2020	22-Jan-2020
EPH CWG (Aromatic) Aqueous GC (W)	21-Jan-2020	21-Jan-2020
GRO by GC-FID (W)	16-Jan-2020	16-Jan-2020
Mercury Dissolved	27-Jan-2020	27-Jan-2020
Nitrite by Kone (w)	16-Jan-2020	16-Jan-2020
PAH Spec MS - Aqueous (W)	21-Jan-2020	17-Jan-2020
pH Value	16-Jan-2020	16-Jan-2020
Phenols by HPLC (W)	16-Jan-2020	16-Jan-2020
TPH CWG (W)	22-Jan-2020	22-Jan-2020



SDG: 200115-46 Location: Cwmcarn High School

Client Reference: Order Number: A110489-4 C20/020 Report Number: Superseded Report: 538469

# **ASSOCIATED AQC DATA**

#### Alkalinity as CaCO3

Component	Method Code	QC 2150	QC 2183
Total Alkalinity as CaCO3	TM043	<b>103.54</b> 96.56 : 106.57	<b>102.53</b> 94.47 : 104.41

## Ammoniacal Nitrogen

Component	Method Code	QC 2187
Ammoniacal Nitrogen as N	TM099	<b>100.0</b> 93.14 : 108.60

## Anions by Kone (w)

Component	Method Code	QC 2146	QC 2159
Chloride	TM184	<b>107.0</b> 92.93 : 115.43	<b>107.0</b> 92.93 : 115.43
Sulphate (soluble)	TM184	<b>108.4</b> 90.53 : 113.03	<b>108.0</b> 90.53 : 113.03
TON as NO3	TM184	<b>105.5</b> 94.00 : 111.10	<b>107.5</b> 94.00 : 111.10

## Cyanide Comp/Free/Total/Thiocyanate

Component	Method Code	QC 2125	QC 2138
Free Cyanide (W)	TM227	<b>103.25</b> 92.00 : 113.00	<b>101.5</b> 92.00 : 113.00
Thiocyanate (W)	TM227	<b>104.5</b> 95.50 : 107.50	<b>103.0</b> 95.50 : 107.50
Total Cyanide (W)	TM227	<b>102.0</b> 91.75 : 112.75	<b>103.0</b> 91.75 : 112.75

## Dissolved Metals by ICP-MS

Component	Method Code	QC 2167	QC 2161
Aluminium	TM152	<b>109.33</b> 90.78 : 110.89	<b>101.33</b> 90.78 : 110.89
Antimony	TM152	<b>102.17</b> 77.22 : 119.42	<b>98.17</b> 77.22 : 119.42
Arsenic	TM152	<b>97.17</b> 86.77 : 107.67	<b>94.83</b> 86.77 : 107.67
Barium	TM152	<b>103.0</b> 87.86 : 110.23	<b>97.0</b> 87.86 : 110.23
Beryllium	TM152	<b>115.5</b> 86.19 : 112.98	<b>101.33</b> 86.19 : 112.98
Bismuth	TM152	<b>102.17</b> 84.06 : 106.46	<b>99.0</b> 84.06 : 106.46
Borate	TM152	<b>116.05</b> 88.00 : 112.00	<b>102.47</b> 88.00 : 112.00

538469

## **CERTIFICATE OF ANALYSIS**



 SDG:
 200115-46
 Client Reference:
 A110489-4
 Report Number:

 Location:
 Cwmcarn High School
 Order Number:
 C20/020
 Superseded Report:

## Dissolved Metals by ICP-MS

		QC 2167	QC 2161
Boron	TM152	116.0	102.67
		83.92 : 114.90	83.92 : 114.90
Cadmium	TM152	103.17	97.33
		88.89 : 106.69	88.89 : 106.69
Calcium	TM152	103.33	104.67
		80.24 : 117.95	80.24 : 117.95
Chromium	TM152	100.83	96.33
		83.22 : 110.16	83.22 : 110.16
Cobalt	TM152	100.33	97.17
		82.49 : 112.36	82.49 : 112.36
Copper	TM152	100.33	96.17
		83.14 : 113.00	83.14 : 113.00
Iron	TM152	104.0	97.33
		88.40 : 109.24	88.40 : 109.24
Lead	TM152	103.83	102.0
		83.71 : 109.58	83.71 : 109.58
Lithium	TM152	117.33	100.17
		84.50 : 114.28	84.50 : 114.28
Magnesium	TM152	110.67	100.0
		87.56 : 114.57	87.56 : 114.57
Manganese	TM152	102.67	95.67
		88.63 : 107.13	88.63 : 107.13
Molybdenum	TM152	99.83	96.5
		85.53 : 107.42	85.53 : 107.42
Nickel	TM152	99.0	95.83
		88.05 : 106.42	88.05 : 106.42
Phosphorus	TM152	99.5	95.33
		82.76 : 107.72	82.76 : 107.72
Potassium	TM152	102.67	98.0
		97.14 : 108.98	97.14 : 108.98
Selenium	TM152	99.5	94.17
0"	T14450	85.61 : 111.03	85.61 : 111.03
Silver	TM152	98.67	94.33
O - disser-	TMACO	86.73 : 107.07	86.73 : 107.07
Sodium	TM152	110.0	98.67
Strontium	TM152	91.84 : 109.17	91.84 : 109.17
Strontum	TIVITOZ	<b>100.33</b> 83.77 : 107.87	<b>96.0</b> 83.77 : 107.87
Tellurium	TM152		
rollanam	1111102	<b>92.0</b> 82.83 : 104.73	<b>93.67</b> 82.83 : 104.73
Thallium	TM152		
	102	<b>92.83</b> 77.47 : 113.87	<b>92.17</b> 77.47 : 113.87
Tin	TM152	103.17	101.0
		91.00 : 109.00	91.00 : 109.00
Titanium	TM152	106.83	101.17
		87.29 : 108.31	87.29 : 108.31
Tungsten	TM152	100.33	101.5
		68.27 : 122.97	68.27 : 122.97
Uranium	TM152	102.0	98.5
		82.46 : 105.16	82.46 : 105.16
Vanadium	TM152	99.5	97.17
		88.43 : 114.30	88.43 : 114.30
Zinc	TM152	102.67	103.0
		85.57 : 114.31	85.57 : 114.31

ALS

SDG: 200115-46 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C20/020 Report Number: Superseded Report: 538469

Validated

#### Dissolved Organic/Inorganic Carbon

Component	Method Code	QC 2186
Dissolved Inorganic Carbon	TM090	<b>99.0</b> 91.27 : 109.87
Dissolved Organic Carbon	TM090	<b>100.67</b> 97.87 : 108.77

#### EPH CWG (Aliphatic) Aqueous GC (W)

Component	Method Code	QC 2146
Total Aliphatics >C10-C40	TM174	94.88
		69.79 : 134.39

## EPH CWG (Aromatic) Aqueous GC (W)

Component	Method Code	QC 2149
Total Aromatics >EC10-EC40	TM174	85.37
		59.92 : 128.54

## GRO by GC-FID (W)

Component	Method Code	QC 2186
Benzene by GC	TM245	<b>92.5</b> 76.38 : 121.90
Ethylbenzene by GC	TM245	<b>93.0</b> 74.02 : 123.14
m & p Xylene by GC	TM245	<b>92.5</b> 74.03 : 123.21
MTBE GC-FID	TM245	<b>93.0</b> 76.82 : 121.46
o Xylene by GC	TM245	<b>94.0</b> 74.37 : 122.75
QC	TM245	<b>100.35</b> 63.32 : 125.20
Toluene by GC	TM245	<b>94.0</b> 75.75 : 124.83

## Mercury Dissolved

Component	Method Code	QC 2140
Mercury Dissolved (CVAF)	TM183	85.4
		75.00 : 111.00

## PAH Spec MS - Aqueous (W)



SDG: 200115-46 Location: Cwmcarn High School Client Reference: Order Number: A110489-4 C20/020 Report Number: Superseded Report: 538469

## PAH Spec MS - Aqueous (W)

Component	Method Code	QC 2180	QC 2162
Acenaphthene by GCMS	TM178		
7.00 naphthono by Come	"""	<b>103.6</b> 90.45 : 118.63	<b>103.6</b> 97.60 : 116.80
Acenaphthylene by GCMS	TM178		
Acenaphiniyiene by GowiG	TIWITTO	103.2	97.2
A II	T14470	90.13 : 116.27	89.20 : 113.20
Anthracene by GCMS	TM178	96.4	97.2
		92.40 : 114.00	92.40 : 116.40
Benz(a)anthracene by GCMS	TM178	103.2	92.4
		89.51 : 117.69	84.40 : 110.80
Benzo(a)pyrene by GCMS	TM178	103.2	95.2
		89.43 : 118.57	87.20 : 106.40
Benzo(b)fluoranthene by	TM178	101.6	92.0
GCMS		87.80 : 121.80	84.80 : 111.20
Benzo(ghi)perylene by GCMS	TM178	102.0	100.8
		87.10 : 119.30	93.60 : 112.80
Benzo(k)fluoranthene by	TM178	105.2	98.4
GCMS		93.23 : 123.57	90.40 : 119.20
Chrysene by GCMS	TM178	102.8	100.8
		88.68 : 116.92	96.80 : 113.60
Dibenzo(ah)anthracene by	TM178	106.4	95.2
GCMS		86.24 : 118.56	88.00 : 112.00
Fluoranthene by GCMS	TM178	102.4	105.6
		86.04 : 121.96	93.49 : 118.20
Fluorene by GCMS	TM178	105.6	101.6
·		90.76 : 121.24	94.39 : 118.66
Indeno(123cd)pyrene by	TM178	111.6	97.6
GCMS		88.39 : 119.61	90.40 : 114.40
Naphthalene by GCMS	TM178		111.2
. apriliaiono by Goino	111111	<b>98.4</b> 89.40 : 121.80	<b>111.2</b> 94.00 : 115.60
Phenanthrene by GCMS	TM178		
i nenanunene by GOMS	TIWITO	104.0	102.0
Dance by COMC	TM470	90.41 : 119.19	94.80 : 114.00
Pyrene by GCMS	TM178	102.4	108.8
		91.00 : 120.20	96.40 : 115.60

## pH Value

	Component	Method Code	QC 2189
1	pН	TM256	101.62
			99.87 : 102.29

## Phenols by HPLC (W)

Component	Method Code	QC 2100
2.3.5 Trimethyl-Phenol by HPLC (W)	TM259	<b>100.0</b> 91.00 : 109.00
2-Isopropyl Phenol by HPLC (W)	TM259	<b>96.0</b> 90.00 : 114.00
Cresols by HPLC (W)	TM259	<b>105.0</b> 90.02 : 130.15
Napthol by HPLC (W)	TM259	<b>104.0</b> 86.00 : 128.00

#### **CERTIFICATE OF ANALYSIS**

ALS

SDG:200115-46Client Reference:A110489-4Report Number:538469Location:Cwmcarn High SchoolOrder Number:C20/020Superseded Report:

Phenols by HPLC (W)

		QC 2100
Phenol by HPLC (W)	TM259	<b>101.0</b> 85.89 : 109.89
Xylenols by HPLC (W)	TM259	<b>101.17</b> 93.33 : 107.33

The above information details the reference name of the analytical quality control sample (AQC) that has been run with the samples contained in this report for the different methods of analysis.

The figure detailed is the percentage recovery result for the AQC.

The subscript numbers below are the percentage recovery lower control limit (LCL) and the upper control limit (UCL). The percentage recovery result for the AQC should be between these limits to be statistically in control.



 SDG:
 200115-46
 Client Reference:
 A110489-4
 Report Number:

 Location:
 Cwmcarn High School
 Order Number:
 C20/020
 Superseded Report:

**Appendix** 

## General

- 1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method. VOC TICs and SVOC TICs.
- 2. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.
- 3. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
- 4. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
- 5. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.
- 6. NDP No determination possible due to insufficient/unsuitable sample.
- 7. Results relate only to the items tested
- 8. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.
- 9. Surrogate recoveries Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.
- 10. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
- 11. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
- 12. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
- 13. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.
- 14. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
- 15. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.
- 16. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

17. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as "mixed hydrocarbons". Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

538469

#### 18. Sample Deviations

If a sample is classed as deviated then the associated results may be compromised

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
§	Sampled on date not provided
•	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to late arrival of instructions or samples

#### 19. Asbestos

When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbe stos Type	Common Name
Chrysofile	White Asbests
Amosite	Brow n Asbestos
Cro d dolite	Blue Asbe stos
Fibrous Act nolite	-
Fib to us Anthop hyll ite	-
Fibrous Tremolite	-

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

#### Respirable Fibres

Respirable fibres are defined as fibres of <3  $\mu$ m diameter, longer than 5  $\mu$ m and with aspect ratios of at least 3:1 that can be inhaled into the lower regions of the lung and are generally acknowledged to be most important predictor of hazard and risk for cancers of the lung.

Standing Committee of Analysts, The Quantification of Asbestos in Soil (2107).

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

Sample Identity	England and Wales (mg/kg) where Soil Organic Matter <1%		SA01 0.20-0.20	WS01 0.40-0.40	BH02 0.20-0.20	HP02 0.25-0.25	TP02 0.50-0.50	WS02 0.80-0.80	WS03 1.00-1.00	TP04 0.30-0.30	WS04 0.20-0.20	WS06 0.90-0.90
Depth (m bgl)												
Reference		Screen Value	4	12	10	23	2	14	16	6	17	20
Sample Date	Units	Residential (without plant uptake)	3/25/2019	3/28/2019	3/28/2019	3/28/2019	3/25/2019	3/28/2019	3/28/2019	3/25/2019	3/28/2019	3/29/2019
рН		<5, >9	7.03	7.66	7.45	8.33	6.75	7.72	6.87	8.56	6.87	8.05
Asbestos	%	Presence	Not Present									
HEAVY METALS/METALLOIDS												
Arsenic	mg/kg	40	13.4	6.93	9.16	9.08	7.25	7.87	8.66	21.8	21.3	11.2
Cadmium	mg/kg	150	0.284	0.225	0.134	0.71	0.143	0.179	0.164	0.541	0.244	0.313
Chromium (III)	mg/kg	910	8	4.32	7.95	<0.9	4.59	5.5	5.53	7.38	9.49	6.52
Chromium (VI)	mg/kg	21	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Lead	mg/kg	310	30.8	11.7	19.5	22.1	11.5	13.3	13.8	81.1	52.5	26.5
Mercury (Elemental)	mg/kg	1.2										
Mercury (Inorganic)	mg/kg	56	<0.14	<0.14	<0.14	<1.4	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
Mercury (Methyl)	mg/kg	15										
Nickel	mg/kg	180	16.3	20.4	10.1	19.4	22.6	24	22	11	20.5	15.7
Selenium	mg/kg	430	2.38	1.15	1.36	<10	1.39	1.52	1.44	<1	2.1	<1
Berylium	mg/kg	1.7	0.313	0.254	0.31	0.343	0.295	0.3	0.318	0.263	0.472	0.375
Boron	mg/kg	11,000	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Vanadium	mg/kg	1,200	21.8	14.2	20.1	19.7	14.9	16.4	15.9	9.27	25	12
Copper	mg/kg	7,100	21.4	6.99	9.98	<14	11.8	9.79	13.5	11.3	29	14.6
Zinc	mg/kg	40,000	77.1	59.9	46.3	68.8	72.9	71.6	70.5	253	96.7	113
GENERAL INORGANICS												
Easily Liberatable Cyanide (free)	mg/kg	24										
US EPA PRIORITY PAHS												
Acenaphthene	mg/kg	3,000 (57,0)sol	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008
Acenaphthylene	mg/kg	2,900 (86.1)sol	<0.012	<0.012	<0.012	0.0239	<0.012	<0.012	<0.012	<0.012	0.0672	0.0177
Anthracene	mg/kg	31,000 (1.17)vap	<0.016	<0.016	< 0.016	0.0342	<0.016	<0.016	<0.016	< 0.016	0.0732	<0.016
Benzo(a)anthracene	mg/kg	11	0.0213	<0.014	<0.014	0.167	<0.014	<0.014	<0.014	0.0161	0.481	0.0909
Benzo(b)fluoranthene	mg/kg	3.9	0.0312	<0.015	0.0237	0.202	<0.015	<0.015	<0.015	0.0231	0.783	0.111
Benzo(k)fluoranthene	mg/kg	110	<0.014	<0.014	< 0.014	0.0755	<0.014	<0.014	<0.014	< 0.014	0.295	0.0621
Benzo(g,h,i)perylene	mg/kg	360	<0.024	<0.024	<0.024	0.147	<0.024	<0.024	<0.024	<0.024	0.337	0.0845
Benzo(a)pyrene	mg/kg	5.3	0.0211	<0.015	<0.015	0.19	<0.015	<0.015	<0.015	0.0188	0.561	0.104
Chrysene	mg/kg	30	0.0378	<0.01	0.0146	0.178	<0.01	<0.01	<0.01	0.0235	0.494	0.115
Di-benzo(a,h)anthracene	mg/kg	0.31	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	<0.023	0.0662	<0.023
Fluoranthene	mg/kg	1,500	0.0506	< 0.017	<0.017	0.311	<0.017	<0.017	<0.017	0.0265	0.804	0.239
Fluorene	mg/kg	2,800 (30.9)sol	<0.01	<0.01	<0.01	0.0119	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	mg/kg	45	<0.018	<0.018	<0.018	0.137	<0.018	<0.018	<0.018	<0.018	0.324	0.0831
Naphthalene	mg/kg	2.3	0.0148	<0.009	<0.009	0.0537	<0.009	<0.009	<0.009	<0.009	0.0399	0.0206
Phenanthrene	mg/kg	1,300 (36.0)sol	0.0496	<0.015	<0.015	0.146	<0.015	<0.015	<0.015	0.0182	0.178	0.158
Pyrene	mg/kg	3,700	0.0399	<0.015	<0.015	0.271	<0.015	<0.015	<0.015	0.0236	0.699	0.202
<u> </u>	55	-,										
TPH												
TPH Aliphatic >C5-6	mg/kg	42	<0.01	<0.01	<0.01	0.00342	<0.01	<0.01	<0.01	<0.01	0.0375	<0.01
TPH Aliphatic >C6-8	mg/kg	100	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0415	<0.01
TPH Aliphatic >C8-10	mg/kg	27	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.598	<0.01
TPH Aliphatic >C10-12	mg/kg	130 (48)vap	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.213	0

Sample Identity	England	and Wales (mg/kg) where	SA01	WS01	BH02	HP02	TP02	WS02	WS03	TP04	WS04	WS06
Depth (m bgl)	Soil	Organic Matter <1%	0.20-0.20	0.40-0.40	0.20-0.20	0.25-0.25	0.50-0.50	0.80-0.80	1.00-1.00	0.30-0.30	0.20-0.20	0.90-0.90
Reference		Screen Value		12	10	23	2	14	16	6	17	20
Sample Date	Units	Residential (without plant uptake)	3/25/2019	3/28/2019	3/28/2019	3/28/2019	3/25/2019	3/28/2019	3/28/2019	3/25/2019	3/28/2019	3/29/2019
TPH Aliphatic >C12-16	mg/kg	1,100 (24)sol	0.128	0.551	0.278	<0.1	0.366	<0.1	<0.1	<0.1	0.257	0.632
TPH Aliphatic >C16-35	mg/kg	65,000 (8.48)sol										
TPH Aliphatic >C35-44	mg/kg	65,000 (8.48)sol	1.1	0.454	<0.1	0.975	0.125	0.106	<0.1	<0.1	0.389	0.847
TPH Aromatic >EC5-7 (Benzene)	mg/kg	0.89	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH Aromatic >EC7-8	mg/kg	860	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH Aromatic >EC8-10	mg/kg	47	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.399	<0.01
TPH Aromatic >EC10-12	mg/kg	250	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.142	<0.01
TPH Aromatic >EC12-16	mg/kg	1,800	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.147	0.687
TPH Aromatic >EC16-21	mg/kg	1,900	0.234	<0.1	<0.1	0.795	<0.1	<0.1	<0.1	<0.1	12.8	3.92
TPH Aromatic >EC21-35	mg/kg	1,900	7.12	0.395	1.25	9.09	0.336	0.276	<0.1	4.25	43	14
TPH Aromatic >EC35-44	mg/kg	1,900	7.22	0.456	0.879	9.77	0.448	0.832	<0.1	5.56	14	4.47
TPH Aliphatic & Aromatic >EC44-70	mg/kg	1,900										
Total TPH	mg/kg	No Sum										
BTEX												
Benzene	mg/kg	0.89	<0.18	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	< 0.009	<0.18	<0.18
Toluene	mg/kg	880vap (869)	<0.14	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	< 0.007	<0.14	<0.14
Ethylbenzene	mg/kg	83	<0.08	< 0.004	< 0.004	< 0.004	< 0.004	<0.004	< 0.004	<0.004	<0.08	<0.08
m-Xylene	mg/kg	82	<0.2	<0.01	< 0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.2	<0.2
o-Xylene	mg/kg	88	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.2	<0.2
p-Xylene	mg/kg	79	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.2	<0.2
Xylenes (mixed isomers)	mg/kg	79	<0.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.2	<0.2

#### Notes:

vap

--- Analyte not tested for

Suitable 4 Use Level exceeds soil saturation limit which is given in brackets (note that if soil data exceeds the sollubility limit, free product may be present). For screening consider applicability of both sollubility limit and soil screening value.

Suitable 4 Use Level exceeds vapour saturation limit

which is given in brackets.

Groundwater Samples	Units	LOD	BH01	BH02	ВН03А	WS02	WS03
Carbon, Organic	mg/l	<3	<3	<3	<3	<3	<3
Nitrite as NO2	mg/l	<0.05	<0.05	<0.05	0.051	<0.05	<0.05
рН	pH Units	<1	7.04	7.46	7.55	7.9	7.34
Sulphate	mg/l	<2	30.8	33	35.3	26.2	25.9
Chloride	mg/l	<2	35.2	37.2	14.2	42.7	40.4
Ammoniacal Nitrogen as NH3	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cyanide, Total	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammoniacal Nitrogen as NH4	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Nitrate as NO3	mg/l	<0.3	6.05	6.44	5.06	8.85	8.07
Alkalinity, Total as CaCO3	mg/l	<2	95	100	195	100	100
Mercury	μg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Antimony	μg/l	<1	<1	<1	<1	<1	<1
Arsenic	μg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Barium	μg/l	<0.2	23.4	41.6	99.3	39.5	21.3
Beryllium	μg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Boron	μg/l	<10	28.3	27.8	25.2	30.3	29
Cadmium	μg/l	<0.08	<0.08	<0.08	<0.08	<0.08	<0.08
Chromium	μg/l	<1	<1	<1	<1	<1	<1
Copper	μg/l	<0.3	<0.3	0.661	0.519	0.424	<0.3
Lead	μg/l	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Molybdenum	μg/l	<3	<3	<3	<3	<3	<3
Nickel	μg/l	<0.4	<0.4	0.715	1.42	0.708	<0.4
Selenium	μg/l	<1	2.39	1.17	2.9	1.6	1.84
Zinc	μg/l	<1	<1	<1	3.98	<1	<1
Phenol	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
GRO Surrogate % recovery**	%		114	108	114	110	113
GRO >C5-C12	μg/l	<50	<50	<50	<50	<50	<50
Methyl tertiary butyl ether (MTBE)	μg/l	<3	<3	<3	<3	<3	<3
Benzene	μg/l	<7	<7	<7	<7	<7	<7
Toluene	μg/l	<4	<4	<4	<4	<4	<4
Ethylbenzene	μg/l	<5	<5	<5	<5	<5	<5
m,p-Xylene	μg/l	<8	<8	<8	<8	<8	<8
o-Xylene	μg/l	<3	<3	<3	<3	<3	<3
Sum of detected Xylenes	μg/l	<11	<11	<11	<11	<11	<11
Sum of detected BTEX	μg/l	<28	<28	<28	<28	<28	<28
Aliphatics >C5-C6	μg/l	<10	<10	<10	<10	<10	<10
Aliphatics >C6-C8	μg/l	<10	<10	<10	<10	<10	<10
Aliphatics >C8-C10	μg/l	<10	<10	<10	<10	<10	<10
Aliphatics >C10-C12	μg/l	<10	<10	<10	<10	<10	<10
Aliphatics >C12-C16 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Aliphatics >C16-C21 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Aliphatics >C21-C35 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Total Aliphatics >C12-C35 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Aromatics >EC5-EC7	μg/l	<10	<10	<10	<10	<10	<10

Groundwater Samples	Units	LOD	BH01	BH02	ВН03А	WS02	WS03
Aromatics >EC7-EC8	μg/l	<10	<10	<10	<10	<10	<10
Aromatics >EC8-EC10	μg/l	<10	<10	<10	<10	<10	<10
Aromatics >EC10-EC12	μg/l	<10	<10	<10	<10	<10	<10
Aromatics >EC12-EC16 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Aromatics >EC16-EC21 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Aromatics >EC21-EC35 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Total Aromatics >EC12-EC35 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Total Aliphatics & Aromatics >C5-35 (aq)	μg/l	<10	<10	<10	<10	<10	<10
Naphthalene (aq)	μg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene (aq)	μg/l	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthylene (aq)	μg/l	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluoranthene (aq)	μg/l	< 0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Anthracene (aq)	μg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenanthrene (aq)	μg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene (aq)	μg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chrysene (aq)	μg/l	< 0.005	< 0.005	<0.005	<0.005	<0.005	< 0.005
Pyrene (aq)	μg/l	< 0.005	< 0.005	<0.005	0.00746	<0.005	< 0.005
Benzo(a)anthracene (aq)	μg/l	< 0.005	< 0.005	<0.005	<0.005	<0.005	<0.005
Benzo(b)fluoranthene (aq)	μg/l	< 0.005	<0.005	< 0.005	<0.005	<0.005	< 0.005
Benzo(k)fluoranthene (aq)	μg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(a)pyrene (aq)	μg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Dibenzo(a,h)anthracene (aq)	μg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(g,h,i)perylene (aq)	μg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Indeno(1,2,3-cd)pyrene (aq)	μg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
PAH, Total Detected USEPA 16 (aq)	μg/l	<0.082	<0.082	<0.082	<0.082	<0.082	<0.082
Aliphatics >C16-C35 Aqueous	μg/l	<10	<10	<10	<10	<10	<10

Soil Derived Leachate Samples			SA01	TP04	WS03	WS06
		I	0.20-0.20	0.30-0.30	1.00-1.00	0.90-0.90
	Units	LOD				
Temperature	℃		18.4	18	18	18.4
рН	pH Units		8.29	7.76	7.76	8.46
Conductivity @ 20 deg.C	μS/cm		28.2	11.1	11.1	84.8
Nitrite as NO2	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
pH	pH Units	<1	7.38	7.96	6.91	7.95
Sulphate	mg/l	<2	<2	5.5	<2	<2
Chloride	mg/l	<2	<2	<2	<2	<2
Ammoniacal Nitrogen as NH3	mg/l	<0.2	<0.2	<0.2	<0.2	<0.2
Cyanide, Total	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Ammoniacal Nitrogen as NH4	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3
Nitrate as NO3	mg/l	<0.3	2.65	0.64	0.807	0.799
Alkalinity,Total as CaCO3	mg/l	<2	17	50	4.5	50
Mercury	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Antimony	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Arsenic	mg/l	<0.0005	<0.0005	0.00106	<0.0005	0.00557
Barium	mg/l	<0.0002	0.00603	0.283	0.00189	0.014
Beryllium	mg/l	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Boron	mg/l	<0.01	<0.01	<0.01	<0.01	0.0105
Cadmium	mg/l	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008
Chromium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Copper	mg/l	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Lead	mg/l	<0.0002	0.000605	<0.0002	0.000332	0.00032
Molybdenum	mg/l	<0.003	<0.003	<0.003	<0.003	0.00716
Nickel	mg/l	<0.0004	0.000668	0.000574	<0.0004	0.000509
Selenium	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	mg/l	<0.001	0.00229	<0.001	0.0044	<0.001
Phenol	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002
000 05 040	0	0.05	2.25	0.05	2.05	0.05
GRO >C5-C12	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05
Methyl tertiary butyl ether (MTBE)	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003
Benzene	mg/l	<0.007	<0.007	<0.007	<0.007	<0.007
Toluene	mg/l	<0.004	0.021	<0.004	<0.004	<0.004
Ethylbenzene	mg/l	<0.005	<0.005	<0.005	<0.005	<0.005
m,p-Xylene	mg/l	<0.008	<0.008	<0.008	<0.008	<0.008
o-Xylene	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003
Aliphatics >C5-C6	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C6-C8	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C8-C10	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C10-C12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C12-C16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C16-C21	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aliphatics >C21-C35	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aliphatics >C12-C35	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC5-EC7	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01

Soil Derived Leachate Samples			SA01	TP04	WS03	WS06
			0.20-0.20	0.30-0.30	1.00-1.00	0.90-0.90
	Units	LOD				
Aromatics >EC7-EC8	mg/l	<0.01	0.021	<0.01	<0.01	<0.01
Aromatics >EC8-EC10	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC10-EC12	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC12-EC16	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC16-EC21	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC21-EC35	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Aromatics >EC16-EC35	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aromatics >EC12-EC35	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
Total Aliphatics & Aromatics >C5-35	mg/l	<0.01	0.023	<0.01	<0.01	<0.01
Naphthalene	mg/l	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Acenaphthene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Acenaphthylene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Fluoranthene	mg/l	<0.000005	0.0000764	0.0000229	0.0000418	0.0000358
Anthracene	mg/l	<0.000005	0.00000791	<0.000005	0.0000104	0.00000531
Phenanthrene	mg/l	<0.000005	0.0000404	0.0000195	0.0000476	0.0000229
Fluorene	mg/l	<0.000005	0.00000542	<0.000005	0.00000688	<0.000005
Chrysene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Pyrene	mg/l	<0.000005	0.000049	0.0000155	0.0000309	0.0000227
Benzo(a)anthracene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	0.0000071
Benzo(b)fluoranthene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Benzo(k)fluoranthene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Benzo(a)pyrene	mg/l	<0.000002	<0.000002	<0.000002	<0.000002	<0.000002
Dibenzo(a,h)anthracene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Benzo(g,h,i)perylene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005
Indeno(1,2,3-cd)pyrene	mg/l	<0.000005	<0.000005	<0.000005	<0.000005	<0.000005

### Former Cwmcarn High School



# APPENDIX G – GROUNDWATER AND GROUNDGAS MONITORING RESULTS

5th Floor, Longcross Court, 47 Newport Road, Cardiff, CF24 0AD

Client: Caerphilly County Borough Council



Site Name: Cwmcarn Date Monitored: 02/04/19
Job No.: A110489-4 Monitoring Engineer: KW

**Weather:** Bright, mild, slight

wind

 EQUIPMENT USED

 Type
 Make
 Serial
 Last Calibrated

 Gas Analyser
 Landtec GA5000
 G502044
 Nov-18

 Interface Meter
 Solinst
 122-004988-1
 n/a

	LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS													
Evploratory	Pe	ak		Steady										
Exploratory Hole No	CH₄	CO ₂	CH ₄	CO ₂	O ₂	BAL	PID	H ₂ S	HCN	СО	Time			
TIOIE NO	(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	Time			
WS01	0.0	1.7	0.0	1.7	20.8	77.5	nt	0	nt	1	13:00:00			
WS02	0.0	1.2	0.0	1.2	20.5	78.3	nt	0	nt	0	12:30:00			
WS03	0.0	3.8	0.0	3.8	17.4	78.7	nt	0	nt	0	12:00:00			
WS05	0.0	0.5	0.0	0.5	22.9	76.6	nt	0	nt	0	13:30:00			
BH01	0.0	0.4	0.0	0.4	22.7	77.9	nt	0	nt	2	14:00:00			

	LANDGAS - PHYSICAL PARAMETERS													
Exploratory	Atmos	Atmos	Atmos BH Flow		BH Pre	essure								
Hole No	Pressure	Temp (°C)	Peak	Steady	Peak	Steady	Remarks							
TIOIE NO	(m bar)	Tellip (C)	(L/hr)	(L/hr)	(mbar)	(mbar)								
WS01	995	nt	0.2	0.2	0.9	0.9								
WS02	995	nt	0.1	0.1	0.0	0.0								
WS03	995	nt	0.3	0.3	-0.4	-0.4								
WS05	996	nt	0.5	0.5	-0.3	-0.3								
BH01	995	nt	-1.5	-1.5	0.3	0.3								

AMBIENT A	TMOSPHERIC COND	ITIONS	ATMOSPHERIC PRESSURE CONDITIONS					
Parameter	Before Monitoring	After Monitoring	ATMOSPHERIC PRESSURE CONDITIONS					
CH ₄ (% vol)	0.0	0.0	3 days prior (m bar)	1022				
CO ₂ (% vol)	0.2	0.2	2 days prior (m bar)	1024				
O ₂ (% vol)	21.3	21.3	1 day prior (m bar)	1019				
PID (ppm)	nt	nt	during (m bar) am,midday,pm	1005				
Atmos Press. (m bar)	995	996	1 day post (m bar)	999				

					-	_ 0.0./						
	GROUNDWATER / NAPL - PHYSIO-CHEMICAL PARAMETERS											
Evelouetem.	Water	Base	LNAPL	DNAPL			Water Qua	ality Indicato	rs			
Exploratory Hole No	Surface	Depth	Surface	Surface	ORP	SPC	С	Ph	DO	Temp	Remarks	
Hole No	(mbgl)	(mbgl)	(mbgl)	(mbgl)	(mV)	(µs/cm)	(μs/cm)	(value)	(mg/L)	(°C)		
WS01	DRY	1.60	nd	nd	nt	nt	nt	nt	nt	nt		
WS02	DRY	1.27	nd	nd	nt	nt	nt	nt	nt	nt		
WS03	1.50	1.55	nd	nd	nt	nt	nt	nt	nt	nt		
WS05	DRY	2.30	nd	nd	nt	nt	nt	nt	nt	nt		
BH02	0.95	4.97	nd	nd	nt	nt	nt	nt	nt	nt		

nt = not tested nd = not detected

Notes

Data Compiled by: KW Data Checked by: SR

5th Floor, Longcross Court, 47 Newport Road, Cardiff, CF24 0AD



Site Name: Cwmcarn Date Monitored: 08/04/19 Job No.: A110489-4
Client: Caerphilly County Borough Council

Monitoring Engineer: KW
Weather: Overcast damp and

			E	QUIPME	NT LICED							
				QUII I IL	Serial							
Type Make Gas Analyser Landtec GA5000									alibrated			
	Lan		000		G502044				v-18			
Meter		Solinst		12	2-004988	3-1		n	/a			
		NDGAS CO	ONCENTR/	ATIONS -	INSTALL			<u>S</u>				
							•	ı				
			_							Time		
							_		_	11:30:0		
							_			14:30:0		
							_			15:45:0		
							_			12:30:0		
										15:15:0		
										14:00:0		
0.0	0.4	0.0	0.4	16.4	83.2	nt	U	nt	U	11:00:0		
Atmos						METERS						
	Atmos	Doak						Domarko				
	Temp (°C)							Remarks				
	nt											
	nt											
1002	nt	0.1	0.1	0.2	0.2							
1001	nt	-0.1	-0.1	0.8	0.8							
MRTENT A	TMOSDUE	PIC COND	TTIONS									
IDILITI A				nitorina		ATMOSI	PHERIC PR	ESSURE C	ONDITIO	NS		
					3 days nr	ior (m har	<u> </u>	l	999			
						•						
							)					
						<u> </u>						
							midday,pm					
m bar)									1014			
				PL - PHY								
				000					Toma	Dema		
	-									Remarks		
				(mV)	(µs/cm)	(μs/cm)	(value)	(mg/L)	(°C)			
1.45	1.60	nd	nd	nt	nt	nt	nt	nt	nt			
0.94		nd	nd			nt		9.0	10.6			
1.17	1.55	nd	nd	324.9	391.8	nt	7.2	7.9	9.9			
DRY	2.30	nd	nd	nt	nt	nt	nt	nt	nt			
1.10	6.79	nd	nd	330.1	337.8	nt	7.1	5.9	10.1			
0.65	4.88	nd	nd	294.1	393.9	nt	7.5	4.4	10.2			
1.22	6.51	nd	nd	264.4	497.7	nt	7.5	5.4	9.5			
	CH ₄ (% vol) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Peak	Peak	Peak	Peak	Peak	Peak	Peak	CH ₄	Peak		

nt = not tested nd = not detected

Notes

Data Compiled by: KW Data Checked by: SR

5th Floor, Longcross Court, 47 Newport Road, Cardiff, CF24 0AD



Weather: Very overcast, rainy

**Site Name:** Cwmcarn Job No.: A110489-4 Client: Caerphilly County Borough Council **Monitoring Engineer:** KW

Client:	Caerprilliy	County bor	ough Cound	CII					Weather:	-	rcast, rainy d mild
				E	QUIPME	NT USED				an.	a milio
Туре	9		Make			Serial				librated	
Gas Ana	•	Lan	dtec GA5	000		G502044	1		No	<b>v-18</b>	
Interface	Meter		Solinst		12	2-004988	3-1		n	/a	
									-		
	<b>D</b>		NDGAS CO	DNCENTRA	ATIONS -	INSTALL		ONDITION	<u>S</u>		
Exploratory		ak	CLI		0	I DAI	Stead	•	LICNI	60	
Hole No	CH ₄	CO ₂	CH ₄	CO ₂	O ₂	BAL	PID	H ₂ S	HCN	CO	Time
WS01	(% vol) 0.0	(% vol) 2.0	(% vol) 0.0	(% vol) 2.0	(% vol) 18.2	(%) 79.7	(ppm) nt	(ppm) 0	(ppm) nt	(ppm) 0	09:40:00
WS02	0.0	1.0	0.0	1.0	21.3	7.6	nt	0	nt	0	10:20:00
WS03	0.0	4.0	0.0	4.0	18.1	78	nt	0	nt	0	11:00:00
WS05	0.0	0.7	0.0	0.7	21.9	77.3	nt	0	nt	0	09:00:00
BH01	0.0	0.2	0.0	0.2	21.7	78.1	nt	0	nt	0	10:40:00
BH02	0.0	0.8	0.0	0.8	21.4	77.9	nt	0	nt	0	10:00:00
BH03A	0.0	2.1	0.0	2.1	18.2	79.7	nt	0	nt	0	09:20:00
				LANDGAS	- DHVST	AI DADA	METEDS				
	Atmos		BH I		essure	ITILILIS					
Exploratory	Pressure	Atmos	Doak	Steady	Peak	Steady			Remarks		
Hole No	(m bar)	Temp (°C)	(L/hr)	(L/hr)	(mbar)	(mbar)					
WS01	1006	nt	0.4	0.4	0.0	0.0					
WS02	1006	nt	0.2	0.2	0.0	0.0					
WS03	1006	nt	0.2	0.2	0.9	0.9					
WS05	1006	nt	0.3	0.3	0.0	0.0					
BH01	1006	nt	0.1	0.1	0.1	0.1					
BH02	1006	nt	-1.2	-1.2	0.5	0.5					
BH03A	1006	nt	0.3	0.3	0.1	0.1					
AN	ABIENT A	TMOSPHE	RIC COND	ITIONS			ATMOSI	PHERIC PR	ESSLIDE C	ONDITIO	NC
Parameter		Before M	onitoring	After Mo	nitoring		ATMOSI	PHERIC PR	ESSURE C	ONDITIO	13
CH ₄ (% vol)		0.	.0	0.	0	3 days pr	ior (m bar	)		1024	
CO ₂ (% vol)		0	.2	0.	2	2 days pr	ior (m bar	)		1023	
O ₂ (% vol)		22	2.3	22	.3	1 day prio	or (m bar)			1017	
PID (ppm)			nt	n		during (m	bar) am,	midday,pm		1016	
Atmos Press. (ı	m bar)	10	06	10	07	1 day pos	t (m bar)			1022	
		GF	ROUNDWA	TER / NA	PL - PHY			ARAMETER:			
Evploratory	Water	Base	LNAPL	DNAPL			Water Qua	ality Indicato	ors		
Exploratory Hole No	Surface	Depth	Surface	Surface	ORP	SPC	С	Ph	DO	Temp	Remarks
TIOLE INO	(mbgl)	(mbgl)	(mbgl)	(mbgl)	(mV)	(µs/cm)	(μs/cm)	(value)	(mg/L)	(°C)	
WS01	1.53	1.60	nd	nd	nt	nt	nt	nt	nt	nt	
WS02	1.18	1.27	nd	nd	nt	nt	nt	nt	nt	nt	
WS03	1.45	1.57	nd	nd	nt	nt	nt	nt	nt	nt	
WS05	DRY	2.35	nd	nd	nt	nt	nt	nt	nt	nt	
BH01	1.33	6.70	nd	nd	nt	nt	nt	nt	nt	nt	
BH02	0.87	4.85	nd	nd	nt	nt	nt	nt	nt	nt	
BH03A	1.38	6.54	nd	nd	nt	nt	nt	nt	nt	nt	
										-	

nt = not tested nd = not detected

Notes

Data Compiled by: KW Data Checked by: SR

5th Floor, Longcross Court, 47 Newport Road, Cardiff, CF24 0AD



Site Name: Cwmcarn **Job No.:** A110489-4

Date Monitored: 13/12/19 **Monitoring Engineer:** DV

Client:	CCBC						141	rionitoring E	Weather:		ercast	
				E	QUIPME	NT USED						
Туре			Make			Serial				alibrated		
Gas Ana		Lan	ndtec GA50	000		G502044		<b></b>	Oct-17			
Interface	Meter	<del> </del>	Solinst		127	2-004988	j-1	<del> </del>	n,	/a		
		LA	NDGAS CO	ONCENTR/	ATIONS -	INSTALI	ATTON C	CONDITION	ıs			
	P€	eak		/// CLIT	1120.13	11.017	Stead					
Exploratory	CH ₄	CO ₂	CH₄	CO ₂	O ₂	BAL	PID	H ₂ S	HCN	СО		
Hole No	(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	Time	
WS101	<0.1	0.6	<0.1	0.6	20.7	nť	nt	<1	nt	<1	nt	
WS102	<0.1	1.5	<0.1	1.5	20.2	nt	nt	<1	nt	<1	nt	
WS105	0.2	1.2	0.2	1.2	18.8	nt	nt	<1	nt	<1	nt	
WS107	<0.1	2.2	< 0.1	2.2	19.0	nt	nt	<1	nt	<1	nt	
WS108	<0.1	1.8	<0.1	1.8	19.2	nt	nt	<1	nt	<1	nt	
BH101A	<0.1	0.2	<0.1	<0.1	20.9	nt	nt	<1	nt	<1	nt	
	<del></del>	<del></del> '	<del>                                     </del>	$\vdash$	<del></del> '	<del>                                     </del>	$\vdash$	$\vdash$		$\vdash$	<del>                                     </del>	
	<del>                                     </del>	<b> </b>	<del>                                     </del>		<b> </b>	<del>                                     </del>	$\vdash$					
							$\overline{}$	<del></del>				
				LANDGAS	- PHYSI	CAL PARA	METERS					
Atmos   Atmos   DH Elou   DH Procesuro												
Exploratory Hole No	Pressure	Temp	Peak	Steady	Peak	Steady			Remarks			
	(m bar)	(°C)	(L/hr)	(L/hr)	(mbar)	(mbar)						
WS101	976	nt	0.0	0.0	nt	-0.03	Γ					
WS102	976	nt	0.2	0.2	nt	-0.05	ſ <u></u>					
WS105	973	nt	0.0	0.0	nt	-0.10	<u> </u>					
WS107	976	nt	0.1	0.1	nt	0.00	ſ		-	-		
WS108	975	nt	0.1	0.1	nt	0.09	ſ					
BH101A	976	nt	0.1	0.1	nt	-0.05	f					
5		<del></del>	<del> </del>	<del> </del>	<del></del>	J						
	<del>                                     </del>	<b>—</b>	+	<del>                                     </del>	<del>                                     </del>	+	<del></del>					
	<del>                                     </del>		<del>                                     </del>	<del>                                     </del>	<del>                                     </del>							
		<del></del>	<del>                                     </del>	<del>                                     </del>	<del></del>		<del></del>					
40	ARTENT A	TMOSPHE	RIC COND	NITIONS								
Parameter	IDILITIA	1	1onitoring	After Mo	nitoring		ATMOSF	PHERIC PRE	ESSURE C	ONDITION	NS	
				After Mo	-	2 days pr	(m ha			nt		
CH ₄ (% vol)			nt nt				rior (m bar		<del> </del>	nt		
CO ₂ (% vol)			nt	<0			ior (m bar		<del>                                     </del>	nt		
O ₂ (% vol)			nt -+	21.			or (m bar)		<del> </del>	nt		
PID (ppm)			nt -t	ni				,midday,pm	<del> </del>	nt		
Atmos Press. (	m bar)		nt	97		1 day pos				nt		
				<del></del>	PL - PHY:			ARAMETERS				
Exploratory	Water	Base	LNAPL	DNAPL				ality Indicato				
Hole No	Surface	Depth	Surface	Surface	ORP	SPC	С	Ph	DO	Temp	Remarks	
	(mbgl)	(mbgl)	(mbgl)	(mbgl)	(mV)	(µs/cm)	(μs/cm)	(value)	(mg/L)	(°C)		
WS101	1.78	1.90	nd	nd	nt	nt	nt	nt	nt	nt		
WS102	1.59	1.65	nd	nd	nt	nt	nt	nt	nt	nt	<u> </u>	
WS105	1.67	1.75	nd	nd	nt	nt	nt	nt	nt	nt	<u> </u>	
WS107	1.59	1.65	nd	nd	nt	nt	nt	nt	nt	nt		
WS108	DRY	1.80	nd	nd	nt	nt	nt	nt	nt	nt		
BH101A	1.97	6.50	nd	nd	nt	nt	nt	nt	nt	nt		
			1		[							
				1								
	<del>                                     </del>	<u> </u>			<u> </u>							
	<del>                                     </del>	<u> </u>			<u> </u>							

**Notes** nt = not tested nd = not detected Data Compiled by: DV Data Checked by: SR

5th Floor, Longcross Court, 47 Newport Road, Cardiff, CF24 0AD



Weather: Clear

Site Name: Cwmcarn
Job No.: A110489-4
Client: CCBC

 EQUIPMENT USED

 Type
 Make
 Serial
 Last Calibrated

 Gas Analyser
 Landtec GA5000
 G502044
 Oct-17

 Interface Meter
 Solinst
 122-004988-1
 n/a

		LA	NDGAS CO	ONCENTRA	ATIONS -	INSTALL	ATION C	ONDITION	S				
Evploratory	Peak			Steady									
Exploratory Hole No	CH ₄	CO ₂	CH ₄	CO ₂	02	BAL	PID	H ₂ S	HCN	СО	Time		
Hole No	(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	Time		
WS101	0.1	0.9	0.1	0.9	20.1	78.8	nt	<1	nt	<1	13:13:00		
WS102	0.1	1.5	0.1	1.5	1.5	78.5	nt	<1	nt	<1	12:59:00		
WS105	0.1	1.0	0.1	1.0	20.1	78.8	nt	<1	nt	<1	12:45:00		
WS107	0.1	2.2	0.1	2.2	18.2	79.5	nt	<1	nt	<1	12:52:00		
WS108	0.1	1.7	0.1	1.7	19.7	78.6	nt	<1	nt	<1	13:20:00		
BH101A	0.1	0.1	0.1	0.1	20.7	79.1	nt	<1	nt	<1	13:07:00		

				LANDGAS	- PHYSIC	CAL PARA	METERS
Exploratory	Atmos	Atmos	BH Flow		BH Pressure		
Hole No	Pressure	Temp (°C)	Peak	Steady	Peak	Steady	Remarks
(m bar)	remp ( C)	(L/hr)	(L/hr)	(mbar)	(mbar)		
WS101	989	nt	0.1	0.1	-0.14	0.00	
WS102	989	nt	0.1	0.1	-0.03	0.00	
WS105	987	nt	0.2	0.1	0.09	0.05	
WS107	989	nt	0.1	0.1	-0.05	-0.02	
WS108	988	nt	0.1	0.1	-0.26	-0.03	
BH101A	989	nt	0.1	0.1	0.65	0.09	

AMBIENT A	TMOSPHERIC COND	ITIONS	ATMOSPHERIC PRESSURE CONDITIONS					
Parameter	Before Monitoring	After Monitoring	AIMOSPHERIC PRESSURE CONDITIONS					
CH ₄ (% vol)	0.1	0.1	3 days prior (m bar)	nt				
CO ₂ (% vol)	0.2	0.1	2 days prior (m bar)	nt				
O ₂ (% vol)	20.9	21.1	1 day prior (m bar)	nt				
PID (ppm)	nt	nt	during (m bar) am,midday,pm	nt				
Atmos Press. (m bar)	987	988	1 day post (m bar) nt					

	24. )		· .	,		_ 0.0.) 000	/e (::: 2 a. )				
		GI	ROUNDWA	TER / NA	PL - PHY	SIO-CHE	MICAL PA	RAMETER	S		
Flaata	Water	Base	LNAPL	DNAPL			Water Qua	ality Indicato	rs		
Exploratory Hole No	Surface	Depth	Surface	Surface	ORP	SPC	С	Ph	DO	Temp	Remarks
TIOIC NO	(mbgl)	(mbgl)	(mbgl)	(mbgl)	(mV)	(µs/cm)	(μs/cm)	(value)	(mg/L)	(°C)	
WS101	1.84	1.95	nd	nd	nt	nt	nt	nt	nt	nt	
WS102	1.85	2.08	nd	nd	nt	nt	nt	nt	nt	nt	
WS105	1.70	1.78	nd	nd	nt	nt	nt	nt	nt	nt	
WS107	1.61	1.64	nd	nd	nt	nt	nt	nt	nt	nt	
WS108	DRY	1.81	nd	nd	nt	nt	nt	nt	nt	nt	
BH101A	4.06	6.45	nd	nd	nt	nt	nt	nt	nt	nt	

nt = not tested nd = not detected

Notes

Data Compiled by: SB Data Checked by: SR

5th Floor, Longcross Court, 47 Newport Road, Cardiff, CF24 0AD



Raining

EQUIPMENT USED									
Type Make Serial Last Calibrated									
Gas Analyser Landtec GA5000 G502044 Oct-17									
Interface Meter Solinst 122-004988-1 n/a									
	LANDGAS CONCENTRA	ATIONS - INSTALLATION C	ONDITIONS						

		LA	NDGAS CO	DNCENTR	ATIONS -	INSTALL	ATION C	ONDITION	S				
Evoloratory	Pe	ak		Steady									
Exploratory Hole No	CH₄	CO ₂	CH ₄	CO ₂	O ₂	BAL	PID	H ₂ S	HCN	СО	Time		
Hole NO	(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(%)	(ppm)	(ppm)	(ppm)	(ppm)	Time		
WS101	0.2	1.8	0.2	1.8	19.5	78.5	nt	<1	nt	<1	11:13:00		
WS102	0.2	2.0	0.2	2.0	19.8	78.5	nt	<1	nt	<1	11:18:00		
WS105	0.2	1.3	0.2	1.3	18.8	79.7	nt	<1	nt	<1	10:41:00		
WS107	0.2	3.0	0.2	3.0	18.3	78.5	nt	<1	nt	<1	11:24:00		
WS108	0.2	1.6	0.2	1.6	20.0	78.3	nt	<1	nt	<1	11:04:00		
BH101A	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt		
BH104A	0.2	1.7	0.2	1.0	20.2	78.7	nt	<1	nt	<1	12:41:00		
BH105	0.2	1.6	0.2	1.6	20.0	78.3	nt	<1	nt	<1	11:01:00		
II					I	I							

				LANDGAS	- PHYSIC	CAL PARA	AMETERS
Exploratory	Atmos	Atmos	BH I	Flow	BH Pressure		
	Pressure		Peak	Steady	Peak	Steady	Remarks
Hole No (m bar)	(m bar)	Temp (°C)	(L/hr)	(L/hr)	(mbar)	(mbar)	
WS101	980	nt	0.1	0.1	-0.15	-0.14	
WS102	980	nt	0.1	0.2	0.00	0.03	
WS105	978	nt	0.1	0.2	2.40	1.64	
WS107	980	nt	0.1	0.2	-0.14	-0.10	
WS108	978	nt	0.1	0.2	-0.03	0.02	
BH101A	nt	nt	nt	nt	nt	nt	Borehole Flooded
BH104A	975	nt	0.1	0.1	0.31	0.14	
BH105	978	nt	0.1	0.2	0.0	0.0	

AMBIENT A	TMOSPHERIC COND	ITIONS	ATMOSPHERIC PRESSURE CONDITIONS					
Parameter	Before Monitoring	After Monitoring	ATMOSPHERIC PRESSURE CONDITIONS					
CH ₄ (% vol)	0.2	0.2	3 days prior (m bar)	1019				
CO ₂ (% vol)	0.2	0.2	2 days prior (m bar)	1019				
O ₂ (% vol)	20.8	21.0	1 day prior (m bar)	995				
PID (ppm)	nt	nt	during (m bar) am,midday,pm	993, 988, 993				
Atmos Press. (m bar)	978	975	1 day post (m bar) 1009					

Aurios Fress. (	ktilos Fiess. (III bai) 370			1 day post (III bai)					1009		
		GI	ROUNDWA	TER / NA	PL - PHY	SIO-CHE	MICAL PA	ARAMETER	S		
Exploratory	Water	Base	LNAPL	DNAPL			Water Qua	ality Indicato	rs		
Hole No	Surface	Depth	Surface	Surface	ORP	SPC	С	Ph	DO	Temp	Remarks
Hole No	(mbgl)	(mbgl)	(mbgl)	(mbgl)	(mV)	(µs/cm)	(µs/cm)	(value)	(mg/L)	(°C)	
WS101	1.8	1.9	nt	nt	nt	nt	nt	nt	nt	nt	
WS102	1.8	2.1	nt	nt	nt	nt	nt	nt	nt	nt	
WS105	1.7	1.8	nt	nt	nt	nt	nt	nt	nt	nt	
WS107	1.6	1.6	nt	nt	nt	nt	nt	nt	nt	nt	
WS108	DRY	0.8	nt	nt	nt	nt	nt	nt	nt	nt	
BH101A	nt	nt	nt	nt	nt	nt	nt	nt	nt	nt	
BH104A	1.9	4.8	nt	nt	113.4	236.9	nt	7.1	9.8	10.0	
BH105	0.5	4.5	nt	nt	47.2	569.4	nt	7.3	0.5	8.9	

Notes nt = not tested Data Compiled by: GT

nd = not detected Data Checked by: SR

### Former Cwmcarn High School



#### **APPENDIX H – CIRIA C552 RISK METHODOLOGY**

### Former Cwmcarn High School



The following tables are derived from CIRIA C552 and have been used to define the risk rating presented in the Qualitative Risk Assessment matrix.

**Classification of consequence** 

lassification of	
Classification	Definition
Severe	Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short term risk of pollution (note; Water Resources Act contains no scope for considering significant pollution) of sensitive water
	resource. Catastrophic damage to building/property. A short-term risk to a particular ecosystem, or organism forming part of such ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Medium	Chronic damage to human health ('significant harm', as defined In DETR, 2000).  Pollution of sensitive water resources (note; Water Resources Act contains no scope for considering significant pollution). A significant change in a particular ecosystem, or an organism forming part of such an ecosystem. (Note the definitions of ecological systems within the Draft Circular on Contaminated Land DETR, 2000).
Mild	Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm', as defined In DETR, 2000). Damage to sensitive buildings/structures/services or the environment.
Minor	Harm, although not necessarily significant harm, which may result in a financial loss, or expenditure to resolve. Non-permanent health effects to human health (easily prevented by means such as personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Classification of probability

Classification	Definition
High	There is a pollution linkage and an event that either appears very likely in the short term
likelihood	and almost inevitable over the long term or there is evidence at the receptor of harm or pollution.
Likely	There is a pollutant linkage and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short term and likely over the long term.
Low likelihood	There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain that even over a longer period that such an event would take place, and is even less likely in the shorter term.
Unlikely	There is a pollution linkage but circumstances are such that it is improbable that an event would occur even in the very long term.

Matrix of consequence against probability to gain a risk classification

		Consequence										
		Severe	Medium	Mild	Minor							
	High Likelihood	Very High Risk	High Risk	Moderate Risk	Moderate/Low Risk							
ΙŢ	Likely	High Risk	Moderate Risk	Moderate/Low Risk	Low Risk							
Probability	Low likelihood	Moderate Risk	Moderate/Low Risk	Low Risk	Very Low Risk							
Prol	Unlikely	Moderate/Low Risk	Low Risk	Very Low Risk	Very Low Risk							