

---

# The Causeway Field, Scotlandwell

## Peat Survey Report



**Prepared by:**

SAC Consulting  
2 Technopole Centre,  
Penicuik, EH26 OPJ

**Contact:**

Neil Stange  
Tel: 0131 603 7526  
Email: [neil.stange@sac.co.uk](mailto:neil.stange@sac.co.uk)

23 September 2021



---

# 1 CONTENTS

1	CONTENTS.....	2
2	INTRODUCTION .....	2
3	SITE HISTORY .....	3
3.1	Desktop review of site conditions.....	3
4	METHODOLOGY.....	4
4.1	Survey methodology .....	4
4.2	Tools .....	4
4.3	Soil analysis .....	4
5	SITE DESCRIPTION.....	5
6	RESULTS .....	6
6.1	Soil analysis .....	6
6.2	Peat depths .....	7
6.3	Peat volumes .....	7
6.4	Acrotelmic and catotelmic peat.....	8
7	EXCAVATION AND SOIL HANDLING .....	8
8	REFERENCES.....	9
9	APPENDIX.....	10
9.1	Peat depth maps .....	10
9.2	Turffit documentation.....	15
9.3	Site photos.....	18
9.4	Soil analysis data .....	23
9.5	Field sheets.....	28

## 2 INTRODUCTION

SAC Consulting Inc. (SAC) was approached by 56Three Architects on behalf of Scotwell LTD (the client) to perform a peat survey at The Causeway Field (the property) at Scotlandwell. The peat survey and report were completed to satisfy the Council of Perth and Kinross Planning Commission and SEPA requirements to proceed with property development application.



## 3 SITE HISTORY

The property is 1.73 hectares in area and is located at the southern end of the village of Scotlandwell. It is bounded by the B920 (The Causeway) to the west, houses along Friar Place to the north, and by agricultural fields to the east and south.

### 3.1 Desktop review of site conditions

Soil data and historical data was collected during a desktop review. Information was gathered from a variety of online databases and publicly available sources as seen in Table 1.

Table 1. Desktop review of site conditions.

Attribute	Result	Data Source
Soil Type	Dystrophic Basin Peat	Scotland's Soil Map <a href="https://map.environment.gov.scot/Soil_maps/?layer=1&amp;extent=317656,701129,318831,701665">https://map.environment.gov.scot/Soil_maps/?layer=1&amp;extent=317656,701129,318831,701665</a>
Land Capability Code	3.2	Scotland's Soil Map <a href="https://map.environment.gov.scot/Soil_maps/?layer=5&amp;extent=317853,701203,319028,701740">https://map.environment.gov.scot/Soil_maps/?layer=5&amp;extent=317853,701203,319028,701740</a>
Nitrate Vulnerable Zone	PS Class (Peat Soil)	Scottish Government <a href="https://www.gov.scot/policies/agriculture-and-the-environment/nvz/">https://www.gov.scot/policies/agriculture-and-the-environment/nvz/</a>
Historic Resources	No Results	Historic Environment Scotland Past Map <a href="https://pastmap.org.uk/map">https://pastmap.org.uk/map</a> <a href="https://canmore.org.uk/event/681667">https://canmore.org.uk/event/681667</a>
Aerial Photo Interpretation	No obvious developments	Google Earth
Nature Conservation Status	None listed	NatureScot <a href="https://sitelink.nature.scot/map">https://sitelink.nature.scot/map</a>

From the listed information sources, and from reviewing previous site assessments, there is a low likelihood that the property has undergone previous development including buildings, made ground, or contamination from storage or handling of hazardous materials.

Scotlandwell has several historical points of interest, including the *Fons Scotiae* (Well of Scotland), and the friar's hospice, though there was no evidence that the property contains historic resources.

Although not farmed in its current state, the property shows evidence of prior cultivation such as perimeter ditching, relatively homogeneous soil conditions in the upper horizons, and local resident's description of prior farmland use in the Perth and Kinross housing application record.



---

## 4 METHODOLOGY

### 4.1 Survey methodology

Information provided in the document “Guidance of Developments on Peatland: Peatland Survey 2017”, and through SEPA email correspondence with the client, was used to develop peat survey outcomes. As the guidance document was written primarily for large scale wind farm developments on complex terrain and potentially undisturbed peatlands, the survey requirements have been adapted to a smaller and simpler project. SEPA 2017 Table 1 advises a site distribution of 100 m x 100 m for an initial survey to determine if peat is present. Table 2 advises site intervals of 10 m x 10 m around each turbine base and 10 m to 50 m along tracks. This survey has used a 30 m x 30 m site interval as an interpretation of SEPA guidance, and to provide sufficient sites (20 sites per 1.73 ha) for characterization.

Sites were plotted in advance using a grid pattern and uploaded to SACs digital data collection systems. Additional sites were added as needed to assist in determining the boundary between peat and peaty topsoil (i.e., those areas above and below 50 cm depth).

SEPA Table 2 recommends a minimum of 4 samples to represent diversity of habitat. Although there was minimal habitat type diversity within the project area, 4 samples were taken to characterize peat throughout the site.

### 4.2 Tools

GPS data was collected using a Trimble with an accuracy of <1 cm. Site data and photos were collected on a mobile app and uploaded throughout the day. Data was also collected on paper field sheets as a backup, and as a place to record comments and site sketches. The test pits were completed using a track spade and both a fixed and extendable Dutch-style auger.

### 4.3 Soil analysis

Bulk density was assessed by digging a 25 cm soil pit to get below most of the root mass. A density sampling ring with a 73 mm diameter and 75 mm depth was pressed into the exposed peat. This ring was then removed with a spade to minimize soil loss through handling. Soil was trimmed from both ends of the ring and placed into a labelled polypropylene bag. The soil was then dried at 90°C for 24 hours and weighed.

Dry Bulk Density (g/cm<sup>3</sup>) = Dried mass (g) / Sampling Ring Volume (cm<sup>3</sup>)

Carbon content was assessed by collecting an aggregate sample between 30 and 90 cm. The sample was collected at this depth range to avoid most of the root mass and to more



readily compare to the sampling depth (0.3 to 1 m) used in SEPA Carbon Stock data (JHI 2015). The samples were delivered to ASD laboratories in Edinburgh (UKAS accredited) and were analysed using Loss on Ignition (LOI). Samples were dried, weighed, then heated to volatilize the carbon. The sample were weighed again to calculate the loss of carbon.

$$\text{Loss on ignition\%} = (\text{Initial weight (g)} - \text{Final weight (g)} / \text{Initial weight (g)}) \times 100$$

Soils were assessed for level of decomposition at each of the 4 sample sites using the von Post scale of humification. These results should be taken as best estimates as peat was dry at time of sampling. A component of an accurate von Post humification assessment involves squeezing out and assessing the colour of water trapped within the peat fibres. As the peat was dry, assessment was limited to visually determining decomposition.

## 5 SITE DESCRIPTION

As stated in the Site History section above, the property was not under cultivation at time of inspection. The vegetation was primarily pioneer weed species indicative of a greenfield site or unmaintained agricultural field. Site characteristics are summarized in Table 2.

Table 2 Site Description Summary

Area	1.73 hectares
Site Access	Vehicle access at northwest corner. Informal vehicle track allowing access to cultivated field to the east.
Topography	Slightly hummocky with highest point at northeast corner of field
Slope	1.63° slope from lowest to highest point, 3.03 m drop over 185 m
Soil Moisture	Dry surface soil, soils generally moist below 50 cm
Surface Drainage	No visible ditching
Perimeter Drainage	Ditches > 1.2 m deep along eastern and southern boundaries
Water Table	Between 1.5 and 2 m
Bare Ground	No bare ground, 100% vegetation cover
Soil Stability	No soil stability or erosion issues observed
Dominant Vegetation	Cocksfoot grass ( <i>Dactylis glomerata</i> ), Sow thistle ( <i>Sonchus sp.</i> ), Stinging nettle ( <i>Urtica dioica</i> ), Couch grass ( <i>Elymus repens</i> ), Sweet fennel ( <i>Foeniculum vulgare</i> )



---

## 6 RESULTS

### 6.1 Soil analysis

To characterize the peat, and to fulfil the Table 2 requirements in SEPA 2017, four samples were taken throughout the property. Samples were analysed for dry bulk density and organic matter content. The results are listed below in Table 3.

Table 3. Soil Analysis Results

Site Number	Dry Bulk Density (g/cm <sup>3</sup> )	Organic Matter%*
6	0.92	10.41
9	0.58	26.25
12	0.64	40.02
19	0.35	32.77

\*Organic matter % derived from Loss on Ignition (L.O.I.)

Further, these results are compared against nationally derived estimates obtained from other publicly available peat surveys and from government publications as seen in Table 4.

Comparison of results from the property to nationally available averages show a higher dry bulk density and a lower carbon content. These numbers reflect the comparison of a drained, and previously farmed peatland with natural peatlands (i.e., high water table and minimal disturbance). Significantly lowering the water table removes the buoyancy of the upper peat horizons, causing settling and compaction over time. This process, combined with historical farming activities could explain the observed increased dry bulk density and reduced carbon content through atmospheric losses. The dry bulk density of the peat on the property is still well below that of a typical mineral topsoil (1.2 to 1.4 g/cm<sup>3</sup>). The lower carbon content in the peat samples could be due, in part, to carbon loss during the drying phase of the analysis, creating a lower initial mass for combustion.



Table 4. Soil analysis results compared with nationally derived estimates.

	Causeway Field	SNH 701 Report	A9 Dualling E.I.A.	Scotland's Soil Map	J.H.I. 2015 SEPA carbon stocks	J.H.I. 2015 NSIS Peatland sites	J.H.I. 2015 Country Side Survey
<b>Dry Bulk Density g/cm<sup>3</sup></b>	Min: 0.35 Max: 0.92 Mean: 0.62	0.06 to 0.4	Peaty topsoil 0.03	n/a	0.136 (0-30 m)	0.122	0.105
			Peat 0.06				
			Peat 62.71*				
<b>Organic Matter Loss on ignition %</b>	Min: 10.41 Max: 40.02 Mean: 27.36	50-60%	Peaty topsoil 64.25	56.7	83.59** (0.3-1 m)	83.42**	81.36**
			Peat 66.29				
			Shallow peat 36.46*				

\*\*Results inferred using conversion factor of organic matter being 58% carbon (JHI 2015).

## 6.2 Peat depths

Peat depth at the property was assessed with 22 depth checks; 20 were pre-plotted and 2 were added to help define the peat/peaty topsoil boundary along the eastern edge. To maintain spatial weighting, the additional 2 boundary points were not included in calculation of averages. Depths ranged from 31 cm to 216 cm with an overall average of 96 cm, and a peat-only average (i.e., excluding those depths <50 cm) of 118 cm. Peat distribution maps, including proposed development overlays and depth contours, are appended in Section 9.1.

## 6.3 Peat volumes

Volumes for each depth category are listed below in Table 5. Estimated total volume for peat >50 cm is 13,816 m<sup>3</sup>. Excavated volumes will differ as the peat/peaty topsoil boundary is clarified, and if the developer chooses to leave any soil around the site perimeter.



Table 5. Peat volumes by depth category.

Peat Depth	Site Count	Area (ha)	Average Depth (m)	Estimated Volume (m <sup>3</sup> ) *
<0.5 m	6	0.37	0.44	1,651
0.51 to 1.0 m	6	0.71	0.77	5,464
1.01 to 2.0 m	6	0.61	1.27	7,691
2.01 to 3.0 m	2	0.03	2.13	660

\*See section 6.4 for comments related to catotelmic peat portion

## 6.4 Acrotelmic and catotelmic peat

Acrotelm and catotelm are terms used to describe the upper and lower layers of an undisturbed peat bog. In a natural setting, the acrotelm is the uppermost peat layer comprised of living vegetation, has some tensile strength, is intermittently aerobic, and has high amounts of soil microorganisms. The catotelm is the lower, non-living peat layer and is defined by amorphous structure, low tensile strength, fewer microorganisms, permanent water table, and anaerobic conditions. Catotelmic peat tends to lose all structure when handled or excavated and can act like a fluid (SEPA 2010, Flores 2014).

Given that the peat on the property is not in an undisturbed state, and that it has been drained for several decades, the definitions of acrotelm and catotelm are less helpful in describing peat attributes. As the water table has been maintained below the peat/stratum interface, it is anticipated that excavated peat will display acrotelmic properties, namely some tensile strength and aerobic conditions.

## 7 EXCAVATION AND SOIL HANDLING

Peat excavation, storage, handling, off-site use, and any required waste licensing is beyond the scope of this report. Turffit Ltd. has provided the client with a statement of intent to use the excavated peat for their business use as well as a copy of their waste transfer license. Both documents are included in the appendix.



---

## 8 REFERENCES

CH2M Fairhurst. A9 Dualling – Crubenmore to Kincaig DMRB Stage 3 Environmental Impact Assessment. Available online at

<https://www.transport.gov.scot/media/41199/appendix-a101-peat-survey-information.pdf>

Flores, R.M. 2014. Coal and Coalbed Gas: Fuelling the Future. Origin of Coal as Gas Source and Reservoir Rocks. Elsevier Publishing.

Guidance of Developments on Peatland: Peatland Survey 2017. Available online at

<https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2018/12/peatland-survey-guidance/documents/peatland-survey-guidance-2017/peatland-survey-guidance-2017/govscot%3Adocument/Guidance%2Bon%2Bdevelopments%2Bon%2Bpeatland%2B-%2Bpeatland%2Bsurvey%2B-%2B2017.pdf>

Scotland's Soil Map. Soil Series CODE 60610 Information. Available online at

[https://map.environment.gov.scot/Soil\\_maps/?layer=1&extent=317656,701129,318831,701665](https://map.environment.gov.scot/Soil_maps/?layer=1&extent=317656,701129,318831,701665)

Scottish Natural Heritage Commissioned Report No. 701: Scotland's peatland – definitions & information resources. 2014. Available online at <https://www.nature.scot/naturescot-commissioned-report-701-scotlands-peatland-definitions-and-information-resources>

SEPA Regulatory Position Statement – Developments on Peat. 2010. Available online at

[https://www.sepa.org.uk/media/143822/peat\\_position\\_statement.pdf](https://www.sepa.org.uk/media/143822/peat_position_statement.pdf)

The James Hutton Institute. 2015. Determination of organic carbon stocks in blanket peat soils in different condition – assessment of peat condition. 2015. Available online at

[https://www.sepa.org.uk/media/162691/sepa\\_carbonstocks\\_in\\_blanket-bog\\_final\\_report\\_a.pdf](https://www.sepa.org.uk/media/162691/sepa_carbonstocks_in_blanket-bog_final_report_a.pdf)

The Journal of Antiquities. 2018. Scotlandwell. Available online at

<https://thejournalofantiquities.com/2018/11/07/scotlandwell-holy-well-perth-and-kinross-central-scotland/>

Perth and Kinross Proposed Local Development Plan. Available online at:

[https://www.pkc.gov.uk/media/17155/35a-Kinross-shire-Area-North-and-East-Settlements-with-Proposals/pdf/35a\\_Kinross-shire\\_Area-North\\_and\\_Eastern\\_Settlements\\_with\\_proposals](https://www.pkc.gov.uk/media/17155/35a-Kinross-shire-Area-North-and-East-Settlements-with-Proposals/pdf/35a_Kinross-shire_Area-North_and_Eastern_Settlements_with_proposals)





---

## 9 APPENDIX

### 9.1 Peat depth maps



**NOTES/LEGEND:**

-  Boundary
-  Sample points



**PEAT DEPTH SURVEY**

CAUSEWAYFIELD, SCOTLANDWELL

SCOTWELL LTD.

DRAWING NO. 20175273-01	SCALE 1:600 @ A3	DATE SEPT 2021
----------------------------	---------------------	-------------------

SAC Consulting  
Environment Team

[www.sac.co.uk](http://www.sac.co.uk)





**NOTES/LEGEND:**

- Boundary
- Peat depth contours
- × Lab analysed

**Peat depth**

- < 0.5 m
- 0.51 to 1.0 m
- 1.01 to 2.0 m
- 2.01 to 3.0 m

**Maximum peat depth = 2.2 m**  
**30 m survey = 20 sample points**

Peat Depth (m)	Count	Area (ha)
< 0.5	6	0.374
0.5 - 1.0	6	0.712
1.0 - 2.0	6	0.608
2.0 - 3.0	2	0.031



**PEAT DEPTH SURVEY**

CAUSEWAYFIELD, SCOTLANDWELL

SCOTWELL LTD.

DRAWING NO.  
20175273-02

SCALE  
1:600 @ A3

DATF  
SEPT 2021

SAC Consulting  
Environment Team

www.sac.co.uk





**NOTES/LEGEND:**

- Boundary
- Peat depth contours
- Sample points
- × Lab analysed

**Peat depth interpolation**

- < 0.5 m
- 0.51 - 1.0 m
- 1.01 - 2.0 m
- 2.01 to 3.0 m

**Maximum peat depth = 2.2 m**  
**30 m survey = 20 sample points**

Peat Depth (m)	Count	Area (ha)
< 0.5	6	0.374
0.5 - 1.0	6	0.712
1.0 - 2.0	6	0.608
2.0 - 3.0	2	0.031



**PEAT DEPTH SURVEY**

CAUSEWAYFIELD, SCOTLANDWELL

SCOTWELL LTD.

DRAWING NO. 20175273-03	SCALE 1:600 @ A3	DATF SEPT 2021
----------------------------	---------------------	-------------------

SAC Consulting  
 Environment Team

www.sac.co.uk





**NOTES/LEGEND:**

- Boundary
- Peat depth contours
- Proposed houses

**Peat depth**

- < 0.5 m
- 0.51 to 1.0 m
- 1.01 to 2.0 m
- 2.01 to 3.0 m

**Maximum peat depth = 2.2 m**  
**30 m survey = 20 sample points**

Peat Depth (m)	Count	Area (ha)
< 0.5	6	0.374
0.5 - 1.0	6	0.712
1.0 - 2.0	6	0.608
2.0 - 3.0	2	0.031



**PEAT DEPTH SURVEY**

CAUSEWAYFIELD, SCOTLANDWELL

SCOTWELL LTD.

DRAWING NO. 20175273-04	SCALE 1:600 @ A3	DATE SEPT 2021
----------------------------	---------------------	-------------------

SAC Consulting  
 Environment Team

www.sac.co.uk





---

## 9.2 Turffit documentation



# TURFFIT

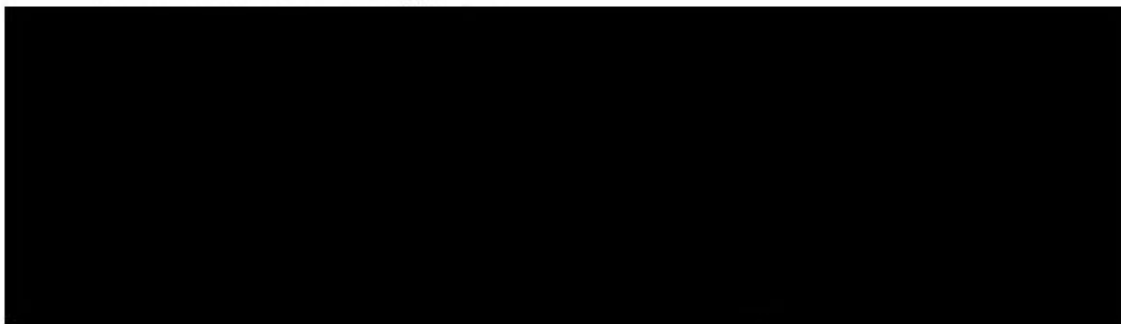
**Growers and Suppliers of quality turf**

Levenmouth Steadings, Scotlandwell,  
Kinross-shire KY13 9JH  
Tel: 01592 869000 info@turffit.co.uk www.turffit.co.uk

To whom it may concern,

I can confirm that Turffit Ltd will excavate and remove the peaty soil from the site at Causeway Field, Scotlandwell and transport it to our turf farm at Levenmouth Steadings, one mile south along the B920. We will store the soil on our premises and will have it independently analysed prior to utilising within our business. Please find attached copy of our Waste Transfer Licence for your perusal.

Yours Sincerely,



Mr. W, Baird



**CERTIFICATE OF REGISTRATION UNDER  
THE CONTROL OF POLLUTION (AMENDMENT) ACT 1989  
Regulation Authority**

**Name:** SEPA - Aberdeen

**Address:** Inverdee House  
Baxter Street  
Torry  
Aberdeen  
AB11 9QA

**Tel:** 01224 266600

**Fax:** 01224 896657

**Telex:**

**E-mail:** registry@sepa.org.uk

The following information is hereby certified by the above mentioned Regulation Authority to be information which at the date of this certificate is entered in the register which they maintain under regulation 3 of the Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991:

<b>REGISTRATION NUMBER:</b>	WCR/R/1098807	Carrier
<b>Name(s) of Registered Carrier:</b>	Turffit Ltd	
<b>Business Name (if any):</b>	Turffit Ltd	
<b>Address of registered carrier's principal place of business:</b>	Levenmouth Steadings Scotlandwell KINROSS KY13 9JH	

**Tel:** 01592869000

**Fax:**

**Telex:**

**E-mail:** info@turffit.co.uk

**Date of Registration:** 25/11/2011

**Date of Expiry of Registration\*:** 24/11/2023

**Date of last amendment (if any) made to the carrier's entry in the register:** 22/10/2020

**Signature of authorised officer of the regulation authority:**

**NOTES**

You can check whether there has been any change in the information contained in this certificate by contacting the regulation authority detailed above.

\*Registration will expire on this date unless-

- (a) it is revoked before expiry;
- (b) The carrier requests the removal of his name from the register at an earlier time;
- (c) an application for renewal is made within the six months ending on the expiry date and the application is still outstanding, or is the subject of an appeal on that date;
- (d) in the case of a registered partnership, if any of the partners ceases to be registered or if anyone who is not registered becomes a partner.



## 9.3 Site photos

### Sample Sites 1 to 6

	
Site 1	Site 2
	
Site 3	Site 4
	
Site 5	Site 6



Sample Sites 7 to 12



Site 7



Site 8



Site 9



Site 10



Site 11



Site 12



Sample Sites 13 to 18



Site 13



Site 14



Site 15



Site 16



Site 17



Site 18



Sample Sites 19 to 22



Site 19



Site 20



Site 21



Site 22



Bagged soil samples



Typical interface between peat and sand stratum



## Site Features



View west from access to adjoining property



Bulk density ring sampling



Dry, compacted surface peat with visible silt content



Typical vegetation >2 m tall at site entrance in northwest corner



Vegetated drainage ditch along eastern property boundary



Photo of cultivated field to the east of the property



---

## 9.4 Soil analysis data





7624

56 Three Architects  
14 Alva ST  
Edinburgh  
EH2 4QG

# Soil Report



<b>Farm Sampled</b>	Scotlandwell	<b>Previous Crop</b>		<b>Batch Number</b>	S59462
<b>Field Name or ID</b>	6, 300-900	<b>Next Crop</b>		<b>Lab Sample No</b>	21006776
<b>FID Number</b>		<b>Date received</b>	17/09/2021	<b>Case No</b>	ASD-2021-4883
<b>Soil Type</b>		<b>Date reported</b>	22/09/2021 09:32:4		

Determination	Result	Units	Target Value	Target Status	Status		
					Low	Moderate	High
Organic Matter (LOI)	10.41	%	4-10	M			

Details of test methods, decision rules and locations can be provided on request. Samples tested as received.

Contact: N Stange  
RENEWABLE & CARBON

Authorised by Ralph Seaton (Scientific Manager)





7624

56 Three Architects  
14 Alva ST  
Edinburgh  
EH2 4QG

# Soil Report



<b>Farm Sampled</b>	Scotlandwell	<b>Previous Crop</b>		<b>Batch Number</b>	S59462
<b>Field Name or ID</b>	9, 200-400	<b>Next Crop</b>		<b>Lab Sample No</b>	21006777
<b>FID Number</b>		<b>Date received</b>	17/09/2021	<b>Case No</b>	ASD-2021-4883
<b>Soil Type</b>		<b>Date reported</b>	22/09/2021 09:32:4		

Determination	Result	Units	Target Value	Target Status	Status		
					Low	Moderate	High
Organic Matter (LOI)	26.25	%	4-10	M			

Details of test methods, decision rules and locations can be provided on request. Samples tested as received.

Contact: N Stange  
RENEWABLE & CARBON

Authorised by Ralph Seaton (Scientific Manager)





7624

56 Three Architects  
14 Alva ST  
Edinburgh  
EH2 4QG

# Soil Report



<b>Farm Sampled</b>	Scotlandwell	<b>Previous Crop</b>		<b>Batch Number</b>	S59462
<b>Field Name or ID</b>	12, 300-900	<b>Next Crop</b>		<b>Lab Sample No</b>	21006778
<b>FID Number</b>		<b>Date received</b>	17/09/2021	<b>Case No</b>	ASD-2021-4883
<b>Soil Type</b>		<b>Date reported</b>	22/09/2021 09:32:4		

Determination	Result	Units	Target Value	Target Status	Status		
					Low	Moderate	High
Organic Matter (LOI)	40.02	%	4-10	M			

Details of test methods, decision rules and locations can be provided on request. Samples tested as received.

Contact: N Stange  
RENEWABLE & CARBON

Authorised by Ralph Seaton (Scientific Manager)





7624

56 Three Architects  
14 Alva ST  
Edinburgh  
EH2 4QG

# Soil Report



<b>Farm Sampled</b>	Scotlandwell	<b>Previous Crop</b>		<b>Batch Number</b>	S59462
<b>Field Name or ID</b>	19	<b>Next Crop</b>		<b>Lab Sample No</b>	21006779
<b>FID Number</b>		<b>Date received</b>	17/09/2021	<b>Case No</b>	ASD-2021-4883
<b>Soil Type</b>		<b>Date reported</b>	22/09/2021 09:32:4		

Determination	Result	Units	Target Value	Target Status	Status
Organic Matter (LOI)	32.77	%	4-10	M	High

## Summary of Results

**Farm Sampled:**

**Batch Number:**

**Report Date:** 22/09/2021

SAC	SAC Status	Extractable Phosphorus	Extractable Potassium	Extractable Magnesium
Scales of Interpretation, results in mg/l	VL	0 - 1.7	0 - 39	0 - 19
	L	1.8 - 4.4	40 - 75	20 - 60
	M-	4.5 - 9.4	76 - 140	61 - 200
	M+	9.50 - 13.4	141 - 200	61 - 200
	H	13.5 - 30.0	201 - 400	201 - 1000
	VH	> 30.0	> 400	> 1000

### Lime Required

### Extractables

ASD Ref	Field Name/Ref	pH	Arable t/ha	Grass t/ha	P mg/l	K mg/l	Mg mg/l
---------	----------------	----	----------------	---------------	-----------	-----------	------------

Details of test methods, decision rules and locations can be provided on request. Samples tested as received.

Contact: N Stange  
RENEWABLE & CARBON

Authorised by Ralph Seaton (Scientific Manager)



## 9.5 Field sheets

### Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	1

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Brown peat with minor silt content Dry	n/a	n/a	0	0.7
Dark brown peat Moist	n/a	n/a	0.7	1.66
Dark grey sand Moist	n/a	n/a	1.66	1.66 +

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Nearly flat, 1° slope
<b>GPS:</b>	See Trimble Data		
<b>Notes:</b> Vegetation over 2 m tall Site nearest field entrance in NW corner			



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	2

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Black peat with minor silt content Dry	n/a	n/a	0	0.9
Brown peat, moderately fibrous Moist	n/a	n/a	0.9	1.14
Brown and grey sand Moist	n/a	n/a	1.14	1.14+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Slight slope to the south, 1° slope
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -sample site immediately north of vehicle track -no water table evident within sample depth
-----------------------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	3

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor silt content Dry	n/a	n/a	0	0.3
Dark brown peat Moist	n/a	n/a	0.3	0.58
Brown sand with oxidized iron deposits Moist	n/a	n/a	0.58	0.58+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Slight slope to the south, 1° slope
<b>GPS:</b>	See trimble data		

<b>Notes:</b> -sample site just north of the vehicle track -water table not evident with 1 m
----------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	4

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peaty topsoil with minor silt and sand content Dry	n/a	n/	0	0.45
Brown sand with oxidized iron deposits	n/a	n/a	0.45	0.45+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Locally high ground, approx. 2° slope
<b>GPS:</b>	See trimble data		

<b>Notes:</b>
-ground elevation raising gradually to the east -highest elevation in northeast corner near track to adjoining field



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.			
<b>Project:</b>	The Causeway Field	<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b> 5

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peaty topsoil Minor silt and sand content Dry	n/a	n/a	0	0.42
Brown sand, oxidized iron deposits	n/a	n/a	0.42	0.42+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	High ground, 3° slope to the south
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -highest ground in northeast corner
------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.			
<b>Project:</b>	The Causeway Field	<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b> 6

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor sand and silt content, von Post H5 Dry	0.26	Dry bulk density	0	0.6
Dark brown fibrous peat, von Post H4 Moist	0.3 to 0.9	Carbon content	0.6	1.46
Grey sand Moist	n/a	n/a	1.46	1.46+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	flat
<b>GPS:</b>	See Trimble data		
<b>Notes:</b> -Deer bedding site -sampled bulk density -sampled carbon content			



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	7

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor silt content Dry	n/a	n/a	0	0.55
Black peat, moderately fibrous Moist	n/a	n/a	0.55	2.1
Grey sand Moist	n/a	n/a	2.1	2.1+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -water table below 2.1 m -vegetation primarily nettles and grass
--------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field	<b>SAC Job #:</b>	20175273		
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	8

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor silt content Dry	n/a	n/a	0	0.5
Black peat, moderately fibrous Moist	n/a	n/a	0.5	0.65
Grey coarse sand, <10% coarse fragments Wet	n/a	n/a	0.65	0.65+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Slightly hummocky
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -site on top of slight hummock
-------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field	<b>SAC Job #:</b>	20175273		
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	9

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor sand content, von Post H5 Dry	0.25	Dry bulk density	0	0.47
Grey sand with <5% coarse fragments Dry	0.2 to 0.4	Carbon content	0.47	0.47+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Slight hummocks
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -sampled bulk density -sampled carbon content -as with other sites, near zero stones found in peat and peaty topsoil
---------------------------------------------------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field	<b>SAC Job #:</b>	20175273		
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	10

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peaty topsoil Dry	n/a	n/a	0	0.37
Brown sand, <5% coarse fragments Moist	n/	n/a	0.37	0.37+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Lower slope, 1° slope
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -site taken near hedgerow along eastern boundary -no water table encountered
--------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	11

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor silt content Dry	n/a	n/a	0	0.52
Black peat, moderately fibrous Moist	n/a	n/a	0.52	2.16
Grey sand Moist	n/a	n/a	2.16	2.16+

<b>Weather:</b>	Cloudy	<b>Surface Expression:</b>	Flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -deepest peat encountered during survey
----------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	12

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor silt content, von Post H5 Dry	0.25	Dry bulk density	0	0.41
Black peat, moderately fibrous, von Post H4 Moist	0.3 to 0.9	Carbon content	0.41	0.9
Brown peat, fibrous, von Post H3	n/a	n/a	0.9	1.23
Grey sand Wet	n/a	n/a	1.23	1.23+

<b>Weather:</b>	Partly cloudy	<b>Surface Expression:</b>	Flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -sample pit exposed many larvae, earthworms and soil fauna in top 0.3 m -sampled bulk density -sampled carbon content
----------------------------------------------------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	13

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with minor silt content Dry	n/a	n/a	0	0.44
Black peat, moderately fibrous Moist	n/a	n/a	0.44	1.07
Grey sand	n/a	n/a	1.07	1.07+

<b>Weather:</b>	Mostly sunny	<b>Surface Expression:</b>	Flat
<b>GPS:</b>	See trimble data		

<b>Notes:</b> -water table near 1.2 m
------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	14

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peat with slight silt content Dry	n/a	n/a	0	0.55
Black peat, moderately fibrous Moist	n/a	n/a	0.55	0.68
Brown sand Moist	n/a	n/a	0.68	0.68+

<b>Weather:</b>	Mostly sunny	<b>Surface Expression:</b>	Flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -area less weedy compared to the northwest corner -mostly grasses
---------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	15

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peaty topsoil with <2% coarse fragment Dry	n/a	n/a	0	0.46
Light brown sand Moist	n/a	n/a	0.46	0.46+

<b>Weather:</b>	Mostly sunny	<b>Surface Expression:</b>	Lower slope position, 1° gradient
<b>GPS:</b>			

<b>Notes:</b> -noted a small volume of angular stones near topsoil surface, <3 cm -site situated along eastern hedgerow -vegetation height <1 m
----------------------------------------------------------------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	16

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Brown peat with minor silt content Dry	n/a	n/a	0	0.43
Black peat, moderately fibrous Moist	n/a	n/a	0.46	0.77
Brown peat, fibrous	n/a	n/a	0.77	1.03
Grey sand Wet	n/a	n/a	1.03	1.03+

<b>Weather:</b>	Mostly sunny	<b>Surface Expression:</b>	Lower slope of hummock
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -site at southwest corner of field -sow thistle prominent vegetation
------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	17

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Brown peat with minor silt content Dry	n/a	n/a	0	0.39
Black peat, moderately fibrous Moist	n/a	n/a	0.39	0.75
Brown peat, fibrous Wet	n/a	n/a	0.75	0.97
Grey sand Wet	n/a	n/a	0.97	0.97+

<b>Weather:</b>	Mostly sunny	<b>Surface Expression:</b>	Lower slope of hummock
<b>GPS:</b>	See Trimble data		

<b>Notes:</b>
---------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field			<b>SAC Job #:</b>	20175273
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	18

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Brown peat with minor silt content Dry	n/a	n/a	0	0.45
Black peat, moderately fibrous Moist	n/a	n/a	0.45	0.87
Grey Sand Moist	n/a	n/a	0.87	0.87+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b>
---------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	19

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Brown peat with minor silt content, von Post H5	0.25	Dry bulk density	0	0.41
Black peat, moderately fibrous, von Post H4 Moist	0.3 to 0.9	Carbon content	0.41	0.86
Grey sand Wet	n/a	n/a	0.86	0.86+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -primarily grass cover -sampled bulk density -sampled carbon content -grass root penetration visible up to 30 cm indicating consistent aeration
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	20

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Brown peaty topsoil with minor sand content Dry	n/a	n/a	0	0.5
Brown sand with oxidized iron deposit	n/a	n/a	0.5	0.5+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -sample site in southeast corner of field -two additional auger pits dug within a 2 m radius to confirm soil depth, all 0.50 m -additional step out pits added to estimate extent of peaty topsoil boundary
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	21

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Brown peat with minor silt content Dry	n/a	n/a	0	0.38
Black peat, moderately fibrous Moist	n/a	n/a	0.38	0.67
Grey sand Moist	n/a	n/a	0.67	0.67+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Flat
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -site 21 is a step out point of site 20 to confirm boundary of peaty topsoil
-----------------------------------------------------------------------------------------------



## Soil Survey Field Sheet

<b>Client:</b>	Scotwell LTD.				
<b>Project:</b>	The Causeway Field		<b>SAC Job #:</b>	20175273	
<b>Date:</b>	Sep 16/21	<b>Surveyor:</b>	NS/RR/JS	<b>Site #:</b>	22

Description	Sample Depth (m)	Sample Type	Depth Below Ground Level (m)	
			From	To
Dark brown peaty topsoil with minor silt content Dry	n/a	n/a	0	0.31
Brown sand Dry	n/a	n/a	0.31	0.31+

<b>Weather:</b>	Sunny	<b>Surface Expression:</b>	Slight hollow
<b>GPS:</b>	See Trimble data		

<b>Notes:</b> -Site 22 is a step out of site 20 to confirm peaty topsoil boundary
--------------------------------------------------------------------------------------