

Prepared for
FCC ENVIRONMENT (UK) LIMITED



**CONSTRUCTION QUALITY ASSURANCE
2023 PERMANENT CAPPING VALIDATION REPORT**

AT PWLLFAWATKIN LANDFILL SITE

CQA Validation Report Reference: WR7957/05/01
January 2024



**Project Quality Assurance
Information Sheet**

**CQA Validation Report 2023 Permanent Capping Works
PWLLFAWATKIN LANDFILL SITE**

**Report
Reference** : WR7957/5/01

Report Status : For Approval

Report Date : January 2024

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**PWLLFAWATKIN LANDFILL SITE
2023 PERMANENT CAPPING WORKS
CQA VALIDATION REPORT**

1. INTRODUCTION

- 1.1 FCC Environment (UK) Limited (FCC) have constructed an engineered cap over previously infilled waste at Pwllfawatkin Landfill Site.
- 1.2 The cap comprised a 1mm Linear Low-Density Polyethylene (LLDPE) geomembrane, textured on both sides.
- 1.3 The Capping Works were carried out in accordance with the CQA Plan and Specification dated February 2014 and May 2016 prepared by FCC, (Reference: CQA Plan and Specification FCC 479 SW 2013-24 & 479 SW 2016-07).
 - The Natural Resources Wales (NRW) Letter EPR/BU8819IV dated 19th August 2016 provided NRW approval of the above CQA Plan, the letter is presented in **Appendix I**.
- 1.4 The Principal Contractor was Jones Bros Ltd, who undertook the construction work between June and November 2023. The geosynthetic installation works were subcontracted to Prime Lining Ltd.
- 1.5 The construction works incorporated the following elements:
 - (i) Trimming of existing surface to remove vegetation and undulations;
 - (ii) Installation of a Lower Geotextile above the waste cover soils as a Regulating Layer;
 - (iii) Installation of a fully welded 1mm LLDPE Double Textured Geomembrane liner over the lower geotextile; and
 - (iv) Installation of sandbag lines to secure the Geomembrane.
- 1.6 The Construction Quality Assurance (CQA) Engineer, Stanley Ugohuckwu, provided the CQA supervision and quality assurance for the works throughout the duration of the construction period.
- 1.7 This CQA Validation Report represents a record of the site works undertaken on the geomembrane capping system at Pwllfawatkin Landfill Site and includes all in-situ and laboratory testing undertaken.

2. THE SITE

- 2.1 Pwllfawatkin Landfill Site is situated approximately 10km north of Swansea, West Glamorgan, at National Grid Reference **SN 698 089**.

3. CONSTRUCTION OF CAP REGULATING LAYER

- 3.1 The lower protection geotextile was deployed directly onto the previously placed waste cover materials, this surface was checked for deleterious materials during the CQA Inspectors walkover survey the waste surface was deemed satisfactory to allow installation of the geotextile.
- 3.2 The CQA Engineer assessed the Lower Geotextile. Surveys were completed throughout the placement of the Lower Geotextile Installation.
- 3.3 The CQA Engineer assessed the waste cover materials ensuring that it provided a firm foundation for the protection geotextile.

4 LOWER GEOTEXTILE PROTECTION LAYER

4.1 General

- 4.1.1 The geotextile protection layer materials comprised of a HPS4 material manufactured by GEOfabrics Ltd.

4.2 Lower Geotextile Delivery, Handling and Storage

- 4.2.1 The geosynthetics were delivered to site prior to and during the works. The material delivery log is presented in **Appendix III**.
- 4.2.2 A dedicated storage area was employed on the Site. The rolls were stored in a manner that precluded sliding or rolling of the stacks, and the rolls were not stacked more than three rolls high and nothing was stacked above them.

4.3 Lower Geotextile Manufacturer's Quality Assurance

- 4.3.1 The CQA Engineer obtained the manufacturer's quality assurance data sheets for the rolls delivered to site. The data sheets are presented in **Appendix III**.

4.4 Lower Geotextile Inspection

- 4.4.1 The CQA Engineer inspected the rolls of and geotextile to check that no damage had occurred during transportation to site. No traces of visible damage were found in the geotextile.

4.5 Lower Geotextile Subgrade Preparation

- 4.5.1 Before the CQA Engineer issued a Subgrade Acceptance Certificate the upper surface of the waste cover layer was rigorously monitored, and any non-compliant materials removed. The Subgrade Acceptance Certificates are presented within **Appendix IV**.

4.6 Lower Geotextile Conformance Testing

4.6.1 There was 18,096m² of lower geotextile placed. 8 samples of the lower geotextile material were required under Table 1 of the Specification and 8 samples were removed from the rolls for testing at an independent laboratory, to check conformance with the Specification. The samples were split into two and one half retained for record purposes. The other half was forwarded to the laboratory, and tested for the following parameters:

- (i) Static puncture strength (CBR) BS EN ISO 12236;
- (ii) Tensile strength (md/cmd) BS EN ISO 10319;
- (iii) Mass per unit area BS EN ISO 9864;
- (iv) Thickness @2Kpa BS EN ISO 9863-1;
- (v) Dynamic Perforation Resistance BS EN ISO 13433.

4.6.2 The conformance testing results indicate that the 8 samples taken conform to the requirements stated within the CQA Plan. The geotextile results are summarised in below and are presented in **Appendix V**.

4.6.3 All the laboratory testing was undertaken at a UKAS accredited laboratory with UKAS accreditation for the tests undertaken. The laboratory details are included with each result sheet in the appendices.

4.7 Lower Geotextile Installation

4.7.1 The seams were aligned normal to contours and the panel layout sought to minimise the total number of seams.

4.7.2 The CQA Engineer did not allow placement of protective layers until the waste cover materials had been inspected and approved.

4.7.3 The rolls were transported to the required position using two straps slung from a 360° excavator; each panel was rolled out manually. Panels were installed with as few seams as possible and with no significant wrinkles in accordance with the CQA Plan and Specification.

4.7.4 The CQA Engineer witnessed all lower geotextile panel deployments. The panel layout is presented within the as-built drawings in **Appendix II**. The lower geotextile panel deployment records are presented in **Appendix IV**.

4.7.5 During the lower geotextile installation, the CQA Engineer:

- (i) inspected each panel deployed for defects or damage;
- (ii) ensured that the correct sheet margin overlap was being adhered to;
- (iii) ensured a consistent and strong seam had been formed;

- (iv) ensured that any uncovered sheet margins were properly weighted down in order to minimise wind damage; and
- (v) kept a record of the geotextile panel layout along with respective roll numbers.

5. GEOMEMBRANE CAP

5.1 General

- 5.1 The geomembrane incorporated into the works was 1mm Linear Low-Density Polyethylene (LLDPE), manufactured by GSE Lining Technology Limited. The geomembrane was textured on both sides.

5.2 Geomembrane Delivery, Handling and Storage

- 5.2.1 The geomembrane was delivered to site prior to the start of the works. Individual rolls were unloaded and handled using two straps slung from a 360° excavator. The geomembrane delivery log is presented in **Appendix III**.
- 5.2.2 A dedicated storage area was employed on the site. The rolls were stored on firm ground preventing movement of the rolls, and the rolls were not stacked more than two rolls high and nothing was stacked above them.

5.3 Geomembrane Manufacturer's Quality Assurance

- 5.3.1 The CQA Engineer obtained the manufacturer's quality assurance data sheet for each roll delivered to site. The data sheets are presented in **Appendix III**.

5.4 Geomembrane Inspection

- 5.4.1 The CQA Engineer inspected the rolls of geomembrane to check that no damage had occurred during transportation to site. The CQA Engineer found no traces of visible damage to the geomembrane.

5.5 Geomembrane Subgrade Preparation

- 5.5.1 The geomembrane was deployed onto the upper surface of the lower geotextile protection layer. Immediately prior to deployment of each panel.
- 5.5.2 Before the CQA Engineer issued a Subgrade Acceptance Certificate the surface of the lower geotextile layer was monitored, and any non-compliant materials were removed. The Subgrade Acceptance Certificates are presented within **Appendix VI**.

5.6 Geomembrane Conformance Testing

- 5.6.1 4 Samples of Geomembrane material were required under Table 3 and 9 samples of the geomembrane were removed for testing at an independent laboratory to check conformance with the CQA Plan. The samples were split into two with one half retained for record purposes. The other half was forwarded to the laboratory, and tested for the following parameters:

- (i) thickness ASTM D5994;
- (ii) density ASTM D1505A;
- (iii) carbon black content ASTM D1603;
- (iv) carbon black dispersion ASTM D5596;
- (v) tensile properties ASTM D6693 Type IV;
- (vi) puncture resistance ASTM D4833;
- (vii) tear resistance ASTM D1004; and
- (viii) asperity height GRI GM12.

5.6.2 The results of the above testing are presented in **Appendix V**. The results indicate the geomembrane complies with the CQA Plan.

5.6.3 All the laboratory testing was undertaken at a UKAS accredited laboratory with UKAS accreditation for the tests undertaken.

5.7 Geomembrane Installation

5.7.1 The seams were aligned normal to the landform contours and the panel layout sought to minimise the total number of seams.

5.7.2 The CQA Engineer witnessed all geomembrane panel deployment ensuring compliance with the CQA Plan. The geomembrane panel layout is included in the As-Built Drawings presented in **Appendix II**. The geomembrane panel deployment records are presented in **Appendix VI**.

5.7.3 During the geomembrane deployment, the CQA Engineer:

- (i) inspected each geomembrane panel installed over the lower geotextile for defects or damage;
- (ii) ensured that the correct sheet margin overlap was being adhered to;
- (iii) ensured that any uncovered sheet margins were properly weighted down in order to prevent wind damage; and
- (iv) kept a record of the geomembrane panel layout along with respective roll numbers.

5.7.4 The welders involved with the works all held third party certification for welding and installation to a recognised Agency/ Industry standard, namely the Thermal Welding Institute (TWI/CSWIP) third party accreditation scheme. The welder's accreditation documentation is presented in **Appendix VII**.

5.8 Trial Seam

- 5.8.1 Geomembrane trial seams were produced by the Contractor and witnessed by the CQA Engineer, to confirm the performance of the welding machine and its operator under the site conditions.
- 5.8.2 The trial seams were carried out under the same conditions as the geomembrane welding.
- 5.8.3 On completion of the trial seam, the Contractor cut a minimum of six tab specimens nominally 25mm wide and 105mm long, normal to the seam, and subjected the tabs to field destructive testing. At least three tab specimens were tested in peel and at least three tested in shear to establish that failure of the weld took place in the Film Tear Bond Mode (as per ASTM D6392).
- 5.8.4 All trial seams constructed were successful. The trial seam records are presented in **Appendix VIII** and **IX**.

5.9 Seaming Procedures

- 5.9.1 The principal seaming method employed on these works was the dual hot wedge fusion process. Prior to each individual fusion seam construction the CQA Engineer ensured that:
 - (i) each panel was aligned correctly without significant wrinkles;
 - (ii) the necessary overlap had been achieved;
 - (iii) the sheet margin was clean and free of moisture and debris;
 - (iv) the welding machine was operating at the speed and temperature determined by the trial seam; and
 - (v) the weather conditions were in accordance with the CQA Plan.
- 5.9.2 Full records of all fusion welded seams are presented in **Appendix VIII**.
- 5.9.3 Handheld extrusion welding was used for patch repairs. Prior to each individual extrusion weld the CQA Engineer ensured that:
 - (i) the necessary overlap had been achieved;
 - (ii) the area to be welded was clean and free of moisture and debris;
 - (iii) the area to be welded was adequately, but not overly buffed to remove surface oxidation and provide a key for the weld;
 - (iv) the welding machine was operating at the temperature determined by the trial seam; and
 - (v) the weather conditions were in accordance with the CQA Plan.

5.9.4 Full records of all extrusion welded seams are presented in **Appendix IX**.

5.10 Non-Destructive Seam Testing

5.10.1 All fusion welded seams were subjected to air pressure testing.

The CQA Engineer:

- (i) observed all testing;
- (ii) ensured that all fusion welds had been tested over their entire length;
- (iii) ensured that the specified minimum air pressure of 2.0 bar was maintained for the minimum period of five minutes (after a two minute stabilisation period) without the loss of any more than 10% of the original air pressure;
- (iv) observed the drop in pressure on the gauge when the air channel was unblocked at the opposite end of the seam; and
- (v) ensured that full records were kept.

5.10.2 All extrusion welded seams were checked by vacuum box testing.

The CQA Engineer:

- (i) observed all testing;
- (ii) ensured that all extrusion welds had been tested over their entire length;
- (iii) ensured that any spots of weld found to be bubbling were clearly marked and remediated; and
- (iv) ensured that full records were kept.

5.10.3 All extrusion welded seams and patches passed vacuum box testing.

5.11 Destructive Seam Testing

5.11.1 To test the strength of each weld, tab samples (small sections of welded seam) were removed from the fusion welded seams. These were subject to destructive testing in the field. The CQA Engineer inspected each tested strip to ensure that field destructive test failure had occurred in the parent material and not the weld. All tab samples passed the destructive testing.

5.11.2 Samples were taken for destructive testing in the laboratory. The laboratory reported the quantitative results and the mode of failure for the testing carried out. The seam was deemed to pass quantitative testing if:

- (i) failure occurred solely in the parent material and did not enter the seam; or

- (ii) the peel strength exceeded or equalled that indicated by the manufacturer; and
- (iii) the shear strength exceeds or equals that indicated by the manufacturer.

5.11.3 There was 18225m² of geomembrane placed. 31 Samples were required under Table 4 of the Specification, 21 fusion welded and 10 extrusion welded samples. 55 samples were collected, 26 fusion welded and 29 extrusion welded. The seam samples were split into two with one half retained for record purposes and the other sent to the laboratory for destructive testing. All the samples passed the destructive testing, the laboratory certificates are presented in **Appendix V**.

5.11.4 All the laboratory testing was undertaken at a UKAS accredited laboratory with UKAS accreditation for the tests undertaken. The laboratory details are included with each result sheet in the appendices.

5.12 Tie In

5.12.1 The geomembrane was welded to the existing cap along the northern, eastern, southern and part of the western edges

5.13 Anchor Trench

5.13.1 The geomembrane was secured within an anchor trench along the remainder of the western edge.

5.14 Protuberances

5.14.1 All Protuberances were completed in accordance with the approved CQA Plan.

5.15 Geomembrane Repairs and Patches

5.15.1 It was necessary to construct patch repairs, typically at holes cut into the geomembrane to give access for the fusion welding machine. The CQA Engineer ensured that all patch repairs were:

- (i) of adequate size and shape to fulfil their purpose;
- (ii) fully tested;
- (iii) clearly labelled on the geomembrane itself; and
- (iv) recorded.

5.15.2 All patch repairs passed non-destructive testing and were deemed satisfactory when visually inspected. Records of all repairs and patches are presented in **Appendix IX**.

6. SANDBAGS

- 6.1 Sandbags with rope lines were installed to secure the geomembrane cap. The details can be seen in the photographs presented in **Appendix X**.

7. PHOTOGRAPHIC AND DAILY RECORDS

- 7.1 As a visual record of the works, the CQA Engineer supervising the works kept an on-going photographic record. **Appendix X** constitutes a selection of photographs showing preparatory operations and capping system installation.
- 7.2 The CQA Engineer maintained daily records throughout the duration of the works. These daily records highlighted any problems encountered; solutions adopted and detailed the day-to-day site operations. The daily records are presented in **Appendix XI**.

8. CONCLUSIONS

- 8.1 LOWER GEOTEXTILE – The lower geotextile was installed over the existing waste cover materials. The conformance testing results indicate the geotextile are acceptable and are presented in **Appendix V**.
- 8.2 GEOMEMBRANE LINING - The Geomembrane was installed over the lower geotextile. The conformance testing results indicate the geomembrane are acceptable and are presented in **Appendix V**.
- 8.3 The Capping Works were carried out in accordance with the CQA Plan and Specification Documents dated January 2019 prepared by FCC, (Reference: CQA Plan and Specification FCC 479 SW 2013-24 & 479 SW 2016-07). Approved 19th August 2016 (EPR/BU8819IV).

APPENDIX I
EA CORRESPONDENCE

Compliance Assessment Report

Report ID:
CAR_NRW0026283

This form will report compliance with your permit as determined by an NRW officer

Site	Pwllfawatkin Landfill Site EPR/BU8819IV	Permit Ref	BU8819IV		
Operator/Permit holder	FCC Waste Services (UK) Limited				
Regime	Installations				
Date of assessment	18/08/2016 - 19/08/2016	Time in	N/A	Out	N/A
Assessment type	Report/Data Review				
Parts of the permit assessed	2.7.4				
Lead officer's name	Thomas, Ffion				
Accompanied by					
Recipient's name/position	Christopher Crosby/ Geotechnical engineer	Date issued	19/08/2016		

Section 1 – Compliance Assessment Summary

This is based on the requirements of the permit under the Environmental Permitting Regulations. A detailed explanation is captured in "Compliance Assessment Report Detail" (Section 2) and any actions you may need to take are given in the "Action(s)" (section 4). This summary details where we believe any non-compliance with the permit has occurred, the relevant condition and how the non-compliance has been categorised using our Compliance Classification Scheme (CCS). CCS Scores can be consolidated or suspended where appropriate, to reflect the impact of some non-compliances more accurately. For more details of our CCS scheme, contact your local office.

Permit conditions and compliance summary	CCS Category	Condition(s) breached
A1 - Specified by permit	A	
B1 - Infrastructure - Engineering for prevention and control of emissions	A	
G4 - Monitoring and Records, Maintenance and Reporting - Reporting and notification to Natural Resources Wales	A	

KEY: See Section 5 for breach categories, suspended scores will be indicated as such.

A = Assessed or assessed in part (no evidence of non-compliance), **X** = Action only,

O = Ongoing non-compliance, not scored.

Number of breaches recorded	0	Total compliance score (see section 5 for scoring scheme)	0
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If the Number of breaches recorded is greater than zero, please see Section 3 for our proposed enforcement response

Section 2 – Compliance Assessment Report Detail

This section contains a report of our findings and will usually include information on:

- The part(s) of the permit that were assessed (eg. Maintenance, training, combustion plant, etc)
- Where the type of assessment was 'Data Review' details of the report/results triggering the assessment
- Any non-compliances identified
- Any non-compliances with directly applicable legislation
- Details of any multiple non-compliances
- Information on the compliance score accrued inc.
- Details of advice given
- Any other areas of concern
- Any actions requested
- Any examples of good practice
- A reference to photos taken

This Compliance Assessment report was completed following the CQA plan submission received 19th August 2016 for additional permanent capping at the Pwllfawatkin landfill site (subject to Capex approval)

Having reviewed the document 497SW 2016-14/01 additional capping works drawing, and the previously accepted CQA plans 497SW 2016/07 V1.1 Pwllfawatkin cap CQA plan addendum V1.1 and 497SW 2013/24 Pwllfawatkin cap CQA plan V1.2 I am able to provide confirmation that NRW is satisfied with the CQA plan for the additional 2016 permanent capping works in accordance with requirements of condition 2.7.4 of the permit.

Please note that the acceptance of the CQA plan for the permanent capping by NRW does not mean the assumptions, design specification, testing regimes will be suitable for future developments at the site.

EPR Compliance Assessment Report

**Report ID:
CAR_NRW0026283**

This form will report compliance with your permit as determined by an NRW officer

Site	Pwllfawatkin Landfill Site EPR/BU8819IV	Permit Ref	BU8819IV
Operator/Permit holder	FCC Waste Services (UK) Limited	Date	18/08/2016

Section 3 – Enforcement Response

You must take immediate action to rectify any non-compliance and prevent repetition. Non-compliance with your permit conditions constitutes an offence and can result in criminal prosecutions and/or suspension or revocation of a permit. Please read the detailed assessment in Section 2 and the steps you need to take in Section 4 below.

Section 4 – Action(s)

This section summarises the actions identified during the assessment along with the timescales for when they will need to be completed.

Criteria Ref.	CCS Category	Action required/advised	Due Date
See Section 1 above			

Section 5 – Compliance notes for the Operator

To ensure you correct actual or potential non-compliance we may

- Advise on corrective actions verbally or in writing
- Require you to take specific actions verbally or in writing
- Issue a notice
- Require you to review your procedures or management system
- Change some of the conditions of your permit
- Decide to undertake a full review of your permit

Any breach of a permit condition is an offence and we may take legal action against you

- We will normally provide advice and guidance to assist you to come back into compliance either after an offence is committed or where we consider that an offence is likely to be committed. This is without prejudice to any other enforcement response that we consider may be required.
- Enforcement action can include the issue of a formal caution, prosecution, the service of a notice and/or suspension or revocation of the permit.

See our Enforcement and Civil Sanctions guidance for further information

This report does not relieve the site operator of the responsibility to

- Ensure you comply with the conditions of the permit at all times and prevent pollution of the environment
- Ensure you comply with other legislative provisions which may apply

Non-compliance scores and categories

CCS category	Description	Score
C1	A non-compliance that could have a major environmental effect	60
C2	A non-compliance which could have a significant environmental effect	31
C3	A non-compliance which could have a minor environmental effect	4
C4	A non-compliance which has no potential environmental effect	0.1

Operational Risk Appraisal (Opra) - Compliance assessment findings may affect your Opra score and/or your charges. This score influences the resource we use to assess permit compliance.

Section 6 – General information

Data protection notice

The information on this form will be processed by the Natural Resources Wales (NRW) to fulfil its regulatory and monitoring functions and to maintain the relevant public register(s). The NRW may also use and/or disclose it in connection with:

- Offering/providing you with its literature/services relating to environmental matters
- Consulting with the public, public bodies and other organisations (eg. Health and Safety Executive, local authorities) on environmental issues
- Carrying out statistical analysis, research and development on environmental issues
- Providing public register information to enquirers
- Investigating possible breaches of environmental law
- Assessing customer service satisfaction and improving its service
- Freedom of Information Act/Environmental Regulations request

The NRW may pass it on to its agents/representatives to do these things on its behalf. You should ensure that any persons named on this form are informed of the contents of this data protection notice.

Disclosure of information

The NRW will provide a copy of this report to the public register(s). However, if you consider that any information contained in this reports should not be released to the public register(s) on the grounds of commercial confidentiality, you must write to your local area office within twenty working days of receipt of this form indicating which information it concerns and why it should not be released, giving your reasons in full.

Customer charter

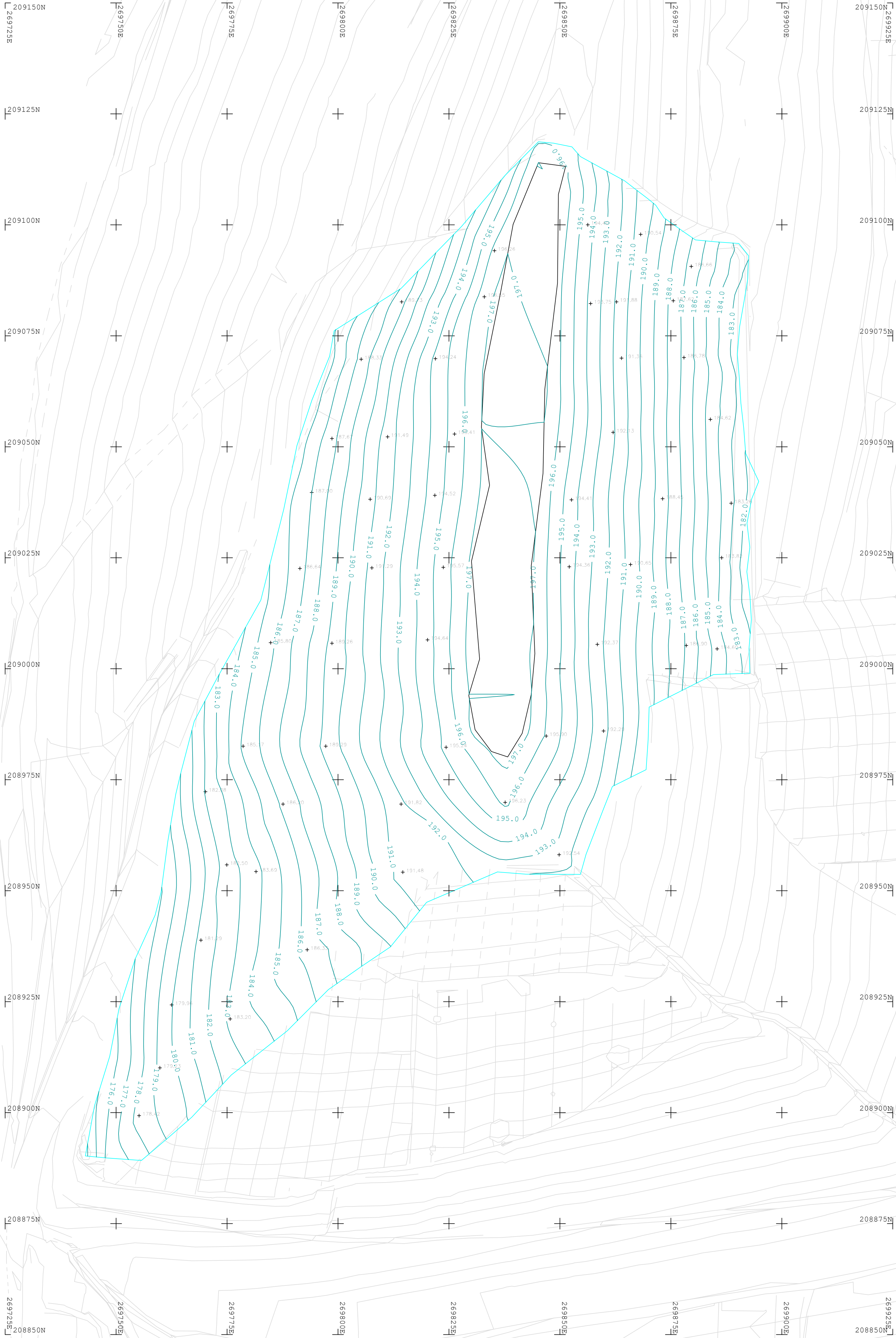
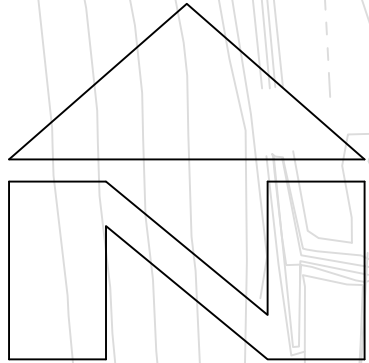
What can I do if I disagree with this compliance assessment report?

If you are unable to resolve the issue with your site officer, you should firstly discuss the matter with officer's line managers using the informal appeals procedure. If you wish to raise your dispute further through our official Complaints and Commendations procedure, phone our general enquiry number 0300 065 3000 (Mon to Fri 08.00 – 18.00) and ask for the Customer Contact team or send an email to enquiries@naturalresourceswales.gov.uk. If you are still dissatisfied you can make a complaint to the Public Services Ombudsman for Wales. For advice on how to complain to the Ombudsman phone their helpline on 0845 607 0987.

Welsh Language

If you would like this form in Welsh please contact your Regulatory Officer.

APPENDIX II
AS BUILT DRAWINGS



LEGEND

ALL LEVELS—COORDINATES RELATE TO FCC
PERMANENT SITE CONTROL STATIONS

- Top of Batter
- Bottom of Batter
- Spot Level



FCC Environment (UK) Limited
Ground Floor West, 600 Pavilion Drive, Northampton Business Park, Northampton, NN4 7RG



Jones Bros Civil Engineering UK
Ty Glyn
Canol y Dre
Ruthin
Denbighshire LL15 1QA Email: mail@jones-bros.com
Tel (01824) 703 661

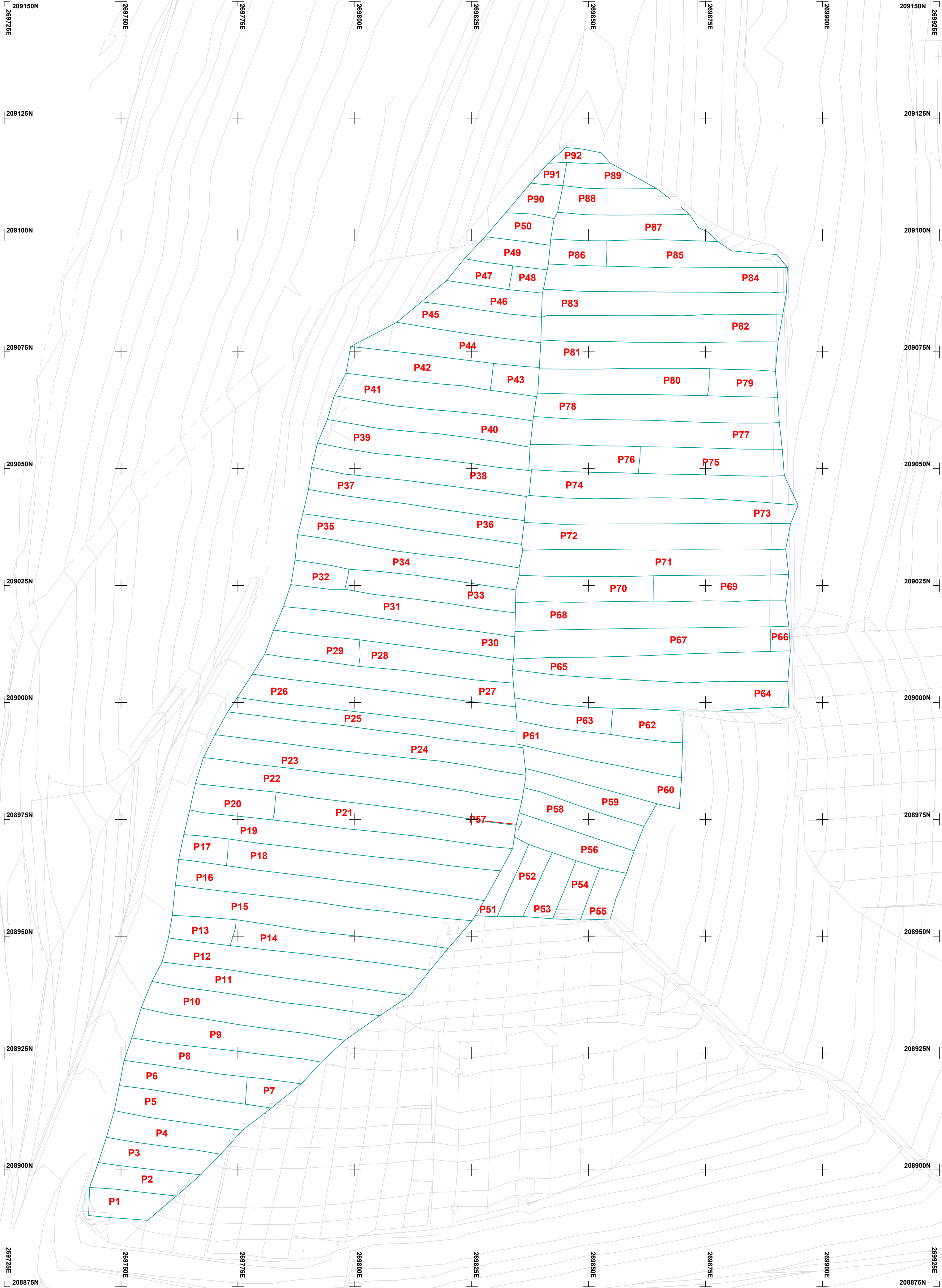
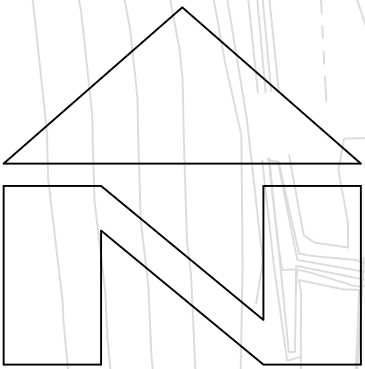
Rev	Description	Date	Initial
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Client
FCC Environment

Site
Pwllfawtkin Landfill

Drawing
Prestart Survey 2023 Works

Drawn By	Date	Checked by
CH	23/10/2023	CH
Scale	Revision	Revision Check
N.T.S	C	
Cad Plot Date	Cad File Name	
23/10/2023	C3230-CH-281123-01 OGL	



LEGEND

ALL LEVELS—COORDINATES RELATE TO FCC
PERMANENT SITE CONTROL STATIONS

Geotextile Panels



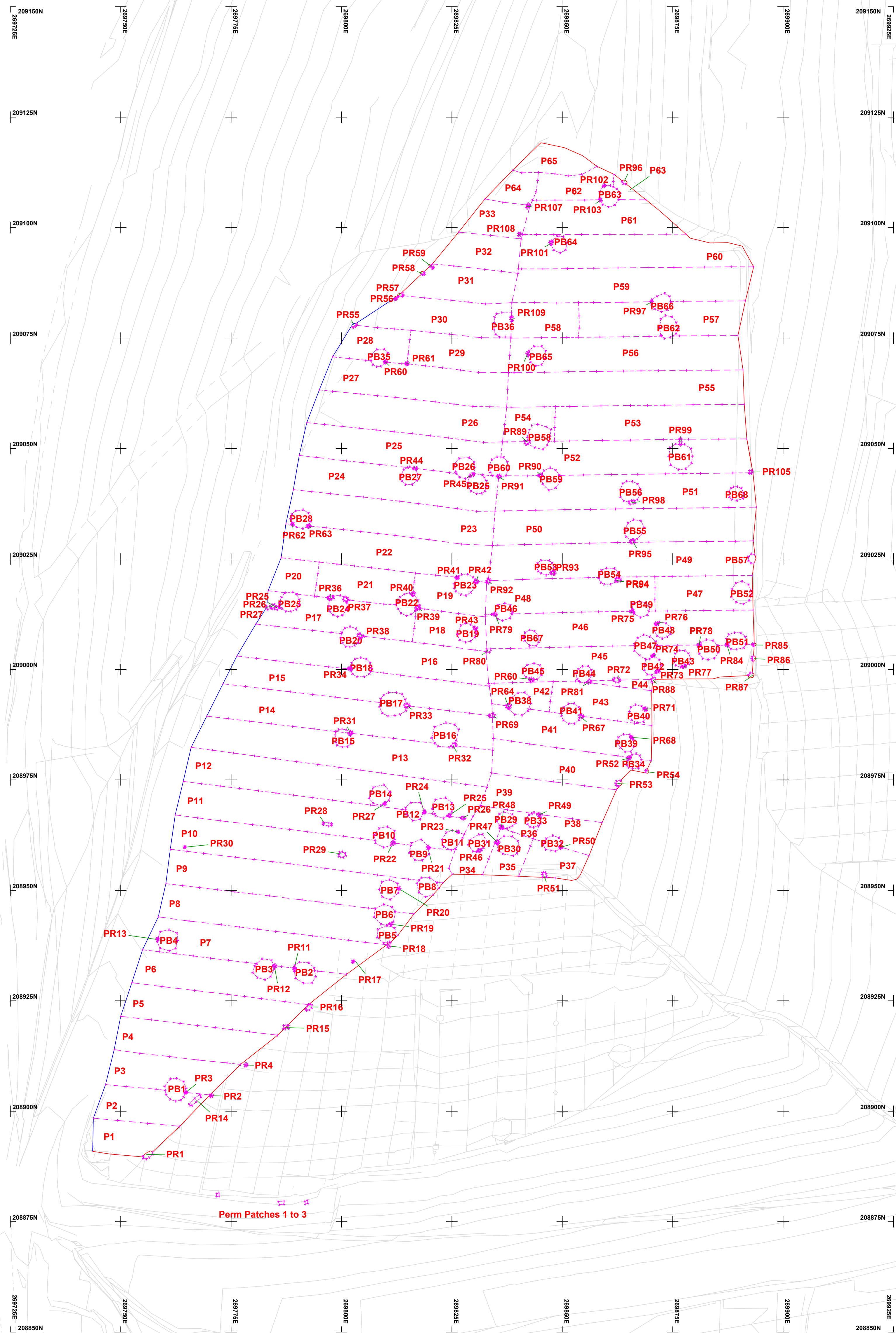
FCC Environment
FCC Environment (UK) Limited
Ground Floor West, 800 Pavilion Drive, Northampton Business Park, Northampton, NN4 7RG



JONES BROS
CIVIL ENGINEERING UK

Jones Bros Civil Engineering UK
Ty Glyn
Caeol y Dre
Ruthin
Denbighshire LL15 1GA Email: mail@jones-bros.com
Tel: (01824) 703 661

Rev Description		Date	Initial
Client		FCC Environment	
Site		Pwllfawatkin Landfill	
Drawing Geotextile Panel Layout 2023 Perm Capping			
Drawn By	Date	Checked by	
CH	23/10/2023	CH	
Scale	Revision	Revision Check	
N.T.S	C		
Cad Plot Date	Cad File Name		
23/10/2023	C3230-CH-281123-02 GTEX		



ALL LEVELS—COORDINATES RELATE TO FCC
PERMANENT SITE CONTROL STATIONS

- LLDPE Panels
- Anchor Trench
- Tie In To Existing



Jones Bros Civil Engineering UK
Ty Glyn
Canol y Dre
Ruthin
Denbighshire LL15 1QA Email: mail@jones-bros.com
Tel (01824) 703 661

Rev	Description	Date	Initia
Client FCC Environment			
Site Pwllfawatkyn Landfill			
Drawing LLDPE Panel Layout 2023 Perm Capping			
Drawn By	Date	Checked by	
Scale	Revision	Revision Check	
N.T.S	C		
Cad Plot Date	Cad File Name		
23/10/2023	C3230-CH-281123-01 LLDPE		

APPENDIX III
MATERIAL RECEIVED & MQC DATA



Materials Received

Site:	Pwllfawatkin	Sheet No:	1 of 1
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Delivery Date	Material	Resin Batch Number	Roll Number	Dimensions (m) Length x Width	QC Certificate Recived Date	QA Certificate Pass / Fail	Visual Inspection
03/07/2023	HPS4	27060	2	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	3	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	4	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	5	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	6	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	7	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	8	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	9	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	11	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	12	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	13	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	14	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	15	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	16	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	17	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	18	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	19	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27060	20	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27049	32	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27049	5	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27049	15	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27049	19	150 x 6.0	03/07/2023	Pass	Good
03/07/2023	HPS4	27049	23	150 x 6.0	03/07/2023	Pass	Good

Quality Control Test Certificate

Our reference: 84032

Your reference: M-C3230/00003

Delivery Date 03/07/2023

Product: GEOfabrics HPS4 6.00m wide black

Despatched to your site:

PWLLFA WATKIN LANDFILL 2023
WORKS PWLLFA WATKIN FARM, RHYDYFRO PONTA

PONTARDAWE
SWANSEA

Serial roll number	m ²	Roll Length (m)
27060/002	900.00	150
27060/003	900.00	150
27060/004	900.00	150
27060/005	900.00	150
27060/006	900.00	150
27060/007	900.00	150
27060/008	900.00	150

This product was sampled to BS EN ISO 9862 & tested in accordance with BS EN ISO 10319, BS EN ISO 12236, BS EN ISO 9863-1, BS EN ISO 9864 & BS EN ISO 13433.

The Product named above complies with quality control requirements.



Maya Dabrowska
Laboratory Manager
Date: 23/01/2024

Quality Control Test Certificate

27060/009	900.00	150
27060/011	900.00	150
27060/012	900.00	150
27060/013	900.00	150
27060/014	900.00	150
27060/015	900.00	150
27060/016	900.00	150
27060/017	900.00	150
27060/018	900.00	150
27060/019	900.00	150
27060/020	900.00	150

This product was sampled to BS EN ISO 9862 & tested in accordance with BS EN ISO 10319, BS EN ISO 12236, BS EN ISO 9863-1, BS EN ISO 9864 & BS EN ISO 13433.

The Product named above complies with quality control requirements.



Maya Dabrowska
Laboratory Manager
Date: 23/01/2024

Quality Control Test Certificate

Our reference: 84032

Your reference: M-C3230/00003

Delivery Date 03/07/2023

Product: GEOfabrics HPS4 6.00m wide black

Despatched to your site:

PWLLFA WATKIN LANDFILL 2023
WORKS PWLLFA WATKIN FARM, RHYDYFRO PONTA

PONTARDAWE
SWANSEA

Serial roll number	m ²	Roll Length (m)
27049/005	900.00	150
27049/015	900.00	150
27049/019	900.00	150
27049/023	900.00	150
27049/032	900.00	150

This product was sampled to BS EN ISO 9862 & tested in accordance with BS EN ISO 10319, BS EN ISO 12236, BS EN ISO 9863-1, BS EN ISO 9864 & BS EN ISO 13433.

The Product named above complies with quality control requirements.



Maya Dabrowska
Laboratory Manager
Date: 23/01/2024

Quality Control Test Certificate

Product:

DiscountBF1

Despatched to your site:

PWLLFA WATKIN LANDFILL 2023
WORKS PWLLFA WATKIN FARM, RHYDYFRO PONTA

PONTARDAWE
SWANSEA

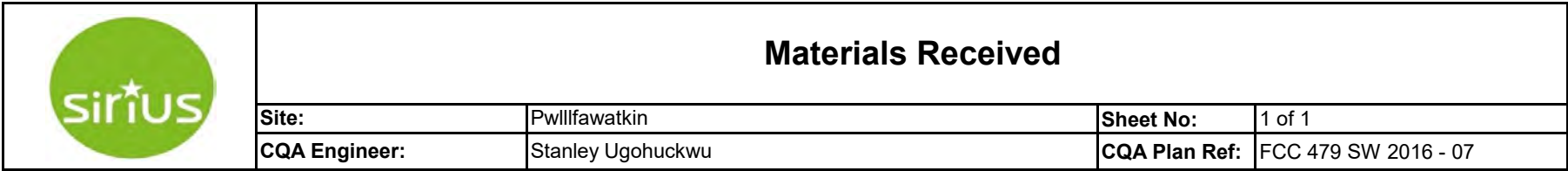
Serial roll number	m ²	Roll Length (m)
	1.00	0

This product was sampled to BS EN ISO 9862 & tested in accordance with BS EN ISO 10319, BS EN ISO 12236, BS EN ISO 9863-1, BS EN ISO 9864 & BS EN ISO 13433.

The Product named above complies with quality control requirements.



Maya Dabrowska
Laboratory Manager
Date: 23/01/2024



	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

	Materials Received			
	Site:	Pwllfawtkin	Sheet No:	1 of 1
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

[illegible]



SOLMAX

MANUFACTURING QUALITY CONTROL



PROJECT NUMBER:

M-C3230/00030

SALES ORDER:

SO-123544

PACKING SLIP NUMBER:

UK-106467

PROJECT NAME:

ROLL NUMBER	MANUFACT. DATE	RESIN LOT NUMBER
Product Code : 1009618		
<u>LLDPE 1.00 mm Black Textured</u>		
0904-089241	2023-06-23	4223148
0904-089254	2023-06-24	4223158
0904-089263	2023-06-24	4223158

QUANTITY (ROLLS): 3

Inspection Certificate 3.1 (DIN EN 10204)

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

Solmax Geosynthetics GmbH

NORMANNENWEG 28, 20537, HAMBURG, DE-HH, DEUTSCHLAND

SOLMAX.COM

10 Okt 2023


TEST RESULTS

PROJECT NUMBER: M-C3230/00030
 SALES ORDER: SO-123544
 PACKING SLIP NUMBER: UK-106467

PROJECT NAME :

PRODUCT: 1009618
 LLDPE 1.00 mm Black Textured

Rolls

Test	Property	Direction	Test Method	Frequency	Unit
1	Thickness (min. avg.)		ASTM D5994	Every roll	mm
2	Lowest individual (10 values/10)				mm
3	Asperity Height (min. avg.)	IN	ASTM D7466	Every roll	mm
4	Asperity Height (min. avg.)	OUT	ASTM D7466	Every roll	mm
5	Density		ASTM D792	Every 10 rolls	g/cm ³
6	Carbon Black Content		ASTM D4218	Every 2 rolls	%
7	Carbon Black Dispersion		ASTM D5596	Every 10 rolls	Category
	Tensile Properties (min. avg) (2)		ASTM D6693	Every 2 rolls	
8	Strength at Break	MD			kN/m
9	Strength at Break	TD			kN/m
10	Elongation at Break	MD			%
11	Elongation at Break	TD			%
12	Tear Resistance (min. avg.)	MD	ASTM D1004	Every 5 rolls	N
13	Tear Resistance (min. avg.)	TD	ASTM D1004	Every 5 rolls	N
14	Puncture Resistance (min. avg.)		ASTM D4833	Every 5 rolls	N

Test	1	2	3	4	5	6	7	8	9	10	11	12	13
SPECIFICATIONS	0.95	0.85	0.40	0.40	≤ 0.939	2.0 - 3.0	Cat. 1 / Cat. 2	18	18	250	250	110	110
0904-089241	0.95	0.90	0.45	0.46	0.935	2.42	10	24.3	22.8	521	513	144	152
0904-089254	0.96	0.93	0.44	0.42	0.938	2.41	10	27.1	23.3	565	498	146	151
0904-089263	0.95	0.91	0.48	0.45	0.938	2.43	10	25.0	22.2	524	488	154	150

Test	14
SPECIFICATIONS	250
0904-089241	454
0904-089254	467
0904-089263	472

Inspection Certificate 3.1 (DIN EN 10204)

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SOLMAX

MANUFACTURING QUALITY CONTROL



PROJECT NUMBER: M-C3230/00002

SALES ORDER: SO-123101

PACKING SLIP NUMBER: UK-106244

PROJECT NAME:

ROLL NUMBER	MANUFACT. DATE	RESIN LOT NUMBER
Product Code : 1009618		
<u>LLDPE 1.00 mm Black Textured</u>		
0904-087788	2023-04-05	4222585
0904-087792	2023-04-05	4222585
0904-087804	2023-04-06	4222641
0904-087819	2023-04-06	4222641
0904-087821	2023-04-07	4222641
0904-087838	2023-04-08	4222641
0904-087839	2023-04-08	4222641
0904-087969	2023-04-15	4222601

QUANTITY (ROLLS): 8

Inspection Certificate 3.1 (DIN EN 10204)

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TEST RESULTS

PROJECT NUMBER:	M-C3230/00002
SALES ORDER:	SO-123101
PACKING SLIP NUMBER:	UK-106244

PROJECT NAME :

PRODUCT: 1009618
LLDPE 1.00 mm Black Textured

Rolls

Test	Property	Direction	Test Method	Frequency	Unit
1	Thickness (min. avg.)		ASTM D5994	Every roll	mm
2	Lowest individual (10 values/10)				mm
3	Asperity Height (min. avg.)	IN	ASTM D7466	Every roll	mm
4	Asperity Height (min. avg.)	OUT	ASTM D7466	Every roll	mm
5	Density		ASTM D792	Every 10 rolls	g/cm ³
6	Carbon Black Content		ASTM D4218	Every 2 rolls	%
7	Carbon Black Dispersion		ASTM D5596	Every 10 rolls	Category
	Tensile Properties (min. avg.) (2)		ASTM D6693	Every 2 rolls	
8	Strength at Break	MD			kN/m
9	Strength at Break	TD			kN/m
10	Elongation at Break	MD			%
11	Elongation at Break	TD			%
12	Tear Resistance (min. avg.)	MD	ASTM D1004	Every 5 rolls	N
13	Tear Resistance (min. avg.)	TD	ASTM D1004	Every 5 rolls	N
14	Puncture Resistance (min. avg.)		ASTM D4833	Every 5 rolls	N

Test	1	2	3	4	5	6	7	8	9	10	11	12	13
SPECIFICATIONS	0.95	0.85	0.40	0.40	≤ 0.939	2.0 - 3.0	Cat. 1 / Cat. 2	18	18	250	250	110	110
0904-087788	0.99	0.91	0.46	0.45	0.938	2.45	10	27.0	24.0	568	525	154	160
0904-087792	0.97	0.89	0.48	0.46	0.938	2.40	10	25.4	20.8	552	457	154	161
0904-087804	0.96	0.93	0.46	0.46	0.937	2.47	10	24.3	21.5	541	483	149	147
0904-087819	0.96	0.89	0.49	0.45	0.938	2.45	10	26.1	22.8	579	514	149	149
0904-087821	0.97	0.91	0.49	0.46	0.939	2.47	10	26.3	23.1	577	529	147	143
0904-087838	0.99	0.97	0.48	0.46	0.939	2.46	10	24.9	21.7	560	506	146	152
0904-087839	0.97	0.90	0.48	0.47	0.939	2.46	10	24.9	21.7	560	506	146	152
0904-087969	0.95	0.93	0.46	0.46	0.939	2.52	10	25.0	22.9	572	542	147	155

Inspection Certificate 3.1 (DIN EN 10204)

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**TEST RESULTS**

PROJECT NUMBER:	M-C3230/00002
SALES ORDER:	SO-123101
PACKING SLIP NUMBER:	UK-106244

PROJECT NAME :

Test	14
SPECIFICATIONS	250
0904-087788	476
0904-087792	472
0904-087804	449
0904-087819	418
0904-087821	449
0904-087838	427
0904-087839	427
0904-087969	431

Inspection Certificate 3.1 (DIN EN 10204)

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Werkzeugnis

Test Report

(DIN EN 10204 - 2.2)

Artikel: Welding Rod Black 5 mm

Article

Identifikation: I22805-C24/22

Identification

Ergebnisse nichtspezifischer Prüfungen

Results of unspecific tests

Dichte:	DIN EN ISO 1183-1/A	0,929 g/cm ³
Density		
Schmelze-Massefließrate 190/5:	DIN EN ISO 1133	2,59 g/10min
Melt Flow Rate 190/5		
Rußgehalt:	ASTM D 4218	2,14 %
Carbon Black Content		

Geprüft und freigegeben durch: DBA , QC Labor Rechlin

Testing and approval by

Datum: 11.11.2022

Date

Dieses Werkzeugnis wurde mittels EDV erstellt und ist ohne Unterschrift gültig.

This test report was created by means of EDP and is valid without signature.



SOLMAX

MANUFACTURING QUALITY CONTROL



PROJECT NUMBER: M-C3230/00002

SALES ORDER: SO-123101

PACKING SLIP NUMBER: UK-106243

PROJECT NAME:

ROLL NUMBER	MANUFACT. DATE	RESIN LOT NUMBER
Product Code : 1009618		
<u>LLDPE 1.00 mm Black Textured</u>		
0904-087791	2023-04-05	4222585
0904-087802	2023-04-06	4222641
0904-087836	2023-04-07	4222641
0904-087856	2023-04-09	4222641
0904-087968	2023-04-15	4222601
0904-087982	2023-04-15	4222601
0904-087996	2023-04-16	4222601

QUANTITY (ROLLS): 7

Inspection Certificate 3.1 (DIN EN 10204)

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TEST RESULTS

PROJECT NUMBER:	M-C3230/00002
SALES ORDER:	SO-123101
PACKING SLIP NUMBER:	UK-106243

PROJECT NAME :

PRODUCT: 1009618
LLDPE 1.00 mm Black Textured

Rolls

Test	Property	Direction	Test Method	Frequency	Unit
1	Thickness (min. avg.)		ASTM D5994	Every roll	mm
2	Lowest individual (10 values/10)				mm
3	Asperity Height (min. avg.)	IN	ASTM D7466	Every roll	mm
4	Asperity Height (min. avg.)	OUT	ASTM D7466	Every roll	mm
5	Density		ASTM D792	Every 10 rolls	g/cm ³
6	Carbon Black Content		ASTM D4218	Every 2 rolls	%
7	Carbon Black Dispersion		ASTM D5596	Every 10 rolls	Category
	Tensile Properties (min. avg.) (2)		ASTM D6693	Every 2 rolls	
8	Strength at Break	MD			kN/m
9	Strength at Break	TD			kN/m
10	Elongation at Break	MD			%
11	Elongation at Break	TD			%
12	Tear Resistance (min. avg.)	MD	ASTM D1004	Every 5 rolls	N
13	Tear Resistance (min. avg.)	TD	ASTM D1004	Every 5 rolls	N
14	Puncture Resistance (min. avg.)		ASTM D4833	Every 5 rolls	N

Test	1	2	3	4	5	6	7	8	9	10	11	12	13
SPECIFICATIONS	0.95	0.85	0.40	0.40	≤ 0.939	2.0 - 3.0	Cat. 1 / Cat. 2	18	18	250	250	110	110
0904-087791	0.97	0.89	0.45	0.45	0.938	2.34	10	27.1	22.4	589	501	154	161
0904-087802	0.96	0.90	0.47	0.46	0.937	2.48	10	24.9	22.8	551	520	149	147
0904-087836	0.96	0.89	0.47	0.47	0.939	2.41	10	25.4	23.6	564	544	146	152
0904-087856	0.95	0.89	0.45	0.47	0.938	2.40	10	25.4	22.1	581	525	142	149
0904-087968	0.96	0.93	0.46	0.47	0.938	2.51	10	24.2	21.9	550	518	141	144
0904-087982	0.95	0.88	0.45	0.43	0.938	2.44	10	25.0	23.3	568	544	138	149
0904-087996	0.95	0.90	0.46	0.45	0.938	2.45	10	24.7	21.4	558	509	146	146

Inspection Certificate 3.1 (DIN EN 10204)

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

Solmax Geosynthetics GmbH

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**TEST RESULTS**

PROJECT NUMBER:	M-C3230/00002
SALES ORDER:	SO-123101
PACKING SLIP NUMBER:	UK-106243

PROJECT NAME :

Test	14
SPECIFICATIONS	250
0904-087791	472
0904-087802	449
0904-087836	427
0904-087856	445
0904-087968	440
0904-087982	449
0904-087996	440

Inspection Certificate 3.1 (DIN EN 10204)

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

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APPENDIX IV
LOWER GEOTEXTILE DEPLOYMENT RECORDS



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	1
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
---------------------------------------	-----------------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P1 to P8

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	17/07/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	2
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
---------------------------------------	-----------------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P9 to P11

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	21/07/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	3
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
---------------------------------------	-----------------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P12 to P21

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	25/07/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	4
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
---------------------------------------	-----------------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P22 Only

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	26/07/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	5
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P23 – P25

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	01/08/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	6
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P26 – P27

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	22/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	7
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P28 – P29

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	26/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	8
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P30 – P33

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	28/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	9
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P34 Only

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	29/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	10
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P35 – P37

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	02/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	11
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P38 – P39

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	04/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	12
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P40 – P42

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	05/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	13
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P43 – P50

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	07/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	14
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P51 – P60

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	08/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	15
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P61 – P64

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	12/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	16
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P65 – P68

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	16/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	17
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P69 – P73

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	24/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	18
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P74 – P82

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	25/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	19
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P83 Only

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	06/11/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	20
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P84 – P86

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	07/11/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	21
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P87 – P89

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	08/11/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	22
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Area of Subgrade under consideration:	Surface of Regulating Cover Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Lower Geotextile Panels P90 – P92

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	15/11/2023	Position:	CQA Engineer

	Geotextile Deployment Records			
	Site:	Pwllfawtkin	Project:	Capping
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Date	Batch No.	Roll No.	Panel No.	Heat Bonded Yes/No	Actual Overlap (mm)	Length (m)	Width (m)	Accumulated Area (m ²)	Visual Inspection
17/07/2023	27049	15	P1	Yes	300	18.0	6.0	108.0	Good
17/07/2023	27049	15	P2	Yes	300	19.0	6.0	222.0	Good
17/07/2023	27049	15	P3	Yes	300	25.0	6.0	372.0	Good
17/07/2023	27049	15	P4	Yes	300	27.0	6.0	534.0	Good
17/07/2023	27049	15	P5	Yes	300	32.0	6.0	726.0	Good
17/07/2023	27049	15	P6	Yes	300	29.0	6.0	900.0	Good
17/07/2023	27049	19	P7	Yes	300	5.0	6.0	930.0	Good
17/07/2023	27049	19	P8	Yes	300	38.0	6.0	1158.0	Good
21/07/2023	27049	19	P9	Yes	300	44.0	6.0	1422.0	Good
21/07/2023	27049	19	P10	Yes	300	45.0	6.0	1692.0	Good
21/07/2023	27060	5	P11	Yes	300	46.0	6.0	1968.0	Good
25/07/2023	27060	5	P12	Yes	300	53.0	6.0	2286.0	Good
25/07/2023	27060	5	P13	Yes	300	45.0	6.0	2556.0	Good
25/07/2023	27060	8	P14	Yes	300	12.0	6.0	2628.0	Good
25/07/2023	27060	8	P15	Yes	300	61.0	6.0	2994.0	Good
25/07/2023	27060	8	P16	Yes	300	65.0	6.0	3384.0	Good
25/07/2023	27060	8	P17	Yes	300	6.0	6.0	3420.0	Good
25/07/2023	27049	32	P18	Yes	300	61.0	6.0	3786.0	Good
25/07/2023	27049	32	P19	Yes	300	69.0	6.0	4200.0	Good
25/07/2023	27049	32	P20	Yes	300	19.0	6.0	4314.0	Good
25/07/2023	27049	14	P21	Yes	300	53.0	6.0	4632.0	Good
26/07/2023	27049	14	P22	Yes	300	72.0	6.0	5064.0	Good
01/08/2023	27049	14	P23	Yes	300	27.0	6.0	5226.0	Good
01/08/2023	27060	12	P24	Yes	300	45.0	6.0	5496.0	Good
01/08/2023	27060	12	P25	Yes	300	72.0	6.0	5928.0	Good
22/09/2023	27060	17	P26	Yes	300	65.0	6.0	6318.0	Good
22/09/2023	27060	17	P27	Yes	300	64.0	6.0	6702.0	Good
26/09/2023	27060	17	P28	Yes	300	25.0	6.0	6852.0	Good
26/09/2023	27060	7	P29	Yes	300	34.0	6.0	7056.0	Good
28/09/2023	27060	7	P30	Yes	300	56.0	6.0	7392.0	Good
28/09/2023	27060	7	P31	Yes	300	54.0	6.0	7716.0	Good
28/09/2023	27060	7	P32	Yes	300	6.0	6.0	7752.0	Good



Geotextile Deployment Records

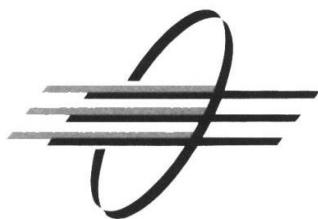
Site:	Pwllfawtkin	Project:	Capping
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Date	Batch No.	Roll No.	Panel No.	Heat Bonded Yes/No	Actual Overlap (mm)	Length (m)	Width (m)	Accumulated Area (m ²)	Visual Inspection
28/09/2023	27060	11	P33	Yes	300	49.0	6.0	8046.0	Good
29/09/2023	27060	11	P34	Yes	300	52.0	6.0	8358.0	Good
02/10/2023	27060	11	P35	Yes	300	52.0	6.0	8670.0	Good
02/10/2023	27060	4	P36	Yes	300	51.0	6.0	8976.0	Good
02/10/2023	27060	4	P37	Yes	300	50.0	6.0	9276.0	Good
04/10/2023	27060	4	P38	Yes	300	49.0	6.0	9570.0	Good
04/10/2023	27060	20	P39	Yes	300	50.0	6.0	9870.0	Good
05/10/2023	27060	20	P40	Yes	300	48.0	6.0	10158.0	Good
05/10/2023	27060	20	P41	Yes	300	46.0	6.0	10434.0	Good
05/10/2023	27060	20	P42	Yes	300	9.0	6.0	10488.0	Good
07/10/2023	27060	13	P43	Yes	300	37.0	6.0	10710.0	Good
07/10/2023	27060	13	P44	Yes	300	43.0	6.0	10968.0	Good
07/10/2023	27060	13	P45	Yes	300	31.0	6.0	11154.0	Good
07/10/2023	27060	13	P46	Yes	300	25.0	6.0	11304.0	Good
07/10/2023	27060	13	P47	Yes	300	10.0	6.0	11364.0	Good
07/10/2023	27060	19	P48	Yes	300	22.0	6.0	11496.0	Good
07/10/2023	27060	19	P49	Yes	300	20.0	6.0	11616.0	Good
07/10/2023	27060	19	P50	Yes	300	15.0	6.0	11706.0	Good
08/10/2023	27060	19	P51	Yes	300	18.0	6.0	11814.0	Good
08/10/2023	27060	19	P52	Yes	300	17.0	6.0	11916.0	Good
08/10/2023	27060	19	P53	Yes	300	15.0	6.0	12006.0	Good
08/10/2023	27060	19	P54	Yes	300	13.0	6.0	12084.0	Good
08/10/2023	27060	19	P55	Yes	300	12.0	6.0	12156.0	Good
08/10/2023	27060	19	P56	Yes	300	26.0	6.0	12312.0	Good
08/10/2023	27060	3	P57	Yes	300	1.0	6.0	12318.0	Good
08/10/2023	27060	3	P58	Yes	300	28.0	6.0	12486.0	Good
08/10/2023	27060	3	P59	Yes	300	32.0	6.0	12678.0	Good
08/10/2023	27060	3	P60	Yes	300	37.0	6.0	12900.0	Good
12/10/2023	27060	3	P61	Yes	300	39.0	6.0	13134.0	Good
12/10/2023	27060	3	P62	Yes	300	17.0	6.0	13236.0	Good
12/10/2023	27060	15	P63	Yes	300	21.0	6.0	13362.0	Good
12/10/2023	27060	15	P64	Yes	300	63.0	6.0	13740.0	Good

	Geotextile Deployment Records			
	Site:	Pwllfawtkin	Project:	Capping
	CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2013 - 24

Date	Batch No.	Roll No.	Panel No.	Heat Bonded Yes/No	Actual Overlap (mm)	Length (m)	Width (m)	Accumulated Area (m ²)	Visual Inspection
16/10/2023	27060	15	P65	Yes	300	63.0	6.0	14118.0	Good
16/10/2023	27060	15	P66	Yes	300	5.0	6.0	14148.0	Good
16/10/2023	27060	16	P67	Yes	300	58.0	6.0	14496.0	Good
16/10/2023	27060	16	P68	Yes	300	63.0	6.0	14874.0	Good
24/10/2023	27060	16	P69	Yes	300	31.0	6.0	15060.0	Good
24/10/2023	27060	9	P70	Yes	300	31.0	6.0	15246.0	Good
24/10/2023	27060	9	P71	Yes	300	61.0	6.0	15612.0	Good
24/10/2023	27060	9	P72	Yes	300	60.0	6.0	15972.0	Good
24/10/2023	27060	6	P73	Yes	300	62.0	6.0	16344.0	Good
25/10/2023	27060	6	P74	Yes	300	59.0	6.0	16698.0	Good
25/10/2023	27060	6	P75	Yes	300	33.0	6.0	16896.0	Good
25/10/2023	27060	18	P76	Yes	300	26.0	6.0	17052.0	Good
25/10/2023	27060	18	P77	Yes	300	77.0	6.0	17514.0	Good
25/10/2023	27060	18	P78	Yes	300	55.0	6.0	17844.0	Good
25/10/2023	27060	18	P79	Yes	300	15.0	6.0	17934.0	Good
25/10/2023	27060	2	P80	Yes	300	39.0	6.0	18168.0	Good
25/10/2023	27060	2	P81	Yes	300	56.0	6.0	18504.0	Good
25/10/2023	27060	2	P82	Yes	300	56.0	6.0	18840.0	Good
06/11/2023	27049	23	P83	Yes	300	55.0	6.0	19170.0	Good
07/11/2023	27049	23	P84	Yes	300	55.0	6.0	19500.0	Good
07/11/2023	27049	23	P85	Yes	300	38.0	6.0	19728.0	Good
07/11/2023	27049	5	P86	Yes	300	15.0	6.0	19818.0	Good
08/11/2023	27049	5	P87	Yes	300	38.0	6.0	20046.0	Good
08/11/2023	27049	5	P88	Yes	300	26.0	6.0	20202.0	Good
08/11/2023	27049	5	P89	Yes	300	25.0	6.0	20352.0	Good
15/11/2023	27049	5	P90	Yes	300	10.0	6.0	20412.0	Good
15/11/2023	27049	5	P91	Yes	300	9.0	6.0	20466.0	Good
15/11/2023	27049	5	P92	Yes	300	32.0	6.0	20658.0	Good

APPENDIX V
MATERIAL CONFORMANCE TESTING RESULTS



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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V293/a

Report Date 18/10/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No M-C3230/00033

Material Tested Geotextile

Date Received 01/08/2023 & 13/10/2023

Sample IDs CF-2, CF-6, CF-8, CF-9 CF-11 & CF-14

Tests Requested Cone Drop - BS EN ISO 13433:2006
Mass per Unit Area - BS EN ISO 9864:2005
Static Puncture CBR - BS EN ISO 12236:2006
Thickness - BS EN ISO 9863-1:2016+A1:2019
Wide Width Tensile - BS EN ISO 10319:2015

Prepared by:

David Smith
Technical Co-ordinator

Approved by:

Shazeena Iqbal
Technical Director



4438

Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory.
Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope.

This test report is in a condensed format, complete test details available upon request.
This test report may not be reproduced other than in full, except with prior written approval.

10 Owler Ings Road, Brighouse, West Yorkshire, HD6 1EJ
Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawarkin Landfill Site
Material: Geotextile

Report Ref No: BS-V293/a
Dates Tested: 16-17/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF-2, Roll No: 015, Batch No: 27049 {P2}

BICS Sample Ref: 1

Cone Drop (BS EN ISO 13433:2006)

mm	2	2	3	3	3						3	1
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Mass per Unit Area (BS EN ISO 9864:2005)

g/m ²	383	395	414	380	352	384	362	409	368	347	379	23
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Static Puncture CBR (BS EN ISO 12236:2006)

Puncture Force kN	4.67	5.08	5.11	4.36	4.11						4.66	0.44
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Puncture Displacement mm	72	69	71	69	70						70	1
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Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm	4.65	4.73	4.40	4.46	4.81	4.86	4.62	4.67	4.42	4.75	4.64	0.16
----	------	------	------	------	------	------	------	------	------	------	------	------

Wide Width Tensile Properties (BS EN ISO 10319:2015)

Tensile Strength kN/m (MD)	30.8	36.0	29.2	32.0	27.4						31.1	3.3
----------------------------	------	------	------	------	------	--	--	--	--	--	------	-----

Tensile Strength kN/m (CD)	24.2	24.1	26.1	26.5	26.0						25.4	1.2
----------------------------	------	------	------	------	------	--	--	--	--	--	------	-----

Tensile Strain % (MD)	70.4	68.4	72.3	71.6	80.8						72.7	4.8
-----------------------	------	------	------	------	------	--	--	--	--	--	------	-----

Tensile Strain % (CD)	87.3	86.4	91.2	86.9	88.3						88.0	1.9
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Sample ID: CF6, Roll No: 008, Batch No: 27060 {P16}

BICS Sample Ref: 2

Mass per Unit Area (BS EN ISO 9864:2005)

g/m ²	335	325	371	401	372	361	369	375	391	397	370	25
------------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----

Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm	4.39	4.17	4.35	4.18	4.49	4.13	4.44	4.65	4.51	4.69	4.40	0.20
----	------	------	------	------	------	------	------	------	------	------	------	------

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

BICS Laboratories Ltd. neither accepts responsibility for nor makes claim as to the final use and purpose of the material.
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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: Geotextile

Report Ref No: BS-V293/a
Dates Tested: 16-17/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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1	2	3	4	5	6	7	8	9	10
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Sample ID: CF-8, Roll No: 012, Batch No: 27060 {P24}

BICS Sample Ref: 3

Cone Drop (BS EN ISO 13433:2006)

mm	3	2	2	2	2							2	0
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Mass per Unit Area (BS EN ISO 9864:2005)

g/m ²	371	333	369	366	386	394	337	389	384	334		366	24
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Static Puncture CBR (BS EN ISO 12236:2006)

Puncture Force kN	5.26	5.21	5.09	4.52	4.22							4.86	0.47
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Puncture Displacement mm	75	71	73	71	69							72	2
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Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm	4.33	4.41	4.76	4.56	4.51	4.39	4.23	4.61	4.56	4.43		4.48	0.15
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Wide Width Tensile Properties (BS EN ISO 10319:2015)

Tensile Strength kN/m (MD)	27.5	28.4	25.6	28.7	30.3							28.1	1.7
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Tensile Strength kN/m (CD)	29.0	26.6	26.7	28.3	29.0							27.9	1.2
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Tensile Strain % (MD)	74.4	87.7	65.4	82.5	77.7							77.6	8.4
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Tensile Strain % (CD)	92.3	79.5	77.5	87.8	80.1							83.5	6.3
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: Geotextile

Report Ref No: BS-V293/a
Dates Tested: 16-17/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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1	2	3	4	5	6	7	8	9	10		
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Sample ID: CF-9, Roll No: 017, Batch No: 27060 {P15}

BICS Sample Ref: 4

Cone Drop (BS EN ISO 13433:2006)

mm	2	2	2	2	3							2	0
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Mass per Unit Area (BS EN ISO 9864:2005)

g/m ²	405	387	356	411	356	347	341	367	347	355		367	25
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Static Puncture CBR (BS EN ISO 12236:2006)

Puncture Force kN	4.09	4.75	4.95	4.65	5.06							4.70	0.38
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Puncture Displacement mm	68	74	74	71	71							72	2
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Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm	4.17	4.30	4.21	4.56	4.13	4.44	4.29	4.47	4.25	4.38		4.32	0.14
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Wide Width Tensile Properties (BS EN ISO 10319:2015)

Tensile Strength kN/m (MD)	29.2	27.8	26.4	30.2	32.0							29.1	2.1
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Tensile Strength kN/m (CD)	26.0	26.5	25.3	28.1	29.3							27.0	1.6
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Tensile Strain % (MD)	71.9	71.2	75.3	74.1	76.1							73.7	2.1
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Tensile Strain % (CD)	83.8	93.1	84.6	91.9	99.4							90.5	6.5
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: Geotextile

Report Ref No: BS-V293/a
Dates Tested: 16-17/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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	1	2	3	4	5	6	7	8	9	10		
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Sample ID: CF-11, Roll No: 017, Batch No: 27060 {P36}

BICS Sample Ref: 5

Cone Drop (BS EN ISO 13433:2006)

mm	2	2	2	2	2						2	0
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Mass per Unit Area (BS EN ISO 9864:2005)

g/m ²	345	334	362	368	377	374	357	389	394	374	367	19
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Static Puncture CBR (BS EN ISO 12236:2006)

Puncture Force kN	4.31	4.47	5.17	4.71	5.31						4.79	0.43
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Puncture Displacement mm	73	69	73	73	74						72	2
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Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm	4.27	4.32	4.27	4.17	4.47	4.17	4.49	4.26	4.53	4.46	4.34	0.14
----	------	------	------	------	------	------	------	------	------	------	------	------

Wide Width Tensile Properties (BS EN ISO 10319:2015)

Tensile Strength kN/m (MD)	27.0	27.6	25.6	29.7	25.3						27.0	1.8
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Tensile Strength kN/m (CD)	26.2	31.7	32.9	30.7	27.8						29.9	2.8
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Tensile Strain % (MD)	77.8	82.0	76.7	68.8	73.6						75.8	4.9
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Tensile Strain % (CD)	91.1	91.9	86.4	93.2	84.0						89.3	3.9
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: Geotextile

Report Ref No: BS-V293/a
Dates Tested: 16-17/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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	1	2	3	4	5	6	7	8	9	10		
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Sample ID: CF-14, Roll No: 019, Batch No: 27060 {P48}

BICS Sample Ref: 6

Cone Drop (BS EN ISO 13433:2006)

mm	2	2	2	2	3						2	0
----	---	---	---	---	---	--	--	--	--	--	---	---

Mass per Unit Area (BS EN ISO 9864:2005)

g/m ²	371	353	381	341	328	368	347	388	377	369	362	19
------------------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	----

Static Puncture CBR (BS EN ISO 12236:2006)

Puncture Force kN	4.19	5.04	4.67	5.01	4.26						4.63	0.40
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Puncture Displacement mm	72	72	71	74	70						72	2
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Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm	4.61	4.24	4.30	4.11	4.20	4.18	4.60	4.30	4.63	4.46	4.37	0.20
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Wide Width Tensile Properties (BS EN ISO 10319:2015)

Tensile Strength kN/m (MD)	25.6	25.5	32.8	29.4	28.0						28.3	3.0
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Tensile Strength kN/m (CD)	29.0	29.4	28.3	27.3	27.2						28.2	1.0
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Tensile Strain % (MD)	70.3	73.2	74.2	78.7	63.6						72.0	5.6
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Tensile Strain % (CD)	80.9	79.1	90.3	94.7	97.7						88.6	8.2
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V620/a

Report Date 20/11/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No M-C3230/00033

Material Tested Geotextile

Date Received 17/11/2023

Sample IDs CF-15, Roll No: 015 & CF-17, Roll No: 009

Tests Requested Cone Drop - BS EN ISO 13433:2006
Mass per Unit Area - BS EN ISO 9864:2005
Static Puncture CBR - BS EN ISO 12236:2006
Thickness - BS EN ISO 9863-1:2016+A1:2019
Wide Width Tensile - BS EN ISO 10319:2015

Prepared by:

David Smith
Technical Co-ordinator

Approved by:

Shazeena Iqbal
Technical Director



Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory.
Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope.
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Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: Geotextile

Report Ref No: BS-V620/a
Dates Tested: 20/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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1	2	3	4	5	6	7	8	9	10		
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Sample ID: CF-15, Roll No: 015, Batch No: 27060, P63

BICS Sample Ref: 1

Cone Drop (BS EN ISO 13433:2006)

mm	3	3	3	3	3						3	0
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Mass per Unit Area (BS EN ISO 9864:2005)

g/m ²	393	344	341	326	329	360	376	379	355	315	352	25
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Static Puncture CBR (BS EN ISO 12236:2006)

Puncture Force kN	4.10	4.65	4.09	4.44	4.14						4.29	0.25
Puncture Displacement mm	71	77	74	75	74						74	2

Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm	4.36	4.52	4.39	4.63	4.69	4.74	4.65	4.43	4.33	4.55	4.53	0.15
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Wide Width Tensile Properties (BS EN ISO 10319:2015)

Tensile Strength kN/m (MD)	28.2	31.2	32.9	27.0	28.9						29.6	2.4
Tensile Strength kN/m (CD)	24.6	28.4	24.7	25.7	27.2						26.1	1.7
Tensile Strain % (MD)	71.3	76.9	82.7	71.0	80.4						76.5	5.3
Tensile Strain % (CD)	98.9	88.4	93.2	90.3	93.0						92.8	4.0

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site

Material: Geotextile

Report Ref No: BS-V620/a

Dates Tested: 20/11/2023

TEST METHOD TEST SPECIMEN NUMBER MEAN Std Dev

1 2 3 4 5 6 7 8 9 10

Sample ID: CF-17, Roll No: 009, Batch No: 27060, P72

BICS Sample Ref: 2

Cone Drop (BS EN ISO 13433:2006)

mm 3 3 3 3 3 3 3 3 3 3 3 3 3 0

Mass per Unit Area (BS EN ISO 9864:2005)

g/m² 351 344 314 368 345 325 369 368 388 336 351 23

Static Puncture CBR (BS EN ISO 12236:2006)

Puncture Force kN 3.72 3.54 3.54 3.81 3.54 3.63 0.13

Puncture Displacement mm 74 78 75 74 72 74 2

Thickness under 2kPa (BS EN ISO 9863-1:2016+A1:2019)

mm 4.54 4.38 4.65 4.75 4.32 4.32 4.38 4.53 4.19 4.34 4.44 0.17

Wide Width Tensile Properties (BS EN ISO 10319:2015)

Tensile Strength kN/m (MD) 26.5 27.0 30.5 30.6 30.3 29.0 2.0

Tensile Strength kN/m (CD) 22.1 26.5 22.9 24.5 24.4 24.1 1.7

Tensile Strain % (MD) 75.5 73.4 76.9 71.0 74.4 74.2 2.2

Tensile Strain % (CD) 81.7 85.3 86.9 85.2 86.5 85.1 2.0

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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[illegible][illegible]



	max/min mm (mm) (-/+%)	
	lowest individual for 8 out of 10 values (+/-95%)	
	Carbon Black Content (%): Value 2 - 3	
	Cationic Black Dispersion: Value = Min. 6	
	10-14 in categories 1 or 2.	
	more than 1 in Category 3	
	Apparent Height (mm): Value = 0.4 (min)	
	(µm)	
	Density (g/cm ³): Value = 0.939 (max)	
	Elastic Properties: Break Stress (N/mm ²)	
	= 11:	
	Break Elongation (%) = 250	
	Puncture Resistance (N): Value = 200	
	Tear Resistance (N): Value = 100	
	oxidative Induction time (OIT)	
	(mins)	
	Standard OIT = Value 100.	
	SEPARATION	
	SUBSTRATE	
	Stitch Strength	
	Stitch & 66 N/mm	
	ELONGATION: Fusion	
	Exhaustion	
	High-Pressure OIT = Value 400.	
	Shear & Shear Strength Fusion &	
	Exhaustion	

[illegible]



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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V291/a

Report Date 24/10/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No M-C3230/00033

Material Tested 1mm Textured LLDPE Geomembrane

Date Received 01/08/2023, 07/08/2023 & 13/10/2023

Sample IDs CF-3, CF-7, CF-10, CF12 & CF-13

Tests Requested Asperity Height - ASTM D7466/D7466M-10(2015)e1
Carbon Black Content - ASTM D4218-20
Carbon Black Dispersion - ASTM D5596-03(2021)
Density - ASTM D1505-18
Oxidative Induction Time - ASTM D8117-21
Puncture Resistance - ASTM D4833/D4833M-07(2020)
Tear Resistance - ASTM D1004-21
Tensile Properties - ASTM D6693/D6693M-20
Thickness - ASTM D5994/D5994M-10(2021)

Prepared by:

David Smith
Technical Co-ordinator

Approved by:

Shazeena Iqbal
Technical Director



4438

Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory.
Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope.
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Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V291/a
Dates Tested: 18-24/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF3, Roll No: 0904-087792, Batch No: 4222585, P1

BICS Sample Ref: 1

Asperity Height (ASTM D7466/D7466M-10(2015)e1)

Side A mm	0.53	0.55	0.55	0.55	0.53	0.55	0.60	0.58	0.58	0.55	0.55	0.0
Side B mm	0.48	0.48	0.43	0.50	0.45	0.50	0.45	0.50	0.43	0.45	0.48	0.1

Carbon Black Content (ASTM D4218-20)

%	2.53	2.61									2.57	0.06
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Carbon Black Dispersion (ASTM D5596-03(2021))

Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0

Density (ASTM D1505-18)

g/ml	0.937	0.937	0.937								0.937	0.000
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Oxidative Induction Time (ASTM D8117-21)

min	158	158									158	0.2
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Puncture Resistance (ASTM D4833/D4833M-07(2020))

N	460	397	454	450	439						440	26
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Tear Resistance (ASTM D1004-21)

N (MD)	149	160	149	162	152	161	162	149	162	153	156	6
N (CD)	164	150	142	162	144	152	156	161	161	141	153	9

Tensile Properties (ASTM D6693/D6693M-20)

Break Strength N/mm (MD)	22.7	21.9	20.0	23.4	20.7						21.8	1.4
Break Strength N/mm (CD)	20.1	21.6	20.1	21.0	22.1						21.0	0.9
Break Elongation % (MD)	540	510	490	580	520						528	34
Break Elongation % (CD)	510	540	490	540	510						518	22

Thickness (ASTM D5994/D5994M-10(2021))

mm	1.18	1.15	1.14	1.09	1.04	1.13	1.13	1.09	1.07	1.02	1.10	0.05
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V291/a
Dates Tested: 18-24/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF7, Roll No: 0904-087788, Batch No: 4222585, P10

BICS Sample Ref: 2

Asperity Height (ASTM D7466/D7466M-10(2015)e1)

Side A mm	0.60	0.53	0.58	0.58	0.58	0.58	0.55	0.58	0.58	0.58	0.58	0.0
Side B mm	0.48	0.48	0.48	0.50	0.45	0.43	0.50	0.50	0.45	0.50	0.48	0.1

Carbon Black Content (ASTM D4218-20)

%	2.53	2.57									2.55	0.03
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Carbon Black Dispersion (ASTM D5596-03(2021))

Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0

Density (ASTM D1505-18)

g/ml	0.937	0.937	0.937								0.937	0.000
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Oxidative Induction Time (ASTM D8117-21)

min	160	160									160	0.3
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Puncture Resistance (ASTM D4833/D4833M-07(2020))

N	435	457	420	393	417						424	23
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Tear Resistance (ASTM D1004-21)

N (MD)	143	129	133	144	154	139	125	143	145	147	140	9
N (CD)	139	154	148	141	141	138	140	149	147	139	144	6

Tensile Properties (ASTM D6693/D6693M-20)

Break Strength N/mm (MD)	22.7	24.1	24.1	23.5	21.9						23.3	1.0
Break Strength N/mm (CD)	22.8	22.9	26.0	21.7	23.0						23.2	1.6
Break Elongation % (MD)	540	540	580	560	530						550	20
Break Elongation % (CD)	540	540	580	540	530						546	19

Thickness (ASTM D5994/D5994M-10(2021))

mm	1.07	1.03	1.08	0.98	1.02	1.02	1.09	1.14	1.03	1.04	1.05	0.05
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V291/a
Dates Tested: 18-24/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF10, Roll No: 0904-087819, P15

BICS Sample Ref: 3

Asperity Height (ASTM D7466/D7466M-10(2015)e1)

Side A mm	0.53	0.60	0.58	0.55	0.58	0.58	0.55	0.53	0.58	0.58	0.58	0.0
Side B mm	0.45	0.50	0.50	0.48	0.50	0.45	0.50	0.48	0.50	0.45	0.48	0.0

Carbon Black Content (ASTM D4218-20)

%	2.57	2.51									2.54	0.04
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Carbon Black Dispersion (ASTM D5596-03(2021))

Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0

Density (ASTM D1505-18)

g/ml	0.937	0.937	0.937								0.937	0.000
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Oxidative Induction Time (ASTM D8117-21)

min	165	163									164	1.9
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Puncture Resistance (ASTM D4833/D4833M-07(2020))

N	447	425	433	420	390						423	21
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Tear Resistance (ASTM D1004-21)

N (MD)	156	164	149	154	141	151	149	146	158	151	152	6
N (CD)	150	147	152	158	144	146	161	154	152	154	152	5

Tensile Properties (ASTM D6693/D6693M-20)

Break Strength N/mm (MD)	24.0	24.0	25.3	22.9	25.6						24.4	1.1
Break Strength N/mm (CD)	19.7	19.8	21.9	20.2	20.0						20.3	0.9
Break Elongation % (MD)	550	600	570	570	610						580	24
Break Elongation % (CD)	490	530	530	500	470						504	26

Thickness (ASTM D5994/D5994M-10(2021))

mm	1.04	0.99	1.05	1.00	1.08	1.08	1.13	1.12	1.07	1.09	1.06	0.05
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V291/a
Dates Tested: 18-24/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: CF12, Roll No: 0904-087804, Batch No: 4222641, P23						BICS Sample Ref: 4						
Asperity Height (ASTM D7466/D7466M-10(2015)e1)												
Side A mm	0.53	0.53	0.58	0.60	0.58	0.53	0.55	0.55	0.53	0.60	0.55	0.0
Side B mm	0.48	0.50	0.48	0.50	0.48	0.43	0.48	0.48	0.48	0.50	0.48	0.0
Carbon Black Content (ASTM D4218-20)												
%	2.44	2.52									2.48	0.06
Carbon Black Dispersion (ASTM D5596-03(2021))												
Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0
Density (ASTM D1505-18)												
g/ml	0.937	0.937	0.937								0.937	0.000
Oxidative Induction Time (ASTM D8117-21)												
min	155	154									154	0.2
Puncture Resistance (ASTM D4833/D4833M-07(2020))												
N	408	430	427	399	431						419	15
Tear Resistance (ASTM D1004-21)												
N (MD)	145	142	147	162	151	153	154	138	157	150	150	7
N (CD)	144	147	148	168	165	151	153	159	158	146	154	8
Tensile Properties (ASTM D6693/D6693M-20)												
Break Strength N/mm (MD)	26.4	24.1	23.5	23.4	25.9						24.7	1.4
Break Strength N/mm (CD)	19.9	19.9	21.2	19.7	21.8						20.5	0.9
Break Elongation % (MD)	580	550	530	560	580						560	21
Break Elongation % (CD)	490	500	490	510	510						500	10
Thickness (ASTM D5994/D5994M-10(2021))												
mm	1.02	1.04	1.15	1.13	1.04	1.04	1.08	1.07	1.06	1.04	1.07	0.04

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V291/a
Dates Tested: 18-24/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: CF-13, Roll No: 0904-087839, Batch No: 4222641, P31						BICS Sample Ref: 5						
Asperity Height (ASTM D7466/D7466M-10(2015)e1)												
Side A mm	0.60	0.58	0.60	0.58	0.60	0.58	0.55	0.55	0.58	0.58	0.58	0.0
Side B mm	0.50	0.45	0.50	0.45	0.48	0.50	0.48	0.50	0.48	0.50	0.48	0.1
Carbon Black Content (ASTM D4218-20)												
%	2.60	2.52									2.56	0.06
Carbon Black Dispersion (ASTM D5596-03(2021))												
Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0
Density (ASTM D1505-18)												
g/ml	0.937	0.937	0.936								0.937	0.000
Oxidative Induction Time (ASTM D8117-21)												
min	152	151									152	0.6
Puncture Resistance (ASTM D4833/D4833M-07(2020))												
N	443	398	449	454	436						436	22
Tear Resistance (ASTM D1004-21)												
N (MD)	143	150	148	145	150	140	152	151	135	147	146	6
N (CD)	151	148	150	163	154	165	147	147	150	144	152	7
Tensile Properties (ASTM D6693/D6693M-20)												
Break Strength N/mm (MD)	23.8	26.4	23.1	27.5	24.2						25.0	1.9
Break Strength N/mm (CD)	19.1	20.8	20.3	22.2	19.4						20.3	1.2
Break Elongation % (MD)	570	610	540	620	540						576	38
Break Elongation % (CD)	480	540	470	510	480						496	29
Thickness (ASTM D5994/D5994M-10(2021))												
mm	1.14	1.07	1.07	1.00	1.12	1.08	1.01	1.12	1.01	1.08	1.07	0.05

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V618/a

Report Date 22/11/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No M-C3230/00033

Material Tested 1mm Textured LLDPE Geomembrane

Date Received 17/11/2023

Sample IDs CF-16, CF-18, CF-19 & CF-20

Tests Requested Asperity Height - ASTM D7466/D7466M-10(2015)e1
Carbon Black Content - ASTM D4218-20
Carbon Black Dispersion - ASTM D5596-03(2021)
Density - ASTM D1505-18
Oxidative Induction Time - ASTM D8117-21
Puncture Resistance - ASTM D4833/D4833M-07(2020)
Tear Resistance - ASTM D1004-21
Tensile Properties - ASTM D6693/D6693M-20
Thickness - ASTM D5994/D5994M-10(2021)

Prepared by:

David Smith
Technical Co-ordinator

Approved by:

Shazeena Iqbal
Technical Director



Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory.
Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope.
This test report is in a condensed format, complete test details available upon request.
This test report may not be reproduced other than in full, except with prior written approval.

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Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V618/a
Dates Tested: 20-22/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF-16, Roll No: 0904-089241, Batch No: 4223148

BICS Sample Ref: 1

Asperity Height (ASTM D7466/D7466M-10(2015)e1)

Side A mm	0.55	0.53	0.60	0.53	0.55	0.48	0.50	0.48	0.50	0.58	0.53	0.0
Side B mm	0.53	0.55	0.45	0.48	0.45	0.50	0.50	0.50	0.53	0.50	0.50	0.0

Carbon Black Content (ASTM D4218-20)

%	2.54	2.53									2.54	0.01
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Carbon Black Dispersion (ASTM D5596-03(2021))

Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0

Density (ASTM D1505-18)

g/ml	0.933	0.933	0.933								0.933	0.000
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Oxidative Induction Time (ASTM D8117-21)

min	150	149									150	1.2
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Puncture Resistance (ASTM D4833/D4833M-07(2020))

N	510	487	488	531	504						504	18
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Tear Resistance (ASTM D1004-21)

N (MD)	167	147	152	157	146	167	156	159	161	151	156	8
N (CD)	152	183	160	165	159	143	160	147	154	155	158	11

Tensile Properties (ASTM D6693/D6693M-20)

Break Strength N/mm (MD)	25.5	25.3	23.9	24.7	25.2						24.9	0.6
Break Strength N/mm (CD)	22.8	24.2	23.1	22.9	22.5						23.1	0.6
Break Elongation % (MD)	560	550	530	540	560						548	13
Break Elongation % (CD)	550	530	540	540	510						534	15

Thickness (ASTM D5994/D5994M-10(2021))

mm	1.02	1.00	1.01	1.05	1.02	1.02	1.01	1.04	1.00	1.09	1.03	0.03
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V618/a
Dates Tested: 20-22/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF-18, Roll No: 0904-089263, Batch No: 4223158

BICS Sample Ref: 2

Asperity Height (ASTM D7466/D7466M-10(2015)e1)

Side A mm	0.50	0.53	0.55	0.58	0.53	0.60	0.58	0.55	0.58	0.65	0.58	0.0
Side B mm	0.48	0.53	0.55	0.50	0.45	0.50	0.55	0.60	0.50	0.48	0.53	0.0

Carbon Black Content (ASTM D4218-20)

%	2.66	2.64									2.65	0.01
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Carbon Black Dispersion (ASTM D5596-03(2021))

Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0

Density (ASTM D1505-18)

g/ml	0.936	0.934	0.934								0.935	0.001
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Oxidative Induction Time (ASTM D8117-21)

min	150	153									151	2.1
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Puncture Resistance (ASTM D4833/D4833M-07(2020))

N	452	469	429	463	417						446	22
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Tear Resistance (ASTM D1004-21)

N (MD)	140	141	136	143	136	156	146	142	138	143	142	6
N (CD)	148	148	127	153	144	147	158	136	151	129	144	10

Tensile Properties (ASTM D6693/D6693M-20)

Break Strength N/mm (MD)	23.9	26.9	23.9	23.6	22.7						24.2	1.6
Break Strength N/mm (CD)	22.2	21.2	22.1	19.8	23.4						21.7	1.3
Break Elongation % (MD)	620	620	590	580	600						602	18
Break Elongation % (CD)	550	550	520	510	590						544	31

Thickness (ASTM D5994/D5994M-10(2021))

mm	1.05	1.05	1.03	1.01	1.04	1.00	1.02	1.01	1.03	1.04	1.03	0.02
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V618/a
Dates Tested: 20-22/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF-19, Roll No: 0904-089254, Batch No: 4223158

BICS Sample Ref: 3

Asperity Height (ASTM D7466/D7466M-10(2015)e1)

Side A mm	0.55	0.50	0.55	0.55	0.55	0.58	0.55	0.43	0.53	0.58	0.53	0.0
Side B mm	0.48	0.53	0.45	0.50	0.60	0.53	0.58	0.50	0.50	0.50	0.53	0.0

Carbon Black Content (ASTM D4218-20)

%	2.54	2.54									2.54	0.00
---	------	------	--	--	--	--	--	--	--	--	------	------

Carbon Black Dispersion (ASTM D5596-03(2021))

Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0

Density (ASTM D1505-18)

g/ml	0.934	0.934	0.935								0.934	0.001
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Oxidative Induction Time (ASTM D8117-21)

min	151	150									151	0.5
-----	-----	-----	--	--	--	--	--	--	--	--	-----	-----

Puncture Resistance (ASTM D4833/D4833M-07(2020))

N	439	440	436	450	450						443	7
---	-----	-----	-----	-----	-----	--	--	--	--	--	-----	---

Tear Resistance (ASTM D1004-21)

N (MD)	142	137	142	130	140	142	140	140	145	139	140	4
N (CD)	148	145	137	138	148	132	154	145	150	150	145	7

Tensile Properties (ASTM D6693/D6693M-20)

Break Strength N/mm (MD)	25.2	24.9	25.3	23.7	23.2						24.5	1.0
Break Strength N/mm (CD)	23.2	21.1	20.8	20.8	23.0						21.8	1.2
Break Elongation % (MD)	620	590	600	600	580						598	15
Break Elongation % (CD)	550	540	500	540	580						542	29

Thickness (ASTM D5994/D5994M-10(2021))

mm	1.01	1.01	1.03	1.02	1.01	1.02	1.02	0.99	1.07	1.04	1.02	0.02
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Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V618/a
Dates Tested: 20-22/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: CF-20, Roll No: 0904-087802, Batch No: 4223158

BICS Sample Ref: 4

Asperity Height (ASTM D7466/D7466M-10(2015)e1)

Side A mm	0.48	0.50	0.48	0.55	0.55	0.55	0.55	0.45	0.50	0.53	0.53	0.0
Side B mm	0.53	0.53	0.53	0.45	0.48	0.55	0.45	0.50	0.45	0.50	0.50	0.0

Carbon Black Content (ASTM D4218-20)

%	2.44	2.49									2.47	0.04
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Carbon Black Dispersion (ASTM D5596-03(2021))

Category Rating - 1st Rf	1	1	1	1	1						1	0
Category Rating - 2nd Rf	1	1	1	1	1						1	0

Density (ASTM D1505-18)

g/ml	0.937	0.936	0.936								0.936	0.000
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Oxidative Induction Time (ASTM D8117-21)

min	147	144									146	2.1
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Puncture Resistance (ASTM D4833/D4833M-07(2020))

N	437	452	443	475	499						461	25
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Tear Resistance (ASTM D1004-21)

N (MD)	163	158	153	159	152	153	136	135	166	144	152	11
N (CD)	152	158	162	149	156	162	158	144	160	168	157	7

Tensile Properties (ASTM D6693/D6693M-20)

Break Strength N/mm (MD)	23.5	24.8	26.9	22.7	25.8						24.7	1.7
Break Strength N/mm (CD)	26.9	22.8	22.9	22.5	26.5						24.3	2.2
Break Elongation % (MD)	510	540	580	520	580						546	33
Break Elongation % (CD)	580	530	540	500	570						544	32

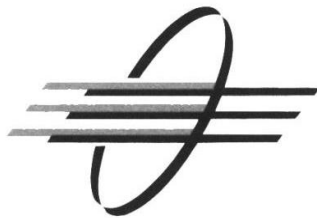
Thickness (ASTM D5994/D5994M-10(2021))

mm	1.00	1.04	1.02	1.02	1.04	1.01	1.07	1.01	1.05	1.03	1.03	0.02
----	------	------	------	------	------	------	------	------	------	------	------	------

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V292/a

Report Date 02/08/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No TBA

Material Tested 1mm Textured LLDPE Geomembrane

Date Received 01/08/2023

Sample IDs FS1 through to FS-4 {Fusion Welds}
DS-1 through to DS-10 {Extrusion Welds}

Tests Requested Seam Integrity (Peel & Shear) - ASTM D6392-12(2018)

Prepared by:

David Smith
Technical Co-ordinator

Approved by:

Shazeena Iqbal
Technical Director



Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory.
Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope.
This test report is in a condensed format, complete test details available upon request.
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Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V292/a
Dates Tested: 01-02/08/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: FS-1 {Trial Weld}

BICS Sample Ref: 1

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	12.9	13.9	15.2	12.5	14.0	13.5	13.2	12.1	13.3	12.8	13.3	0.9
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	17.1	17.4	16.9	16.9	17.1						17.1	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: FS-2 {Trial Weld}

BICS Sample Ref: 2

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	14.0	13.8	13.4	14.9	13.5	13.7	13.4	14.0	12.5	12.9	13.6	0.6
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	17.8	17.6	17.5	18.2	16.6						17.6	0.6
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: FS-3 {Trial Weld}

BICS Sample Ref: 3

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	13.4	13.6	13.2	13.1	13.2	15.5	14.7	14.6	14.9	15.0	14.1	0.9
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	17.2	17.1	17.2	17.3	16.8						17.1	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	BRK	SE1	BRK	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V292/a
Dates Tested: 01-02/08/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: FS-4 {Trial Weld}

BICS Sample Ref: 4

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	13.3	13.4	13.4	14.4	13.9	14.8	14.8	15.9	15.2	15.4	14.4	0.9
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	17.2	17.2	16.9	17.3	16.8						17.1	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	BRK	SE1	SE1							

Sample ID: DS-1 {Rain Flats}

BICS Sample Ref: 5

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	15.2	13.8	14.8	15.6	15.0						14.9	0.7
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							

Shear Strength N/mm	16.8	16.7	15.7	15.2	15.5						16.0	0.7
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE2	SE1	SE2	SE1							

Sample ID: DS-2 {Pipe Boot}

BICS Sample Ref: 6

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	16.1	14.6	14.0	14.4	14.6						14.7	0.8
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							

Shear Strength N/mm	18.2	17.6	17.7	17.7	17.3						17.7	0.3
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE2	SE2	SE2	SE2	SE2							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V292/a
Dates Tested: 01-02/08/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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1	2	3	4	5	6	7	8	9	10		
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Sample ID: DS-3 {Pipe Boot}

BICS Sample Ref: 7

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	15.5	15.9	16.6	14.6	15.2						15.5	0.8
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							
Shear Strength N/mm	16.6	16.3	16.1	16.2	15.6						16.2	0.4
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: DS-4 {Pipe Boot}

BICS Sample Ref: 8

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	14.0	15.2	14.1	15.0	13.6						14.4	0.7
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							
Shear Strength N/mm	18.3	18.2	17.5	18.0	17.6						17.9	0.4
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	BRK2	SE1	SE2	SE1	BRK1							

Sample ID: DS-5 {Pipe Boot}

BICS Sample Ref: 9

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	14.9	15.4	15.8	13.2	15.6						15.0	1.1
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							
Shear Strength N/mm	18.4	18.2	18.0	18.6	18.2						18.3	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE2	SE2	SE2	SE2	SE2							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawtkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V292/a
Dates Tested: 01-02/08/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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1	2	3	4	5	6	7	8	9	10		
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Sample ID: DS-6 {Weld Sample}

BICS Sample Ref: 10

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	16.4	16.5	17.4	17.0	16.4						16.7	0.4
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							

Shear Strength N/mm	17.7	16.8	16.8	17.7	17.2						17.2	0.4
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: DS-7 {Patch on Existing Liner}

BICS Sample Ref: 11

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	16.2	15.1	15.6	14.7	15.8						15.5	0.6
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							

Shear Strength N/mm	17.5	17.2	16.0	17.6	17.3						17.1	0.6
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE2	SE2							

Sample ID: DS-8 {Weld Sample}

BICS Sample Ref: 12

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	15.2	16.7	16.8	16.3	15.9						16.2	0.7
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	NOBRK	NOBRK	SE3	SE3							

Shear Strength N/mm	16.9	17.5	17.1	17.7	17.7						17.4	0.4
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V292/a
Dates Tested: 01-02/08/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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1	2	3	4	5	6	7	8	9	10		
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Sample ID: DS-9 {Weld Sample}

BICS Sample Ref: 13

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	16.6	16.2	16.4	16.1	15.8						16.2	0.3
Peel Separation %	0	0	0	0	0							
Peel Break Classification	NOBRK	NOBRK	SE3	SE3	SE3							
Shear Strength N/mm	17.9	16.3	16.0	17.8	17.2						17.0	0.9
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: DS-10 {Weld Sample}

BICS Sample Ref: 14

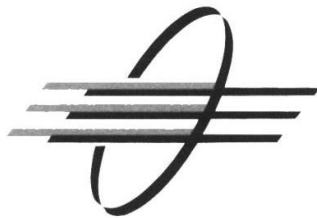
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	16.4	16.3	16.5	15.8	16.5						16.3	0.3
Peel Separation %	0	0	0	0	0							
Peel Break Classification	NOBRK	NOBRK	SE3	NOBRK	SE3							
Shear Strength N/mm	17.6	17.7	17.2	18.3	16.5						17.4	0.7
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	NOBRK	NOBRK	NOBRK	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V292/b

Report Date 07/08/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No TBA

Material Tested 1mm Textured LLDPE Geomembrane

Date Received 01/08/2023

Sample IDs FS-5 {Fusion Weld}
DS-11 {Extrusion Weld}

Tests Requested Seam Integrity (Peel & Shear) - ASTM D6392-12(2018)

Prepared by:

Shazeena Iqbal
Technical Director

Approved by:

Cliff Butt
Managing Director



Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory. Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope. This test report is in a condensed format, complete test details available upon request. This test report may not be reproduced other than in full, except with prior written approval.

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Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V292/b
Dates Tested: 07/08/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: FS-5, Trial Weld

BICS Sample Ref: 15

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	15.9	15.6	16.0	16.3	15.6	14.7	13.7	13.0	13.4	13.8	14.8	1.2
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.5	17.4	17.1	17.1	17.4						17.3	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: DS-11, Weld Sample

BICS Sample Ref: 16

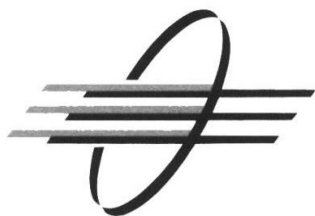
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	14.6	14.9	12.2	13.1	13.0						13.6	1.1
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							
Shear Strength N/mm	15.0	15.7	16.5	15.0	17.2						15.9	1.0
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V528/a

Report Date 13/10/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No TBC

Material Tested 1mm Textured LLDPE Geomembrane

Date Received 13/10/2023

Sample IDs FS-6 through to FS-17 {Fusion Welds}
DS-12 through to DS-19 {Extrusion Welds}

Tests Requested Seam Integrity (Peel & Shear) - ASTM D6392-12(2018)

Prepared by:

David Smith
Technical Co-ordinator

Approved by:

Shazeena Iqbal
Technical Director



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Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory.
Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope.
This test report is in a condensed format, complete test details available upon request.
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Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V528/a
Dates Tested: 13/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev		
	1	2	3	4	5	6	7	8	9	10				
Sample ID: FS-6 {Trial Weld}											BICS Sample Ref: 1			
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											14.7	0.6		
Peel Strength N/mm	15.4	14.7	15.1	14.9	15.2	14.0	13.9	14.6	13.7	15.5				
Peel Separation %	0	0	0	0	0	0	0	0	0	0				
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	17.0	0.4		
Shear Strength N/mm	16.5	17.2	17.3	16.9	17.4									
Shear Elongation %	>50	>50	>50	>50	>50									
Shear Break Classification	SE1	SE1	SE1	SE1	SE1									
Sample ID: FS-7 {Trial Weld}													BICS Sample Ref: 2	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											15.6	0.4		
Peel Strength N/mm	15.2	15.8	15.4	15.0	15.1	16.0	15.2	16.0	15.9	16.2				
Peel Separation %	0	0	0	0	0	0	0	0	0	0				
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	17.5	0.2		
Shear Strength N/mm	17.4	17.6	17.6	17.5	17.2									
Shear Elongation %	>50	>50	>50	>50	>50									
Shear Break Classification	SE1	SE1	SE1	SE1	SE1									
Sample ID: FS-8 {Trial Weld}													BICS Sample Ref: 3	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											14.8	0.8		
Peel Strength N/mm	14.8	14.7	14.0	14.9	13.1	15.2	15.8	14.4	15.1	16.1				
Peel Separation %	0	0	0	0	0	0	0	0	0	0				
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	17.4	0.4		
Shear Strength N/mm	16.8	17.7	17.5	17.3	17.5									
Shear Elongation %	>50	>50	>50	>50	>50									
Shear Break Classification	SE1	SE1	SE1	SE1	SE1									

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V528/a
Dates Tested: 13/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: FS-9 {Trial Weld}											BICS Sample Ref: 4	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											15.1	0.6
Peel Strength N/mm	14.0	15.2	14.7	15.6	14.7	15.2	15.0	14.7	15.8	15.7		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.0	17.8	17.6	17.1	17.1						17.3	0.3
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							
Sample ID: FS-10 {Trial Weld}											BICS Sample Ref: 5	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											15.1	1.1
Peel Strength N/mm	15.2	15.3	15.6	15.9	12.5	14.2	15.1	16.8	15.4	15.2		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.3	17.6	17.7	17.6	17.4						17.5	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							
Sample ID: FS-11 {Trial Weld}											BICS Sample Ref: 6	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											15.3	0.4
Peel Strength N/mm	15.0	14.3	15.4	15.4	15.2	15.3	15.5	15.6	15.9	15.2		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.7	17.9	17.9	18.0	18.3						17.9	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V528/a
Dates Tested: 13/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: FS-12 {Trial Weld}											BICS Sample Ref: 7	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											14.3	0.9
Peel Strength N/mm	14.7	14.3	14.3	15.6	14.9	14.8	13.9	13.1	12.3	14.8		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.6	17.8	17.4	18.1	18.2						17.8	0.3
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							
Sample ID: FS-13 {Trial Weld}											BICS Sample Ref: 8	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											15.5	0.8
Peel Strength N/mm	16.9	16.3	15.1	15.8	16.1	15.5	14.0	14.9	14.9	15.0		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.7	18.2	18.0	17.8	17.9						17.9	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							
Sample ID: FS-14 {Trial Weld}											BICS Sample Ref: 9	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											15.0	0.4
Peel Strength N/mm	15.3	14.2	14.6	15.0	15.4	14.6	15.1	15.1	15.2	15.5		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.4	17.6	17.2	17.4	17.1						17.3	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawarkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V528/a
Dates Tested: 13/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: FS-15 {Trial Weld}											BICS Sample Ref: 10	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											14.5	0.7
Peel Strength N/mm	14.8	15.1	14.5	15.1	15.2	15.1	13.8	13.8	14.0	13.1		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	18.0	18.0	18.1	18.1	18.2						18.1	0.1
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							
Sample ID: FS-16 {Trial Weld}											BICS Sample Ref: 11	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											14.7	0.9
Peel Strength N/mm	15.1	16.0	14.9	15.2	15.7	13.9	13.4	13.4	14.3	14.7		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	18.1	18.1	18.1	18.2	18.0						18.1	0.1
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							
Sample ID: FS-17 {Trial Weld}											BICS Sample Ref: 12	
Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}											14.6	0.9
Peel Strength N/mm	13.4	14.4	13.6	14.3	14.2	15.7	14.6	14.9	15.1	16.1		
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	17.4	17.5	17.1	17.5	17.6						17.4	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawtkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V528/a
Dates Tested: 13/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: DS-12						BICS Sample Ref: 13						
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											15.9	0.8
Peel Strength N/mm	16.3	14.6	16.6	16.0	15.8							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3						16.8	1.2
Shear Strength N/mm	17.9	18.4	15.9	15.6	16.2							
Shear Elongation %	39	48	>50	39	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	NOBRK							
Sample ID: DS-13						BICS Sample Ref: 14						
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											14.9	1.0
Peel Strength N/mm	15.7	14.7	14.9	13.2	15.8							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3						17.1	1.0
Shear Strength N/mm	17.8	17.7	17.5	17.0	15.4							
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE2	SE2	SE1							
Sample ID: DS-14						BICS Sample Ref: 15						
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											14.6	1.0
Peel Strength N/mm	15.2	15.7	13.6	15.2	13.6							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3						17.5	0.8
Shear Strength N/mm	18.2	16.6	16.8	17.4	18.4							
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE2	SE1	SE2							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V528/a
Dates Tested: 13/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: DS-15											BICS Sample Ref: 16	
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											15.6	0.6
Peel Strength N/mm	16.2	16.3	15.2	15.7	14.9							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3						17.7	0.8
Shear Strength N/mm	18.2	17.9	16.3	18.0	17.9							
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	NOBRK	SE2	NOBRK	NOBRK							
Sample ID: DS-16											BICS Sample Ref: 17	
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											16.2	0.3
Peel Strength N/mm	16.5	16.1	15.6	16.4	16.2							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	NOBRK	NOBRK	NOBRK	NOBRK	NOBRK						16.2	0.1
Shear Strength N/mm	16.1	16.5	16.1	16.2	16.2							
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	NOBRK	NOBRK	SE2	SE1	SE1							
Sample ID: DS-17											BICS Sample Ref: 18	
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											15.9	0.7
Peel Strength N/mm	16.2	16.1	14.7	16.5	15.9							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3						16.8	0.3
Shear Strength N/mm	17.1	16.9	16.7	16.3	16.9							
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	NOBRK	SE2	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V528/a
Dates Tested: 13/10/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		
Sample ID: DS-18											BICS Sample Ref: 19	
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											16.0	0.5
Peel Strength N/mm	16.2	16.4	16.3	16.1	15.1							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	NOBRK	NOBRK	NOBRK	NOBRK	NOBRK						16.9	0.3
Shear Strength N/mm	16.8	16.7	17.3	17.2	16.5							
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	NOBRK	SE2	SE1	NOBRK	NOBRK							
Sample ID: DS-19											BICS Sample Ref: 20	
Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}											16.1	0.4
Peel Strength N/mm	15.8	16.0	16.2	16.8	15.9							
Peel Separation %	0	0	0	0	0							
Peel Break Classification	NOBRK	NOBRK	NOBRK	NOBRK	NOBRK						16.6	0.3
Shear Strength N/mm	16.6	16.7	16.8	16.9	16.2							
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE2	SE1	NOBRK	SE2	SE2							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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REPORT

GEOSYNTHETICS TEST REPORT

REPORT REFERENCE: BS-V619/a

Report Date 17/11/2023

Client Jones Bros (Ruthin) Ltd

Address Ruthin, Denbighshire, LL15 2YH

Contact Chris Hunt

Contract Reference Pwllfawatkin Landfill Site

Client PO/Ref No M-C3230/00033

Material Tested 1mm Textured LLDPE Geomembrane

Date Received 17/11/2023

Sample IDs FS-18 through to FS-26 {Fusion Welds}
DS-20 through to DS-29 {Extrusion Welds}

Tests Requested Seam Integrity (Peel & Shear) - ASTM D6392-12(2018)

Prepared by:

David Smith
Technical Co-ordinator

Approved by:

Shazeena Iqbal
Technical Director



Samples tested as received. Tests Marked with an asterisk (*) in this report are not included in the UKAS Accreditation Schedule for our laboratory. Tests marked # have been subcontracted, tests marked * are not accredited. Tests marked F are accredited under the company's UKAS Flexible Scope. This test report is in a condensed format, complete test details available upon request. This test report may not be reproduced other than in full, except with prior written approval.

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Directors: Clifford Butt, Shazeena N. Iqbal Company Registration Number: 4213030



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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V619/a
Dates Tested: 17/11/2023

TEST METHOD TEST SPECIMEN NUMBER MEAN Std Dev

1 2 3 4 5 6 7 8 9 10

Sample ID: FS-18, Roll No: 0904-089241, Batch No: 4223148 {Trial Weld}

BICS Sample Ref: 1

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	14.7	14.4	15.7	15.3	16.4	15.0	15.3	14.9	15.1	14.8	15.2	0.6
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	18.0	17.6	18.0	17.8	17.9						17.8	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: FS-19, Roll No: 0904-089263, Batch No: 4223158 {Trial Weld}

BICS Sample Ref: 2

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	14.0	14.1	15.3	15.0	15.4	15.7	15.6	15.6	14.5	14.9	15.0	0.6
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	18.2	17.6	18.1	18.2	17.8						18.0	0.3
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: FS-20, Roll No: 0904-089263, Batch No: 4223158 {Trial Weld}

BICS Sample Ref: 3

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	14.4	14.6	14.1	14.2	14.5	15.0	13.5	13.7	14.8	14.0	14.3	0.5
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	17.9	18.1	18.1	18.0	17.6						17.9	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

BICS Laboratories Ltd. neither accepts responsibility for nor makes claim as to the final use and purpose of the material.
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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V619/a
Dates Tested: 17/11/2023

TEST METHOD TEST SPECIMEN NUMBER MEAN Std Dev

1 2 3 4 5 6 7 8 9 10

Sample ID: FS-21, Roll No: 0904-087838, Batch No: 4222641 {Trial Weld} BICS Sample Ref: 4

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	15.1	15.4	15.5	11.3	14.6	12.9	13.6	12.7	7.7	8.5	12.7	2.8
Peel Separation %	0	0	0	100	100	70	40	100	100	100		
Peel Break Classification	SE1	SE1	SE1	AD	AD	AD-BRK	AD-BRK	AD	AD	AD		

Shear Strength N/mm	17.4	17.5	17.7	17.4	17.9						17.6	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	NOBRK	NOBRK	SE1							

Sample ID: FS-22, Roll No: 0904-087969, Batch No: 4222601 {Trial Weld} BICS Sample Ref: 5

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	15.0	15.0	14.1	16.1	13.7	14.1	15.0	14.6	14.6	15.1	14.7	0.7
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	18.4	18.5	17.7	18.2	18.2						18.2	0.3
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: FS-23, Roll No: 0904-089254, Batch No: 4223158 {Trial Weld} BICS Sample Ref: 6

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	15.7	15.8	15.5	16.7	16.1	15.0	12.3	14.1	12.1	13.5	14.7	1.6
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		

Shear Strength N/mm	18.3	18.4	18.0	18.5	18.3						18.3	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkyn Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V619/a
Dates Tested: 17/11/2023

TEST METHOD TEST SPECIMEN NUMBER MEAN Std Dev

1 2 3 4 5 6 7 8 9 10

Sample ID: FS-24, Roll No: 0904-087838, Batch No: 4222641 {Trial Weld}

BICS Sample Ref: 7

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	16.5	16.5	16.5	16.6	15.9	16.1	16.0	15.2	15.3	15.0	16.0	0.6
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	18.1	18.2	18.5	17.9	18.4						18.2	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Sample ID: FS-25, Roll No: 0904-089254, Batch No: 4223158 {Trial Weld}

BICS Sample Ref: 8

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	15.7	14.5	16.0	16.2	15.8	14.6	14.6	14.7	14.9	15.3	15.2	0.7
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	18.0	18.1	18.0	18.5	18.2						18.2	0.2
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	NOBRK	SE1	SE1	SE1	SE1							

Sample ID: FS-26, Roll No: 0904-087802, Batch No: 4223158 {Trial Weld}

BICS Sample Ref: 9

Seam Integrity (ASTM D6392-12(2018)) {Fusion Weld}

Peel Strength N/mm	12.4	14.5	15.8	15.2	14.3	15.4	15.3	15.3	13.8	13.6	14.5	1.0
Peel Separation %	0	0	0	0	0	0	0	0	0	0		
Peel Break Classification	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1	SE1		
Shear Strength N/mm	18.5	18.5	18.7	18.8	18.7						18.6	0.1
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE1	SE1	SE1	SE1							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V619/a
Dates Tested: 17/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
	1	2	3	4	5	6	7	8	9	10		

Sample ID: DS-20, Roll No: 0904-089263, Batch No: 4223158

BICS Sample Ref: 10

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	16.3	13.2	16.2	16.6	16.2	15.7	1.4
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	BRK2	SE3	NO-BRK	SE3		
Shear Strength N/mm	17.1	17.1	17.4	15.9	17.1	16.9	0.6
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	NOBRK	SE1	SE1	SE1	SE1		

Sample ID: DS-21, Roll No: 0904-089263, Batch No: 4223158

BICS Sample Ref: 11

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	12.5	14.8	14.0	13.7	14.5	13.9	0.9
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	18.9	18.3	18.6	18.8	18.7	18.7	0.2
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	NOBRK	SE2	SE2	SE2	SE2		

Sample ID: DS-22, Roll No: 0904-089263, Batch No: 4223158

BICS Sample Ref: 12

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	12.4	13.4	14.3	14.6	14.6	13.8	1.0
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	17.7	18.6	18.5	18.5	17.7	18.2	0.4
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	NOBRK	SE2	SE2	NOBRK	SE1		

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawtkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V619/a
Dates Tested: 17/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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1	2	3	4	5	6	7	8	9	10		
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Sample ID: DS-23, Roll No: 0904-087838, Batch No: 4222641

BICS Sample Ref: 13

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	13.7	14.3	14.3	13.7	14.4	14.1	0.4
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	18.6	18.1	19.3	18.3	18.6	18.6	0.5
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	SE2	SE1	SE2	SE2	SE2		

Sample ID: DS-24, Roll No: 0904-087969, Batch No: 4222601

BICS Sample Ref: 14

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	14.7	14.7	14.8	15.5	12.9	14.5	1.0
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	18.2	18.8	18.3	17.8	18.7	18.4	0.4
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	SE2	SE2	SE2	SE1	SE1		

Sample ID: DS-25, Roll No: 0904-089263, Batch No: 4223158

BICS Sample Ref: 15

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	13.6	12.2	13.6	16.1	14.2	14.0	1.4
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	18.5	18.2	18.7	18.8	19.0	18.6	0.3
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	SE2	SE2	SE2	SE2	SE2		

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS

JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawatkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V619/a
Dates Tested: 17/11/2023

TEST METHOD TEST SPECIMEN NUMBER MEAN Std Dev

1 2 3 4 5 6 7 8 9 10

Sample ID: DS-26, Roll No: 0904-089254, Batch No: 4223158

BICS Sample Ref: 16

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	12.9	16.5	16.9	13.5	16.6	15.2	1.9
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	18.5	18.2	19.1	18.6	18.6	18.6	0.3
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	SE2	SE2	SE2	SE2	SE2		

Sample ID: DS-27, Roll No: 0904-087802, Batch No: 4223158

BICS Sample Ref: 17

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	16.4	14.3	14.8	15.5	16.2	15.4	0.9
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	18.9	18.7	18.5	18.0	19.3	18.7	0.4
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	SE2	SE2	SE2	SE2	SE2		

Sample ID: DS-28, Roll No: 0904-089245, Batch No: 4223158

BICS Sample Ref: 18

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	15.3	15.8	15.0	14.9	14.7	15.1	0.4
Peel Separation %	0	0	0	0	0		
Peel Break Classification	SE3	SE3	SE3	SE3	SE3		
Shear Strength N/mm	18.2	18.5	18.3	18.8	18.3	18.4	0.2
Shear Elongation %	>50	>50	>50	>50	>50		
Shear Break Classification	SE1	SE2	SE1	SE2	SE2		

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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GEOSYNTHETICS TEST RESULTS JONES BROS (RUTHIN) LTD

Contract Ref: Pwllfawtkin Landfill Site
Material: 1mm Textured LLDPE Geomembrane

Report Ref No: BS-V619/a
Dates Tested: 17/11/2023

TEST METHOD	TEST SPECIMEN NUMBER										MEAN	Std Dev
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	1	2	3	4	5	6	7	8	9	10		
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Sample ID: DS-29, Roll No: 0904-087802, Batch No: 4223158

BICS Sample Ref: 19

Seam Integrity (ASTM D6392-12(2018)) {Extrusion Weld}

Peel Strength N/mm	13.5	16.6	13.1	15.7	13.3						14.5	1.6
Peel Separation %	0	0	0	0	0							
Peel Break Classification	SE3	SE3	SE3	SE3	SE3							
Shear Strength N/mm	18.8	18.6	18.4	19.1	18.9						18.8	0.3
Shear Elongation %	>50	>50	>50	>50	>50							
Shear Break Classification	SE1	SE2	SE2	SE1	SE2							

Atmospheric Conditions at Test: 21 ± 2 °C, Relative Humidity : 65 ± 5 % RH

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APPENDIX VI
GEOMEMBRANE DEPLOYMENT RECORDS



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	1
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Surface of Regulating Layer
---------------------------------------	-----------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P1 to P5

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	17/07/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	2
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P6 to P7

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	21/07/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	3
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P8 to P12

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	25/07/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	4
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P13 to P14

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	01/08/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	5
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P15 Only

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	22/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	6
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P16 Only

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	26/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	7
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P17 – P20

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	28/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	8
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P21 – P22

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	29/09/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	9
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P23 – P24

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	02/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	10
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P25 Only

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	04/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	11
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P26 Only

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	05/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	12
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P27 – P33

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	07/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	13
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P34 – P41

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	08/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	14
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P42 – P45

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	12/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	15
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P46 – P48

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	16/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	16
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P49 – P51

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	24/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	17
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P52 – P58

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	25/10/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	18
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P59 – P60

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	07/11/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	19
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
---------------------------------------	------------------------

I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P61 – P63

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	08/11/2023	Position:	CQA Engineer



Surface Acceptance Certificate

Site:	Pwllfawatkin	Sheet No:	20
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Area of Subgrade under consideration:	Lower Geotextile Layer
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I the undersigned, a duly appointed representative of Sirius Environmental Limited, have visually observed the subgrade described above and confirm the subgrade is an acceptable surface upon which to install Geomembrane Panels P64 – P65

This certification is based on observation of the surface of the subgrade only. No subterranean inspections or tests have been performed by Sirius Environmental Limited, and Sirius Environmental Limited makes no representations or warranties regarding the conditions which may exist below the surface of the subgrade.

Sirius Environmental Representative:			
Name:	S. Ugohuckwu	Signature:	
Date:	15/11/2023	Position:	CQA Engineer



Geomembrane Panel Deployment

Site:	Pwllfawatkin	Project:	Capping
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Panel No.	Resin/Batch No.	Roll No.	Length (m)	Width (m)	Accumulated Area (m ²)	Acceptable Subgrade?	Visual Inspection
17/07/2023	P1	4222585	0904-087792	21.0	8.0	168.0	Yes	Good
17/07/2023	P2	4222585	0904-087792	25.0	8.0	368.0	Yes	Good
17/07/2023	P3	4222585	0904-087792	32.0	8.0	624.0	Yes	Good
17/07/2023	P4	4222585	0904-087792	33.0	8.0	888.0	Yes	Good
17/07/2023	P5	4222585	0904-087792	40.0	8.0	1208.0	Yes	Good
21/07/2023	P6	4222601	0904-087996	44.0	8.0	1560.0	Yes	Good
21/07/2023	P7	4222601	0904-087996	57.0	8.0	2016.0	Yes	Good
25/07/2023	P8	4222601	0904-087996	59.0	8.0	2488.0	Yes	Good
25/07/2023	P9	4222585	0904-087788	60.0	8.0	2968.0	Yes	Good
25/07/2023	P10	4222585	0904-087788	65.0	8.0	3488.0	Yes	Good
25/07/2023	P11	4222641	0904-087836	67.0	8.0	4024.0	Yes	Good
25/07/2023	P12	4222641	0904-087836	71.0	8.0	4592.0	Yes	Good
01/08/2023	P13	4222641	0904-087821	72.0	8.0	5168.0	Yes	Good
01/08/2023	P14	4222641	0904-087821	72.0	8.0	5744.0	Yes	Good
22/09/2023	P15	4222641	0904-087819	67.0	8.0	6280.0	Yes	Good
26/09/2023	P16	4222641	0904-087819	58.0	8.0	6744.0	Yes	Good
28/09/2023	P17	4222641	0904-087819	58.0	8.0	7208.0	Yes	Good
28/09/2023	P18	4222641	0904-087856	19.0	8.0	7360.0	Yes	Good
28/09/2023	P19	4222641	0904-087856	20.0	8.0	7520.0	Yes	Good
28/09/2023	P20	4222641	0904-087856	12.0	8.0	7616.0	Yes	Good
29/09/2023	P21	4222641	0904-087856	23.0	8.0	7800.0	Yes	Good
29/09/2023	P22	4222641	0904-087856	52.0	8.0	8216.0	Yes	Good
02/10/2023	P23	4222641	0904-087804	51.0	8.0	8624.0	Yes	Good
02/10/2023	P24	4222641	0904-087804	51.0	8.0	9032.0	Yes	Good
04/10/2023	P25	4222601	0904-087968	51.0	8.0	9440.0	Yes	Good
05/10/2023	P26	4222601	0904-087968	50.0	8.0	9840.0	Yes	Good
07/10/2023	P27	4222601	0904-087968	49.0	8.0	10232.0	Yes	Good
07/10/2023	P28	4222601	0904-087968	18.0	8.0	10376.0	Yes	Good
07/10/2023	P29	4222641	0904-087839	25.0	8.0	10576.0	Yes	Good
07/10/2023	P30	4222641	0904-087839	33.0	8.0	10840.0	Yes	Good
07/10/2023	P31	4222641	0904-087839	24.0	8.0	11032.0	Yes	Good
07/10/2023	P32	4222641	0904-087839	19.0	8.0	11184.0	Yes	Good
07/10/2023	P33	4222641	0904-087839	11.0	8.0	11272.0	Yes	Good



Geomembrane Panel Deployment

Site:	Pwllfawatkin	Project:	Capping
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Panel No.	Resin/Batch No.	Roll No.	Length (m)	Width (m)	Accumulated Area (m ²)	Acceptable Subgrade?	Visual Inspection
08/10/2023	P34	4222601	0904-087982	19.0	8.0	11424.0	Yes	Good
08/10/2023	P35	4222601	0904-087982	13.0	8.0	11528.0	Yes	Good
08/10/2023	P36	4222601	0904-087982	5.0	8.0	11568.0	Yes	Good
08/10/2023	P37	4222601	0904-087982	16.0	8.0	11696.0	Yes	Good
08/10/2023	P38	4222601	0904-087982	16.0	8.0	11824.0	Yes	Good
08/10/2023	P39	4222601	0904-087982	31.0	8.0	12072.0	Yes	Good
08/10/2023	P40	4222601	0904-087982	38.0	8.0	12376.0	Yes	Good
08/10/2023	P41	4222601	0904-087982	37.0	8.0	12672.0	Yes	Good
12/10/2023	P42	4222601	0904-087982	25.0	8.0	12872.0	Yes	Good
12/10/2023	P43	4223148	0904-089241	14.5	8.0	12988.0	Yes	Good
12/10/2023	P44	4223148	0904-089241	19.5	8.0	13144.0	Yes	Good
12/10/2023	P45	4223148	0904-089241	65.0	8.0	13664.0	Yes	Good
16/10/2023	P46	4223148	0904-089241	65.0	8.0	14184.0	Yes	Good
16/10/2023	P47	4223148	0904-089241	24.0	8.0	14376.0	Yes	Good
16/10/2023	P48	4223148	0904-089263	40.0	8.0	14696.0	Yes	Good
24/10/2023	P49	4223148	0904-089263	63.0	8.0	15200.0	Yes	Good
24/10/2023	P50	4223148	0904-089263	63.0	8.0	15704.0	Yes	Good
24/10/2023	P51	4222601	0904-087969	63.0	8.0	16208.0	Yes	Good
25/10/2023	P52	4222601	0904-087969	60.0	8.0	16688.0	Yes	Good
25/10/2023	P53	4222601	0904-087969	13.0	8.0	16792.0	Yes	Good
25/10/2023	P54	4222641	0904-087838	45.0	8.0	17152.0	Yes	Good
25/10/2023	P55	4222641	0904-087838	57.0	8.0	17608.0	Yes	Good
25/10/2023	P56	4222641	0904-087838	58.0	8.0	18072.0	Yes	Good
25/10/2023	P57	4222641	0904-087838	43.0	8.0	18416.0	Yes	Good
25/10/2023	P58	4223148	0904-089254	16.0	8.0	18544.0	Yes	Good
07/11/2023	P59	4223148	0904-089254	58.0	8.0	19008.0	Yes	Good
07/11/2023	P60	4223148	0904-089254	56.0	8.0	19456.0	Yes	Good
08/11/2023	P61	4222641	0904-087802	32.0	8.0	19712.0	Yes	Good
08/11/2023	P62	4222641	0904-087802	29.0	8.0	19944.0	Yes	Good
08/11/2023	P63	4223148	0904-089254	8.0	8.0	20008.0	Yes	Good
15/11/2023	P64	4222641	0904-087802	6.0	8.0	20056.0	Yes	Good
15/11/2023	P65	4222641	0904-087802	18.0	8.0	20200.0	Yes	Good

APPENDIX VII
WELDERS ACCREDITATION CERTIFICATES



Approval Certificate

EN 13067 Plastics Welding Personnel - Approval Testing of Welders - Thermoplastic Welded Assemblies

CSWIP CERT NO 452456/2

This is to certify that:

Richard Vaughan Roberts

Date of birth 24 September 1987

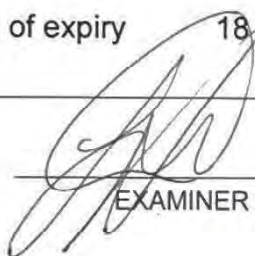
has demonstrated proficiency as a Plastics Welder Standard Level in accordance with the CSWIP requirements published in Document CSWIP-PW-6-96, 8th Edition, March 2021 and amendments in force on the examination date. This certificate is valid for the special categories mentioned below:

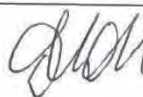
Geomembrane welding

- 7.4 Heated Hot Wedge for PE membranes $1 \leq e_n \leq 5\text{mm}$
- 7.5 Extrusion – manual for PE membranes. $1 \leq e_n \leq 5\text{mm}$

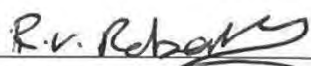
Date of issue 8 July 2022

Date of expiry 18 July 2023


EXAMINER

Signed 
(For CSWIP)

SIGNATURE OF HOLDER
(Person named above)



Date 23/7/22

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Approval Certificate

EN 13067 Plastics Welding Personnel - Approval Testing of Welders - Thermoplastic Welded Assemblies

CSWIP CERT NO 452456/3

This is to certify that:

Richard Vaughan Roberts

Date of birth 24 September 1987

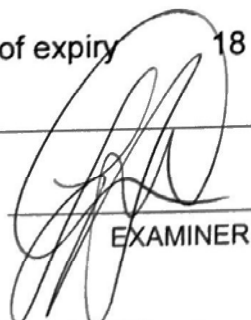
has demonstrated proficiency as a Plastics Welder Standard Level in accordance with the CSWIP requirements published in Document CSWIP-PW-6-96, 8th Edition, March 2021 and amendments in force on the examination date. This certificate is valid for the special categories mentioned below:

Geomembrane welding

- 7.4 Heated Hot Wedge for PE membranes $1 \leq e_n \leq 5\text{mm}$
- 7.5 Extrusion – manual for PE membranes. $1 \leq e_n \leq 5\text{mm}$

Date of issue 28 June 2023

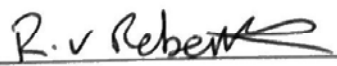
Date of expiry 18 July 2024


EXAMINER

Signed


(For CSWIP)

SIGNATURE OF HOLDER
(Person named above)



Date

3-7-23

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0025

RICHARD VAUGHAN ROBERTS

TWI Certification Ltd
Granta Park, Gt Abington
Cambridge, CB21 6AL UK
Tel: +44 (0) 1223 899000

**PLASTICS WELDER STANDARD
LEVEL 7.4, 7.5**

Expiry Date: 18 July 2023

No: 585793

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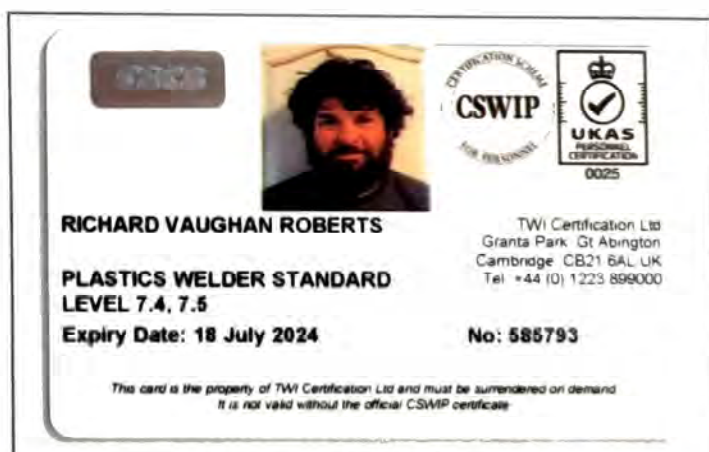


TWI Certification Ltd

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Registered Number 3108202 England



Approval Certificate

EN 13067 Plastics Welding Personnel - Approval Testing of Welders - Thermoplastic Welded Assemblies

CSWIP CERT NO 472010/2

This is to certify that:

Jordan Le Maitre

Date of birth 14 June 1997

has demonstrated proficiency as a Plastics Welder Standard Level in accordance with the CSWIP requirements published in Document CSWIP-PW-6-96, 8th Edition, March 2021 and amendments in force on the examination date. This certificate is valid for the special categories mentioned below:

Geomembrane welding

7.4 Heated Hot Wedge for PE membranes $1 \leq e_n \leq 5\text{mm}$

7.5 Extrusion – manual for PE membranes. $1 \leq e_n \leq 5\text{mm}$

Date of issue 2 February 2023

Date of expiry 6 February 2024

SIGNATURE OF HOLDER
(Person named above)

EXAMINER

Signed

(For CSWIP)

Date

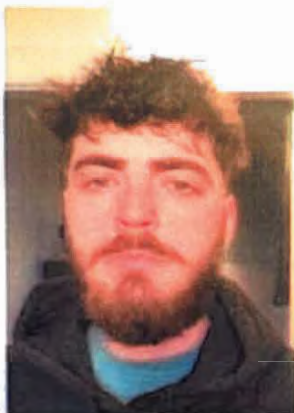
14/8/23

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0025

JORDAN LE MAITRE

**PLASTICS WELDER STANDARD
LEVEL 7.4, 7.5**

Expiry Date: 6 February 2024

TWI Certification Ltd
Granta Park, Gt Abington
Cambridge, CB21 6AL UK
Tel: +44 (0) 1223 899000

No: 0000739460

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Approval Certificate

EN 13067 Plastics Welding Personnel - Approval Testing of Welders - Thermoplastic Welded Assemblies

CSWIP CERT NO 452458/2

This is to certify that:

Barry Hunter

Date of birth 2 May 1981

has demonstrated proficiency as a Plastics Welder Standard Level in accordance with the CSWIP requirements published in Document CSWIP-PW-6-96, 8th Edition, March 2021 and amendments in force on the examination date. This certificate is valid for the special categories mentioned below:

Geomembrane welding

7.4 Heated Hot Wedge for PE membranes $1 \leq e_n \leq 5\text{mm}$

7.5 Extrusion – manual for PE membranes. $1 \leq e_n \leq 5\text{mm}$

Date of issue 8 July 2022

Date of expiry 18 July 2023

A stylized signature of the examiner, consisting of a large 'A' and some loops.

EXAMINER

Signed

A stylized signature for CSWIP, consisting of a large 'G' and some loops.

(For CSWIP)

SIGNATURE OF HOLDER
(Person named above)

A stylized signature of the holder, consisting of a large 'H' and some loops.

Date

23/7/22

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BARRY HUNTER

**PLASTICS WELDER STANDARD
LEVEL 7.4, 7.5**

Expiry Date: 18 July 2023

TWI Certification Ltd
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Cambridge, CB21 6AL UK
Tel: +44 (0) 1223 899000

No: 659099

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Approval Certificate

EN 13067 Plastics Welding Personnel - Approval Testing of Welders - Thermoplastic Welded Assemblies

CSWIP CERT NO 452458/3

This is to certify that:

Barry Hunter

Date of birth 2 May 1981

has demonstrated proficiency as a Plastics Welder Standard Level in accordance with the CSWIP requirements published in Document CSWIP-PW-6-96, 8th Edition, March 2021 and amendments in force on the examination date. This certificate is valid for the special categories mentioned below:

Geomembrane welding

7.4 Heated Hot Wedge for PE membranes $1 \leq e_n \leq 5\text{mm}$

7.5 Extrusion – manual for PE membranes. $1 \leq e_n \leq 5\text{mm}$

Date of issue 28 June 2023

Date of expiry 18 July 2024

SIGNATURE OF HOLDER
(Person named above)

EXAMINER

Signed

(For CSWIP)

Date

PLEASE READ THE NOTES OVERLEAF

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APPENDIX VIII
FUSION SEAM & WELD TEST RECORDS



Fusion Seam Construction and Testing Records

Site:	Pwllfawatin	Sheet No:	1 of 5
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Trial Seam Undertaken Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DS1, DS2	Air Pressure Test Pass/Fail	Tab Pass/Fail	Seam Length (m)	Accumulated Length (m)
17/07/2023	09:00 / UKLT252	FU1	Trial Weld	Richard Roberts	FS1	Pass	Pass	3.0	3.0
17/07/2023	UKLT252	FU2	Existing / P1	Richard Roberts		Pass	Pass	21.0	24.0
17/07/2023	UKLT252	FU3	P1 / P2	Richard Roberts		Pass	Pass	21.0	45.0
17/07/2023	UKLT252	FU4	P2 / P3	Richard Roberts		Pass	Pass	25.0	70.0
17/07/2023	UKLT252	FU5	PB1 / P2 - P3	Richard Roberts		Pass	Pass	12.0	82.0
17/07/2023	UKLT252	FU6	P3 / P4	Richard Roberts		Pass	Pass	32.0	114.0
17/07/2023	14:00 / UKLT252	FU7	Ex east / P1 - P4	Richard Roberts	TW	Pass	Pass	24.0	138.0
17/07/2023	UKLT252	FU8	P4 / P5	Richard Roberts		Pass	Pass	33.0	171.0
21/07/2023	08:10 / UKLT252	FU9	Trial Weld	Richard Roberts		Pass	Pass	3.0	174.0
21/07/2023	UKLT252	FU10	P5 / P6	Richard Roberts	FS2	Pass	Pass	40.0	214.0
21/07/2023	UKLT252	FU11	P6 / P7	Richard Roberts		Pass	Pass	44.0	258.0
21/07/2023	UKLT252	FU12	PB2 / P6-P7	Richard Roberts		Pass	Pass	15.0	273.0
21/07/2023	UKLT252	FU13	PB3 / P6-P7	Richard Roberts	TW	Pass	Pass	16.0	289.0
21/07/2023	14:15 / UKLT252	FU14	PB4 / P7	Richard Roberts		Pass	Pass	15.0	304.0
21/07/2023	UKLT252	FU15	Ex east / P6 - P7	Richard Roberts		Pass	Pass	19.0	323.0
25/07/2023	07:55 / UKLT252	FU16	Trial Weld	Richard Roberts	FS3	Pass	Pass	3.0	326.0
25/07/2023	UKLT252	FU17	P7 / P8	Richard Roberts		Pass	Pass	59.0	385.0
25/07/2023	UKLT252	FU18	P8 / P9	Richard Roberts		Pass	Pass	59.0	444.0
25/07/2023	12:55 / UKLT252	FU19	P9 / P10	Richard Roberts	TW	Pass	Pass	60.0	504.0
25/07/2023	UKLT252	FU20	P10 / P11	Richard Roberts		Pass	Pass	65.0	569.0
25/07/2023	UKLT252	FU21	Ex east / P8 - P10	Richard Roberts		Pass	Pass	22.0	591.0
25/07/2023	UKLT252	FU22	PB5 / P8	Richard Roberts		Pass	Pass	15.0	606.0
25/07/2023	UKLT252	FU23	PB6 / P8 - P9	Richard Roberts		Pass	Pass	16.0	622.0
25/07/2023	16:05 / UKLT252	FU24	PB7 / P9	Richard Roberts	TW	Pass	Pass	15.0	637.0
25/07/2023	UKLT252	FU25	PB8 / P9 - P10	Richard Roberts		Pass	Pass	15.0	652.0
26/07/2023	07:55 / UKLT252	FU26	Trial Weld	Richard Roberts	FS4	Pass	Pass	3.0	655.0
26/07/2023	UKLT252	FU27	P11 / P12	Richard Roberts		Pass	Pass	63.0	718.0
26/07/2023	UKLT252	FU28	PB9 / P10 - P11	Richard Roberts		Pass	Pass	15.0	733.0
26/07/2023	UKLT252	FU29	PB10 / P11	Richard Roberts		Pass	Pass	16.0	749.0
26/07/2023	UKLT252	FU30	PB11 / P11	Richard Roberts		Pass	Pass	16.0	765.0
26/07/2023	UKLT252	FU31	PB12 / P11 - P12	Richard Roberts	TW	Pass	Pass	15.0	780.0
26/07/2023	UKLT252	FU32	PB13 / P12	Richard Roberts		Pass	Pass	15.0	795.0
26/07/2023	UKLT252	FU33	PB14 / P12	Richard Roberts		Pass	Pass	16.0	811.0
26/07/2023	UKLT252	FU34	P11 / P12 A	Richard Roberts		Pass	Pass	4.0	815.0
01/08/2023	08:05 / UKLT252	FU35	Trial Weld	Richard Roberts	FS5	Pass	Pass	3.0	818.0



Fusion Seam Construction and Testing Records

Site:	Pwllfawtkin	Sheet No:	2 of 5
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Trial Seam Undertaken Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DS1, DS2	Air Pressure Test Pass/Fail	Tab Pass/Fail	Seam Length (m)	Accumulated Length (m)
01/08/2023	UKLT252	FU36	P12 / P13	Richard Roberts		Pass	Pass	72.0	890.0
01/08/2023	UKLT252	FU37	P13 / P14	Richard Roberts		Pass	Pass	72.0	962.0
01/08/2023	UKLT252	FU38	PB15 / P13 - P14	Richard Roberts	TW	Pass	Pass	15.0	977.0
01/08/2023	UKLT252	FU39	PB16 / P13 - P14	Richard Roberts		Pass	Pass	15.0	992.0
22/09/2023	08:05 / UKLT252	FU39	Trial Weld	Jordan Le Maitre	FS6	Pass	Pass	3.0	995.0
22/09/2023	UKLT252	FU41	P14 / P15	Jordan Le Maitre		Pass	Pass	67.0	1062.0
25/09/2023	08:24 / UKLT252	FU42	Trial Weld	Jordan Le Maitre	FS7	Pass	Pass	3.0	1065.0
25/09/2023	UKLT252	FU43	PB17 / P14 - P15	Jordan Le Maitre		Pass	Pass	15.0	1080.0
26/09/2023	08:16 / UKLT252	FU44	Trial Weld	Jordan Le Maitre	FS8	Pass	Pass	3.0	1083.0
26/09/2023	UKLT252	FU45	P15 / P16	Jordan Le Maitre		Pass	Pass	58.0	1141.0
26/09/2023	UKLT252	FU46	PB18 / P15 - P16	Jordan Le Maitre		Pass	Pass	16.0	1157.0
28/09/2023	08:05 / UKLT252	FU47	Trial Weld	Jordan Le Maitre	FS9	Pass	Pass	3.0	1160.0
28/09/2023	UKLT252	FU48	P17 / P18	Jordan Le Maitre		Pass	Pass	8.00	1168.0
28/09/2023	UKLT252	FU49	P16 / P17 - P18	Jordan Le Maitre		Pass	Pass	77.0	1245.0
28/09/2023	UKLT252	FU50	P17 - P18 / P19	Jordan Le Maitre		Pass	Pass	20.0	1265.0
28/09/2023	UKLT252	FU51	PB19 / P18	Jordan Le Maitre		Pass	Pass	15.0	1280.0
28/09/2023	14:15 / UKLT252	FU52	P17 / P20	Jordan Le Maitre	TW	Pass	Pass	12.0	1292.0
28/09/2023	UKLT252	FU53	PB20 / P16 - P17	Jordan Le Maitre		Pass	Pass	16.0	1308.0
28/09/2023	UKLT252	FU54	PB21 / P17 - P20	Jordan Le Maitre		Pass	Pass	15.0	1323.0
29/09/2023	08:35 / UKLT252	FU55	Trial Weld	Jordan Le Maitre	FS10	Pass	Pass	3.0	1326.0
29/09/2023	UKLT252	FU56	P19 / P21	Jordan Le Maitre		Pass	Pass	8.0	1334.0
29/09/2023	UKLT252	FU57	P17 / P21	Jordan Le Maitre		Pass	Pass	23.0	1357.0
29/09/2023	UKLT252	FU58	P20 / P21	Jordan Le Maitre		Pass	Pass	8.0	1365.0
29/09/2023	UKLT252	FU59	P19 - P21 / P22	Jordan Le Maitre		Pass	Pass	52.0	1417.0
29/09/2023	14:05 / UKLT252	FU60	PB22 / P17-P19 -P21	Jordan Le Maitre	TW	Pass	Pass	16.0	1433.0
29/09/2023	UKLT252	FU61	PB23 / P19 - P22	Jordan Le Maitre		Pass	Pass	16.0	1449.0
29/09/2023	UKLT252	FU62	PB24 / P17 - P21	Jordan Le Maitre		Pass	Pass	16.0	1465.0
02/10/2023	08:05 / UKLT252	FU63	Trial Weld	Jordan Le Maitre	FS11	Pass	Pass	3.0	1468.0
02/10/2023	UKLT252	FU64	P22 / P23	Jordan Le Maitre		Pass	Pass	51.0	1519.0
02/10/2023	UKLT252	FU65	P23 / P24	Jordan Le Maitre		Pass	Pass	51.0	1570.0
04/10/2023	08:05 / UKLT252	FU66	Trial Weld	Jordan Le Maitre	FS12	Pass	Pass	3.0	1573.0
04/10/2023	UKLT252	FU67	P24 / P25	Jordan Le Maitre		Pass	Pass	50.0	1623.0
04/10/2023	UKLT252	FU68	PB25 / P17	Jordan Le Maitre		Pass	Pass	16.0	1639.0
04/10/2023	UKLT252	FU69	PB26 / P24 - P25	Jordan Le Maitre		Pass	Pass	15.0	1654.0
04/10/2023	14:15 / UKLT252	FU70	PB27 / P24 - P25	Jordan Le Maitre	TW	Pass	Pass	15.0	1669.0
04/10/2023	UKLT252	FU71	PB28 / P22 - P23	Jordan Le Maitre		Pass	Pass	15.0	1684.0



Fusion Seam Construction and Testing Records

Site:	Pwllfawtkin	Sheet No:	3 of 5
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Trial Seam Undertaken Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DS1, DS2	Air Pressure Test Pass/Fail	Tab Pass/Fail	Seam Length (m)	Accumulated Length (m)
05/10/2023	07:58 / UKLT252	FU72	Trial Weld	Jordan Le Maitre	FS13	Pass	Pass	3.0	1687.0
05/10/2023	UKLT252	FU73	P25 / P26	Jordan Le Maitre		Pass	Pass	50.0	1737.0
07/10/2023	08:18 / UKLT252	FU74	Trial Weld	Barry Hunter	FS14	Pass	Pass	3.0	1740.0
07/10/2023	UKLT252	FU75	P26 / P27	Barry Hunter		Pass	Pass	49.0	1789.0
07/10/2023	UKLT252	FU76	P28 / P29	Barry Hunter		Pass	Pass	8.0	1797.0
07/10/2023	UKLT252	FU77	P27 / P28 - P29	Barry Hunter		Pass	Pass	43.0	1840.0
07/10/2023	13:05 / UKLT252	FU78	P28 - P29 / P30	Barry Hunter	TW	Pass	Pass	33.0	1873.0
07/10/2023	UKLT252	FU79	P30 - P31	Barry Hunter		Pass	Pass	24.0	1897.0
07/10/2023	UKLT252	FU80	P31 / P32	Barry Hunter		Pass	Pass	19.0	1916.0
07/10/2023	UKLT252	FU81	P32 / P33	Barry Hunter		Pass	Pass	11.0	1927.0
08/10/2023	08:25 / UKLT252	FU82	Trial Weld	Barry Hunter	FS15	Pass	Pass	3.0	1930.0
08/10/2023	UKLT252	FU83	P35 / P36	Barry Hunter		Pass	Pass	8.0	1938.0
08/10/2023	UKLT252	FU84	P34 / P35 - P36	Barry Hunter		Pass	Pass	18.0	1956.0
08/10/2023	UKLT252	FU85	P34 / P10 - P12	Barry Hunter		Pass	Pass	18.0	1974.0
08/10/2023	UKLT252	FU86	P37 / P38	Barry Hunter		Pass	Pass	16.0	1990.0
08/10/2023	UKLT252	FU87	P35 - P36 / P37 - P38	Barry Hunter		Pass	Pass	18.0	2008.0
08/10/2023	12:05 / UKLT252	FU88	P35 - P38 / P39	Barry Hunter	TW	Pass	Pass	31.0	2039.0
08/10/2023	UKLT252	FU89	P39 / P40	Barry Hunter		Pass	Pass	31.0	2070.0
08/10/2023	UKLT252	FU90	P40 / P41	Barry Hunter		Pass	Pass	37.0	2107.0
08/10/2023	UKLT252	FU91	PB29 / P34 - P35	Barry Hunter		Pass	Pass	15.0	2122.0
08/10/2023	UKLT252	FU92	PB30 / P35	Barry Hunter		Pass	Pass	16.0	2138.0
08/10/2023	UKLT252	FU93	PB31 / P34	Barry Hunter		Pass	Pass	16.0	2154.0
08/10/2023	UKLT252	FU94	PB32 / P37 - P38	Barry Hunter		Pass	Pass	15.0	2169.0
08/10/2023	UKLT252	FU95	PB33 / P36 - P39	Barry Hunter		Pass	Pass	15.0	2184.0
08/10/2023	16:45 / UKLT252	FU96	PB34 / P40 - P41	Barry Hunter	TW	Pass	Pass	16.0	2200.0
08/10/2023	UKLT252	FU97	P12 - P14 / P34 - P41	Barry Hunter		Pass	Pass	42.0	2242.0
08/10/2023	UKLT252	FU98	Ex / P8-P10-P34-P41	Barry Hunter		Pass	Pass	74.0	2316.0
09/10/2023	07:45 / UKLT252	FU99	Trial Weld	Barry Hunter	FS16	Pass	Pass	3.0	2319.0
09/10/2023	UKLT252	FU100	PB35 / P27 - P28	Barry Hunter		Pass	Pass	16.0	2335.0
09/10/2023	UKLT252	FU101	PB36 / P30	Barry Hunter		Pass	Pass	20.0	2355.0
09/10/2023	UKLT252	FU102	Ex west / P28 - P31	Barry Hunter		Pass	Pass	37.0	2392.0
10/10/2023	07:50 / UKLT252	FU103	Trial Weld	Barry Hunter	FS17	Pass	Pass	3.0	2395.0
10/10/2023	UKLT252	FU104	PB37 / P40	Barry Hunter		Pass	Pass	12.0	2407.0
12/10/2023	07:42 / UKLT252	FU105	Trial Weld	Barry Hunter	FS18	Pass	Pass	3.0	2410.0
12/10/2023	UKLT252	FU106	P42 / P43	Barry Hunter		Pass	Pass	8.0	2418.0
12/10/2023	UKLT252	FU107	P41 / P42 - P43	Barry Hunter		Pass	Pass	37.0	2455.0



Fusion Seam Construction and Testing Records

Site: Pwllfawtkin
CQA Engineer: Stanley Ugohuckwu
Sheet No: 4 of 5
CQA Plan Ref: FCC 479 SW 2016 - 07

Date	Trial Seam Undertaken Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DS1, DS2	Air Pressure Test Pass/Fail	Tab Pass/Fail	Seam Length (m)	Accumulated Length (m)
12/10/2023	UKLT252	FU108	PB38 / P41 - P42	Barry Hunter		Pass	Pass	17.0	2472.0
12/10/2023	11:50 / UKLT252	FU109	P43 / P44	Barry Hunter	TW	Pass	Pass	19.5	2491.5
12/10/2023	UKLT252	FU110	P42 - P44 / P45	Barry Hunter		Pass	Pass	16.0	2507.5
12/10/2023	UKLT252	FU111	PB39 / P41	Barry Hunter		Pass	Pass	17.0	2524.5
12/10/2023	UKLT252	FU112	PB40 / P43	Barry Hunter		Pass	Pass	17.0	2541.5
12/10/2023	UKLT252	FU113	PB41 / P41 - P43	Barry Hunter		Pass	Pass	13.0	2554.5
12/10/2023	UKLT252	FU114	PB42 / P45	Barry Hunter		Pass	Pass	12.0	2566.5
12/10/2023	UKLT252	FU115	PB43 / P45	Barry Hunter		Pass	Pass	13.0	2579.5
12/10/2023	UKLT252	FU116	PB44 / P43 - P45	Barry Hunter		Pass	Pass	12.0	2591.5
12/10/2023	14:55 / UKLT252	FU117	PB45 / P45	Barry Hunter	TW	Pass	Pass	13.0	2604.5
12/10/2023	UKLT252	FU118	Ex east / P41 - P45	Barry Hunter		Pass	Pass	40.0	2644.5
12/10/2023	UKLT252	FU119	P13-P16 / P42 -P45	Barry Hunter		Pass	Pass	24.0	2668.5
16/10/2023	07:42 / UKLT252	FU120	Trial Weld	Barry Hunter	FS19	Pass	Pass	3.0	2671.5
16/10/2023	UKLT252	FU121	P45 / P46	Barry Hunter		Pass	Pass	65.0	2736.5
16/10/2023	UKLT252	FU122	P47 / P48	Barry Hunter		Pass	Pass	8.0	2744.5
16/10/2023	UKLT252	FU123	P46 / P47 - P48	Barry Hunter		Pass	Pass	64.0	2808.5
16/10/2023	UKLT252	FU124	PB46 / P46 - P48	Barry Hunter		Pass	Pass	13.0	2821.5
16/10/2023	UKLT252	FU125	P16-P19 / P45-P48	Barry Hunter		Pass	Pass	16.0	2837.5
16/10/2023	UKLT252	FU126	PB47 / P45 - P46	Barry Hunter		Pass	Pass	16.0	2853.5
16/10/2023	13:45 / UKLT252	FU127	PB48 / P46	Barry Hunter	TW	Pass	Pass	13.0	2866.5
16/10/2023	UKLT252	FU128	P49 / P46 - P48	Barry Hunter		Pass	Pass	13.0	2879.5
16/10/2023	UKLT252	FU129	PB50 / P45 - P46	Barry Hunter		Pass	Pass	15.0	2894.5
16/10/2023	UKLT252	FU130	PB51 / P45 - P46	Barry Hunter		Pass	Pass	14.0	2908.5
16/10/2023	UKLT252	FU131	PB52 / P47	Barry Hunter		Pass	Pass	14.0	2922.5
16/10/2023	UKLT252	FU132	P18 - P19 / P46 - P48	Barry Hunter		Pass	Pass	16.0	2938.5
24/10/2023	07:58 / UKLT252	FU133	Trial Weld	Barry Hunter	FS20	Pass	Pass	3.0	2941.5
24/10/2023	UKLT252	FU134	P47 - P48 / P49	Barry Hunter		Pass	Pass	64.0	3005.5
24/10/2023	UKLT252	FU135	P49 / P50	Barry Hunter	TW	Pass	Pass	63.0	3068.5
24/10/2023	UKLT252	FU136	P50 / P51	Barry Hunter		Pass	Pass	63.0	3131.5
24/10/2023	UKLT252	FU137	PB53 / P48 - P49	Barry Hunter		Pass	Pass	15.0	3146.5
24/10/2023	UKLT252	FU138	PB54 / P48 - P49	Barry Hunter		Pass	Pass	15.0	3161.5
24/10/2023	UKLT252	FU139	PB55 / P50	Barry Hunter	TW	Pass	Pass	16.0	3177.5
24/10/2023	UKLT252	FU140	PB56 / P51	Barry Hunter		Pass	Pass	14.0	3191.5
24/10/2023	UKLT252	FU141	PB57 / P49	Barry Hunter		Pass	Pass	14.0	3205.5
24/10/2023	UKLT252	FU142	P22 - P24/P49 - P51	Barry Hunter		Pass	Pass	24.0	3229.5
25/10/2023	UKLT252	FU143	Trial Weld	Barry Hunter	FS21	Pass	Pass	3.0	3232.5



Fusion Seam Construction and Testing Records

Site:	Pwllfawtkin	Sheet No:	5 of 5
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Trial Seam Undertaken Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DS1, DS2	Air Pressure Test Pass/Fail	Tab Pass/Fail	Seam Length (m)	Accumulated Length (m)
25/10/2023	UKLT252	FU144	P51 / P52	Barry Hunter		Pass	Pass	60.0	3292.50
25/10/2023	UKLT252	FU145	P53 / P54	Barry Hunter		Pass	Pass	8.0	3300.50
25/10/2023	UKLT252	FU146	P52 / P53 - P54	Barry Hunter		Pass	Pass	59.0	3359.50
25/10/2023	UKLT252	FU147	PB58 / P52 - P54	Barry Hunter		Pass	Pass	15.0	3374.50
25/10/2023	UKLT252	FU148	P53 - P54 / P55	Barry Hunter		Pass	Pass	57.0	3431.50
25/10/2023	UKLT252	FU149	PB59 / P51 - P52	Barry Hunter		Pass	Pass	15.0	3446.50
25/10/2023	13:47 / UKLT252	FU150	P55 / P56	Barry Hunter	TW	Pass	Pass	57.0	3503.50
25/10/2023	UKLT252	FU151	P57 / P58	Barry Hunter		Pass	Pass	8.0	3511.50
25/10/2023	UKLT252	FU152	P56 / P57 - P58	Barry Hunter		Pass	Pass	59.0	3570.50
25/10/2023	UKLT252	FU153	P25 - P30 / P54 - P58	Barry Hunter		Pass	Pass	20.0	3590.50
03/11/2023	08:08 / UKLT252	FU154	Trial Weld	Barry Hunter	FS22	Pass	Pass	3.0	3593.50
03/11/2023	UKLT252	FU155	PB60 / P25 - P52	Barry Hunter		Pass	Pass	16.0	3609.50
03/11/2023	UKLT252	FU156	PB61 / P52	Barry Hunter		Pass	Pass	16.0	3625.50
07/11/2023	08:19 / UKLT252	FU157	Trial Weld	Barry Hunter	FS23	Pass	Pass	3.0	3628.50
07/11/2023	UKLT252	FU158	P57 - P58 / P59	Barry Hunter		Pass	Pass	58.0	3686.50
07/11/2023	UKLT252	FU159	P59 / P60	Barry Hunter		Pass	Pass	56.0	3742.50
07/11/2023	UKLT252	FU160	P30 - P32 / P59 -P60	Barry Hunter		Pass	Pass	16.0	3758.50
08/11/2023	08:00 / UKLT252	FU161	Trial Weld	Barry Hunter	FS24	Pass	Pass	3.0	3761.50
08/11/2023	UKLT252	FU162	PB62 / P56 - P57	Barry Hunter		Pass	Pass	14.0	3775.50
08/11/2023	UKLT252	FU163	P60 / P61	Barry Hunter		Pass	Pass	32.0	3807.50
08/11/2023	UKLT252	FU164	P62 / P63	Barry Hunter		Pass	Pass	8.0	3815.50
08/11/2023	13:00 / UKLT252	FU165	P61 / P62 - P63	Barry Hunter	TW	Pass	Pass	28.0	3843.50
08/11/2023	UKLT252	FU166	P31 - P33 / P59 - P61	Barry Hunter		Pass	Pass	24.0	3867.50
14/11/2023	07:50 / UKLT252	FU167	Trial Weld	Barry Hunter	FS25	Pass	Pass	3.0	3870.50
14/11/2023	UKLT252	FU168	Ex / P45 - P63	Barry Hunter		Pass	Pass	120.0	3990.50
14/11/2023	UKLT252	FU169	PB63 / P62 - P63	Barry Hunter		Pass	Pass	15.0	4005.50
14/11/2023	13:00 / UKLT252	FU170	PB64 / P60	Barry Hunter	TW	Pass	Pass	15.0	4020.50
14/11/2023	UKLT252	FU171	PB65 / P56	Barry Hunter		Pass	Pass	15.0	4035.50
14/11/2023	UKLT252	FU172	PB66 / P57 - P59	Barry Hunter		Pass	Pass	15.0	4050.50
15/11/2023	07:50 / UKLT252	FU173	Trial Weld	Barry Hunter	FS26	Pass	Pass	3.0	4053.50
15/11/2023	UKLT252	FU174	P33 / P64	Barry Hunter		Pass	Pass	18.0	4071.50
15/11/2023	UKLT252	FU175	P64 / P62	Barry Hunter		Pass	Pass	8.0	4079.50
15/11/2023	UKLT252	FU176	P66 / P64 - P62	Barry Hunter		Pass	Pass	18.0	4097.50
15/11/2023	UKLT252	FU177	Ex / P32-P33-P64-P65	Barry Hunter		Pass	Pass	25.0	4122.50
15/11/2023	UKLT252	FU178	PB67 / P46	Barry Hunter		Pass	Pass	15.0	4137.50
15/11/2023	UKLT252	FU179	PB68 / P51	Barry Hunter		Pass	Pass	15.0	4152.50

APPENDIX IX
EXTRUSION SEAM & WELD TEST RECORDS



Extrusion Seam Construction & Patch Repair Records

Site:	Pwllfawtkin	Sheet No:	1 of 4
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Trial Seam Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DSE 1, DSE 2	Vacuum Pass/Fail	Seam Length (m)	Accumulated Length (m)
07/05/2023	10:30 / PLS 210	Ext 1	Prefabrication of Pipeboot	Barry Hunter	DS1	Pass	1.0	1.0
10/07/2023	10:00 / PLS 201	Ext 2	Prefabrication of Pipeboot	Barry Hunter	DS2	Pass	1.2	2.2
11/07/2023	09:00 / PLS 201	Ext 3	Prefabrication of Pipeboot	Barry Hunter	DS3	Pass	1.3	3.5
12/07/2023	12.30 / PLS 201	Ext 4	Prefabrication of Pipeboot	Barry Hunter	DS4	Pass	1.0	4.5
13/07/2023	09:30 / PLS 201	Ext 5	Prefabrication of Pipeboot	Barry Hunter	DS5	Pass	1.2	5.7
17/07/2023	09:30 / PLS 201	Ext 6	Prefabrication of Pipeboot	Barry Hunter		Pass	1.0	6.7
19/07/2023	08:15 / PLS 201	PR1	Existing Liner	Barry Hunter		Pass	2.0	8.7
19/07/2023		PR2	Existing Liner	Barry Hunter		Pass	6.0	14.7
19/07/2023		PR3	Existing Liner	Barry Hunter		Pass	1.0	15.7
19/07/2023		PR4	Existing Liner	Barry Hunter	DS6	Pass	1.0	16.7
20/07/2023	09:00 / PLS 201	PR5	Existing Liner	Barry Hunter	TW	Pass	2.0	18.7
20/07/2023		PR6	Existing Liner	Barry Hunter		Pass	1.0	19.7
20/07/2023		PR7	Existing Liner	Barry Hunter		Pass	1.0	20.7
20/07/2023		PR8	Existing Liner	Barry Hunter		Pass	5.0	25.7
20/07/2023		PR9	Existing Liner	Barry Hunter		Pass	5.0	30.7
20/07/2023		PR10	Existing Liner	Barry Hunter	DS7	Pass	5.0	35.7
24/07/2023	08:00 / PLS 201	PR11	Existing Liner	Barry Hunter	TW & DS8	Pass	1.0	36.7
24/07/2023		PR12	Existing Liner	Barry Hunter		Pass	1.0	37.7
24/07/2023		PR13	Existing Liner	Barry Hunter		Pass	1.0	38.7
24/07/2023		PR14	P2	Barry Hunter		Pass	9.0	47.7
24/07/2023		PR15	Existing Liner	Barry Hunter		Pass	2.0	49.7
24/07/2023		PR16	Existing Liner	Barry Hunter		Pass	7.0	56.7
24/07/2023		PR17	Existing Liner	Barry Hunter		Pass	1.0	57.7
25/07/2023	08:00 / PLS 201	PR18	PB5 - P7/P8/Ex	Barry Hunter	TW & DS9	Pass	3.0	60.7
25/07/2023		PR19	P8-PB5 / PB6	Barry Hunter		Pass	1.0	61.7
25/07/2023		PR20	P20 (P9 - PB7)	Barry Hunter		Pass	1.0	62.7
26/07/2023	07:45 / PLS 201	PR21	PR21 (PB9 - P10/P11)	Barry Hunter	TW & DS10	Pass	1.0	63.7
26/07/2023		PR22	PB10 - P11	Barry Hunter		Pass	1.0	64.7
26/07/2023		PR23	PB11 - P11	Barry Hunter		Pass	1.0	65.7
26/07/2023		PR24	PB12 - P11/P12	Barry Hunter		Pass	1.0	66.7
26/07/2023		PR25	PB13 - P11/P12	Barry Hunter		Pass	1.0	67.7
26/07/2023		PR26	P11/P12	Barry Hunter		Pass	1.0	68.7
26/07/2023		PR27	PB14 - P12	Barry Hunter		Pass	1.0	69.7
26/07/2023		PR28	P11	Barry Hunter		Pass	1.0	70.7
26/07/2023		PR29	P10	Barry Hunter		Pass	1.0	71.7



Extrusion Seam Construction & Patch Repair Records

Site:	Pwllfawatkin	Sheet No:	2 of 4
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

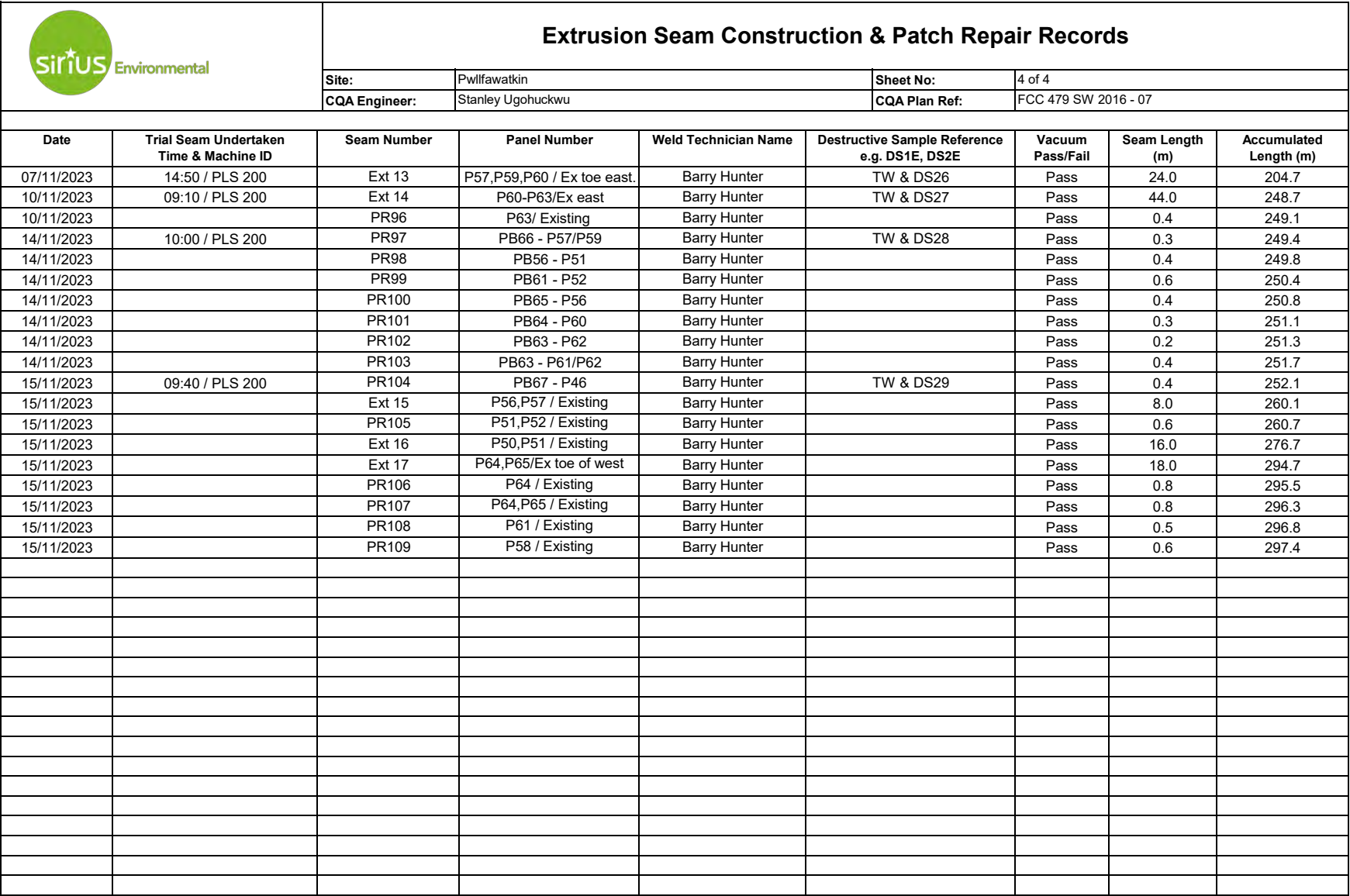
Date	Trial Seam Undertaken Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DS1E, DS2E	Vacuum Pass/Fail	Seam Length (m)	Accumulated Length (m)
26/07/2023		PR30	P10	Barry Hunter		Pass	1.0	72.7
02/08/2023	08:00 / PLS 201	PR31	PB15 - P13/P14	Barry Hunter	TW & DS11	Pass	1.0	73.7
02/08/2023		PR32	PB16 - P13/P14	Barry Hunter		Pass	1.0	74.7
25/09/2023	08:00 / PLS 201	PR33	PB17 - P14/P15	Barry Hunter	TW & DS12	Pass	1.0	75.7
26/09/2023	08:00 / PLS 201	PR34	PB18 - P15/P16	Barry Hunter	TW & DS13	Pass	1.0	76.7
26/09/2023		PR35	P17/P20	Barry Hunter	DS14	Pass	1.0	77.7
29/09/2023	10:10 / PLS 201	Ext 7	Ext 7	Barry Hunter	TW	Pass	3.0	80.7
29/09/2023		Ext 8	Ext 8	Barry Hunter		Pass	3.0	83.7
29/09/2023		Ext 9	Ext 9	Barry Hunter		Pass	3.0	86.7
29/09/2023		PR36	P17/P21	Barry Hunter	DS15	Pass	0.3	87.0
29/09/2023		PR37	P17	Barry Hunter		Pass	0.2	87.2
29/09/2023		PR38	P16/P17	Barry Hunter		Pass	0.2	87.4
29/09/2023		PR39	P21	Barry Hunter		Pass	0.2	87.6
29/09/2023		PR40	P17/P18/P19	Barry Hunter		Pass	0.2	87.8
29/09/2023		PR41	P18	Barry Hunter		Pass	0.4	88.2
29/09/2023		PR42	P19/P22	Barry Hunter		Pass	0.2	88.4
29/09/2023		PR43	P18	Barry Hunter		Pass	0.2	88.6
04/10/2023	14:10 / PLS 201	PR44	P24	Barry Hunter	TW & DS16	Pass	0.2	88.8
04/10/2023		PR45	P24	Barry Hunter		Pass	0.4	89.2
08/10/2023	13:20 / PLS 201	PR46	P34	Barry Hunter	TW & DS17	Pass	0.2	89.4
08/10/2023		PR47	P35	Barry Hunter		Pass	0.4	89.8
08/10/2023		PR48	P34,P35,P36	Barry Hunter		Pass	0.2	90.0
08/10/2023		PR49	P36,P38	Barry Hunter		Pass	0.3	90.3
08/10/2023		PR50	P37,P38	Barry Hunter		Pass	0.3	90.6
08/10/2023		PR51	P37 / Existing	Barry Hunter		Pass	0.2	90.8
08/10/2023		PR52	P40/P41	Barry Hunter		Pass	0.2	91.0
09/10/2023	10:00 / PLS 200	PR53	P40 / Existing	Barry Hunter	TW & DS18	Pass	0.2	91.2
09/10/2023		PR54	P40 / Existing	Barry Hunter		Pass	0.4	91.6
10/10/2023	08:45 / PLS 200	PR55	P28,P30 / Existing	Barry Hunter	TW & DS19	Pass	0.3	91.9
10/10/2023		PR56	P30 / Existing	Barry Hunter		Pass	0.3	92.2
10/10/2023		PR57	P30,P31 / Existing	Barry Hunter		Pass	0.2	92.4
10/10/2023		PR58	P31 / Existing	Barry Hunter		Pass	0.3	92.7
10/10/2023		PR59	P31 / Existing	Barry Hunter		Pass	0.2	92.9
10/10/2023		PR60	P31,PB35	Barry Hunter		Pass	0.3	93.2
10/10/2023		PR61	P28/P29/P30	Barry Hunter		Pass	0.2	93.4
10/10/2023		PR62	P23	Barry Hunter		Pass	1.5	94.9



Extrusion Seam Construction & Patch Repair Records

Site:	Pwllfawtkin	Sheet No:	3 of 4
CQA Engineer:	Stanley Ugohuckwu	CQA Plan Ref:	FCC 479 SW 2016 - 07

Date	Trial Seam Undertaken Time & Machine ID	Seam Number	Panel Number	Weld Technician Name	Destructive Sample Reference e.g. DS1E, DS2E	Vacuum Pass/Fail	Seam Length (m)	Accumulated Length (m)
10/10/2023		PR63	P23	Barry Hunter		Pass	1.5	96.4
16/10/2023	08:45 / PLS 200	PR64	PR64 (P42,PB38)	Barry Hunter	TW	Pass	0.2	96.6
16/10/2023		PR65	P45,PB45	Barry Hunter		Pass	0.4	97.0
16/10/2023		PR66	P46,PB45	Barry Hunter		Pass	0.2	97.2
16/10/2023		PR67	P43,PB41	Barry Hunter		Pass	0.3	97.5
16/10/2023		PR68	P41,PB39	Barry Hunter		Pass	0.3	97.8
16/10/2023		PR69	P41 / Existing	Barry Hunter		Pass	0.3	98.1
16/10/2023		PR70	P41/ Existing	Barry Hunter		Pass	0.3	98.4
16/10/2023		PR71	P43 / Existing	Barry Hunter		Pass	0.5	98.9
16/10/2023	12:30 / PLS 200	PR72	P44,P45 / Existing	Barry Hunter	DS20	Pass	1.5	100.4
16/10/2023		PR73	P45, PB42	Barry Hunter		Pass	0.5	100.9
16/10/2023		PR74	P45/P46, PB47	Barry Hunter		Pass	0.2	101.1
16/10/2023		PR75	P46/P48, PB49	Barry Hunter		Pass	0.2	101.3
16/10/2023		PR76	P46, PB48	Barry Hunter		Pass	0.2	101.5
16/10/2023		PR77	P45, PB43	Barry Hunter		Pass	0.3	101.8
16/10/2023		PR78	P45/P46, PB50	Barry Hunter		Pass	0.2	102.0
17/10/2023	08:30 / PLS 200	PR79	P46/P48, PB46	Barry Hunter	TW & DS21	Pass	0.2	102.2
17/10/2023		PR80	P45/P46, Existing	Barry Hunter		Pass	0.4	102.6
17/10/2023		PR81	P43/P44/P45, PB44	Barry Hunter		Pass	0.3	102.9
17/10/2023		PR82	P46/P48	Barry Hunter		Pass	0.1	103.0
17/10/2023		PR83	P46/P48	Barry Hunter		Pass	9.0	112.0
17/10/2023		PR84	P45/P46	Barry Hunter		Pass	0.3	112.3
17/10/2023		PR85	P45/ Existing	Barry Hunter		Pass	0.2	112.5
17/10/2023		PR86	P45/ Existing	Barry Hunter		Pass	0.7	113.2
17/10/2023		PR87	P45/ Existing	Barry Hunter		Pass	0.4	113.6
17/10/2023		PR88	P45/ Existing	Barry Hunter		Pass	0.5	114.1
17/10/2023		Ext 10	P45-P47 / Ex toe of east	Barry Hunter		Pass	23.0	137.1
24/10/2023	15:10 / PLS 200	Ext 11	P49-P50 / Ex toe of east	Barry Hunter	TW & DS22	Pass	16.0	153.1
25/10/2023	16:20 / PLS 200	Ext 12	P52-P55 / Ex toe of east	Barry Hunter	TW & DS23	Pass	24.0	177.1
03/11/2023	08:25 / PLS 200	PR89	P42/P54	Barry Hunter	TW & DS24	Pass	0.3	177.4
03/11/2023		PR90	P51/P52	Barry Hunter		Pass	0.3	177.7
03/11/2023		PR91	P52/P54 / Existing	Barry Hunter		Pass	0.3	178.0
03/11/2023		PR92	P48/P49/existing	Barry Hunter		Pass	1.4	179.4
06/11/2023	11:15 / PLS 200	PR93	PB53 - P48/P49	Barry Hunter	TW & DS25	Pass	0.3	179.7
06/11/2023		PR94	PB54 - P48	Barry Hunter		Pass	0.3	180.0
06/11/2023		PR95	PB55 - P49/P50	Barry Hunter		Pass	0.7	180.7



APPENDIX X
PHOTOGRAPHIC RECORDS

PHOTOGRAPHS

Plate:
1



Prefabricating Pipe Boots

Plate:
2



Materials Received Storage Area

	Job Title		
	Pwllfawatkyn Capping 2023		
Approved ASC	Signature 	Client	FCC

PHOTOGRAPHS

Plate:
3



Regulating Layer Preparation

Plate:
4



Regulating Layer Preparation



Job Title

Pwllfawatkin Capping 2023

Approved
ASC

Signature

A handwritten signature in black ink, appearing to be "ASC".

Client

FCC

PHOTOGRAPHS

Plate:
5



Rolling Regulating Layer

Plate:
6



Regulating Layer Preparation

	Job Title		
	Pwllfawatkin Capping 2023		
Approved ASC	Signature 	Client FCC	

PHOTOGRAPHS

Plate:
7



Ready for Lining

Plate:
8



Installation of Lower Geotextile

	Job Title		
	Pwllfawatkin Capping 2023		
Approved ASC	Signature 	Client	FCC

PHOTOGRAPHS

Plate:
9



Installed Lower Geotextile

Plate:
10



Heat Bonding Lower Geotextile



Job Title

Pwllfawatkin Capping 2023

Approved
ASC

Signature

Client

FCC

PHOTOGRAPHS

Plate:
11



Overview of Work

Plate:
12



Geomembrane Into Anchor Trench

	Job Title		
	Pwllfawatkin Capping 2023		
Approved ASC	Signature 	Client FCC	

PHOTOGRAPHS

Plate:
13



Installing Geomembrane

Plate:
14



Overview of Work

	Job Title			Pwllfawatkin Capping 2023	
	Approved ASC	Signature 	Client	FCC	

PHOTOGRAPHS

Plate:
15



Overview of Work

Plate:
16



Fusion Welding Geomembrane

	Job Title		
	Pwllfawatkin Capping 2023		
	Approved ASC	Signature	Client FCC

PHOTOGRAPHS

Plate:
17



Fusion Welding Geomembrane

Plate:
18



Air Pressure Test in Progress

	Job Title		
	Pwllfawatkin Capping 2023		
Approved ASC	Signature 	Client	FCC

PHOTOGRAPHS

Plate:
19



Start of Extrusion Welding

Plate:
20



Completed Extrusion Welded Patch



Job Title

Pwllfawatkin Capping 2023

Approved
ASC

Signature

A handwritten signature in black ink, appearing to be 'J. H.' or similar.

Client

FCC

PHOTOGRAPHS

Plate:
21



Completed Section of Tie in

Plate:
22



Completed Lower Geotextile Installation



Job Title

Pwllfawatkin Capping 2023

Approved
ASC

Signature

A handwritten signature in black ink.

Client

FCC

PHOTOGRAPHS

Plate:
23



Geomembrane Installation Complete

Plate:
24



Completed Pipe Boot

	Job Title		
	Pwllfawatkin Capping 2023		
Approved ASC	Signature 	Client	FCC

PHOTOGRAPHS

Plate:
25



Completed Section of Capping

Plate:
26



Completed Section of Capping



Job Title

Pwllfawatkin Capping 2023

Approved
ASC

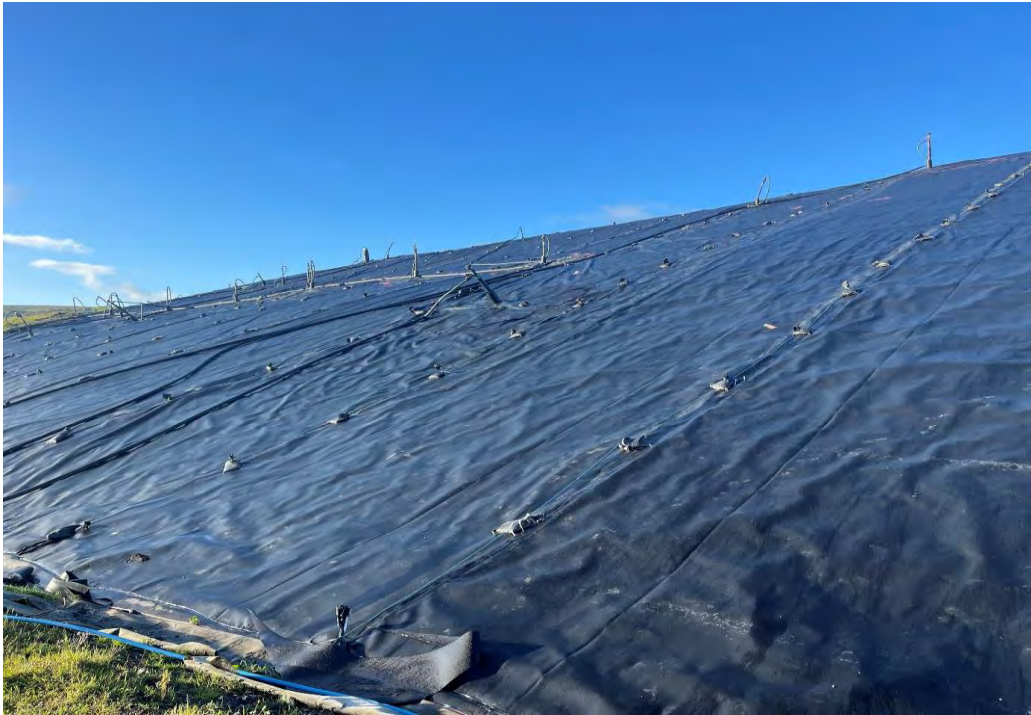
Signature

Client

FCC

PHOTOGRAPHS

Plate:
27



Completed Section of Capping

Plate:
28



Completed Anchor Trench



Job Title

Pwllfawatkin Capping 2023

Approved
ASC

Signature

A handwritten signature in black ink, appearing to be "Mh".

Client

FCC

PHOTOGRAPHS

Plate:
29



Completed Anchor Trench

Plate:
30



Completed Anchor Trench

	Job Title		
	Pwllfawatkin Capping 2023		
Approved ASC	Signature 	Client	FCC

APPENDIX XI
DAILY RECORDS



Daily Site Record Sheet

Date:	Monday 17/07/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and dry. PM: Cloudy and dry.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- The V380 excavator loaded restoration soil material onto the A30 dump trucks for covering/protecting the installed GDL panels.
- The A30 dump trucks then transported the clay material to the front of the D6 bulldozer.
- The D6 bulldozer spread the restoration material to cover/protect the installed GDL panels.
- JB engineer collaborated with the D6 operator to establish design levels.
- The PC210 excavator assisted the liners in installing Geotextile and Geomembrane panels along the western slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance with design specifications.

Location: Geomembrane Capping works along the Western flank.

Assessed the method statement for Lower geotextile & geomembrane installation.

- Geotextile and Geomembrane materials were deployed /installed along the western slope.
- Deployed /installed Geotextile panels were referenced P1 to P5, and heat bonded together.
- Deployed /installed Geomembrane panels were referenced P1 to P8, and fusion welded together.

All Geotextile and Geomembrane deployment /installation works undertaken was overseen and inspected by the CQA Inspector, who also collected conformance and trial weld samples.

List of Plant	Hours of Operation	Comments
1 x 360 Volvo Digger 1 x CAT D6 Dozer 1 x Volvo A30 Dumper 1 x Bell 30 Dumper 1 x Hitachi 210 Excavator 1 x Smooth Roller 1 x Pad / Sheep foot Roller	07:00 – 19:00	

Prepared by:	Stanley .U	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 18/07/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy with light rain showers. PM: Heavy rain showers.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
-------------------	------

Location: Capping Works.

- The V380 excavator loaded restoration soil material onto 2 x dump trucks for covering/protecting the installed GDL panels.
- 2 x dump trucks then transported the clay material to the front of the D6 bulldozer.
- The D6 bulldozer spread the restoration material to cover/protect the installed GDL panels.
- JB engineer collaborated with the D6 operator to establish design levels.
- The PC210 excavator assisted the liners in installing GDL panels across the southern slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance with design specifications.
- Progressed with the deployment and installation of GDL material along the southern flank.
- Deployed /installed GDL panels were referenced P33 to P43, and heat bonded together.
- JB engineer registered the installed GDL panels on GPS.

All GDL deployment /installation works undertaken was overseen and inspected by the CQA Inspector, who also collected a conformance sample.

List of Plant	Hours of Operation	Comments
1 x 360 Volvo Digger 1 x CAT D6 Dozer 1 x Volvo A30 Dumper 1 x Bell 30 Dumper 1 x Hitachi 210 Excavator 1 x Smooth Roller 1 x Pad / Sheep foot Roller	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 19/07/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy with gusty winds. PM: Sunny intervals and dry.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping works.

- The V380 excavator loaded restoration soil material onto 2 x dump trucks for covering/protecting the installed GDL panels.
- 2 x dump trucks then transported the clay material to the front of the D6 bulldozer.
- The D6 bulldozer spread the restoration material to cover/protect the installed GDL panels.
- JB engineer collaborated with the D6 operator to establish design levels.
- The PC210 excavator assisted the liners on the installation of GDL panels along the southern slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance to design specifications.

Location: Geomembrane Capping works on the southern flank.

- Conducted extrusion weld to sufficiently seal patches (PR1, PR2, PR3 and PR4) on the installed geomembrane liner material.
- Sandbags deployed to adequately weigh down the installed geomembrane panels.
- PC210 utilized in collaboration with the lining technicians and stripped off existing geomembrane materials across the western flank.
- Regulation layer prepped by PC210 in preparation for subsequent deployment of geomembrane cover.
- Progressed with GDL deployment and installation works. Installed GDL panels were referenced from P44 to P55.

CQA Inspector ensured that non compliant areas were remediated and unsuitable materials removed from the restoration layer.

Installed GDL panels were heat bonded together and conformance sample taken by CQA Inspector.

List of Plant	Hours of Operation	Comments
1 x 360 Volvo Digger 1 x CAT D6 Dozer 1 x Volvo A30 Dumper 1 x Bell 30 Dumper 1 x Hitachi 210 Excavator 1 x Smooth Roller 1 x Pad / Sheep foot Roller	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 20/07/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy with dry. PM: Sunny intervals and dry.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping works.

- The V380 excavator loaded restoration soil material onto 2 x dump trucks for covering/protecting the installed GDL panels.
- 2 x dump trucks then transported the clay material to the front of the D6 bulldozer.
- The D6 bulldozer spread the restoration material to cover/protect the installed GDL panels.
- JB engineer collaborated with the D6 operator to establish design levels.
- The PC210 excavator assisted the liners on the installation of GDL panels along the southern slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance to design specifications.
- Conductor Conducted repairs on existing geomembrane liner at the bottom edge of the southern slope, to patch and adequately seal the geomembrane material within that section.
- The repairs /patches works on the existing geomembrane was carried out in preparation for the deployment of GDL material to cover and tie into the existing GDL material along the toe of the southern slope.
- PC210 in collaboration with the lining technicians, progressed with the deployment /installation of GDL material cover and tie into the existing GDL material along the toe edge of the southern slope.
- The deployed /installed GDL panels were referenced from P55.to P58.

CQA Inspector observed and ensured extrusion welding works on the geomembrane patches were properly sealed and collected extrusion weld samples for lab testing.

Installed GDL panels were heat bonded together and conformance sample taken by CQA Inspector.

List of Plant	Hours of Operation	Comments
1 x 360 Volvo Digger 1 x CAT D6 Dozer 1 x Volvo A30 Dumper 1 x Bell 30 Dumper 1 x Hitachi 210 Excavator 1 x Smooth Roller 1 x Pad / Sheep foot Roller	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 21/07/2023	Site:	Pwllfawatkin
Weather:	AM: Sunny intervals and dry. PM: Sunny intervals and dry.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping works.

- The V380 excavator loaded restoration soil material onto 2 x dump trucks for covering/protecting the installed GDL panels.
- 2 x dump trucks then transported the clay material to the front of the D6 bulldozer.
- The D6 bulldozer spread the restoration material to cover/protect the installed GDL panels.
- JB engineer collaborated with the D6 operator to establish design levels.
- The PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance to design specifications.

Location: Geomembrane capping works on the western flank.

- 1 x PC210 and 1 x smooth roller prepped regulation layer on the western slope in preparation for materials (geotextile & geomembrane) deployment /installation works.
- PC210 in collaboration with the lining technicians, progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P9 to P11, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P6 to P7, and welded together.

CQA Inspector observed and ensured all fusion weld works on the geomembrane panels were properly conducted /air tested, and collected fusion weld sample for lab testing.

List of Plant	Hours of Operation	Comments
1 x 360 Volvo Digger 1 x CAT D6 Dozer 1 x Volvo A30 Dumper 1 x Bell 30 Dumper 1 x Hitachi 210 Excavator 1 x Smooth Roller 1 x Pad / Sheep foot Roller	07:00 – 17:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 24/07/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy rain showers. PM: Intermittent light rain showers..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- The No works due to inclement wet weather conditions.

Location: Geomembrane capping works along the Western flank.

- Lining technicians conducted repairs and patching on the installed Geomembrane panels. The sections were carefully sealed using extrusion welding techniques.

The CQA Inspector closely monitored the repair and welding process, ensuring adherence to quality standards. As part of the documentation process, the CQA Inspector collected an extrusion weld sample for lab testing.

List of Plant	Hours of Operation	Comments
1 x 360 Volvo Digger 1 x CAT D6 Dozer 1 x Volvo A30 Dumper 1 x Bell 30 Dumper 1 x Hitachi 210 Excavator 1 x Smooth Roller 1 x Pad / Sheep foot Roller	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 25/07/2023	Site:	Pwllfawatkin
Weather:	AM: Sunny intervals and dry. PM: Sunny intervals and dry.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping works.

- 1 x V380 excavator properly graded and dressed the southern buttress to design gradient.
- The PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance to design specifications.

Location: Geomembrane capping works on the western flank.

- 1 x PC210 prepped regulation layer on the western slope in preparation for materials (geotextile & geomembrane) deployment /installation works.
- PC210 in collaboration with the lining technicians, progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P12 to P21, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P8 to P12, and welded together.

CQA Inspector observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.

List of Plant	Hours of Operation	Comments
1 x 360 Volvo Digger 1 x Hitachi 210 Excavator	07:00 – 19:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 26/07/2023	Site:	Pwllfawatkin
Weather:	AM: Intermittent light rain showers. PM: Heavy rain showers.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- The No works due to inclement wet weather conditions.

Location: Geomembrane capping works along the Western flank.

- Lining technicians conducted repairs and patching on the installed Geomembrane panels. The sections were carefully sealed using extrusion welding techniques.
- 1 x PC210 prepped regulation layer on the western slope in preparation for materials (geotextile) deployment /installation works.
- The deployed /installed geotextile panels were referenced P22, and heat bonded together.

The CQA Inspector closely monitored the repair and welding process, ensuring adherence to quality standards. As part of the documentation process, the CQA Inspector collected an extrusion weld sample for lab testing.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 27/07/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy rain showers. PM: Heavy rain showers.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- The No works due to inclement wet weather conditions.

Location: Capping works along the Western flank.

- The No works due to inclement wet weather conditions.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator (Not Working)	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 28/07/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy rain showers. PM: Heavy rain showers.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- The No works due to inclement wet weather conditions.

Location: Capping works along the Western flank.

- The No works due to inclement wet weather conditions.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator (Not Working)	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 31/07/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy rain showers. PM: Heavy rain showers.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- The No works due to inclement wet weather conditions.

Location: Capping works along the Western flank.

- The No works due to inclement wet weather conditions.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator (Not Working)	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 01/08/2023	Site:	Pwllfawatkin
Weather:	AM: Intermittent light rain showers. PM: Cloudy and dry..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- No works.

Location: Geomembrane capping works along the Western flank.

- Lining technicians conducted repairs and patching on the installed Geomembrane panels. The sections were carefully sealed using fusion welding techniques.
- 1 x PC210 prepped regulation layer on the western slope in preparation for materials (geotextile and geomembrane) deployment /installation works.
- The deployed /installed geotextile panels was referenced from P23 to P25, and heat bonded together.
- The deployed /installed geomembrane panels was referenced from P13 to P14, and welded together via fusion welding technique.
- 2 x pipe boots were also installed and fusion welded onto the geomembrane panels referenced P13 & P14.
- Anchor trench dug adverts slope face to secure deployed materials.

The CQA Inspector closely monitored the welding process, ensuring adherence to quality standards. As part of the documentation process, the CQA Inspector collected an conformance and fusion weld sample for lab testing.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 19:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 02/08/2023	Site:	Pwllfawatkin
Weather:	AM: Intermittent light rain showers. PM: Cloudy and dry..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- No works.

Location: Geomembrane capping works along the Western flank.

- Lining technicians conducted repairs and patching on the installed Geomembrane panels. The sections were carefully sealed using welding techniques.
- Repaired patches were referenced P31 and P32.

The CQA Inspector closely monitored the welding process, ensuring adherence to quality standards. As part of the documentation process, the CQA Inspector collected an extrusion weld sample for lab testing.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 19:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 03/08/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy rain showers. PM: Heavy rain showers.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 -07

Visitors to Site:	None
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- The No works due to inclement wet weather conditions.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator (Not Working)	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 04/08/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy with intermittent rain showers. PM: intermittent rain showers..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None		
• No works due to inclement weather. • Works postponed due to unseasonal inclement weather.			
List of Plant (Not Working)	Hours of Operation	Comments	
1 x Hitachi 210 Excavator (Not Working)	07:00 – 12:00	Off-hired.	

Prepared by:	Stanley .U	Signed:	
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Daily Site Record Sheet

Date:	Monday 14/09/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy Rain Showers. PM: Heavy Rain Showers	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No works. Site inundated with heavy rain showers.

List of Plant NOT Working	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 15/09/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and dry. PM: Cloudy and dry.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping Works.

- 1 x Hitachi 210 Excavator dressed the regulation layer in preparation for liner installation works next week.

List of Plant Working	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 18/09/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy Rain Showers. PM: Heavy Rain Showers	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work. Site inundated with heavy rain showers.

List of Plant NOT Working	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 13:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 19/09/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy Rain Showers. PM: Heavy Rain Showers	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 -07

Visitors to Site:	None
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- No work. Site inundated with heavy rain showers.

List of Plant NOT Working	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 13:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 20/09/2023	Site:	Pwllfawatkin
Weather:	AM: Heavy Rain Showers. PM: Heavy Rain Showers	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 -07

Visitors to Site:	None
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- No work. Site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 13:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 21/09/2023	Site:	Pwllfawatkin
Weather:	AM: Intermittent Rain Showers. PM: Intermittent Rain Showers	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping Works.

- Fitted last collar and pipe onto pipe work on the concrete road crossing.
- Moved rolls (6 x Geomembrane and 7x Geotextile) to the top of the capping area.

List of Plant Working	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 22/09/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and dry PM: Intermittent Rain Showers with Moderately Strong Winds..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works on the western flank.

- PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- The PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance with design specifications.
- PC210 in collaboration with the lining technicians, progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P26 to P27. and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P15, and welded together.
- CQA Inspector observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Deployed materials (geotextiles and geomembrane) were properly secured in anchor trench at both the toe and crest of slope.
- Conformance samples were taken and referenced. Fusion trial weld samples taken for lab test and referenced.
- Unable to continue with materials (geotextile and geomembrane) deployment mid-afternoon due to increasing rain showers with strong winds. Unsafe to adequately deploy materials in the wet strong windy weather condition.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 25/09/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Cloudy with Moderately Strong Winds Intermittent Rain Showers.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works on the western flank.

- PC210 excavator dug an anchor trench along the toe of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Unable to deploy materials due to moderately strong winds. Unsafe to deploy materials in this strong windy weather condition.
- Photographs were taken to document the completed tasks.
- All works were carried out in accordance with design specifications.
- Pipe boot installed and welded on P14/P15 seam. Pipe boot referenced PB17.
- Unable to deploy materials due to moderately strong winds. Unsafe to deploy materials in this strong windy weather condition.
- CQA Inspector observed and ensured all fusion and extrusion welding works on the pipe boot were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and extrusion trial weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 15:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 26/09/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and dry PM: Heavy Rain Showers with Moderately Strong Winds..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works on the western flank.

- PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- The PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 assisted the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P28 to P29. and heat bonded together.
- The deployed /installed geomembrane panels was referenced P16, and welded together.
- Pipe boot installed and welded on panels P15/P16 seam. Pipe boot referenced PB18.
- Unable to progress with the deployment of additional materials due to changing weather conditions (rain with increasing strong winds).
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the material to be deployed and installed, and for pipe boots to be welded onto the gas pipes. After the material was deployed and installed, and the pipe boots were welded on, the gas engineer reconnected the pipes.
- CQA Inspector observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Deployed materials (geotextiles and geomembrane) were properly secured in an anchor trench along the toe and crest of slope.
- Fusion and extrusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 27/09/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Heavy Rain Showers with Moderately Strong Winds.	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work. Site inundated with heavy rain showers with moderately strong winds.

List of Plant NOT Working	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 13:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 28/09/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Intermittent Rain Showers with Moderately Strong Winds..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:		
Location: Geomembrane capping works on the western flank.		
• PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works. • Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed. • The PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope. • The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works. • Photographs were taken to document the completed activities. • All works were carried out in accordance with design specifications. • PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the western slope. • The deployed /installed geotextile panels were referenced from P30 to P33, and heat bonded together. • The deployed /installed geomembrane panels were referenced from P17 to P20, and welded together. • Installed pipe boots which were referenced PB19, PB20 and PB21. • Unable to progress with the deployment of additional materials due to changing weather conditions (rain with increasing strong winds). Lost (got blown away) approximately 21meters of plastic panel during installation due to very strong winds. • To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the material to be deployed and installed, and for pipeboots to be welded onto the gas pipes. After the material was deployed and installed, and the pipeboots were welded on, the gas engineer reconnected the pipes. • CQA engineer observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing. • Deployed materials (geotextiles and geomembrane) were properly secured in an anchor trench along the toe and crest of slope. • Fusion and extrusion trail weld samples taken for lab test and referenced.		
List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 29/09/2023	Site:	Pwllfawatkin
Weather:	AM: Light Rain Showers. PM: Intermittent Rain Showers with Moderately Strong Winds..	CQA Plan Ref:	WR7842/02 Rev 1 & FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works on the western flank.

- PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- The PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- The CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels was referenced P34, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P21 to P22, and welded together.
- Installed pipe boots which were referenced PB19, PB20, PB21, PB22, PB23 and PB24.
- Unable to progress with the deployment of additional materials due to changing weather conditions (rain with increasing strong winds).
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the material to be deployed and installed, and for pipe boots to be welded onto the gas pipes. After the material was deployed and installed, and the pipe boots were welded on, the gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Deployed materials (geotextiles and geomembrane) were properly secured in an anchor trench along the toe and crest of slope.
- Fusion and extrusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 02/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and dry. PM: Rain Showers Strong Winds..	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works on the western flank.

- PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with materials deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P35 to P37, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P23 to P24, and welded together.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA Inspector observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Deployed materials (geotextiles and geomembrane) were properly secured in an anchor trench along the toe and crest of slope.
- Fusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 03/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Intermittent Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator and two laborer's dug up the existing plastic liners at the base of the eastern side of the cap in preparation for future plastic installation works to tie into the exposed existing liner.
- PC210 excavators dug a shallow drainage trench at the base of the western slope to direct surface rainwater into the nearby lagoon.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- Lining technicians fabricated pipe boots in preparation for future plastic deployment and pipe boot installation work on the capping area.
- Unable to deploy geotextile and geomembrane materials due to rain showers with moderately strong winds.
- CQA engineer observed and ensured pipe boot fabrication works were properly built in accordance to design specification.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 04/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and dry. PM: Rain Showers Strong Winds..	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- PC210 excavator and 1 x labourer dug up the existing plastic liners at the base of the north western side of the cap in preparation for future plastic installation works to tie into the exposed existing liner.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P38 to P39, and heat bonded together.
- The deployed /installed geomembrane panels was referenced P25, and welded together.
- Installed pipe boots which were referenced PB25 to PB28.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Deployed materials (geotextiles and geomembrane) were properly secured in an anchor trench along the toe and crest of slope.
- Fusion and extrusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 05/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Rain Showers Strong Winds.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- PC210 excavator and 1 x laborer dug up the existing plastic liners at the base of the north western side of the cap in preparation for future plastic installation works to tie into the exposed existing liner.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P40 to P42, and heat bonded together.
- The deployed /installed geomembrane panels was referenced P26, and welded together.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Deployed materials (geotextiles and geomembrane) were properly secured in an anchor trench along the toe and crest of slope.
- Fusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 06/10/2023	Site:	Pwllfawatkin
Weather:	AM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping works.

- PC210 excavator and two laborers dug up the existing plastic liners at the base of the western side of the cap in preparation for future plastic installation works to tie into the exposed existing liner.
- All works were carried out in accordance with design specifications.
- Unable to deploy geotextile and geomembrane materials due to rain showers with moderately strong winds.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Saturday 07/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator dug anchor trench along the toe and crest of western slope in preparation for material (Geotextile and Geomembrane) deployment /installation works.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the western slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- PC210 excavator and 1 x laborer dug up the existing plastic liners at the base of the north western side of the cap in preparation for future plastic installation works to tie into the exposed existing liner.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the western slope.
- The deployed /installed geotextile panels were referenced from P43 to P50, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P27 to P33, and welded together.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Deployed materials (geotextiles and geomembrane) were properly secured in an anchor trench along the toe and crest of slope.
- Fusion trail weld samples taken for lab test and referenced.
- Conformance samples were collected from the geomembrane and geotextile materials; and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Sunday 08/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Capping works.

- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P51 to P60, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P34 to P41, and welded together.
- Deployed geomembrane panels were tied /secured into the existing plastic liners along the toe and crest of the eastern slope.
- Installed pipe boots which were referenced PB29 to PB34.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and extrusion trial weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 09/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator and dug up the existing plastic liners at the base of the eastern side of the cap in preparation for future plastic installation works to tie into the exposed existing liner along the toe of the eastern slope.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- Installed pipe boots which were referenced PB35 and PB36.
- Panels P28 to P33 were welded /tied into the existing plastic liner along the toe base of western slope.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and extrusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 10/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	Marc Cooper (Sirius Engineering Designer), Graham Cherrell (FCC Regional Manager), Laura (Planner at Neath Port Talbot Council).
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Location: Geomembrane capping works.

- Sirius, FCC, local council, and Jones Bros conducted a site walk-through inspection, followed by a works progress meeting.
- PC210 excavator and dug up the existing plastic liners at the base of the eastern side of the cap in preparation for future plastic installation works to tie into the exposed existing liner along the toe of the eastern slope.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- Installed pipe boot which was referenced PB37.
- Lining technicians repaired /patched some localized sections of the geomembrane panels on the western slope.
- CQA engineer observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and extrusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 11/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 12:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 12/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P61 to P64, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P42 to P45, and welded together.
- Deployed geomembrane panels were tied /secured into the existing plastic liners along the toe and crest of the eastern slope.
- Installed pipe boots which were referenced PB38 to PB45.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion trial weld samples taken for lab test and referenced. Conformance sample taken for lab testing and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwy	Signed:	
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Daily Site Record Sheet

Date:	Friday 13/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	WR7842/02 Rev 1

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 12:00	

Prepared by:	Stanley Ugohuckwui	Signed:	
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Daily Site Record Sheet

Date:	Monday 16/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P65 to P68, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P46 to P48, and welded together.
- Deployed geomembrane panels were tied /secured into the existing plastic liners along the toe and crest of the eastern slope.
- Installed pipe boots which were referenced PB46 to PB52.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and extrusion trial weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 17/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator and dug up the existing plastic liners at the base of the eastern side of the cap in preparation for future plastic installation works to tie into the exposed existing liner along the toe of the eastern slope.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- Lining technicians repaired /patched some localized sections of the geomembrane panels on the western slope.
- Panels P45,P46 & P47 were welded /tied into the existing plastic liner along the toe base of western slope.
- CQA engineer observed and ensured all extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Extrusion trail weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 18/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 19/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 20/10/2023	Site:	Pwllfawatkin
Weather:	AM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 12:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 20/10/2023	Site:	Pwllfawatkin
Weather:	AM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 24/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 exposed existing plastic liner along the toe base of eastern slope in preparation for future plastic tie in works along the toe base of eastern slope.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P69 to P73, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P49 to P51, and welded together.
- Deployed geomembrane panels were tied /secured into the existing plastic liners along the toe and crest of the eastern slope.
- Installed pipe boots which were referenced.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing. Fusion and extrusion trial weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 25/10/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 exposed existing plastic liner along the toe base of eastern slope in preparation for future plastic tie in works along the toe base of eastern slope.
- Regulation layer prepped. Non compliant areas addressed and unsuitable materials removed.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P74 to P82, and heat bonded together.
- The deployed /installed geomembrane panels were referenced from P52 to P58, and welded together.
- Deployed geomembrane panels were tied /secured into the existing plastic liners along the toe and crest of the eastern slope.
- Installed pipe boots which were referenced PB58 to PB59.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and extrusion trial weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 26/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 27/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 30/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 31/10/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 01/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds.	CQA Plan Ref:	FCC 479 SW 2016 – 07

Visitors to Site:	Marc Cooper (Sirius Engineering Designer), Graham Cherrell (FCC Regional Manager), Environmental Agency.
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Progress Meeting:

- Sirius, FCC, Environmental Agency, and Jones Bros conducted a site walk-through inspection, followed by a works progress meeting.
- No works conducted due to inclement wet weather conditions.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 15:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 02/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 03/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Cloudy with intermittent light showers.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- 210 excavator built bund along the toe of western slope.
- Installed 2 x pipe boots, referenced PB59 and PB60.
- Repaired /patched up localized damaged sections on the plastic liner.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Monday 06/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Cloudy with Intermittent Light Rain Showers.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 properly prep and smoothen regulation layer in preparation for material deployment works.
- Non compliant areas addressed and unsuitable materials removed from regulation material.
- PC210 excavator assisted the liners on the installation of Geotextile panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Built bund along the toe base of western slope.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile material across the eastern slope.
- The deployed /installed geotextile panels, referenced P83 and heat bonded together.
- Repairs were carried out on damaged plastic liners and referenced PR93 to PR95.
- To install geotextile material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing. Extrusion trial weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 07/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Cloudy with Intermittent Light Rain Showers.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 properly prepped and smoothen the regulation layer in preparation for material deployment works.
- Non compliant areas addressed and unsuitable materials removed from regulation material.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P84 to P86, and heat bonded together.
- The deployed /installed geomembrane panels were referenced P59 and P60, fission welded together.
- Panels P59 and P60 were tied into the existing plastic liners along the toe base of eastern slope.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and Extrusion trial weld samples taken for lab test and referenced.
- Conformance sample taken from geomembrane material and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 08/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Cloudy with Intermittent Light Rain Showers.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 properly prepped and smoothen the regulation layer in preparation for material deployment works.
- Non compliant areas addressed and unsuitable materials removed from regulation material.
- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P87 to P89, and heat bonded together.
- The deployed /installed geomembrane panels were referenced P61 and P63, fission welded together.
- Panels P61 to P63 were tied into the existing plastic liners along the crest of the eastern slope.
- Pipe boot installed on gas well at panel P57 and referenced PB62.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion trial weld samples taken for lab test and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:30	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 09/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 12:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Friday 10/11/2023	Site:	Pwllfawatkin
Weather:	AMPM: Cloudy with Intermittent Light Rain Showers.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 exposed existing plastic liner along the edge (mid slope) of eastern slope in preparation for plastic tie in works.
- PC210 properly prepped and smoothen the regulation layer in preparation for material deployment works.
- Non compliant areas addressed and unsuitable materials removed from regulation material.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- Pipe boots built and fabricated onsite.
- Tied in /welded installed plastic panels P60,P61,P62,P63 into the existing plastic liners.
- Repaired damaged plastic liner along a tie into the existing plastic panel number P63 and referenced P96.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Extrusion trial weld samples taken for lab test, and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 14:30	

Prepared by:	Stanley .U	Signed:	
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Daily Site Record Sheet

Date:	Monday 13/11/2023	Site:	Pwllfawatkin
Weather:	AM/PM: Rain Showers with Moderately Strong Winds	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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- No work, site inundated with heavy rain showers.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 12:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Tuesday 14/11/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy with Intermittent Light Rain Showers.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	
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Location: Geomembrane capping works.

- PC210 excavator constructed a bund along the toe base of the western slope to facilitate surface water runoff from the slope down to the toe base, where it will be channeled along the toe base and into the surrounding on-site lagoons.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- Installed 4 x pipe boots, referenced PB63, PB64, PB65 and PB66.
- Loose plastic off cuts picked up and removed from the capping area. General cap cleaned and tidied up, all loose materials picked up and removed from cap.
- Tied in /welded installed plastic panels P60,P61,P62,P63 into the existing plastic liners.
- Sealed damaged plastic liners on the seam of pipe boots and referenced from PR97 to PR103.
- CQA engineer observed and ensured all fusion and extrusion welding works were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion trial and Extrusion weld samples taken for lab test, and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 16:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Wednesday 15/11/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator assisted the liners on the installation of Geotextile and Geomembrane panels along the eastern slope.
- CQA engineer ensured that non-compliant areas were properly addressed and unsuitable materials were removed before proceeding with material deployment works.
- Photographs were taken to document the completed activities. All works were carried out in accordance with design specifications.
- PC210 and the lining technicians progressed with the deployment /installation of geotextile and geomembrane materials across the eastern slope.
- The deployed /installed geotextile panels were referenced from P90 to P92, and heat bonded together.
- The deployed /installed geomembrane panels were referenced P64 and P65, fission welded together.
- Panels P64 and P65 were tied into the existing plastic liners along the crest of the eastern slope.
- Installed 2 x pipe boots, referenced PB67 and PB68.
- Loose plastic off cuts picked up and removed from the capping area. Capping area was dressed and tidied up, all loose materials picked up and removed from the capping area.
- Tied in /welded installed plastic panels P50,P51 and P56,P57 into the existing plastic liners along the toe base of eastern slope.
- Repaired sections of damaged plastic liners and referenced these repair patches as PR105, PR106, PR107, PR108 and PR109.
- To install geotextile and geomembrane material, a gas engineer disconnected the gas pipes in the affected areas. This allowed the gas pipes to be moved for material to be deployed and installed. The gas engineer reconnected the pipes.
- CQA engineer observed and ensured all fusion and extrusion welding works on the geomembrane panels were properly conducted /air tested, and collected weld samples for lab testing.
- Fusion and Extrusion trial weld samples taken for lab test and referenced. Conformance sample taken from the geomembrane material and referenced.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 18:00	

Prepared by:	Stanley Ugohuckwu	Signed:	
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Daily Site Record Sheet

Date:	Thursday 16/11/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator constructed a bund along the toe base of the western slope to facilitate surface water runoff from the slope down to the toe base, where it will be channeled along the toe base and into the surrounding on-site lagoons.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- For added stability and permanent attachment of the installed plastic panels on the slope, sandbags were strategically placed along the panel seams on both the eastern and western slopes.
- Engineer reconnected gas pipes.
- CQA engineer observed and ensured the constructed bund was built in accordance to spec.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 17:00	

Prepared by:	Stanley Ugohucku	Signed:	
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Daily Site Record Sheet

Date:	Friday 17/11/2023	Site:	Pwllfawatkin
Weather:	AM: Cloudy and Dry. PM: Cloudy and Dry.	CQA Plan Ref:	FCC 479 SW 2016 - 07

Visitors to Site:	None
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Location: Geomembrane capping works.

- PC210 excavator constructed a bund along the toe base of the western slope to facilitate surface water runoff from the slope down to the toe base, where it will be channeled along the toe base and into the surrounding on-site lagoons.
- Photographs were taken to document the completed activities.
- All works were carried out in accordance with design specifications.
- For added stability and permanent attachment of the installed plastic panels on the slope, sandbags were strategically placed along the panel seams on both the eastern and western slopes.
- Engineer reconnected gas pipes.
- CQA engineer observed and ensured the constructed bund was built in accordance to spec.

Works completed.

List of Plant	Hours of Operation	Comments
1 x Hitachi 210 Excavator	07:00 – 15:00	

Prepared by:	Stanley Ugohucku	Signed:	
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