Application for an environmental permit:
Part LPD1 – Application for a deployment

Use this form for deployments for the landspreading of waste where the operator holds a permit for any of the following standard rules:

- SR2010No4 Mobile plant for landspreading (land treatment resulting in agricultural or ecological benefit);
- SR2010No5 Use of mobile plant for land reclamation, restoration or improvement of land;
- SR2010No6 Mobile plant for landspreading of sewage sludge; or a
- Bespoke mobile plant permit for landspreading or land reclamation.

Please check that this is the latest version of the form available from our website.

Please read through this form and the guidance notes that come with it. All relevant guidance documents can be found on our website.

Where you see the term 'document reference' on the form, give the document references and send the documents with the application form when you've completed it.

Contents

1 About the permit

1a Discussions before your application

If you have had discussions with us before your application, give us the case reference or details on a separate sheet.

Case or document reference

1b Permit number

Permit number this application relates to GP3792SK

1c What type of permit do you want to deploy under? (Please tick)

SR2010No4 Mobile plant for landspreading (land treatment resulting in agricultural or ecological benefit) ☒

SR2010No5 Use of mobile plant for land reclamation, restoration or improvement of land ☐

SR2010No6 Mobile plant for landspreading of sewage sludge ☐

Bespoke mobile plant permit for landspreading or reclamation, restoration or improvement of land ☐

2 About you

Please give us details of the permit holder. For companies, the details must match Companies House.

Organisation name (if relevant) ByProduct Recovery Ltd

Title

First name

Last name

Address Control House

	A1 Business Park
	Knottingley
	West Yorkshire
Postcode	WF11 0BU
Telephone - mobile	07824 323 318
Telephone - office	0113 232 2418
Email address	info@4r-group.co.uk

If you are applying as an organisation of individuals, every partner needs to give us their details, including their title. If necessary, continue on a separate sheet and tell us the reference you have given the sheet.

Document reference	

3 Contact details

Who can we talk to about your application? This can be someone acting as a consultant or 'agent' for you.

Title	Dr	
First name	Chris	
Last name	Ash	
Telephone - mobile	07950 285 187	
Telephone - office		
Email address	chris.ash@4r-group.co.uk / info@4r-group.co.uk	

4 About the deployment

4a Multiple deployments for one area of land

You may spread more than 10 waste streams on the same area of land, provided you submit additional fully completed deployment forms listing the additional wastes. Your benefit statement must take into account the total benefit to the land of all wastes to be spread.

Is this deployment one of a batch (multiple deployments) for the same area of land?

No ☒ *Go to section 4b*

Yes ☐ How many deployments are in the batch?

4b Nominated competent person

4b1 Give us details of the nominated competent person. This is the person who will be responsible for compliance with the permit for this deployment. See the guidance notes on LPD1 for further details.

Title	Mr	
First name	Richard	
Last name	Evans	

Telephone - mobile	07506 672839
Telephone - office	
Email address	richard.evans@4r-group.co.uk / info@4r-group.co.uk

4b2 What evidence are you using to show the nominated competent person has suitable technical skills and knowledge to manage the activity?

An approved technical scheme ☐ *Go to section 4b3*

Documented in-house training ☒ You must provide evidence – see below.

You must provide evidence to show the documented in-house training meets the requirements set out in technical guidance. See the guidance notes on LPD1 for further details and give us the document reference.

Document reference: 4R Training Certificate Waste to Land - RE *Go to section 4c*

4b3 Which approved scheme are you using to show you have the suitable technical skills and knowledge to manage your facility?

CIWM / WAMITAB ☐

ESA / EU ☐

4b4 Tick to confirm you've included all original *and* continuing competence evidence. ☐

4c Which risk band does the activity fall within?

Please complete Table 1 below to indicate which risk band your activity falls within. This is a combination of waste types and proximity to sensitive receptors.

Once you have selected the risk band your activity falls within, the form guidance tells you what additional information you need to send with the application.

The risk banding affects the fee you need to send with your deployment application. See section 6.

Table 1 – risk band

Permit type	**Lower risk location** - Not in an SPZ 2, and/or - Over 500 meters from: • European site, and/or • Ramsar, and/or • SSSI	**High risk location** - In a Source Protection Zone 2, and/or - 500 meters or less from: • European site, and/or • Ramsar, and/or • SSSI **You *must* submit a site specific risk assessment.**
SR2010No4 List A wastes (Lower risk)	Low risk deployment ☐	Medium risk (2) deployment ☐
SR2010No4 List B wastes (Higher risk)	Medium risk (1) deployment ☐	High risk deployment ☒
SR2010No5 (Any waste listed)	Medium risk (1) deployment ☐	High risk deployment ☐
SR2010No6 (Any waste listed)	Medium risk (1) deployment ☐	High risk deployment ☐
Bespoke mobile plant permit	Low risk deployment ☐	Medium risk deployment ☐ / High risk deployment ☐

4d Additional information on sensitive receptors

Is the deployment within an SPZ 2 and/or 500m of a European site, Ramsar or SSSI, or being made under a

bespoke permit?

No ☐

Yes ☒ You must submit a site specific risk assessment (see question 4e).

4e Site specific risk assessment

Your site specific risk assessment must show how you intend to prevent any harm to any SPZ 2, European site, Ramsar or SSSI. For more information on risk-assessment please see the accompanying guidance to LPD1 and Technical Guidance Note 'TGN 8.01'.

Please tick a box below to indicate which type of risk-assessment you have submitted.

I have attached a site-specific risk-assessment as the deployment is within and SPZ 2 and/or 500m of a European site, Ramsar or SSSI. I have also addressed risks to other receptors in the risk assessment ☒

I am not within an SPZ 2 and/or 500 m of a European site, Ramsar or SSSI but have addressed risks to other receptors in my benefit statement. ☐

I am deploying under a bespoke permit and have attached a site-specific risk assessment (regardless of location). ☐

4f About the waste

Please list all the individual waste streams you want to spread/use under this deployment, in Table 2 below. We've included an example to help you.

Please note: You can only spread/use 10 waste types per deployment.

Table 2 – waste types

	List of Waste code (6 digit)	**Waste description**	**Physical form**	**Waste producer**	**Total amount being spread/used** (tonnes)
e.g.	03 03 05	De-inked paper	Sludge	Smith's Newsprint	500
1	19 09 02	Potable water treatment sludge	Sludge cake	DCWW Bolton Hill	629
2	19 09 02	Potable water treatment sludge	Sludge cake	DCWW Bontgoch	974
3	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Bontgoch	1874
4	19 09 02	Potable water treatment sludge	Sludge cake	DCWW Llechryd	3299
5	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Llechryd	6004
6	19 09 02	Potable water treatment sludge	Sludge cake	DCWW Preseli	754
7	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Preseli	3143
8	19 09 02	Potable water treatment sludge	Sludge cake	DCWW Strata Florida	1370
9	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Strata Florida	3143
10	19 06 06	Anaerobic digestate	Liquid	Andigestion	1076
				Total tonnage	3299

4g About the land you want to treat

4g1 Please give details of the main address of the land to be treated.

Address	Crugmore
	Penparc
	Cardigan
	Ceredigion
Postcode	SA43 1QY
National grid reference (12 digit)	SN 20609 47236

4g2 What type of land do you want to treat?

Agricultural land ☒ Please give your County/ Parish/ Holding number 55/220/0071

Non-agricultural land ☐

4h The parcels of land you want to treat

Please list all the individual areas (parcels) of land you want to include this deployment, in Table 3 below.

Please note: the total area to be treated must not be more than 50 hectares.

Table 3 – parcels of land

	Field name/ number/ reference	**Grid reference - centre of field** (12 digit)	**Waste types to be spread/used** (List of Waste code) Separate using commas.	**Size** (hectares)
1	**Please refer to LPD1**			
2	**Supplement**			
3				
4				
5				
6				
7				
8				
9				
10				
			Total hectares	25.02

4i Is the permit holder the owner or occupier of the land you want to spread on/treat?

Yes ☐ *Go to section 4k*

No ☒ You must give us details of the land owner or occupier, below.

Organisation name (if relevant)	
Title	Mr
First name	Marc
Last name	Davies

Address	Crugmore
	Penparc
	Cardigan
	Ceredigion
Postcode	SA43 1QY
Telephone - mobile	07971 689590
Telephone - office	
Email address	

If there is more than one owner or occupant for the area covered by this deployment, you must give us details of each. Please continue on a separate sheet and tell us the reference you have given the sheet.

Document reference	

4j Do you have the consent of the owner or occupier to carry out the activity?

Yes ☒ *Go to section 4k*

No ☐ You must tell us why you think you can carry out the activity without the consent of the occupier. Please give an explanation in the box, below. Continue on a separate sheet if needed.

Explanation

4k Previous land treatment

Has any of the land listed in Table 3 been treated with other wastes, sewage sludge, slurries or manures etc. in the last 12 months?

No ☒ *Go to section 4l*

Yes ☐ You must give us details in Table 4 below *and* account for them in your benefit statement.

Table 4 – previous land treatment

	Field name/ number/ reference	**Describe the waste spread** (in last 12 months)	**Person/ company who spread the waste**	**Quantity spread per hectare** (in tonnes)	**Deployment/ other reference** (if known)
e.g.	East field	Digested sewage sludge cake	Eastern Waters	20	PAN 000000
1	19 09 02	Water treatment sludges	4R/Contractor	69	PAN 009913
2					
3					

4					
5					
6					
7					
8					
9					
10					

4l Waste storage

Are you proposing to store waste in connection with this deployment?

No ☐ *Go to section 5*

Yes ☒ You must give us details in Table 5 below.

Table 5 – waste storage details

	Grid reference (12 digit)	**Waste type being stored** (6 digit List of Waste code)	**Storage method**	**Quantity stored at any one time** (in tonnes)
1	SN 21114 47172	19 09 02	Field stockpile	3000
2	SN 20526 47271	19 09 02	Field stockpile	3000
3	SN 21102 48388	19 09 02	Field stockpile	3000
4	SN 20928 48733	19 09 02	Field stockpile	3000
5	SN 20919 48762	19 09 02	Field stockpile	3000
6				
7				
8				
9	No more than 3000t will	be stored across all storage	locations at any one time.	
10				

5 Payment

5a Tick an option below to show how you will pay for the application.

Electronic transfer (for example, BACS) ☒ *Go to section 5b*

Cheque ☐ *Go to section 5c*

Postal order ☐ *Go to section 5d*

Credit or debit card ☐ *Go to section 5e*

5b Paying by electronic transfer

If you choose to pay by electronic transfer use the following information to make your payment.

Company name: Natural Resources Wales

Company address: Income Dept., PO BOX 663, Cardiff, CF24 0TP

Bank: RBS

Address: National Westminster Bank Plc, 2 ½ Devonshire Square, London, EC2M 4BA

Sort code: 60-70-80

Account number: 10014438

Reference number

You can use any reference number but we prefer the number to be 'EPDEP' followed by the first five letters of your organisation name followed by a four-digit number.

For example, for a company named Joe Bloggs Ltd, the reference number might be EPDEPJOEBL0001. (Remember you can use any four-digit number at the end.)

The reference number you will provide will appear on our bank statements so we can check your payment. We may need to contact your bank to make sure the reference number is quoted correctly.

You should also email your payment details and payment reference number to banking.team@naturalresourceswales.gov.uk / banking.team@cyfoethnaturiolcymru.gov.uk or fax it to 0300 065 3001 and enter it in the space provided below.

BACS reference	PSCAPPBYPRO0890
Amount paid	£1018

Making payments from outside the UK

These details have changed. If you are making your payment from outside the United Kingdom (which must be received in sterling), our IBAN number is GB70 NWBK6070 8010 0144 38 and our SWIFT/BIC number is NWBKGB2L.

If you do not quote your payment reference number, there may be a delay in processing your payment and application.

5c Paying by cheque or postal order

You should make cheques or postal orders payable to Natural Resources Wales and they should be marked 'A/c Payee'. We will not accept post-dated cheques (cheques with a future date written on them).

Cheque/ postal order number	
Amount paid	

5d Paying by credit or debit card

If you are paying by credit or debit card, please fill in the separate form CC1.

You can download this from our Website or you can ask for one of our customer service providers to send one by post. We will destroy your card details once we have processed your payment. We can accept payments by Visa, MasterCard or Maestro UK card only.

6 Supporting documents

You must provide all relevant documents to support your application. The information we need depends on the type of deployment application you're making. If you don't provide us with all the information we need, we won't be able to assess your proposal and the application may be rejected.

Better quality deployments result in shorter processing times. If we don't need to come back to you for more information, we'll be able to give you a decision quicker.

6a What supporting evidence do you need to send?

Are you applying to spread/use waste under a SR2010 No4 standard rule set permit?

Yes	☒	Complete the checklist in Table 6 *and* Table 7	*Go to section 6b*
No	☐	Complete the checklist in Table 7 only.	*Go to section 6c*

6b Checklist for deployments under SR2010 No4 only

Complete the checklist in Table 6, below. Tick to confirm you've completed the action.

Table 6	
Do the grid references (for fields and storage areas) match the map locations?	☒
Are the grid references in the correct format i.e. AB 12345 67890?	☒
Have details of previous land treatment been provided?	☒
Have you included a location map?	☒
Does the map include all the relevant features as set out in the guidance?	☒
Have you included a waste analysis?	☒
Is the waste analysis for each waste less than 12 months old?	☒
Does the waste analysis include pH, Nitrogen (N), Phosphorus (P), Potassium (K), % dry matter and Potentially Toxic Elements (PTE's)?	☒
Have you included a soil analysis?	☒
Is the soil analysis less for each field than 4 years old?	☒
Does the soil analysis provide the soil pH, Potassium (K), Phosphorus (P), Magnesium (Mg) and PTEs if they are high in the waste?	☒
Have the soil indices for P, K and Mg for each field been provided?	☒
Have you included a Certificate of Agricultural Benefit?	☒
Has the proposed cropping regime been stated?	☒
Has the waste application rate been stated?	☒
Has the timing of application been stated and is it appropriate for the cropping regime?	☒
Has the intended method of waste application been stated?	☒
Have the total nutrients supplied by the waste been stated and have they been provided in oxide format?	☒
Has the nutrient requirement for the proposed crop been provided?	☒
Has the soil nitrogen supply (SNS) for each field been provided?	☒
If the land has been treated with other wastes, sewage sludge, slurries manures etc. in the last 12 months, has relevant information been provided?	☒
If more than one waste stream is to be applied to the land; has the benefit for each individual waste stream been demonstrated?	☒
Have you included a site specific risk assessment? (where relevant)	☒
Does the Site Specific Risk Assessment; consider all potential receptors, identify all risks from the activity, and include information on all measures you'll use to minimise or mitigate the impact and why they're suitable.	☒

6c Checklist for all types of deployment application.

Complete the checklist in Table 7, below. Tick to confirm you've completed the action.

Table 7		
Item	**Complete**	**Your document reference/ description**
Location map (required for all deployments)	☒	C Maps (C-01)
Benefit statement (required for all deployments)	☒	C ABS
Waste analysis (required for all deployments)	☒	Waste Analysis

Receiving soil analysis (required for all deployments)	☒	Soil Analysis
Site-specific risk assessment (in accordance with 4e)	☒	C SSRA
Any other additional information	N/A	4R Training Certificate Waste to Land - RE
	N/A	LPD1 Supplement
	N/A	
	N/A	

7 The data Protection Act 1998

We, the Natural Resources Body for Wales (hereafter "Natural Resources Wales"), will process the information you provide so that we can:

- deal with your application;
- make sure you keep to the conditions of the licence, permit or registration;
- process renewals; and
- keep the public registers up to date.

We may also process or release the information to:

- offer you documents or services relating to environmental matters;
- consult the public, public organisations and other organisations (for example, the Health and Safety Executive, local authorities, the emergency services, the Department for Environment, Food and Rural Affairs) on environmental issues;
- carry out research and development work on environmental issues;
- provide information from the public register to anyone who asks;
- prevent anyone from breaking environmental law, investigate cases where environmental law may have been broken, and take any action that is needed;
- assess whether customers are satisfied with our service, and to improve our service; and
- respond to requests for information under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004 (if the Data Protection Act allows).

We may pass the information on to our agents or representatives to do these things for us.

8 Confidentiality and national security

We will normally put all the information in your application on a public register of environmental information. However, we may not include certain information in the public register if this is in the interests of national security, or because the information is confidential.

You can ask for information to be made confidential by ticking the box below and enclosing a letter with your application giving your reasons. If we agree with your request, we will tell you and not include the information in the public register. If we do not agree with your request, we will let you know how to appeal against our decision, or you can withdraw your application.

Please treat the information in my application as confidential. ☐

You can tell the Secretary of State that you believe including information on a public register would not be in the interests of national security. You must enclose a letter with your application telling us that you have told the Welsh Ministers and you must still include the information in your application. We will not include the information in the public register unless the Welsh Ministers decides that it should be included.

Only tick the box below if you are certain that you wish to claim confidentiality or national security for your application. This may delay your application.

I attach a letter stating that I have written to the Welsh Ministers explaining why my information should not be included on the public register for national security reasons ☐

9 Declaration

You must read this section before making the declaration and sending your form to us.

A relevant person should make the declaration. You must be a relevant person or have the authority of a relevant person to sign this application on their behalf.

Relevant people means each applicant, and in the case of a company, a director, manager, company secretary or any similar officer or employee listed on current appointments in Companies House. In the case of a Limited Liability Partnership (LLP), it includes any partner. If the permit holder is an organisation of individuals, each individual (or individual trustee) must complete the declaration.

To simplify and speed up the application process we recommend that the declaration is filled in by an officer of a company or one of the partners in a Limited Liability Partnership (LLP).

If you wish a manager, employee or consultant etc. to sign the declaration on behalf of a relevant person, we will need written confirmation from a relevant person; that is, an officer of the company, a partner in the LLP or the individual, confirming that the person has the authority to fill in the declaration.

If you are joint permit holders you should each fill in your own declaration. We have provided a separate sheet for this.

Where the operator is the subject of any insolvency procedure, the declaration must be filled in by the official receiver/appointed insolvency practitioner.

9a Are you signing the form on *behalf of* a relevant person?

If you are *not* a relevant person, but want to sign the application on their behalf, you must include confirmation that you can do this.

I have included written confirmation from a relevant person to confirm I can sign on their behalf. ☐

9b Does your deployment application relate to a standard facility permit?

If your deployment application is being made in relation to a standard facility permit (SRP), you also need to confirm that you are able to meet all relevant criteria of the standard rule set/sets under which you are applying.

I confirm that my activity/activities will fully meet the rules of the permit deployment I have applied for. ☒

9c Sign to confirm you understand the declaration.

If you knowingly or recklessly make a statement which is false or misleading to help you get an environmental permit (for yourself or another person), you are committing an offence under the Environmental Permitting (England and Wales) Regulations 2016.

I declare that the information in this application is true to the best of my knowledge and belief. I understand that this application may be refused or approval withdrawn if I give false or incomplete information.

I understand that if I knowingly or recklessly make a false or misleading statement:

- **I may be prosecuted; and**
- **if convicted, I may have to pay a fine and/or go to prison.**

By signing below, you are confirming that you understand and agree with the declaration above.

Title	Mr	
First name	Jon	
Last name	Smith	
On behalf of (if relevant)		
Today's date (DD/MM/YYYY)	12/03/2021	

LPD1 Supplement

4h The parcels of land you want to treat.

Table 3 – parcels of land				
	Field name/ number/ reference	**Grid reference – centre of field** (12 digit)	**Waste types to be spread/used** (List of waste code) separate using commas	**Size** (hectares)
1	1	SN 21204 47273	19 09 02, 19 06 06	3.12
2	2	SN 21040 47203	19 09 02, 19 06 06	3.18
3	3	SN 20781 47324	19 09 02, 19 06 06	2.78
4	4	SN 20571 47371	19 09 02, 19 06 06	2.02
5	5	SN 20435 47313	19 09 02, 19 06 06	1.24
6	6	SN 21009 48397	19 09 02, 19 06 06	1.84
7	7	SN 21134 48472	19 09 02, 19 06 06	1.39
8	8	SN 20986 48518	19 09 02, 19 06 06	1.82
9	9	SN 21024 48623	19 09 02, 19 06 06	0.62
10	10	SN 20843 48489	19 09 02, 19 06 06	2.71
11	11	SN 20851 48663	19 09 02, 19 06 06	1.28
12	12	SN 20838 48801	19 09 02, 19 06 06	3.02
			Total hectares	**25.02**

Location Plan

Crugmore

Site:
Crugmore
Cardigan
Ceredigion
SA43 1QY

Client:
Dŵr Cymru / Welsh Water

Key:

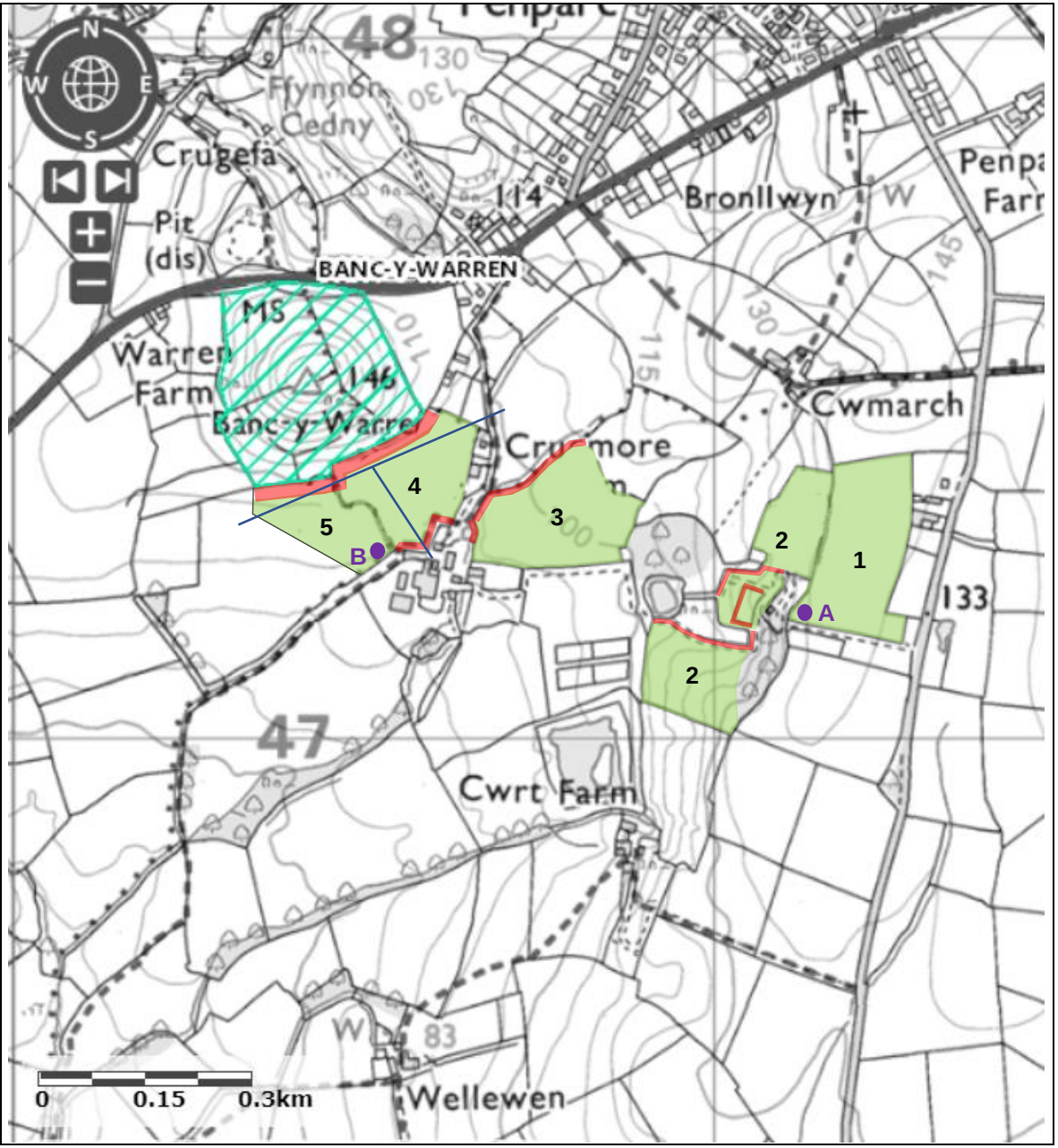
- Spreading area
- Non-spreading area
- Location tags
- SSSI
- Overhead cables

Location tags:

Field stockpiles

A. SN 21114 47172
B. SN 20526 47271

Map reference:
C-01



Location Plan

Crugmore

Site:
Crugmore
Cardigan
Ceredigion
SA43 1QY

Client:
Dŵr Cymru / Welsh Water

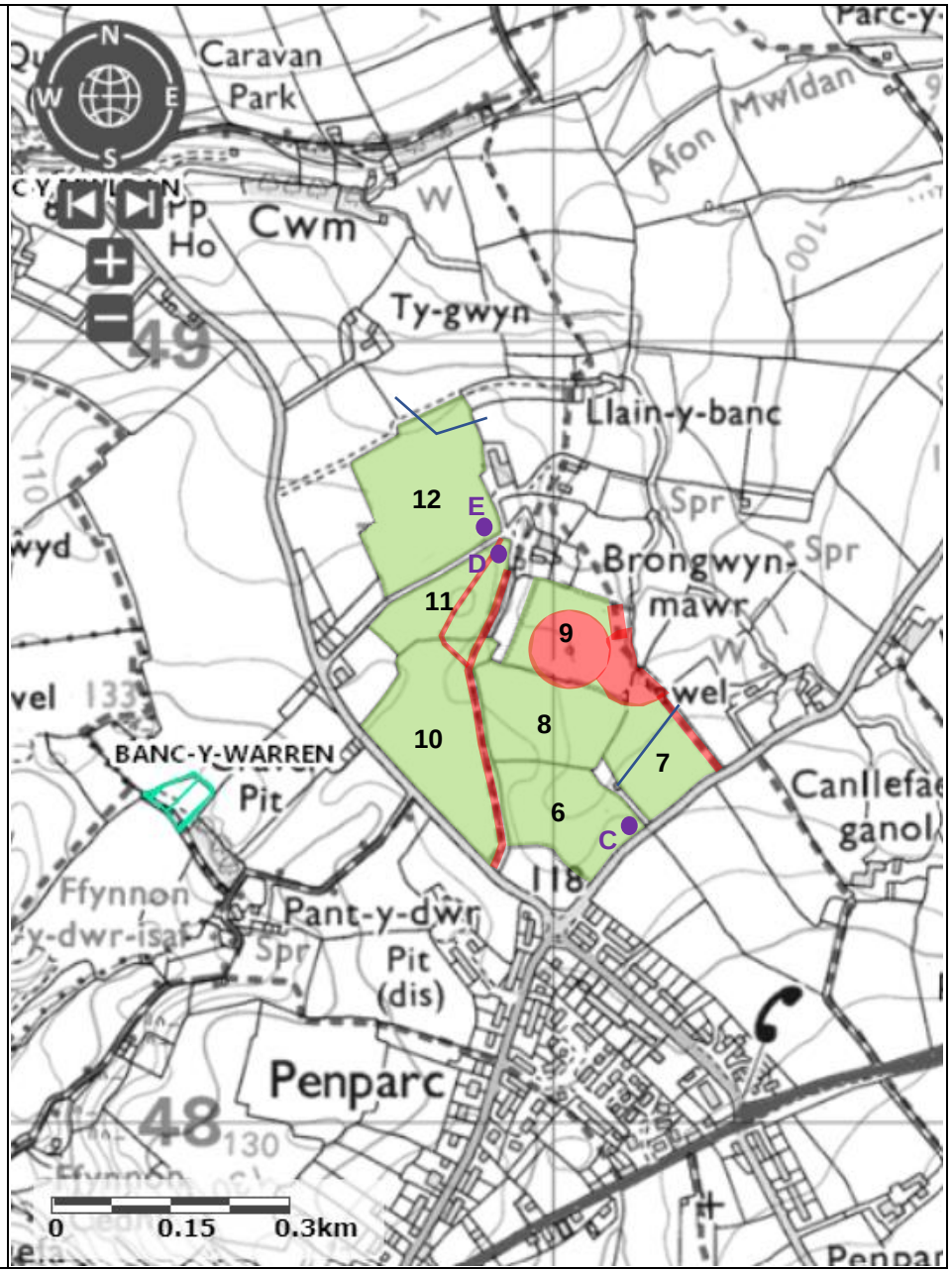
Key:

- Spreading area
- Non-spreading area
- Location tags
- SSSI
- Overhead cables

Location tags:

Field stockpiles

- C. SN 21102 48388
- D. SN 20928 48733
- E. SN 20919 48762



Map reference:
C-01

Agricultural Benefit Statement

For the application of beneficial wastes to fields at;

Crugmore, Cardigan, Ceredigion. SA43 1QY

12th March 2021

1 Person with appropriate technical expertise and permit details

This benefit statement has been compiled by Dr Chris Ash (Consultant at 4R Group) who has the following qualifications and experience;

- Ph.D. Fate and Behaviour of Potentially Toxic Elements in Soils
- MSc. Natural Resources and Environment
- BSc. (Hons) Environmental Science
- FACTS Qualified Advisor (No. FE/6324) and Full Member of BASIS Professional Register
- 4 years landspreading experience

Permit number under which this deployment application is being made: EPR/ GP3792SK

2 Where the waste is to be spread

Table 1. Where the waste is to be spread

Farm address:	Crugmore, Cardigan, Ceredigion. SA43 1QY	
Stockpile grid reference:	Refer to Table 4	
Area of the receiving land:	25.02 ha	
Quantity to be stored at any one time:	Stackable: 3,000t	Non-Stackable: N/A
Total maximum quantity to be spread:	6,004t	
Location map document reference:	C Maps (C-01)	

3 What is the waste to be spread

Table 2. Description of waste(s) to be applied

Waste	*EWC Code*	*Description*	*Waste Producer*	*Additional Information*
1	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Bolton Hill	Stackable alum sludge cake
2	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Bontgoch	Stackable alum sludge cake
3	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Bontgoch	Non-stackable alum liquid sludge
4	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Llechryd	Stackable ferric sludge cake
5	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Llechryd	Non-stackable ferric liquid sludge
6	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Preseli	Stackable alum sludge cake
7	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Preseli	Non-stackable alum liquid sludge
8	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Strata Florida	Stackable alum sludge cake
9	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Strata Florida	Non-stackable alum liquid sludge
10	19 06 06	Whole digestate from anaerobic treatment of source segregated biodegradable waste.	Andigestion	SP3132VU

4 Operational details

4.1 Cropping details

Table 3. Cropping details

Current crop including projected yield if known:	Refer to Tables 6-15
Is straw removed?	Y ☐ N ☐ N/A ☒

Following crop and any sensitive crops within rotation which you are amending the soil for in good time:	Refer to Tables 6-15
When do you intend to apply this waste; e.g. post harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:	Spreading will only take place subject to ground conditions and following the Code of Good Agricultural Practice (Defra, 2011), NVZ regulations and the permit holder's Environmental Management System (EMS). Targeted periods of spreading on grass fields include spring, after cutting of silage, and prior to grazing through summer and autumn. No more than 50t/ha will be spread on a field in any 3-week period in accordance with CoGAP, and no more than 250t/ha will be spread within any 12-month period.

4.2 Waste storage

Table 4. Waste storage

How is the waste to be stored? *e.g. mobile tank, field heap, spread on delivery*	Stackable wastes: fields stockpiles Non-stackable wastes: spread on delivery
Where is the waste to be stored prior to spreading?	Stockpiles: A. SN 21114 47172 B. SN 20526 47271 C. SN 21102 48388 D. SN 20928 48733 E. SN 20919 48762
Why were these storage locations chosen?	The storage locations are accessible by delivering vehicle, near field entrances so the potential damage to fields by delivering vehicles is minimal. The storage locations are not within 10m of any ditch, watercourse, or footpath, not within a SPZ1, and are at least 50m from any well spring or borehole. They are also a safe distance from overhead powerlines.

4.3 Waste application

Table 5. Waste application

How is the waste to be spread and why is it to be spread that way?	The cake will be spread using conventional rear discharge spreaders as this equipment is readily available to the farmer/contractor and the most appropriate for the material and application rates used.

	Liquid DCWW sludges will be surface spread by tractor and tanker using a low-trajectory splash plate. Digestate will be spread by a tractor and tanker using a trailing shoe.
How do you plan to incorporate the waste following application?	There is no requirement for further incorporation of wastes on grass fields.
With liquid wastes is there any mole draining or sub-soiling planned? *Are there land drains in the field?*	No No
Other relevant operational information:	The wastes may be applied separately or in combination. If the wastes are applied in combination the total combined amount applied will not exceed 250t/ha, the total nitrogen loading will be less than 250kg/ha, and the amount of available nitrogen and total or available phosphate and potash (whichever is appropriate) will not exceed the fertiliser recommendation or the amount removed in crop offtake, whichever is the greater. Fields 2-7 have soil pH below 6, therefore no alum based DCWW sludge will be spread on these field. All other fields are above pH 6.

Table 6. DCWW Bolton Hill cake

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	0.4	0	165	75	74*	1	285	248	5.6	2	0	1.2	50	**156**
2	3.38	3.18	Grass	Grass	5.5	Mod	235		3	20	75		1	285	248		2	0			
3	2.99	2.78	Grass	Grass	5.9	Mod	235		0	165	75		0	350	248		2	0			
4	2.49	2.02	Grass	Grass	5.9	Mod	235		2	75	75		0	350	248		2	0			
5	1.46	1.24	Grass	Grass	5.7	Mod	235		3	20	75		1	285	248		2	0			
6	1.84	1.84	Grass	Grass	5.8	Mod	235		0	165	75		0	350	248		1	0			
7	1.57	1.39	Grass	Grass	5.8	Mod	235		1	120	75		0	350	248		2	0			
8	1.88	1.82	Grass	Grass	6.0	Mod	235	0.4	2	75	75	74*	0	350	248	5.6	2	0	1.2	50	**91**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	0.4	0	165	75	37	0	350	248	5.6	1	0	1.2	50	**31**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	0.4	1	120	75	37	0	350	248	5.6	2	0	1.2	50	**136**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	0.4	3	20	75	74*	2-	230	248	5.6	2	0	1.2	50	**64**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	0.4	2	75	75	74*	0	350	248	5.6	3	0	1.2	50	**151**
Ha	**27.75**	**25.02**																			**629**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 50t/ha is 97kg/ha

Table 7. DCWW Bontgoch cake

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	0.3	0	165	75	75	1	285	248	0.8	2	0	1.8	52	**162**
2	3.38	3.18	Grass	Grass	5.5	Mod	235	0.2	3	20	75	74*	1	285	248	0.4	2	0	0.9	26	**83**
3	2.99	2.78	Grass	Grass	5.9	Mod	235	0.3	0	165	75	75	0	350	248	0.8	2	0	1.8	52	**145**
4	2.49	2.02	Grass	Grass	5.9	Mod	235	0.2	2	75	75	74*	0	350	248	0.4	2	0	0.9	26	**53**
5	1.46	1.24	Grass	Grass	5.7	Mod	235	0.2	3	20	75	74*	1	285	248	0.4	2	0	0.9	26	**32**
6	1.84	1.84	Grass	Grass	5.8	Mod	235	0.3	0	165	75	75	0	350	248	0.8	1	0	1.8	52	**96**
7	1.57	1.39	Grass	Grass	5.8	Mod	235	0.3	1	120	75	75	0	350	248	0.8	2	0	1.8	52	**72**
8	1.88	1.82	Grass	Grass	6.0	Mod	235	0.2	2	75	75	74*	0	350	248	0.4	2	0	0.9	26	**47**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	0.3	0	165	75	75	0	350	248	0.8	1	0	1.8	52	**32**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	0.3	1	120	75	75	0	350	248	0.8	2	0	1.8	52	**141**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	0.2	3	20	75	74*	2-	230	248	0.4	2	0	0.9	26	**33**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	0.2	2	75	75	74*	0	350	248	0.4	3	0	0.9	26	**79**
Ha	**27.75**	**25.02**																			**974**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 52t/ha is 136kg/ha

Table 8. DCWW Bontgoch liquid

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	0.6	0	165	75	76	1	285	248	0.4	2	0	1.8	100	**312**
2	3.38	3.18	Grass	Grass	5.5	Mod	235	0.3	3	20	75	75*	1	285	248	0.4	2	0	0.9	50	**159**
3	2.99	2.78	Grass	Grass	5.9	Mod	235	0.6	0	165	75	76	0	350	248	0.4	2	0	1.8	100	**278**
4	2.49	2.02	Grass	Grass	5.9	Mod	235	0.3	2	75	75	75*	0	350	248	0.4	2	0	0.9	50	**101**
5	1.46	1.24	Grass	Grass	5.7	Mod	235	0.3	3	20	75	75*	1	285	248	0.4	2	0	0.9	50	**62**
6	1.84	1.84	Grass	Grass	5.8	Mod	235	0.6	0	165	75	76	0	350	248	0.4	1	0	1.8	100	**184**
7	1.57	1.39	Grass	Grass	5.8	Mod	235	0.6	1	120	75	76	0	350	248	0.4	2	0	1.8	100	**139**
8	1.88	1.82	Grass	Grass	6.0	Mod	235	0.3	2	75	75	75*	0	350	248	0.4	2	0	0.9	50	**91**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	0.6	0	165	75	76	0	350	248	0.4	1	0	1.8	100	**62**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	0.6	1	120	75	76	0	350	248	0.4	2	0	1.8	100	**271**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	0.3	3	20	75	75*	2-	230	248	0.4	2	0	0.9	50	**64**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	0.3	2	75	75	75*	0	350	248	0.4	3	0	0.9	50	**151**
Ha	**27.75**	**25.02**																			**1874**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 100t/ha is 134kg/ha

Table 9. DCWW Llechryd cake

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	1.4	0	165	75	68	1	285	248	12	2	0	4	170	**530**
2	3.38	3.18	Grass	Grass	5.5	Mod	235	0.8	3	20	75	75*	1	285	248	6.8	2	0	2	94	**299**
3	2.99	2.78	Grass	Grass	5.9	Mod	235	1.4	0	165	75	68	0	350	248	12	2	0	4	170	**473**
4	2.49	2.02	Grass	Grass	5.9	Mod	235	0.8	2	75	75	75*	0	350	248	6.8	2	0	2	94	**190**
5	1.46	1.24	Grass	Grass	5.7	Mod	235	0.8	3	20	75	75*	1	285	248	6.8	2	0	2	94	**117**
6	1.84	1.84	Grass	Grass	5.8	Mod	235	1.4	0	165	75	68	0	350	248	12	1	0	4	170	**313**
7	1.57	1.39	Grass	Grass	5.8	Mod	235	1.4	1	120	75	68	0	350	248	12	2	0	4	170	**236**
8	1.88	1.82	Grass	Grass	6.0	Mod	235	0.8	2	75	75	75*	0	350	248	6.8	2	0	2	94	**171**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	1.4	0	165	75	68	0	350	248	12	1	0	4	170	**105**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	1.4	1	120	75	68	0	350	248	12	2	0	4	170	**461**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	0.8	3	20	75	75*	2-	230	248	6.8	2	0	2	94	**120**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	0.8	2	75	75	75*	0	350	248	6.8	3	0	2	94	**284**
Ha	**27.75**	**25.02**																			**3299**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 170t/ha is 248kg/ha

Table 10. DCWW Llechryd liquid

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	6	0	165	75	40	1	285	248	25	2	0	23	250	**780**
2	3.38	3.18	Grass	Grass	5.5	Mod	235	6	3	20	75	73*	1	285	248	23	2	0	21	230	**731**
3	2.99	2.78	Grass	Grass	5.9	Mod	235	6	0	165	75	40	0	350	248	25	2	0	23	250	**695**
4	2.49	2.02	Grass	Grass	5.9	Mod	235	6	2	75	75	73*	0	350	248	23	2	0	21	230	**465**
5	1.46	1.24	Grass	Grass	5.7	Mod	235	6	3	20	75	73*	1	285	248	23	2	0	21	230	**285**
6	1.84	1.84	Grass	Grass	5.8	Mod	235	6	0	165	75	40	0	350	248	25	1	0	23	250	**460**
7	1.57	1.39	Grass	Grass	5.8	Mod	235	6	1	120	75	40	0	350	248	25	2	0	23	250	**348**
8	1.88	1.82	Grass	Grass	6.0	Mod	235	6	2	75	75	73*	0	350	248	23	2	0	21	230	**419**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	6	0	165	75	40	0	350	248	25	1	0	23	250	**155**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	6	1	120	75	40	0	350	248	25	2	0	23	250	**678**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	6	3	20	75	73*	2-	230	248	23	2	0	21	230	**294**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	6	2	75	75	73*	0	350	248	23	3	0	21	230	**695**
Ha	**27.75**	**25.02**																			**6004**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 250t/ha is 75kg/ha

Table 11. DCWW Preseli cake

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	0.4	0	165	75	74*	1	285	248	4.2	2	0	0.9	60	**187**
2	3.38	3.18	Grass	Grass	5.5	Mod	235		3	20	75		1	285	248		2	0			
3	2.99	2.78	Grass	Grass	5.9	Mod	235		0	165	75		0	350	248		2	0			
4	2.49	2.02	Grass	Grass	5.9	Mod	235		2	75	75		0	350	248		2	0			
5	1.46	1.24	Grass	Grass	5.7	Mod	235		3	20	75		1	285	248		2	0			
6	1.84	1.84	Grass	Grass	5.8	Mod	235		0	165	75		0	350	248		1	0			
7	1.57	1.39	Grass	Grass	5.8	Mod	235		1	120	75		0	350	248		2	0			
8	1.88	1.82	Grass	Grass	6.0	Mod	235	0.4	2	75	75	74*	0	350	248	4.2	2	0	0.9	60	**109**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	0.4	0	165	75	74*	0	350	248	4.2	1	0	0.9	60	**37**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	0.4	1	120	75	74*	0	350	248	4.2	2	0	0.9	60	**163**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	0.4	3	20	75	74*	2-	230	248	4.2	2	0	0.9	60	**77**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	0.4	2	75	75	74*	0	350	248	4.2	3	0	0.9	60	**181**
Ha	**27.75**	**25.02**																			**754**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 60t/ha is 129kg/ha

Table 12. DCWW Preseli liquid

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	1.5	0	165	75	47*	1	285	248	4.4	2	0	0.4	250	**780**
2	3.38	3.18	Grass	Grass	5.5	Mod	235		3	20	75		1	285	248		2	0			
3	2.99	2.78	Grass	Grass	5.9	Mod	235		0	165	75		0	350	248		2	0			
4	2.49	2.02	Grass	Grass	5.9	Mod	235		2	75	75		0	350	248		2	0			
5	1.46	1.24	Grass	Grass	5.7	Mod	235		3	20	75		1	285	248		2	0			
6	1.84	1.84	Grass	Grass	5.8	Mod	235		0	165	75		0	350	248		1	0			
7	1.57	1.39	Grass	Grass	5.8	Mod	235		1	120	75		0	350	248		2	0			
8	1.88	1.82	Grass	Grass	6.0	Mod	235	1.5	2	75	75	47*	0	350	248	4.4	2	0	0.4	250	**455**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	1.5	0	165	75	47*	0	350	248	4.4	1	0	0.4	250	**155**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	1.5	1	120	75	47*	0	350	248	4.4	2	0	0.4	250	**678**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	1.5	3	20	75	47*	2-	230	248	4.4	2	0	0.4	250	**320**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	1.5	2	75	75	47*	0	350	248	4.4	3	0	0.4	250	**755**
Ha	**27.75**	**25.02**																			**3143**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 250t/ha is 60kg/ha

Table 13. DCWW Strata Florida cake

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	2	0	165	75	75*	1	285	248	0.8	2	0	0.4	109	**340**
2	3.38	3.18	Grass	Grass	5.5	Mod	235		3	20	75		1	285	248		2	0			
3	2.99	2.78	Grass	Grass	5.9	Mod	235		0	165	75		0	350	248		2	0			
4	2.49	2.02	Grass	Grass	5.9	Mod	235		2	75	75		0	350	248		2	0			
5	1.46	1.24	Grass	Grass	5.7	Mod	235		3	20	75		1	285	248		2	0			
6	1.84	1.84	Grass	Grass	5.8	Mod	235		0	165	75		0	350	248		1	0			
7	1.57	1.39	Grass	Grass	5.8	Mod	235		1	120	75		0	350	248		2	0			
8	1.88	1.82	Grass	Grass	6.0	Mod	235	2	2	75	75	75*	0	350	248	0.8	2	0	0.4	109	**198**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	2	0	165	75	37	0	350	248	0.8	1	0	0.4	109	**68**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	2	1	120	75	75*	0	350	248	0.8	2	0	0.4	109	**295**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	2	3	20	75	75*	2-	230	248	0.8	2	0	0.4	109	**140**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	2	2	75	75	75*	0	350	248	0.8	3	0	0.4	109	**329**
Ha	**27.75**	**25.02**																			**1370**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 109t/ha is 238kg/ha

Table 14. DCWW Strata Florida liquid

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	6	0	165	75	27*	1	285	248	3	2	0	1.0	250	**780**
2	3.38	3.18	Grass	Grass	5.5	Mod	235		3	20	75		1	285	248		2	0			
3	2.99	2.78	Grass	Grass	5.9	Mod	235		0	165	75		0	350	248		2	0			
4	2.49	2.02	Grass	Grass	5.9	Mod	235		2	75	75		0	350	248		2	0			
5	1.46	1.24	Grass	Grass	5.7	Mod	235		3	20	75		1	285	248		2	0			
6	1.84	1.84	Grass	Grass	5.8	Mod	235		0	165	75		0	350	248		1	0			
7	1.57	1.39	Grass	Grass	5.8	Mod	235		1	120	75		0	350	248		2	0			
8	1.88	1.82	Grass	Grass	6.0	Mod	235	6	2	75	75	27*	0	350	248	3	2	0	1.0	250	**455**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	6	0	165	75	27*	0	350	248	3	1	0	1.0	250	**155**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	6	1	120	75	27*	0	350	248	3	2	0	1.0	250	**678**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	6	3	20	75	27*	2-	230	248	3	2	0	1.0	250	**320**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	6	2	75	75	27*	0	350	248	3	3	0	1.0	250	**755**
Ha	**27.75**	**25.02**																			**3143**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 250t/ha is 75kg/ha

Table 15. Andigestion

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	3.12	3.12	Grass	Grass	6.8	Mod	235	133	0	165	75	25	1	285	248	92	2	0	2.0	43	**134**
2	3.38	3.18	Grass	Grass	5.5	Mod	235	133	3	20	75	50*	1	285	248	92	2	0	2.0	43	**137**
3	2.99	2.78	Grass	Grass	5.9	Mod	235	133	0	165	75	25	0	350	248	92	2	0	2.0	43	**120**
4	2.49	2.02	Grass	Grass	5.9	Mod	235	133	2	75	75	50*	0	350	248	92	2	0	2.0	43	**87**
5	1.46	1.24	Grass	Grass	5.7	Mod	235	133	3	20	75	50*	1	285	248	92	2	0	2.0	43	**53**
6	1.84	1.84	Grass	Grass	5.8	Mod	235	133	0	165	75	25	0	350	248	92	1	0	2.0	43	**79**
7	1.57	1.39	Grass	Grass	5.8	Mod	235	133	1	120	75	25	0	350	248	92	2	0	2.0	43	**60**
8	1.88	1.82	Grass	Grass	6.0	Mod	235	133	2	75	75	50*	0	350	248	92	2	0	2.0	43	**78**
9	1.64	0.62	Grass	Grass	6.2	Mod	235	133	0	165	75	25	0	350	248	92	1	0	2.0	43	**27**
10	3.00	2.71	Grass	Grass	6.1	Mod	235	133	1	120	75	25	0	350	248	92	2	0	2.0	43	**117**
11	1.36	1.28	Grass	Grass	6.2	Mod	235	133	3	20	75	50*	2-	230	248	92	2	0	2.0	43	**55**
12	3.02	3.02	Grass	Grass	6.5	Mod	235	133	2	75	75	50*	0	350	248	92	3	0	2.0	43	**130**
Ha	**27.75**	**25.02**																			**1076**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2017)

Expected Grazing yield of 9-12t/ha

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2017)

To account for aftermath grazing, 1/2 of the P & K requirement for grazing has been added, and 10kg/ha P and 20kg/ha K is added to crop use

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 43t/ha is 249kg/ha

5 Compliance with NVZ regulations

Table 16. Compliance with NVZ regulations

<table>
<tr><td>Does the site fall within a designated NVZ?</td><td>Y ☐ N ☒ (Please skip to section 6)</td></tr>
<tr><td>Do closed periods apply for the wastes to be applied?</td><td>Y ☐ N ☐

Applicable to:

If yes, please indicate the appropriate period:

<table>
<tr><th>Start Date</th><th>End Date</th><th>Land Use</th><th>Soil Type</th><th></th></tr>
<tr><td>1st Aug</td><td>31st Dec</td><td>Tillage Land</td><td>Shallow/Sandy</td><td>☐</td></tr>
<tr><td>1st Sept</td><td>31st Dec</td><td>Grassland</td><td>Shallow/Sandy</td><td>☐</td></tr>
<tr><td>16th Sept</td><td>31st Dec</td><td>Tillage Land*</td><td>Shallow/Sandy</td><td>☐</td></tr>
<tr><td>1st Oct</td><td>31st Jan</td><td>Tillage Land</td><td>All Other Soils</td><td>☐</td></tr>
<tr><td>15th Oct</td><td>31st Jan</td><td>Grassland</td><td>All Other Soils</td><td>☐</td></tr>
</table>

*For Tillage Land with crops sown on or before 15th September

If no, applications will be carried out as per CoGAP i.e. when ground conditions are suitable and when no heavy rain is forecast.</td></tr>
<tr><td>Will application rates comply with crop requirement and field/whole farm limit?</td><td>Refer to Table 6-15</td></tr>
<tr><td>Previous applications:</td><td>Refer to Table 4 in LPD1.</td></tr>
</table>

6 Benefits and nutrients supplied to the soil or crop from this application

6.1 Receiving soils

The nutrient status of individual fields to be registered are provided in Tables 6-15 above. General soil type(s) for the fields to be registered are;

Table 17. Soil type

Light sand soils	Soils which are sand, loamy sand or sandy loam to 40cm depth and are sand or loamy sand between 40 and 80 cm, or over sandstone rock.	☐
Shallow soils	Soils over impermeable subsoils and those where the parent rock (chalk, limestone or other rock) is within 40cm of the soil surface. Sandy soils developed over sandstone rock should be regarded as light sand soils.	☐
Medium soils	Mostly medium-textured mineral soils that do not fall into any other soil category. This includes sandy loams over clay, deep loams, and silty or clayey topsoils that have sandy or loamy subsoils.	☒
Deep clayey soils	Soils with predominantly sandy clay loam, silty clay loam, clay loam, sandy clay, silty clay or clay topsoil overlying clay subsoil to more than 40cm depth. Deep clayey soils normally need artificial field drainage.	☐
Deep silty soils	Soils of sandy silt loam, silt loam or silty clay loam textures to 100 cm depth or more. Silt soils formed on marine alluvium, warp soils (river alluvium) and brickearth soils are in this category. Silty clays of low fertility should be regarded as other mineral soils.	☐
Organic soils	Soils that are predominantly mineral but with between 10 and 20% organic matter to depth. These can be distinguished by darker colouring that stains the fingers black or grey.	☐
Peat soils	Soils that contain more than 20% organic matter derived from sedge or similar peat material.	☐

The soil analyses (**Soil Analysis**) shows the soils to have ample background concentrations of Mg (i.e. ADAS Index of 1-3). It is therefore unlikely that the crop will require any additional input of Mg over the course of the cropping cycle. None of the wastes contain any notable concentration of Mg and therefore applications of these materials will not increase background levels in the receiving soil over time.

6.2 Waste characterisation

Full characterisations of individual wastes with total and available nutrients at the recommended rates for each waste stream are supplied in **Waste Analysis**. This information is further summarised against the nutrient requirements for proposed crops in Tables 6-15 above.

The limiting factors for the different wastes are as follows;

- Bolton Hill, Llechryd, and Preseli cakes: total N or total P on fields with P index ≥2
- Bontgoch and Strata Florida cakes, and Strata Florida liquid: arsenic or total P on fields with P index ≥2
- Bontgoch and Llechryd liquids: max rate of 250t/ha or total P on fields with P index ≥2
- Preseli liquid: max rate of 250t/ha
- Andigestion: total N

6.3 *Summary of benefits*

These wastes are a source of essential elements N, P, K, macronutrients Mg, Ca, S and provide trace amounts of micronutrients. Wastes are beneficially used to replace a proportion of the bagged mineral fertiliser used by farmers. The recommended application rates shown in Tables 6-15 are based on the crop requirement and soil analysis.

Clean water treatment sludges contain significant amounts of organic matter. Additions of organic matter to soil will improve soil structural stability, biological activity, water and nutrient holding capacity, i.e. resistance to drought, and reduction of localised flooding, reduced leaching of nutrients, and improved workability in soil. Organic matter is a particularly good source of N and S, and organic acids that aid nutrient solubility and uptake, as well as enhancing microbial activity for enhanced nutrient cycling in soils.

6.4 *Additional requirements*

Fields may require additional N, P, and K to achieve optimum yield.

7 Potential negative impacts to the soil or crop from this application

7.1 *Potentially Toxic Elements (PTEs)*

All the wastes contain traces of PTEs, however concentrations applied to the receiving soils are below maximum upper limits for heavy metal applications described in the Sludge (Use in Agriculture) Regulations 1989 (SI, 1989). Refer to interpretations in **Waste Analysis**.

7.2 *Other waste characteristics*

The pH levels in the wastes range from 5.5 to 8.3.

It is unlikely that soil pH will decrease following the application detailed here due to the extensive buffering capacity of the receiving soils. The pH levels of the receiving soils are ≥ 5.5 therefore it is unlikely that availability of any naturally occurring heavy metals present in these soils will become more available after application of these wastes.

7.3 *Operational factors*

1. Solid wastes will be spread using conventional rear discharge spreaders.
2. Liquid wastes will be surface spread, applied using a low trajectory splash plate or trailing shoe for digestate.
3. Potential compaction of receiving soil will be mitigated by suitable adjustment of tyres/tyre pressure to match soil conditions, direction of spreading and load to be spread.
4. Wastes will be applied when ground and weather conditions are suitable, following CoGAP to avoid soil damage including wheel ruts, compaction, structural damage, erosion and run-off.
5. Where SSSI designated sites borders fields, they will be protected by a 20m non-spreading buffer zone.

8 Sensitive human and environmental receptors

Please refer to site specific risk assessment (**C SSRA**). Locations of sensitive receptors are shown in the maps **C-01**. Prevailing winds are south-westerly.

9 Practices to reduce the impacts of the operation on identified sensitive receptors

Mitigation measures to safeguard site-specific high and moderate likelihood of emission detection by sensitive receptors are shown in **C SSRA**. Generic measures (in addition to permit requirements and following the EMS) to reduce potential negative impacts of the proposed spreading operation will be as follows;

1. Spreading will only be undertaken when weather conditions are suitable within restrictions outlined in CoGAP and any relevant closed periods.
2. Spreading will not be carried out in any areas of a field that will be sub-soiled.
3. Machinery operations will take account of soil conditions, slopes *etc.*
4. Liquid spreading machinery will be turned off and lifted away from soil prior to turning at the end of each run.
5. Machinery will be checked daily when in use, regularly serviced and spreading equipment calibrated. Umbilical hoses will be regularly checked for damage to prevent leaks.
6. Machinery turns will not be executed in the buffer strips.
7. Waste deliveries to field/stores will be supervised.
8. All spillages will be reported immediately to NRW.

10 Contingency planning

Replacement spreading machinery will be available to prevent waste being retained in faulty machinery. Hire vehicles will be used if required. All machinery will be fully serviced.
There will be a sufficient number of trained staff available to ensure that the operation continues throughout operational hours (*i.e.* there will be sufficient cover for illness, holiday *etc.*).
In adverse weather, storage is available until ground/weather conditions become favourable for land application.
In circumstances where the wastes cannot be stored or spread beyond normal capacities, wastes will be diverted to a local alternative deployment or DCWW sewage treatment works.

Dŵr Cymru Welsh Water

Historical Data

SPT Number	SPT Description	Date Time Taken	Det Code	Det Description	Result Value	Result Qual	Result Check	Min Limit	Max Limit	Original Sample	PC	Sample Status	Result Status	Sampler Comment
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9271	Cadmium	0.39					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9282	% Minerals	55.3					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	4620	pH	6.4					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	7774	Mercury	0.34	<				6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9281	% Dry solids	14.7					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9284	% P (dry weight)	0.441					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9234	Sulphur	5860					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	288	Aluminium	154000					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	238	Magnesium	1020					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9275	Nickel	28.8					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9233	Ammoniacal nitrogen	52					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9278	Iron	23400					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9276	Lead	9.3					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9272	Chromium	10.8					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9285	% N (dry weight)	1.32					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9273	Copper	67.9					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	8241	Volatile solids	44.7					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9277	Zinc	119					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	357	Arsenic	17.4					6879844	ME	A	A	
120038	BOLTON HILL Sludge Tankering Point	13/Jan/2021 09:20	9283	% K (dry weight)	0.0707					6879844	ME	A	A	

Det Comment	OOH
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
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EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N
EMPTY	N

Sample Analysis Report

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Sampling Point No:	100521	**Location:**	BONTGOCH WTW SLUDGE TANKERING POINT
Date Sampled:	29/01/2021	**Time Taken:**	11:34
Laboratory:	ALS	**Sample ID:**	6894538
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results

Dŵr Cymru
Welsh Water

Sample Analysis Report

Dŵr Cymru Welsh Water

Sample Analysis Report

Code		Result	Units	Qualifier	Lower Limit
238	Magnesium	1220	mg/kg		
288	Aluminium	5980	mg/kg		
357	Arsenic	14.3	mg/kg		
4620	pH	7	pH		
7774	Mercury	0.3	mg/kg	<	
8241	Volatile solids	44.599998	%		
9233	Ammoniacal nitrogen	35.799999	mg/kg	<	
9234	Sulphur	2350	mg/kg		
9271	Cadmium	1.02	mg/kg		
9272	Chromium	16	mg/kg		
9273	Copper	16.4	mg/kg		
9275	Nickel	20.200001	mg/kg		
9276	Lead	49.400002	mg/kg		
9277	Zinc	353	mg/kg		
9278	Iron	331000	mg/kg		
9281	% Dry solids	16.9	%		
9282	% Minerals	55.400002	%		
9283	% K (dry weight)	0.0087	mg/kg	<	
9284	% P (dry weight)	0.743	%		
9285	% N (dry weight)	1.54	%		

Comments:

Signed: _____

Approved by:

Position:

Upper Limit

Sample Analysis Report

xxxx

xxxx

xxxx

xxxx

xxxx

Sampling Point No:	100521	**Location:**	BONTGOCH WTW SLUDGE TANKERING POINT
Date Sampled:	29/01/2021	**Time Taken:**	11:36
Laboratory:	ALS	**Sample ID:**	6894540
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results

Dŵr Cymru
Welsh Water

Sample Analysis Report

Dŵr Cymru Welsh Water

Sample Analysis Report

Code		Result	Units	Qualifier	Lower Limit
238	Magnesium	1470	mg/kg		
288	Aluminium	7220	mg/kg		
357	Arsenic	12.9	mg/kg		
4620	pH	6.7	pH		
7774	Mercury	0.28	mg/kg	<	
8241	Volatile solids	43.099998	%		
9233	Ammoniacal nitrogen	82.599998	mg/kg	<	
9234	Sulphur	2690	mg/kg		
9271	Cadmium	1.1	mg/kg		
9272	Chromium	20.9	mg/kg		
9273	Copper	19.5	mg/kg		
9275	Nickel	25.700001	mg/kg		
9276	Lead	60.400002	mg/kg		
9277	Zinc	424	mg/kg		
9278	Iron	392000	mg/kg		
9281	% Dry solids	7.39	%		
9282	% Minerals	56.900002	%		
9283	% K (dry weight)	0.00982	mg/kg		
9284	% P (dry weight)	0.892	%		
9285	% N (dry weight)	1.81	%		

Comments:

Signed: _____

Approved by:

Position:

Upper Limit

Sample Analysis Report

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Sampling Point No:	100504	**Location:**	LLECHRYD WTW SLUDGE TANKERING POINT
Date Sampled:	08/10/2020	**Time Taken:**	14:28
Laboratory:	ALS	**Sample ID:**	6792626
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results

Sample Analysis Report

Dŵr Cymru Welsh Water

Sample Analysis Report

Code		Result	Units	Qualifier	Lower Limit
238	Magnesium	1360	mg/kg		
288	Aluminium	6860	mg/kg		
357	Arsenic	18.4	mg/kg		
4620	pH	5.5	pH		
7774	Mercury	0.18	mg/kg	<	
8241	Volatile solids	51.799999	%		
9233	Ammoniacal nitrogen	73	mg/kg		
9234	Sulphur	4820	mg/kg		
9271	Cadmium	0.09	mg/kg	<	
9272	Chromium	15.8	mg/kg		
9273	Copper	35.5	mg/kg		
9275	Nickel	16.5	mg/kg		
9276	Lead	31.299999	mg/kg		
9277	Zinc	117	mg/kg		
9278	Iron	243000	mg/kg		
9281	% Dry solids	11.3	%		
9282	% Minerals	48.200001	%		
9283	% K (dry weight)	0.0589	mg/kg		
9284	% P (dry weight)	0.308	%		
9285	% N (dry weight)	1.29	%		

Comments:

Signed: _____

Approved by:

Position:

Upper Limit

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

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LLECHRYDD WWTE

LIQUID WASTE

SLURRY/SLUDGE ANALYSIS RESULTS

Laboratory References	
Report Number	43906
Sample Number	105647

Sample Reference :

LLECHRYDD

Sample Matrix : SLURRY/SLUDGE

Date Received	08-MAR-2021
Date Reported	12-MAR-2021

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Oven Dry Solids	5.89	%
Conductivity 1:6	87.0	uS/cm
Total Kjeldahl Nitrogen	0.03	% w/w
Ammonium Nitrogen	<25	mg/kg
Total Phosphorus (P)	140	mg/kg
Total Potassium (K)	94.3	mg/kg
Total Magnesium (Mg)	229	mg/kg
Total Copper (Cu)	2.25	mg/kg
Total Zinc (Zn)	9.56	mg/kg
Total Sulphur (S)	170	mg/kg

Released by ..... *Myles Nicholson* ..... Date ..... *12/03/21* .....

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LLECHRYDD WWTE

LIQUID WASTE

SLURRY/SLUDGE ANALYSIS RESULTS

Laboratory References	
Report Number	43906
Sample Number	105647

Sample Reference :

LLECHRYDD

Sample Matrix : SLURRY/SLUDGE

Date Received	08-MAR-2021
Date Reported	12-MAR-2021

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Calcium (Ca)	156	mg/kg
Total Molybdenum (Mo)	0.12	mg/kg
Total Lead (Pb)	2.38	mg/kg
Total Cadmium (Cd)	0.02	mg/kg
Total Mercury (Hg)	<0.05	mg/kg
Total Nickel (Ni)	1.79	mg/kg
Total Chromium (Cr)	1.94	mg/kg
Total Sodium (Na)	14.8	mg/kg
pH 1:6 [Fresh]	5.44	
Organic Matter LOI	1.11	% w/w

Released by *Myles Nicholson* Date *12/03/21*

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LLECHRYDD WWTE

LIQUID WASTE

SLURRY/SLUDGE ANALYSIS RESULTS

Laboratory References	
Report Number	43906
Sample Number	105647

Sample Reference :

LLECHRYDD

Sample Matrix : SLURRY/SLUDGE

Date Received	08-MAR-2021
Date Reported	12-MAR-2021

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Lime Equivalent as CaCO3	<2	% w/w
Total Aluminium	989	mg/kg
Fluoride [100:1 H2S04 Soluble]	<10	mg/kg
Total Arsenic (As)	1.13	mg/kg
Total Selenium (Se)	0.09	mg/kg
Neutralising Value as CaO [TNV]	<1	% w/w

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Sample Analysis Report

xxxx

xxxx

xxxx

xxxx

xxxx

Sampling Point No:	100506	**Location:**	PRESELI WTW SLUDGE Tankering Point (New Works)
Date Sampled:	13/01/2021	**Time Taken:**	09:07
Laboratory:	ALS	**Sample ID:**	6879830
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results

Sample Analysis Report

Dŵr Cymru Welsh Water

Sample Analysis Report

Code		Result	Units	Qualifier	Lower Limit
238	Magnesium	556	mg/kg		
288	Aluminium	108000	mg/kg		
357	Arsenic	15	mg/kg		
4620	pH	6.6	pH		
7774	Mercury	0.32	mg/kg	<	
8241	Volatile solids	42.599998	%		
9233	Ammoniacal nitrogen	37	mg/kg	<	
9234	Sulphur	7410	mg/kg		
9271	Cadmium	0.83	mg/kg		
9272	Chromium	5.66	mg/kg		
9273	Copper	27.700001	mg/kg		
9275	Nickel	28	mg/kg		
9276	Lead	2.02	mg/kg	<	
9277	Zinc	147	mg/kg		
9278	Iron	13200	mg/kg		
9281	% Dry solids	16.4	%		
9282	% Minerals	57.400002	%		
9283	% K (dry weight)	0.0395	mg/kg		
9284	% P (dry weight)	0.33	%		
9285	% N (dry weight)	1.31	%		

Comments:

Signed: _____

Approved by:

Position:

Upper Limit

Sample Analysis Report

xxxx

xxxx

xxxx

xxxx

xxxx

Sampling Point No:	100506	**Location:**	PRESELI WTW SLUDGE Tankering Point (New Works)
Date Sampled:	13/01/2021	**Time Taken:**	09:09
Laboratory:	ALS	**Sample ID:**	6879832
No. of Results:	20		
Sampling Reason:	WTW Sludge - Product Monitoring (SW_ME)		
Type:	WTW Sludge (SW)		

Sample Results

Sample Analysis Report

Dŵr Cymru Welsh Water

Sample Analysis Report

Code		Result	Units	Qualifier	Lower Limit
238	Magnesium	570	mg/kg		
288	Aluminium	173000	mg/kg		
357	Arsenic	17.299999	mg/kg	<	
4620	pH	6.7	pH		
7774	Mercury	1.16	mg/kg	<	
8241	Volatile solids	43.200001	%		
9233	Ammoniacal nitrogen	354	mg/kg	<	
9234	Sulphur	11800	mg/kg		
9271	Cadmium	0.98	mg/kg		
9272	Chromium	3.92	mg/kg	<	
9273	Copper	29.1	mg/kg		
9275	Nickel	13.9	mg/kg		
9276	Lead	7.49	mg/kg	<	
9277	Zinc	225	mg/kg		
9278	Iron	13900	mg/kg		
9281	% Dry solids	1.73	%		
9282	% Minerals	56.799999	%		
9283	% K (dry weight)	0.0949	mg/kg		
9284	% P (dry weight)	0.473	%		
9285	% N (dry weight)	1.39	%		

Comments:

Signed: _____

Approved by:

Position:

Upper Limit

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STRATA FLORIDA WTW

CAKE

CAKE ANALYSIS RESULTS (Metric Units)

Sample Reference : STRATA FLORIDA CAKE

Sample Matrix : CAKE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept as the dry ground sample for at least 1 month.

Laboratory References	
Report Number	38749
Sample Number	119897

Date Received	01-FEB-2021
Date Reported	09-FEB-2021

ANALYTICAL RESULTS

Determinand on a DM basis unless otherwise indicated	Units	Result	Amount per fresh tonne	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		6.09			
Oven Dry Matter	%	14.1	141.00	16129	kg DM
Total Nitrogen	% w/w	1.55	2.19	250	kg N
Ammonium Nitrogen	mg/kg	128	0.02	2.06	kg NH4-N
Total Phosphorus (P)	% w/w	0.213	0.69	78.67	kg P2O5
Total Potassium (K)	% w/w	<0.005			kg K2O
Total Magnesium (Mg)	% w/w	0.016	0.04	4.28	kg MgO
Total Sulphur (S)	% w/w	0.401	1.41	161.69	kg SO3
Total Copper (Cu)	mg/kg	17.3	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	75.7	0.01	1.22	kg Zn
Total Sodium (Na)	% w/w	0.052	0.10	11.31	kg Na2O
Total Calcium (Ca)	mg/kg	751	0.11	12.11	kg Ca
Equivalent field application rate		——	1.00	114.39	tonnes/ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by ..... *Myles Nicholson* ..... Date ..... *09/02/21* .....

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STRATA FLORIDA WTW

CAKE

CAKE ANALYSIS RESULTS (Metric Units)

Sample Reference : STRATA FLORIDA CAKE

Sample Matrix : CAKE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept as the dry ground sample for at least 1 month.

Laboratory References	
Report Number	38749
Sample Number	119897

Date Received	01-FEB-2021
Date Reported	09-FEB-2021

ANALYTICAL RESULTS

Determinand on a DM basis unless otherwise indicated	Units	Result
Conductivity 1:6 [Fresh]	uS/cm	72.0
Total Iron (Fe)	mg/kg	12449
Total Molybdenum (Mo)	mg/kg	0.596
Total Lead (Pb)	mg/kg	34.1
Total Cadmium (Cd)	mg/kg	0.314
Total Mercury (Hg)	mg/kg	0.161
Total Nickel (Ni)	mg/kg	8.32
Total Chromium (Cr)	mg/kg	6.31
Organic Matter LOI	% w/w	67.3
Lime Equivalent as CaCO3	% w/w	<2
Total Aluminium	mg/kg	116537
Fluoride [100:1 H2S04 Soluble]	mg/kg	364
Total Arsenic (As)	mg/kg	23.1
Total Selenium (Se)	mg/kg	2.50
N. V. as CaO equivalents	% w/w	<1

Released by ..... *Myles Nicholson* ..... Date ..... *09/02/21* .....

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How does your sample analysis compare with the 'standard' figures for organic manures?

Farmyard Manure	Dry Matter (% DM)	Total Nitrogen (Kg N/t)	Total Phosphate (Kg P2O5/t)	Total Potash (Kg K2O/t)	Total Sulphur (Kg SO3/t)	Total Magnesium (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

Poultry Manure	Dry Matter (% DM)	Total Nitrogen (Kg N/t)	Total Phosphate (Kg P2O5/t)	Total Potash (Kg K2O/t)	Total Sulphur (Kg SO3/t)	Total Magnesium (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

Cattle & Pig Slurries	Dry Matter (% DM)	Total Nitrogen (Kg N/m3)	Total Phosphate (Kg P2O5/m3)	Total Potash (Kg K2O/m3)	Total Sulphur (Kg SO3/m3)	Total Magnesium (Kg MgO/m3)
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.
The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

Biosolids	Dry Matter (% DM)	Total Nitrogen (Kg N/t)	Total Phosphate (Kg P2O5/t)	Total Potash (Kg K2O/t)	Total Sulphur (Kg SO3/t)	Total Magnesium (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stablised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

Other Organic Manures	Dry Matter	Total Nitrogen	Total Phosphate	Total Potash	Total Sulphur	Total Magnesium
Composts	(% DM)	(Kg N/t)	(Kg P2O5/t)	(Kg K2O/t)	(Kg SO3/t)	(Kg MgO/t)
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
Digestates						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
Paper Crumble						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
Water Treatment Cake						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
Food industry 'wastes'	(% DM)	(Kg N/m3)	(Kg P2O5/m3)	(Kg K2O/m3)	(Kg SO3/m3)	(Kg MgO/m3)
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9th edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.

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STRATA FLORIDA WTW

SLUDGE

SLURRY/SLUDGE ANALYSIS RESULTS

Sample Reference :

STRATA FLORIDA LIQ

Sample Matrix : SLURRY/SLUDGE

Laboratory References	
Report Number	38719
Sample Number	104212

Date Received	01-FEB-2021
Date Reported	05-FEB-2021

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Oven Dry Solids	1.85	%
Conductivity 1:6	25.0	uS/cm
Total Kjeldahl Nitrogen	0.03	% w/w
Ammonium Nitrogen	<25	mg/kg
Total Phosphorus (P)	47.9	mg/kg
Total Potassium (K)	<10	mg/kg
Total Magnesium (Mg)	<10	mg/kg
Total Copper (Cu)	0.38	mg/kg
Total Zinc (Zn)	1.57	mg/kg
Total Sulphur (S)	106	mg/kg

Released by *Myles Nicholson* Date *05/02/21*

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STRATA FLORIDA WTW

SLUDGE

SLURRY/SLUDGE ANALYSIS RESULTS

Sample Reference :

STRATA FLORIDA LIQ

Sample Matrix : SLURRY/SLUDGE

Laboratory References	
Report Number	38719
Sample Number	104212

Date Received	01-FEB-2021
Date Reported	05-FEB-2021

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Calcium (Ca)	18.6	mg/kg
Total Iron (Fe)	291	mg/kg
Total Molybdenum (Mo)	<0.05	mg/kg
Total Lead (Pb)	0.68	mg/kg
Total Cadmium (Cd)	<0.01	mg/kg
Total Mercury (Hg)	<0.05	mg/kg
Total Nickel (Ni)	<0.2	mg/kg
Total Chromium (Cr)	0.28	mg/kg
Total Sodium (Na)	21.4	mg/kg
pH 1:6 [Fresh]	5.81	

Released by *Myles Nicholson* Date *05/02/21*

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STRATA FLORIDA WTW

SLUDGE

SLURRY/SLUDGE ANALYSIS RESULTS

Sample Reference :

STRATA FLORIDA LIQ

Sample Matrix : SLURRY/SLUDGE

Laboratory References	
Report Number	38719
Sample Number	104212

Date Received	01-FEB-2021
Date Reported	05-FEB-2021

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Organic Matter LOI	1.18	% w/w
Lime Equivalent as CaCO3	<2	% w/w
Total Aluminium	2534	mg/kg
Fluoride [100:1 H2S04 Soluble]	12.7	mg/kg
Total Arsenic (As)	<0.5	mg/kg
Total Selenium (Se)	0.06	mg/kg
Neutralising Value as CaO [TNV]	<1	% w/w

Released by *Myles Nicholson* Date *05/02/21*

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REAL BCS Approved Testing Laboratory

PAS110 2014 Certificate of Analysis

Client: ANDIGESTION LTD
(T489) WINGMOOR FARM EAST
STOKE ORCHARD ROAD
BISHOPS CLEEVE
GLOUCESTERSHIRE
GL52 7DG

Originator: WINGMOOR FARM EAST
WHOLE DIGESTATE

Lab ID: 20009 - 98914
Sample ID: 08/20 25/08/20
Sample Type: Whole Digestate

Certification Code: AND-WIN-WD
BCS Number: AD00046

Date Received: 26/08/2020
Date Reported: 02/09/2020
Date Sampled: 25/08/2020

Potentially Toxic Elements in WD / SL / SF, on a fresh weight basis

Parameter	Units	Result	Upper Limit	Pass	Method of Test
Cadmium (Cd)	mg/kg	0.01	0.72 mg / kg	Y	BS EN 15587 (soluble in aqua regia)
Chromium (Cr)	mg/kg	0.53	48 mg / kg	Y	BS EN 15587 (soluble in aqua regia)
Copper (Cu)	mg/kg	1.18	96 mg / kg	Y	BS EN 15587 (soluble in aqua regia)
Lead (Pb)	mg/kg	<0.5	96 mg / kg	Y	BS EN 15587 (soluble in aqua regia)
Mercury (Hg)	mg/kg	<0.05	0.48 mg / kg	Y	BS EN 15587 (soluble in aqua regia)
Nickel (Ni)	mg/kg	0.53	24 mg / kg	Y	BS EN 15587 (soluble in aqua regia)
Zinc	mg/kg	5.03	192 mg / kg	Y	BS EN 15587 (soluble in aqua regia)

Stability of WD / SL / SF on a fresh weight basis

Parameter	Units	Result	Upper Limit	Pass	Method of Test
Volatile Fatty Acids	g COD / g VS	N/A	0.774 g VS		Chromatography

Test is valid unless otherwise specified

Physical contaminants in WD / SL / SF on a fresh weight basis

Parameter	Units	Result	Upper Limit	Pass	Method of Test
Plastics > 2mm	kg / t	0.051			NRM-SOP-JAS-497
Glass > 2mm	kg / t	Zero			NRM-SOP-JAS-497
Metals > 2mm	kg / t	0.003			NRM-SOP-JAS-497
Other > 2mm	kg / t	Zero			NRM-SOP-JAS-497
Total > 2mm	kg / t	0.054	0.22 kg / t	Y	NRM-SOP-JAS-497
of which Sharps:	kg / t	Zero	Zero in sample tested	Y	NRM-SOP-JAS-497
Stones > 5mm	kg / t	Zero	19.2 kg / t		NRM-SOP-JAS-497

Zero - No visible contaminants were found in the sample as submitted

The sample was dispatched within 1 working day after sampling
The sample was received within 48 hours after dispatch.
The sample was received in a cool box with ice packs

Released by: *Linaben Patel* **Date: 02/09/2020**

REAL BCS Approved Testing Laboratory

PAS110 2014 Certificate of Analysis (Continued)

Client: ANDIGESTION LTD
(T489) WINGMOOR FARM EAST
STOKE ORCHARD ROAD
BISHOPS CLEEVE
GLOUCESTERSHIRE
GL52 7DG

Originator: WINGMOOR FARM EAST
WHOLE DIGESTATE

Lab ID: 20009 - 98914
Sample ID: 08/20 25/08/20
Sample Type: Whole Digestate

Certification Code: AND-WIN-WD
BCS Number: AD00046

Date Received: 26/08/2020
Date Reported: 02/09/2020
Date Sampled: 25/08/2020

Characteristics of WD / SL / SF for declaration, without limit values, that influence application rates
(Results on an 'as received' basis)

Parameter	Units	Result	M *	Amount per fresh tonne or m^3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH		8.3	1			
Oven Dry Matter	% m/m	4.90	2	49.00	2112	Kg DM
Loss On Ignition	% m/m	3.32	3	33.20	1431	Kg OM
Total Kjeldahl Nitrogen (N)	% m/m	0.58	4	5.80	250	Kg N
Ammoniacal Nitrogen (NH4-N)	mg/kg	3101	5	3.10	133.65	Kg NH4-N
Total Phosphorus (P)	mg/kg	507	6	1.16	50.04	Kg P2O5
Total Potassium (K)	mg/kg	1976	6	2.37	102.20	Kg K2O
Total Magnesium (Mg)	mg/kg	105	6	0.17	7.51	Kg MgO
Total Sulphur (S)	mg/kg	427	6	1.07	46.01	Kg SO3
Equivalent field application rate		——		1.00	43.10	tonnes or m^3 / ha

*** Method of Test**

1 BS EN 13037
2 BS EN 14346
3 BS EN 15169
4 BS EN 13654-1 (Kjeldahl)
5 Sciantec SOP S1162 (Kjeldahl)
6 BS EN 15587 (soluble in aqua regia)

REAL BCS Approved Testing Laboratory

PAS110 2014 Certificate of Analysis (Continued)

Client: ANDIGESTION LTD
(T489) WINGMOOR FARM EAST
STOKE ORCHARD ROAD
BISHOPS CLEEVE
GLOUCESTERSHIRE
GL52 7DG

Originator: WINGMOOR FARM EAST
WHOLE DIGESTATE

Lab ID: 20009 - 98914
Sample ID: 08/20 25/08/20
Sample Type: Whole Digestate

Certification Code: AND-WIN-WD
BCS Number: AD00046

Date Received: 26/08/2020
Date Reported: 02/09/2020
Date Sampled: 25/08/2020

Pathogens (human and animal indicator species) **in WD / SL / SF**

Parameter	Units	Result Rep 1	Result Rep 2	Result Rep 3	Result Rep 4	Result Rep 5	Pass	Method of Test
Salmonella		Absent	Absent	Absent	Absent	Absent	Y	Part II schedule of ABP regulations 2005
E. coli	CFU/g	<10	<10	<10	<10	<10	Y	Part III schedule of ABP regulations 2005

For Salmonella spp 5 out of 5 sub-sample results must be ABSENT in the quantity tested.

For Escherichia coli 4 out of 5 sub-sample results must be less than or equal to 1000 CFU/g but none may be greater than 5000 CFU/g.

How does your sample analysis compare with the 'standard' figures for organic manures?

Farmyard Manure	Dry Matter (% DM)	Total Nitrogen (Kg N/t)	Total Phosphate (Kg P2O5/t)	Total Potash (Kg K2O/t)	Total Sulphur (Kg SO3/t)	Total Magnesium (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

Poultry Manure	Dry Matter (% DM)	Total Nitrogen (Kg N/t)	Total Phosphate (Kg P2O5/t)	Total Potash (Kg K2O/t)	Total Sulphur (Kg SO3/t)	Total Magnesium (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

Cattle & Pig Slurries	Dry Matter (% DM)	Total Nitrogen (Kg N/m3)	Total Phosphate (Kg P2O5/m3)	Total Potash (Kg K2O/m3)	Total Sulphur (Kg SO3/m3)	Total Magnesium (Kg MgO/m3)
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.
The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

Biosolids	Dry Matter (% DM)	Total Nitrogen (Kg N/t)	Total Phosphate (Kg P2O5/t)	Total Potash (Kg K2O/t)	Total Sulphur (Kg SO3/t)	Total Magnesium (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stablised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

Other Organic Manures	Dry Matter	Total Nitrogen	Total Phosphate	Total Potash	Total Sulphur	Total Magnesium
Composts	(% DM)	(Kg N/t)	(Kg P2O5/t)	(Kg K2O/t)	(Kg SO3/t)	(Kg MgO/t)
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
Digestates						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
Paper Crumble						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
Water Treatment Cake						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
Food industry 'wastes'	(% DM)	(Kg N/m3)	(Kg P2O5/m3)	(Kg K2O/m3)	(Kg SO3/m3)	(Kg MgO/m3)
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9th edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.

DCWW

Analysis of Bolton Hill cake

Date: 13.1.2021 Sample ID. 6879844

Application rate (t/ha)	**50**
Application rate (t/acre)	**20.0**
pH	**6.4**
Dry solids (%)	**14.7**
Organic matter (%)	**44.7**
Conductivity (µS/cm)	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.32	%	1.94	97.0	0.01	0.4
Ammonium-N	52	mg/kg	0.01	0.4		
Phosphorus (P)	4410	mg/kg	0.65	32.4		
Phosphate (P_2O_5)			1.48	73.9	0.3	37.0
Potassium (K)	707	mg/kg	0.10	5.2		
Potash (K_2O)			0.12	6.2	0.0	5.6
Magnesium (Mg)	1020	mg/kg	0.15	7.5		
Magnesium (MgO)			0.24	12.0	0.0	1.2
Sulphur (S)	5860	mg/kg	0.86	43.1		
Sulphur (SO_3)			2.15	107.7	0.2	10.8
Calcium (Ca)		mg/kg	0.0	0.0		
Sodium (Na)		mg/kg	0.00	0.0		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	119.0	mg/kg	17.5	0.87	15.00
Copper	67.9	mg/kg	9.98	0.50	7.50
Nickel	28.8	mg/kg	4.23	0.21	3.00
Lead	9.3	mg/kg	1.37	0.07	15.00
Cadmium	0.4	mg/kg	0.06	0.00	0.15
Chromium	10.8	mg/kg	1.59	0.08	15.00
Mercury	0.3	mg/kg	0.05	0.00	0.10
Arsenic	17.4	mg/kg	2.56	0.13	0.70
Aluminium	154000	mg/kg	22638	1132	-
Iron	23400	mg/kg	3439.80	171.99	-

DCWW

Analysis of Bontgoch cake

Date: 29 Jan 21 Sample ID. 6894538

Application rate (t/ha)	**52**
Application rate (t/acre)	**20.8**
pH	**7.0**
Dry solids (%)	**16.9**
Organic matter (%)	**44.6**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.54	%	2.60	135.3	0.01	0.3
Ammonium-N	35.8	mg/kg	0.01	0.3		
Phosphorus (P)	7430	mg/kg	1.26	65.3		
Phosphate (P^2O^5)			2.86	148.9	0.6	74.4
Potassium (K)	87	mg/kg	0.01	0.8		
Potash (K^2O)			0.02	0.9	0.0	0.8
Magnesium (Mg)	1220	mg/kg	0.21	10.7		
Magnesium (MgO)			0.33	17.2	0.1	1.7
Sulphur (S)	2350	mg/kg	0.40	20.7		
Sulphur (SO_3)			0.99	51.6	0.1	5.2
Calcium (Ca)		mg/kg	0.0	0.0		
Sodium (Na)		mg/kg	0.00	0.0		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	353	mg/kg	59.7	3.10	15.00
Copper	16.4	mg/kg	2.77	0.14	7.50
Nickel	20.2	mg/kg	3.41	0.18	3.00
Lead	49.4	mg/kg	8.35	0.43	15.00
Cadmium	0.5	mg/kg	0.09	0.00	0.15
Chromium	16.0	mg/kg	2.70	0.14	15.00
Mercury	0.3	mg/kg	0.05	0.00	0.10
Arsenic	14.3	mg/kg	2.42	0.13	0.70
Aluminium	5980	mg/kg	1011	53	-
Iron	331000	mg/kg	55939.00	2908.83	-

DCWW

Analysis of Bontgoch liquid

Date: 29 Jan 21 Sample ID. 6894540

Application rate (t/ha)	**100**
Application rate (t/acre)	**40.0**
pH	**6.7**
Dry solids (%)	**7.4**
Organic matter (%)	**43.1**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.81	%	1.34	133.8	0.01	0.6
Ammonium-N	82.6	mg/kg	0.01	0.6		
Phosphorus (P)	8920	mg/kg	0.66	65.9		
Phosphate (P^2O^5)			1.50	150.3	0.3	75.1
Potassium (K)	98	mg/kg	0.01	0.7		
Potash (K^2O)			0.01	0.9	0.0	0.8
Magnesium (Mg)	1470	mg/kg	0.11	10.9		
Magnesium (MgO)			0.17	17.4	0.0	1.7
Sulphur (S)	2690	mg/kg	0.20	19.9		
Sulphur (SO_3)			0.50	49.7	0.0	5.0
Calcium (Ca)		mg/kg	0.0	0.0		
Sodium (Na)		mg/kg	0.00	0.0		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	424.0	mg/kg	31.3	3.13	15.00
Copper	19.5	mg/kg	1.44	0.14	7.50
Nickel	25.7	mg/kg	1.90	0.19	3.00
Lead	60.4	mg/kg	4.46	0.45	15.00
Cadmium	0.5	mg/kg	0.03	0.00	0.15
Chromium	20.9	mg/kg	1.54	0.15	15.00
Mercury	0.3	mg/kg	0.02	0.00	0.10
Arsenic	12.9	mg/kg	0.95	0.10	0.70
Aluminium	7220	mg/kg	534	53	-
Iron	392000	mg/kg	28968.80	2896.88	-

DCWW

Analysis of Llechyryd cake

Date: 08.10.2020 Sample ID. 6792626

Application rate (t/ha)	**170**
Application rate (t/acre)	**68.0**
pH	**5.5**
Dry solids (%)	**11.3**
Organic matter (%)	**51.8**
Conductivity (µS/cm)	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.29	%	1.46	247.8	0.01	1.4
Ammonium-N	73	mg/kg	0.01	1.4		
Phosphorus (P)	3080	mg/kg	0.35	59.2		
Phosphate (P_2O_5)			0.79	134.9	0.2	67.5
Potassium (K)	589	mg/kg	0.07	11.3		
Potash (K_2O)			0.08	13.6	0.0	12.2
Magnesium (Mg)	1360	mg/kg	0.15	26.1		
Magnesium (MgO)			0.25	41.8	0.0	4.2
Sulphur (S)	4820	mg/kg	0.54	92.6		
Sulphur (SO_3)			1.36	231.5	0.1	23.1
Calcium (Ca)		mg/kg	0.0	0.0		
Sodium (Na)		mg/kg	0.00	0.0		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	117.0	mg/kg	13.2	2.25	15.00
Copper	35.5	mg/kg	4.01	0.68	7.50
Nickel	16.5	mg/kg	1.86	0.32	3.00
Lead	31.3	mg/kg	3.54	0.60	15.00
Cadmium	0.1	mg/kg	0.01	0.00	0.15
Chromium	15.8	mg/kg	1.79	0.30	15.00
Mercury	0.2	mg/kg	0.02	0.00	0.10
Arsenic	18.4	mg/kg	2.08	0.35	0.70
Aluminium	6860	mg/kg	775	132	-
Iron	243000	mg/kg	27459.00	4668.03	-

DCWW

Analysis of Llechyrydd liquid

Date 08/03/2021 **Lab ref. 43906**

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**5.4**
Dry solids (%)	**5.9**
Organic matter content (%)	**1.1**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.03	%	0.30	75	0.03	6
Ammonium-N	25	mg/kg	0.03	6		
Phosphorus (P)	140	mg/kg	0.14			
Phosphate (P_2O_5)			0.32	80	0.16	40
Potassium (K)	94.3	mg/kg	0.09			
Potash (K_2O)			0.11	28	0.10	25
Magnesium (Mg)	229	mg/kg	0.23			
Magnesium (MgO)			0.37	92	0.09	23
Sulphur (S)	170	mg/kg	0.17			
Sulphur (SO_3)			0.43	106	0.09	21
Sodium (Na)	14.8	mg/kg	0.01	4	0.01	2

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	9.56	mg/kg	9.6	2.39	15.00
Copper	2.25	mg/kg	2.3	0.56	7.50
Nickel	1.79	mg/kg	1.8	0.45	3.00
Lead	2.38	mg/kg	2.4	0.60	15.00
Cadmium	0.02	mg/kg	0.0	0.01	0.15
Chromium	1.94	mg/kg	1.9	0.49	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Aluminium	989	mg/kg	989.0	247.25	-

DCWW

Analysis of Preseli cake

Date: 13.1.2021 Sample ID. 6879830

Application rate (t/ha)	**60**
Application rate (t/acre)	**24.0**
pH	**6.6**
Dry solids (%)	**16.4**
Organic matter (%)	**42.6**
Conductivity (µS/cm)	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.31	%	2.15	128.9	0.01	0.4
Ammonium-N	37	mg/kg	0.01	0.4		
Phosphorus (P)	3300	mg/kg	0.54	32.5		
Phosphate (P_2O_5)			1.23	74.0	0.2	37.0
Potassium (K)	395	mg/kg	0.06	3.9		
Potash (K_2O)			0.08	4.7	0.0	4.2
Magnesium (Mg)	556	mg/kg	0.09	5.5		
Magnesium (MgO)			0.15	8.8	0.0	0.9
Sulphur (S)	7410	mg/kg	1.22	72.9		
Sulphur (SO_3)			3.04	182.3	0.3	18.2
Calcium (Ca)		mg/kg	0.0	0.0		
Sodium (Na)		mg/kg	0.00	0.0		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	147.0	mg/kg	24.1	1.45	15.00
Copper	27.7	mg/kg	4.54	0.27	7.50
Nickel	28.0	mg/kg	4.59	0.28	3.00
Lead	2.0	mg/kg	0.33	0.02	15.00
Cadmium	0.8	mg/kg	0.14	0.01	0.15
Chromium	5.7	mg/kg	0.93	0.06	15.00
Mercury	0.3	mg/kg	0.05	0.00	0.10
Arsenic	15.0	mg/kg	2.46	0.15	0.70
Aluminium	108000	mg/kg	17712	1063	-
Iron	13200	mg/kg	2164.80	129.89	-

DCWW

Analysis of Preseli liquid sludge

Date: 13.1.2021 Sample ID. 6879832

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.7**
Dry solids (%)	**1.7**
Organic matter (%)	**43.2**
Conductivity (µS/cm)	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.39	%	0.24	60.1	0.01	1.5
Ammonium-N	354	mg/kg	0.01	1.5		
Phosphorus (P)	4730	mg/kg	0.08	20.5		
Phosphate (P_2O_5)			0.19	46.6	0.0	23.3
Potassium (K)	949	mg/kg	0.02	4.1		
Potash (K_2O)			0.02	4.9	0.0	4.4
Magnesium (Mg)	570	mg/kg	0.01	2.5		
Magnesium (MgO)			0.02	3.9	0.0	0.4
Sulphur (S)	11800	mg/kg	0.20	51.0		
Sulphur (SO_3)			0.51	127.6	0.1	12.8
Calcium (Ca)		mg/kg	0.0	0.0		
Sodium (Na)		mg/kg	0.00	0.0		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	225.0	mg/kg	3.9	0.97	15.00
Copper	29	mg/kg	0.50	0.13	7.50
Nickel	13.9	mg/kg	0.24	0.06	3.00
Lead	7.5	mg/kg	0.13	0.03	15.00
Cadmium	1.0	mg/kg	0.02	0.00	0.15
Chromium	3.9	mg/kg	0.07	0.02	15.00
Mercury	1.2	mg/kg	0.02	0.01	0.10
Arsenic	17.3	mg/kg	0.30	0.07	0.70
Aluminium	173000	mg/kg	2992.90	748.23	-
Iron	13900	mg/kg	240.47	60.12	-

DCWW

Analysis of Strata Florida cake

Date: 01/02/2021 Sample ID. 38749

Application rate (t/ha)	**109**
Application rate (t/acre)	**43.6**
pH	**6.1**
Dry solids (%)	**14.1**
Organic matter (%)	**67.3**
Conductivity (µS/cm)	**72**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.55	%	2.19	238.2	0.02	2.0
Ammonium-N	128	mg/kg	0.02	2.0		
Phosphorus (P)	2130	mg/kg	0.30	32.7		
Phosphate (P_2O_5)			0.68	74.6	0.1	37.3
Potassium (K)	50	mg/kg	0.01	0.8		
Potash (K_2O)			0.01	0.9	0.0	0.8
Magnesium (Mg)	160	mg/kg	0.02	2.5		
Magnesium (MgO)			0.04	3.9	0.0	0.4
Sulphur (S)	4010	mg/kg	0.57	61.6		
Sulphur (SO_3)			1.41	154.1	0.1	15.4
Calcium (Ca)	751	mg/kg	0.1	11.5		
Sodium (Na)	520	mg/kg	0.07	8.0		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	75.7	mg/kg	10.7	1.16	15.00
Copper	17.3	mg/kg	2.44	0.27	7.50
Nickel	8.3	mg/kg	1.17	0.13	3.00
Lead	34.1	mg/kg	4.81	0.52	15.00
Cadmium	0.3	mg/kg	0.04	0.00	0.15
Chromium	6.3	mg/kg	0.89	0.10	15.00
Mercury	0.2	mg/kg	0.02	0.00	0.10
Arsenic	23.1	mg/kg	3.26	0.36	0.70
Aluminium	116537	mg/kg	16432	1791	-
Iron	12449	mg/kg	1755.31	191.33	-

DCWW

Analysis of Strata Florida liquid

Date 01/02/2021 **Lab ref. 38719**

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**5.8**
Dry solids (%)	**1.9**
Organic matter content (%)	**1.2**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.03	%	0.30	75	0.03	6
Ammonium-N	25	mg/kg	0.03	6		
Phosphorus (P)	47.9	mg/kg	0.05			
Phosphate (P_2O_5)			0.11	27	0.05	14
Potassium (K)	10	mg/kg	0.01			
Potash (K_2O)			0.01	3	0.01	3
Magnesium (Mg)	10	mg/kg	0.01			
Magnesium (MgO)			0.02	4	0.00	1
Sulphur (S)	106	mg/kg	0.11			
Sulphur (SO_3)			0.27	66	0.05	13
Sodium (Na)	21.4	mg/kg	0.02	5	0.01	3

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	1.57	mg/kg	1.6	0.39	15.00
Copper	0.38	mg/kg	0.4	0.10	7.50
Nickel	0.20	mg/kg	0.2	0.05	3.00
Lead	0.68	mg/kg	0.7	0.17	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.28	mg/kg	0.3	0.07	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Aluminium	2534	mg/kg	2534.0	633.50	-
Iron	291	mg/kg	291.0	72.75	-

Andigestion Ltd.

Analysis of whole digestate

Date 25/08/2020 **Lab ref. 20009 - 98914**

Application rate (t/ha)	**43**
Application rate (t/acre)	**17.2**
pH	**8.3**
Dry solids (%)	**4.9**
Organic matter content (%)	**3.2**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.58	%	5.80	249	3.10	133
Ammonium-N	3101	mg/kg	3.10	133		
Phosphorus (P)	507	mg/kg	0.51			
Phosphate (P_2O_5)			1.16	50	0.58	25
Potassium (K)	1976	mg/kg	1.98			
Potash (K_2O)			2.37	102	2.13	92
Magnesium (Mg)	105	mg/kg	0.11			
Magnesium (MgO)			0.17	7	0.04	2
Sulphur (S)	427	mg/kg	0.43			
Sulphur (SO_3)			1.07	46	0.21	9
Sodium (Na)		mg/kg	0.00	0	0.00	0

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	5.03	mg/kg	5.0	0.22	15.00
Copper	1.18	mg/kg	1.2	0.05	7.50
Nickel	0.53	mg/kg	0.5	0.02	3.00
Lead	0.50	mg/kg	0.5	0.02	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.53	mg/kg	0.5	0.02	15.00
Mercury	0.05	mg/kg	0.1	0.00	0.10

SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 1

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

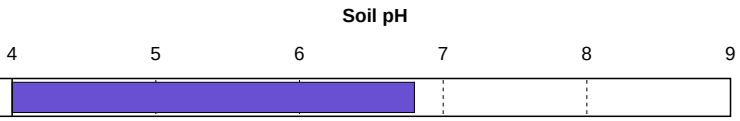
Date Received	04-FEB-2020
Date Reported	07-FEB-2020

Laboratory References

Report Number	85957
Sample Number	468592

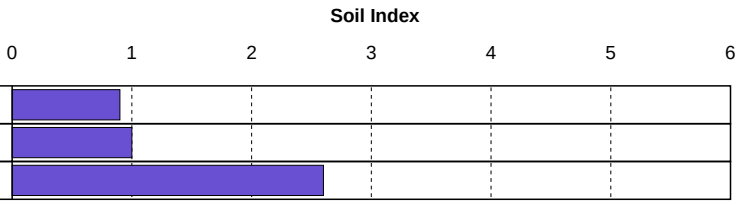
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)



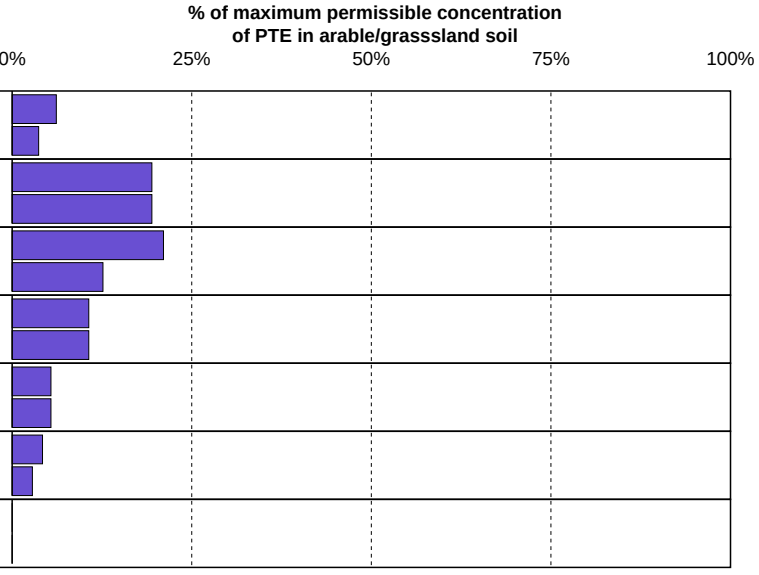
Determinand	Result
Soil pH	6.8

Soil Nutrients (1)



Determinand	Result mg/litre	Soil Index
Available Phosphorus	8.6	0
Available Potassium	62.0	1
Available Magnesium	81.0	2

Potentially Toxic Elements (2)



Determinand	Result mg/kg		Maximum mg/kg
Total Copper	8.3	Arable	135
		Grassland	225
Total Zinc	38.9	Arable	200
		Grassland	200
Total Nickel	15.8	Arable	75
		Grassland	125
Total Cadmium	0.32	Arable	3
		Grassland	3
Total Lead	16.2	Arable	300
		Grassland	300
Total Chromium	16.9	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Myles Nicholson* Date *07/02/20*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 1

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KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

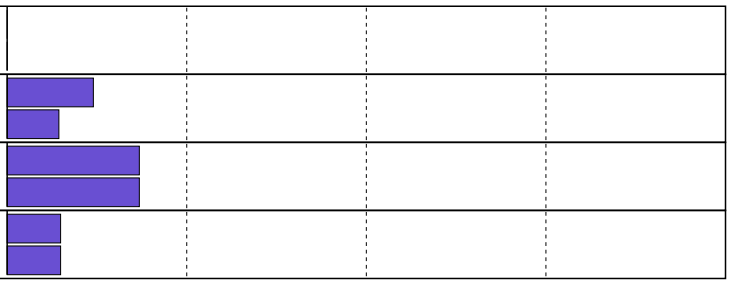
Laboratory References

Report Number	85957
Sample Number	468592

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg	% of maximum permissible concentration of PTE in arable/grasssland soil (0% 25% 50% 75% 100%)
Total Molybdenum	<1	Arable	4	
		Grassland	4	
Total Selenium	0.36	Arable	3	
		Grassland	5	
Total Arsenic	9.2	Arable	50	
		Grassland	50	
Fluoride	37.2	Arable	500	
		Grassland	500	



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(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 2

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CONTROL HOUSE
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KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

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CRUGMORE FARM
CARDIGAN

SOIL

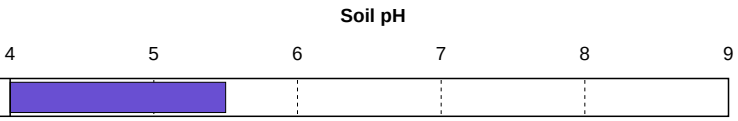
Date Received	04-FEB-2020
Date Reported	07-FEB-2020

Laboratory References

Report Number	85957
Sample Number	468593

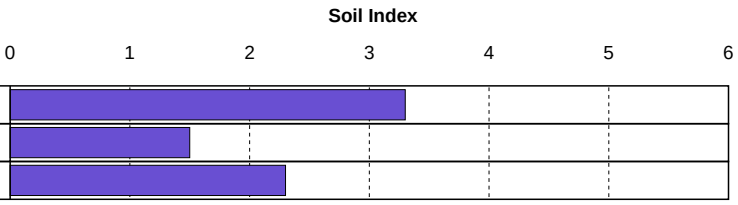
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)



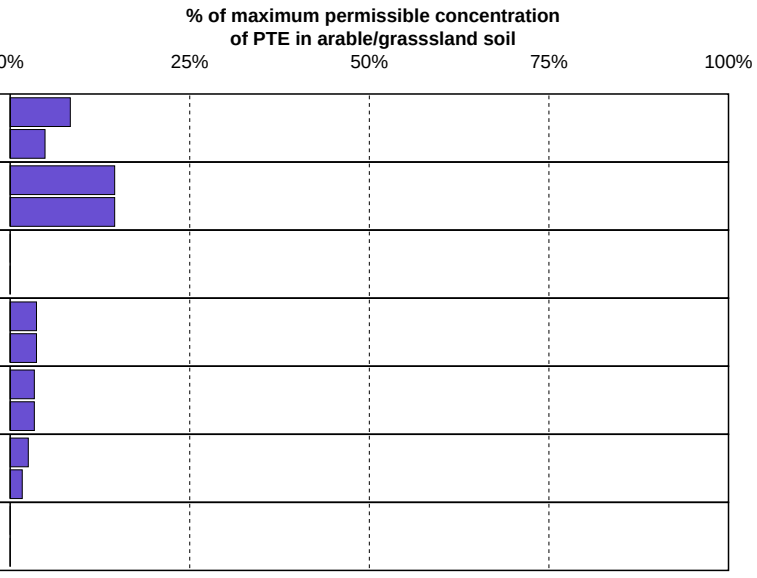
Determinand	Result
Soil pH	5.5

Soil Nutrients (1)



Determinand	Result mg/litre	Soil Index
Available Phosphorus	32.8	3
Available Potassium	90.7	1
Available Magnesium	66.4	2

Potentially Toxic Elements (2)



Determinand	Result mg/kg		Maximum mg/kg
Total Copper	6.7	Arable	80
		Grassland	138
Total Zinc	29.1	Arable	200
		Grassland	200
Total Nickel	<10	Arable	50
		Grassland	80
Total Cadmium	0.11	Arable	3
		Grassland	3
Total Lead	10.1	Arable	300
		Grassland	300
Total Chromium	10.1	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 2

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

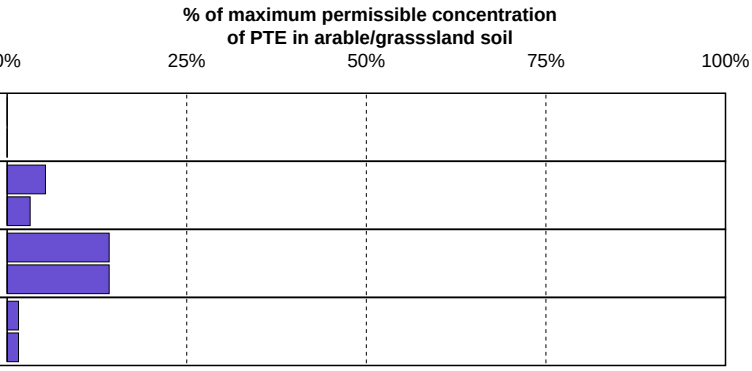
Laboratory References

Report Number	85957
Sample Number	468593

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.16	Arable	3
		Grassland	5
Total Arsenic	7.1	Arable	50
		Grassland	50
Fluoride	7.9	Arable	500
		Grassland	500



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(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 3

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

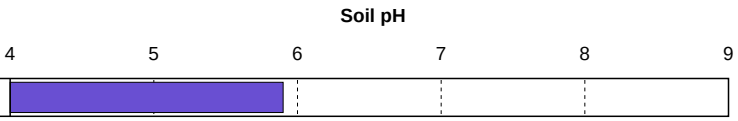
Laboratory References

Report Number	85957
Sample Number	468594

ANALYTICAL RESULTS *on 'dry matter' basis.*

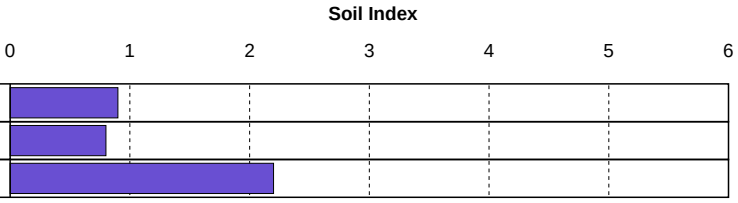
pH (1)

Determinand	Result
Soil pH	5.9



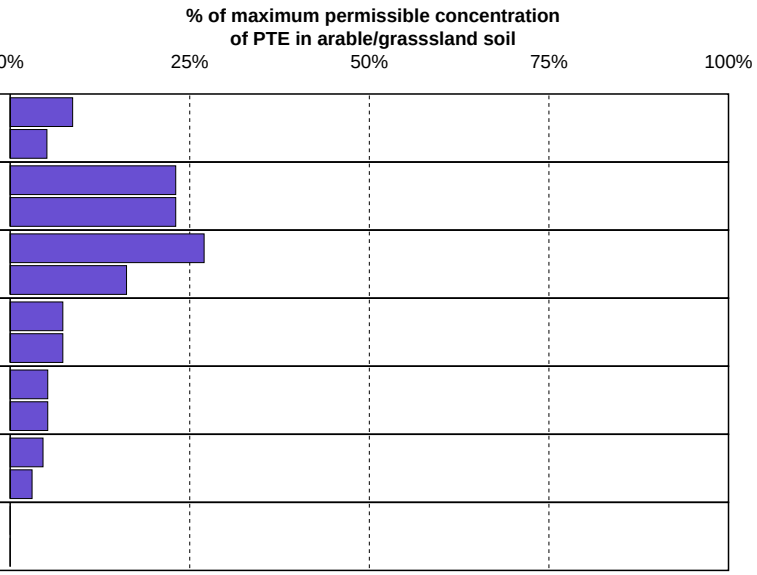
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	9.4	0
Available Potassium	49.5	0
Available Magnesium	62.8	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	8.7	Arable	100
		Grassland	170
Total Zinc	46.1	Arable	200
		Grassland	200
Total Nickel	16.2	Arable	60
		Grassland	100
Total Cadmium	0.22	Arable	3
		Grassland	3
Total Lead	15.7	Arable	300
		Grassland	300
Total Chromium	18.3	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5



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Released by *Myles Nicholson* Date *07/02/20*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 3

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

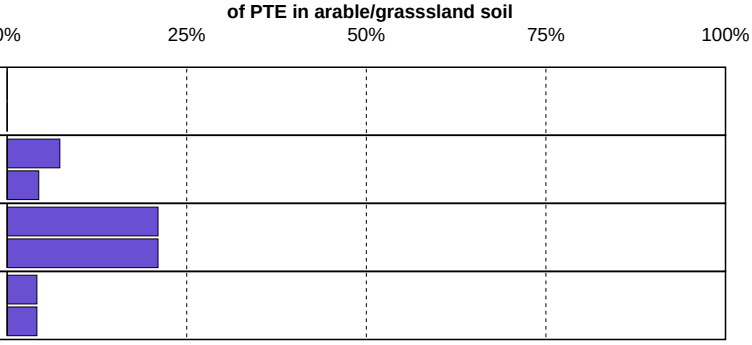
Laboratory References

Report Number	85957
Sample Number	468594

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.22	Arable	3
		Grassland	5
Total Arsenic	10.5	Arable	50
		Grassland	50
Fluoride	20.7	Arable	500
		Grassland	500



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(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 4

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

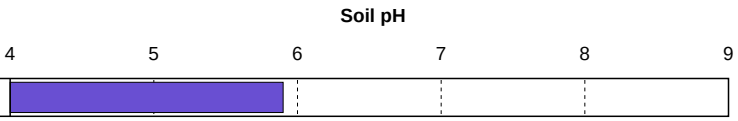
Laboratory References

Report Number	85957
Sample Number	468595

ANALYTICAL RESULTS *on 'dry matter' basis.*

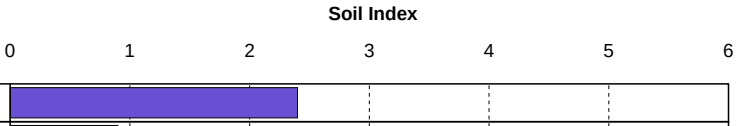
pH (1)

Determinand	Result
Soil pH	5.9



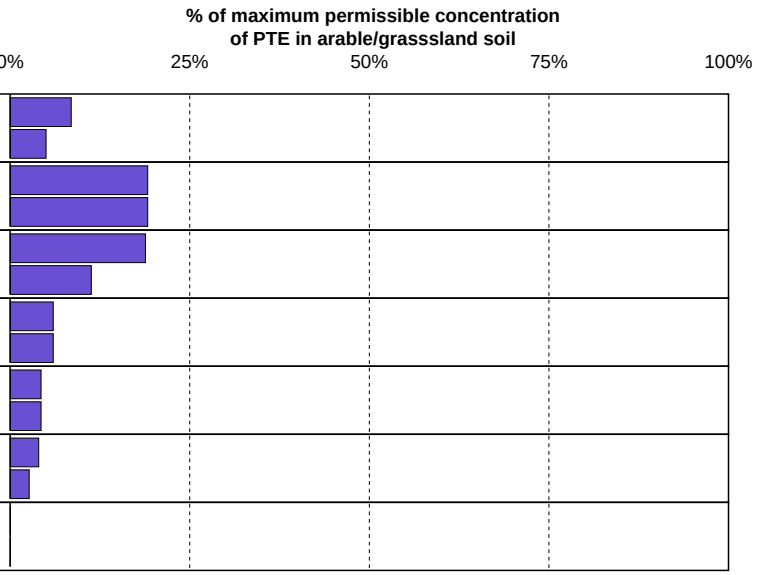
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	20.0	2
Available Potassium	57.6	0
Available Magnesium	61.8	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	8.5	Arable	100
		Grassland	170
Total Zinc	38.3	Arable	200
		Grassland	200
Total Nickel	11.3	Arable	60
		Grassland	100
Total Cadmium	0.18	Arable	3
		Grassland	3
Total Lead	12.9	Arable	300
		Grassland	300
Total Chromium	15.9	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5



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(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Myles Nicholson* Date *07/02/20*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 4

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
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KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

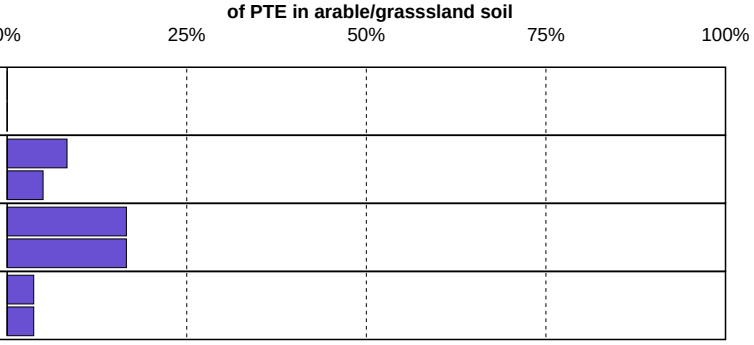
Laboratory References

Report Number	85957
Sample Number	468595

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.25	Arable	3
		Grassland	5
Total Arsenic	8.3	Arable	50
		Grassland	50
Fluoride	18.5	Arable	500
		Grassland	500



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Myles Nicholson* Date *07/02/20*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 5

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

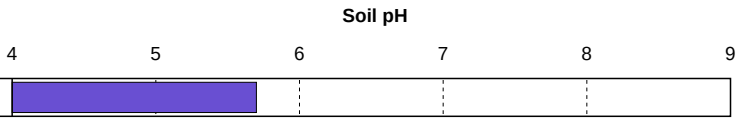
Date Received	04-FEB-2020
Date Reported	07-FEB-2020

Laboratory References

Report Number	85957
Sample Number	468596

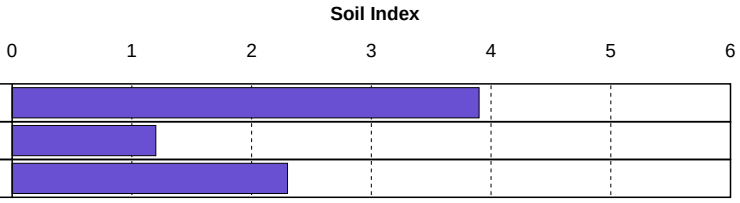
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)



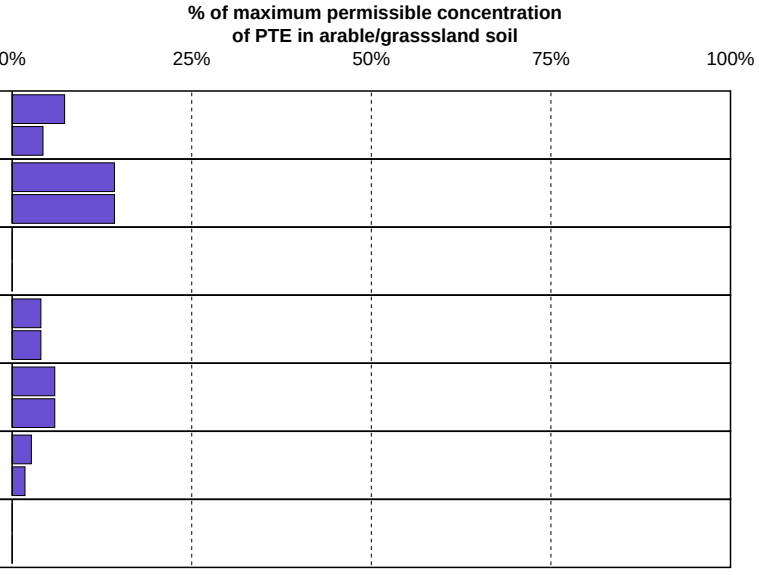
Determinand	Result
Soil pH	5.7

Soil Nutrients (1)



Determinand	Result mg/litre	Soil Index
Available Phosphorus	43.6	3
Available Potassium	74.9	1
Available Magnesium	66.8	2

Potentially Toxic Elements (2)



Determinand	Result mg/kg		Maximum mg/kg
Total Copper	7.3	Arable	100
		Grassland	170
Total Zinc	28.5	Arable	200
		Grassland	200
Total Nickel	<10	Arable	60
		Grassland	100
Total Cadmium	0.12	Arable	3
		Grassland	3
Total Lead	17.8	Arable	300
		Grassland	300
Total Chromium	10.7	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 5

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

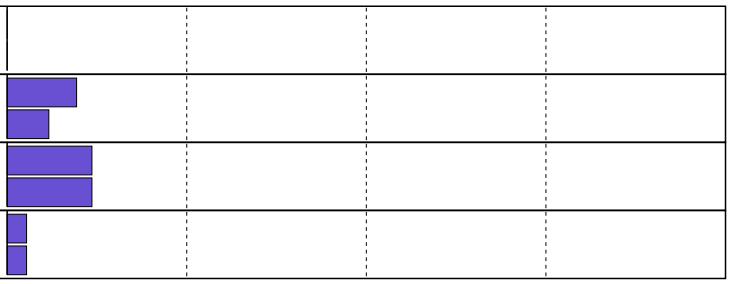
Laboratory References

Report Number	85957
Sample Number	468596

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg	% of maximum permissible concentration of PTE in arable/grasssland soil (0% 25% 50% 75% 100%)
Total Molybdenum	<1	Arable	4	
		Grassland	4	
Total Selenium	0.29	Arable	3	
		Grassland	5	
Total Arsenic	5.9	Arable	50	
		Grassland	50	
Fluoride	13.5	Arable	500	
		Grassland	500	



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 6

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

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CRUGMORE FARM
CARDIGAN

SOIL

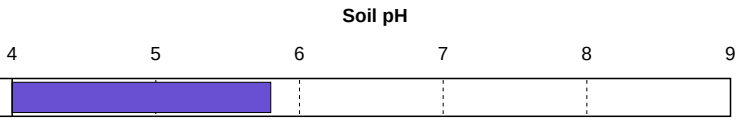
Date Received	04-FEB-2020
Date Reported	07-FEB-2020

Laboratory References

Report Number	85957
Sample Number	468597

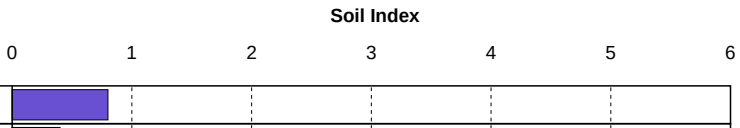
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)



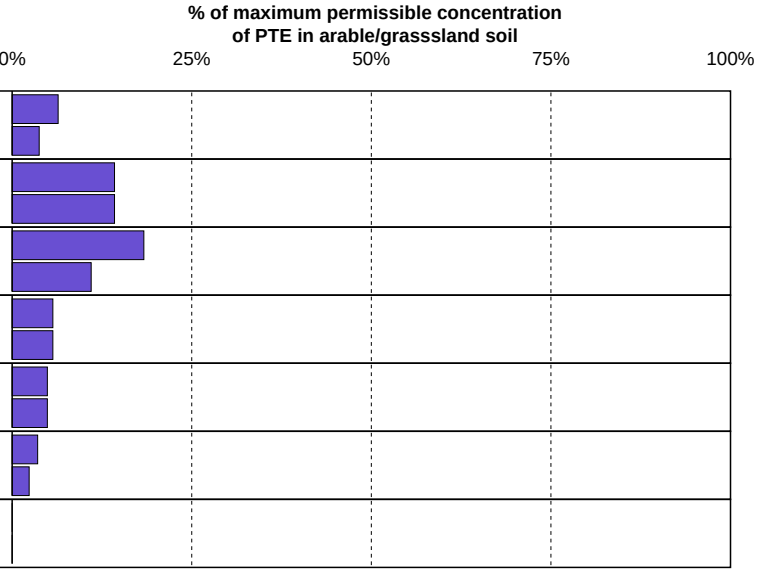
Determinand	Result
Soil pH	5.8

Soil Nutrients (1)



Determinand	Result mg/litre	Soil Index
Available Phosphorus	8.2	0
Available Potassium	25.0	0
Available Magnesium	50.1	1

Potentially Toxic Elements (2)



Determinand	Result mg/kg		Maximum mg/kg
Total Copper	6.4	Arable	100
		Grassland	170
Total Zinc	28.5	Arable	200
		Grassland	200
Total Nickel	11.0	Arable	60
		Grassland	100
Total Cadmium	0.17	Arable	3
		Grassland	3
Total Lead	14.7	Arable	300
		Grassland	300
Total Chromium	14.2	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 6

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

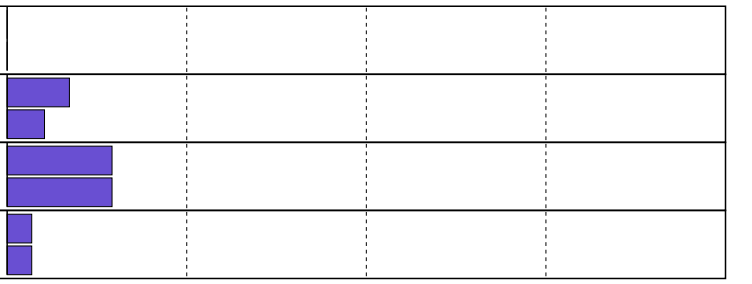
Laboratory References

Report Number	85957
Sample Number	468597

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.26	Arable	3
		Grassland	5
Total Arsenic	7.3	Arable	50
		Grassland	50
Fluoride	17.1	Arable	500
		Grassland	500



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 7

RICHARD EVANS
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CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

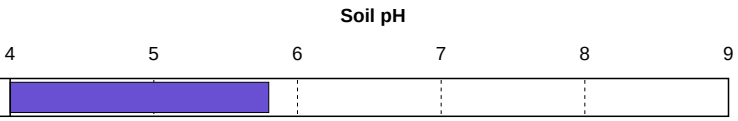
Laboratory References

Report Number	85957
Sample Number	468598

ANALYTICAL RESULTS *on 'dry matter' basis.*

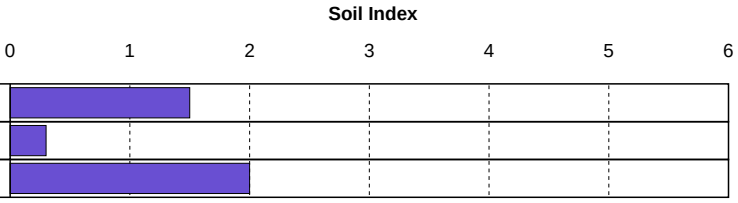
pH (1)

Determinand	Result
Soil pH	5.8



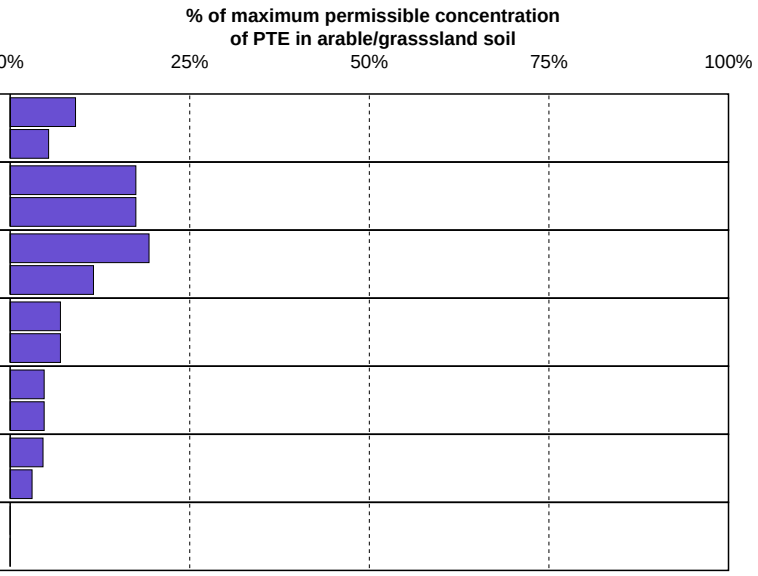
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	12.8	1
Available Potassium	23.0	0
Available Magnesium	55.3	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	9.1	Arable	100
		Grassland	170
Total Zinc	35.0	Arable	200
		Grassland	200
Total Nickel	11.6	Arable	60
		Grassland	100
Total Cadmium	0.21	Arable	3
		Grassland	3
Total Lead	14.2	Arable	300
		Grassland	300
Total Chromium	18.3	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 7

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

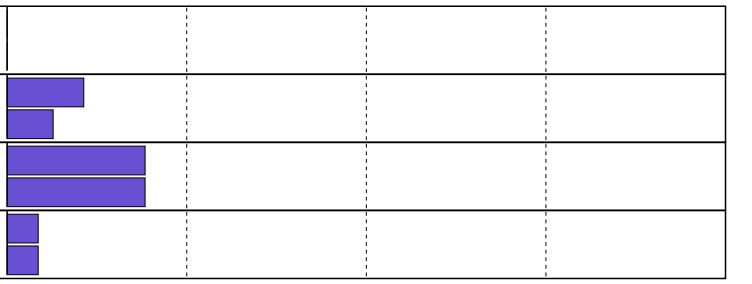
Laboratory References

Report Number	85957
Sample Number	468598

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.32	Arable	3
		Grassland	5
Total Arsenic	9.6	Arable	50
		Grassland	50
Fluoride	21.6	Arable	500
		Grassland	500



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(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 8

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

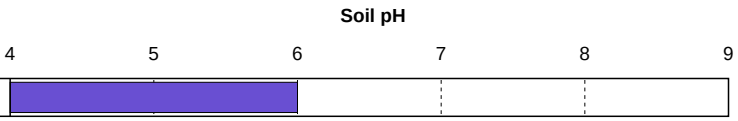
Laboratory References

Report Number	85957
Sample Number	468599

ANALYTICAL RESULTS *on 'dry matter' basis.*

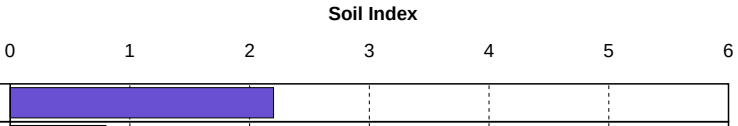
pH (1)

Determinand	Result
Soil pH	6.0



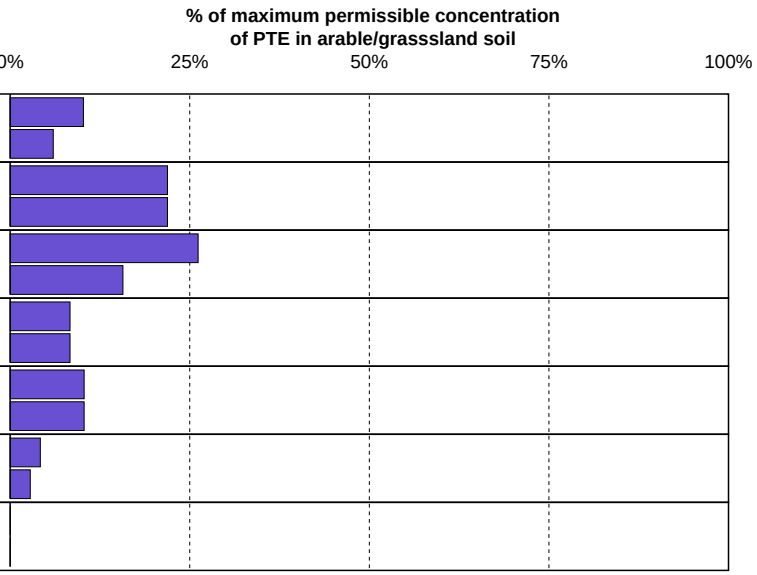
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	17.8	2
Available Potassium	54.4	0
Available Magnesium	78.3	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	10.2	Arable	100
		Grassland	170
Total Zinc	43.8	Arable	200
		Grassland	200
Total Nickel	15.7	Arable	60
		Grassland	100
Total Cadmium	0.25	Arable	3
		Grassland	3
Total Lead	30.9	Arable	300
		Grassland	300
Total Chromium	16.8	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 8

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

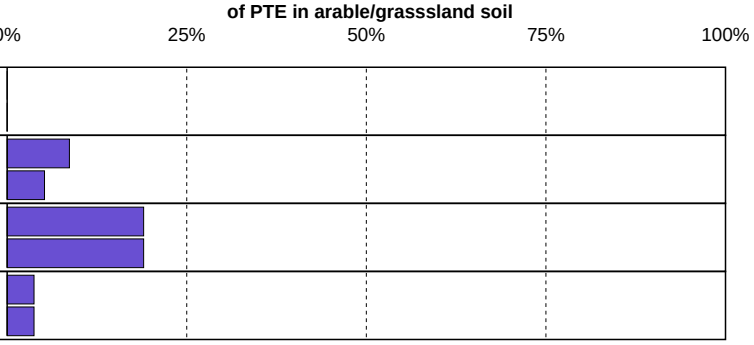
Laboratory References

Report Number	85957
Sample Number	468599

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.26	Arable	3
		Grassland	5
Total Arsenic	9.5	Arable	50
		Grassland	50
Fluoride	18.7	Arable	500
		Grassland	500



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 9

RICHARD EVANS
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CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

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CRUGMORE FARM
CARDIGAN

SOIL

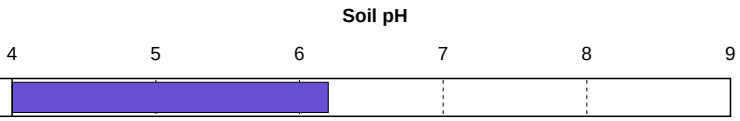
Date Received	04-FEB-2020
Date Reported	07-FEB-2020

Laboratory References

Report Number	85957
Sample Number	468600

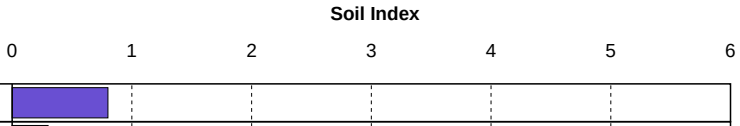
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)



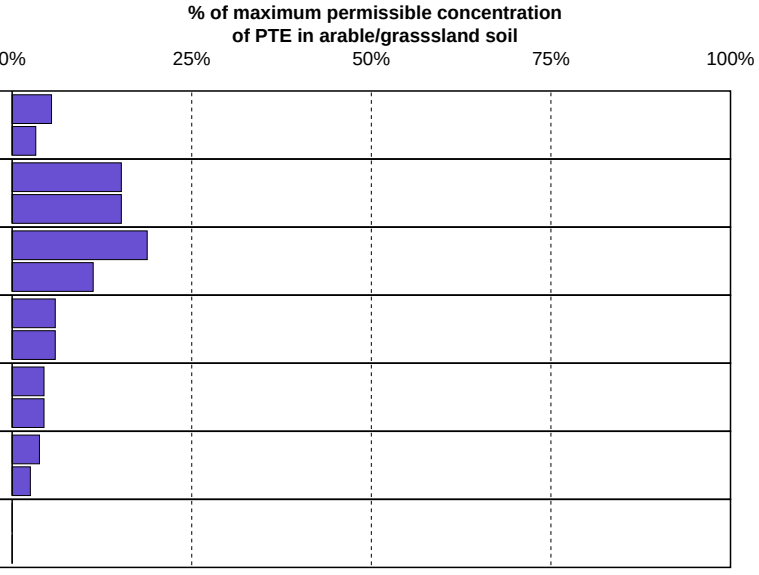
Determinand	Result
Soil pH	6.2

Soil Nutrients (1)



Determinand	Result mg/litre	Soil Index
Available Phosphorus	8.4	0
Available Potassium	20.5	0
Available Magnesium	47.3	1

Potentially Toxic Elements (2)



Determinand	Result mg/kg		Maximum mg/kg
Total Copper	7.4	Arable	135
		Grassland	225
Total Zinc	30.4	Arable	200
		Grassland	200
Total Nickel	14.1	Arable	75
		Grassland	125
Total Cadmium	0.18	Arable	3
		Grassland	3
Total Lead	13.3	Arable	300
		Grassland	300
Total Chromium	15.2	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Myles Nicholson* Date *07/02/20*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 9

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

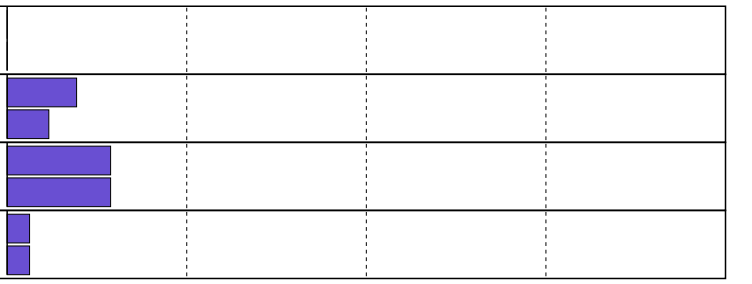
Laboratory References

Report Number	85957
Sample Number	468600

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.29	Arable	3
		Grassland	5
Total Arsenic	7.2	Arable	50
		Grassland	50
Fluoride	15.6	Arable	500
		Grassland	500



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 10

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

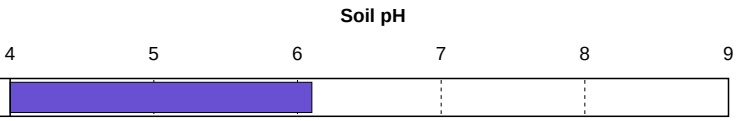
Laboratory References

Report Number	85957
Sample Number	468601

ANALYTICAL RESULTS *on 'dry matter' basis.*

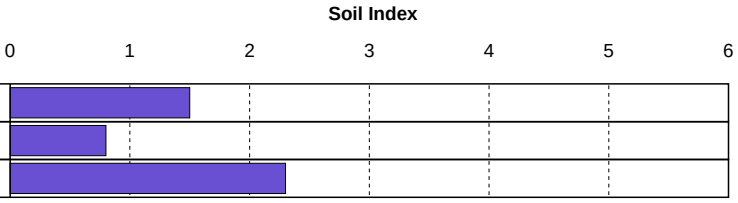
pH (1)

Determinand	Result
Soil pH	6.1



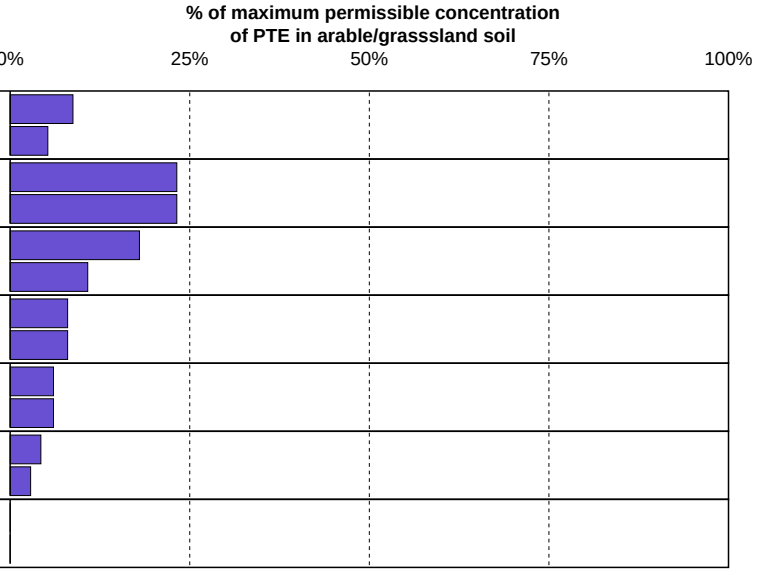
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	12.6	1
Available Potassium	49.2	0
Available Magnesium	70.2	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	11.8	Arable	135
		Grassland	225
Total Zinc	46.4	Arable	200
		Grassland	200
Total Nickel	13.5	Arable	75
		Grassland	125
Total Cadmium	0.24	Arable	3
		Grassland	3
Total Lead	18.1	Arable	300
		Grassland	300
Total Chromium	17.1	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 10

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

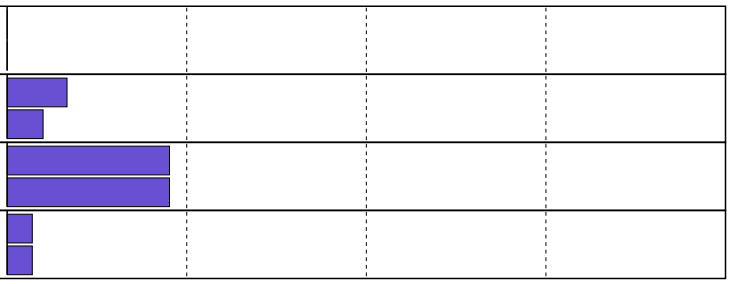
Laboratory References

Report Number	85957
Sample Number	468601

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.25	Arable	3
		Grassland	5
Total Arsenic	11.3	Arable	50
		Grassland	50
Fluoride	17.5	Arable	500
		Grassland	500



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 11

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

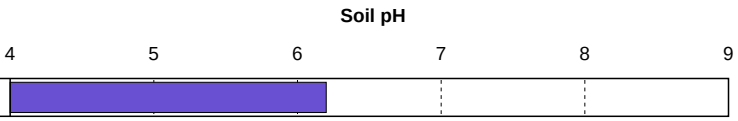
Laboratory References

Report Number	85958
Sample Number	468602

ANALYTICAL RESULTS *on 'dry matter' basis.*

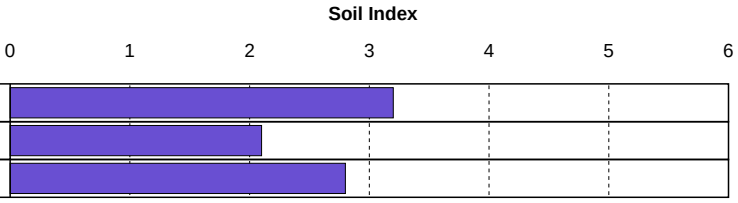
pH (1)

Determinand	Result
Soil pH	6.2



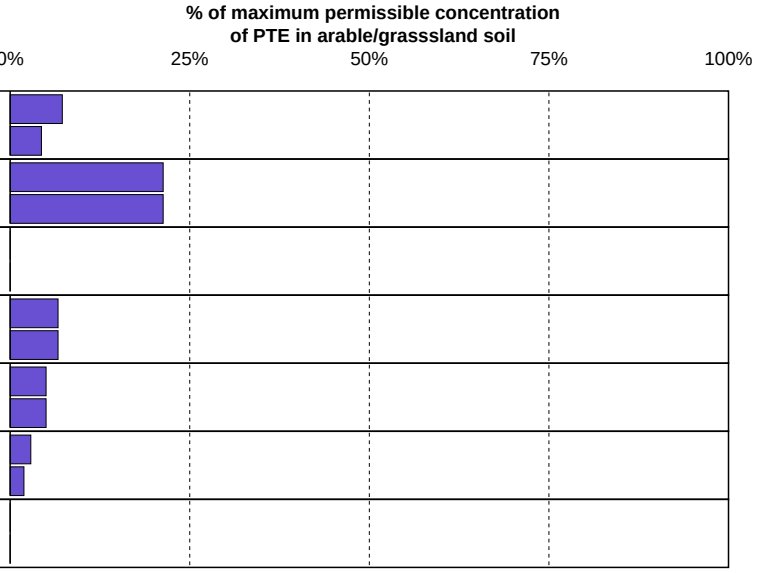
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	30.6	3
Available Potassium	137	2-
Available Magnesium	90.8	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	9.8	Arable	135
		Grassland	225
Total Zinc	42.6	Arable	200
		Grassland	200
Total Nickel	<10	Arable	75
		Grassland	125
Total Cadmium	0.20	Arable	3
		Grassland	3
Total Lead	15.0	Arable	300
		Grassland	300
Total Chromium	11.5	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 11

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

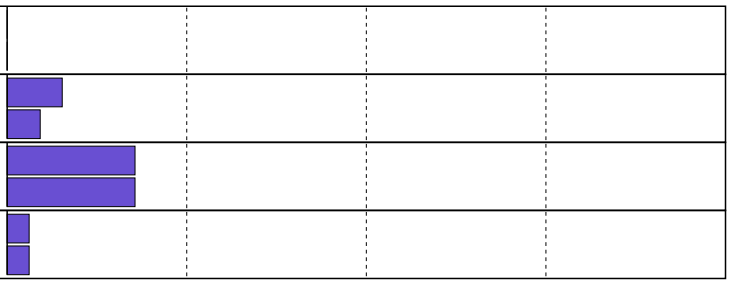
Laboratory References

Report Number	85958
Sample Number	468602

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.23	Arable	3
		Grassland	5
Total Arsenic	8.9	Arable	50
		Grassland	50
Fluoride	15.3	Arable	500
		Grassland	500



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 12

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

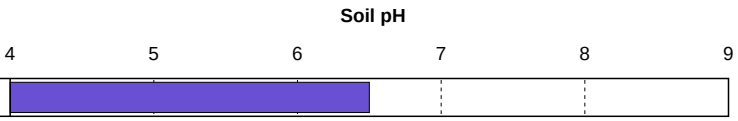
Laboratory References

Report Number	85958
Sample Number	468603

ANALYTICAL RESULTS *on 'dry matter' basis.*

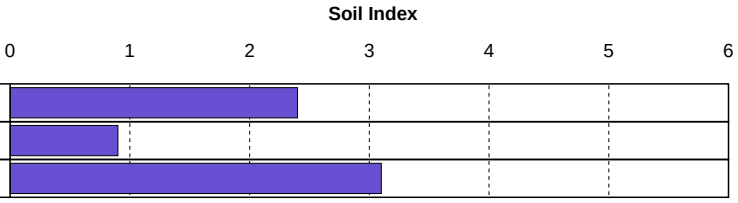
pH (1)

Determinand	Result
Soil pH	6.5



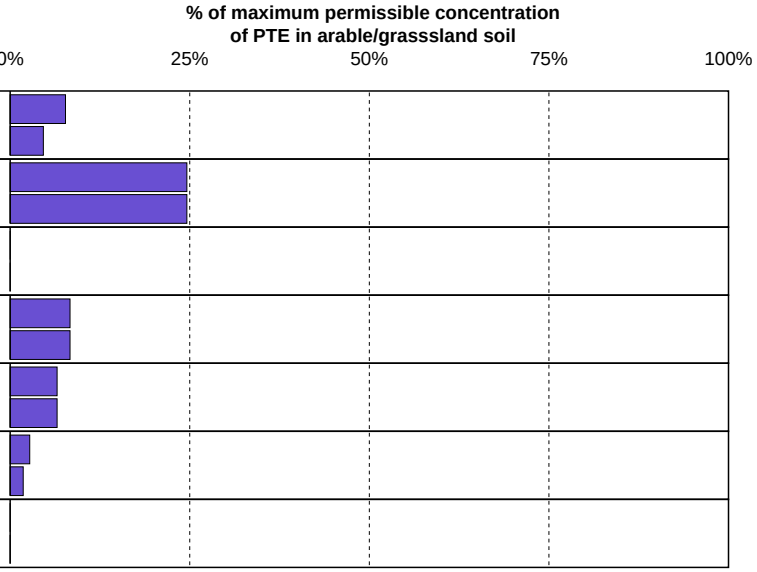
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	20.2	2
Available Potassium	56.0	0
Available Magnesium	113	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	10.4	Arable	135
		Grassland	225
Total Zinc	49.2	Arable	200
		Grassland	200
Total Nickel	<10	Arable	75
		Grassland	125
Total Cadmium	0.25	Arable	3
		Grassland	3
Total Lead	19.6	Arable	300
		Grassland	300
Total Chromium	10.9	Arable	400
		Grassland	600
Total Mercury	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 12

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CRUGMORE FARM
CARDIGAN

SOIL

Date Received	04-FEB-2020
Date Reported	07-FEB-2020

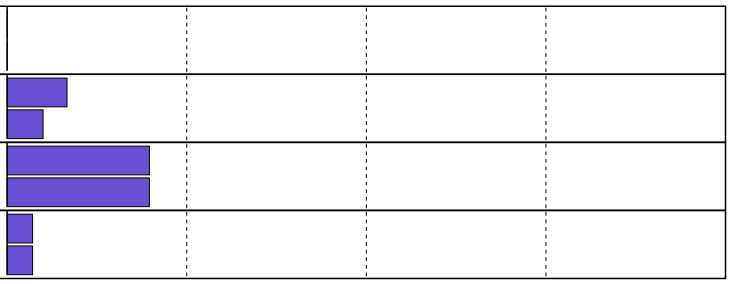
Laboratory References

Report Number	85958
Sample Number	468603

ANALYTICAL RESULTS *on 'dry matter' basis.*

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Molybdenum	<1	Arable	4
		Grassland	4
Total Selenium	0.25	Arable	3
		Grassland	5
Total Arsenic	9.9	Arable	50
		Grassland	50
Fluoride	17.7	Arable	500
		Grassland	500



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Risk Assessment

Risk assessment for land spreading activity at Crugmore, Cardigan.

Risk assessment reviewed by Chris Ash in March 2021.

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
Surface water – ditches, watercourses and ponds	Nutrients, aluminium, and organic matter	Surface water pollution	Surface run-off	Medium	High	Medium	Proximity of ditches and under drainage Low pollution potential of water treatment works sludge	Comply with Water Code, NVZ, Cross Compliance, Sludge Regs and EPR. No spreading areas to be observed as per attached plans. Follow PQA	Low
Groundwater	Nutrients, Aluminium, PTEs	Groundwater pollution	Inappropriate application	Medium	Medium	Low	WTW sludge has low concentrations of PTEs. Some WTW sludges contain aluminium but solubility low at observed soil pHs. Alum sludge will not be spread on fields with soil pH <6	As above	Low
Soils	Physical damage to soil structure	Damage to soil structure and poor subsequent grass yields	Delivery and spreading activity	Low	Medium to high	Low	Delivery and spreading to be undertaken when ground conditions are suitable	Comply with Soil Code and Cross Compliance Criteria. Apply only in suitable conditions. Follow PQA	Low

Risk Assessment (continued)

Soils	Nutrients, Aluminium, and PTEs	Build-up of nutrients. and/or PTEs	Spreading activity	High	Medium to high	Low	Waste analysis. Soil analysis. Appropriate rates of application. Alum sludge will not be spread on fields with soil pH <6	Apply according to PQA, RB209 and Soil Code	Low
Local human population and wildlife	Spreading activities – physical	Harm to humans or animals	Trespass, accidental contact	Low	Medium	Low	Agricultural areas with limited public access. Minimum 3-week non-utilisation period	Application during appropriate conditions and awareness of access issue	Low
Local human population	Odour during spreading activity	Odour issues/complaints	Airborne compounds	Low	Low	Low	The WTW sludge has minimal odour	Odour management plan available in EMS in accordance with SR2010No4 permit	Low
Local human population	Releases of airborne dusts/ particulate matter	Harm to human health - respiratory irritation and illness.	Air transport then inhalation	Low	Medium	Low	Waste streams have low potential to produce airborne dust and particulate matter	Waste will be applied in accordance with CoGAP and EMS	Low
Local human population	As above	Nuisance dust on cars, clothing etc.	Deposition from air	Low	Low	Low	As above	As above	Low
Local human population	Emissions; litter	Nuisance loss of amenity and harm to pet health	Transport through air	Low	Low	Low	Waste does not contain litter as it derives from a controlled manufacturing processes	Waste will be applied according to Codes of Good Agricultural Practice and SR2010No4 EMS.	Low
Local human population	Noise	Noise complaints	Noise from delivery, and spreading	Low	Low to Medium	Low	Agricultural machinery in agricultural areas	Avoid sensitive spreading periods e.g. bank holidays and weekends. Delivery during daylight hours	Low
Local human population	Pests (e.g. scavenging animals, flies)	Harm to human health, nuisance, loss of amenity	Air transport and over land	Low / Medium	Low / Medium	Low / Medium	The WTW sludge is highly unlikely to attract scavenging animals. Sludge has low potential to attract flies	All waste will be stored, transported and spread in accordance with conditions set in SR2010No4 permit and CoGAP. Wastes are unlikely to attract pests as WTW sludge is not food based	Low
Local human population and local environment.	Mud on local roads	Nuisance, loss of amenity, risk of accident	Vehicles entering and leaving site	Medium	Medium	Medium	Road safety. Tractors/ spreaders trailing mud and debris from fields	Operation will not cause any additional effects on surrounding roads than normal agricultural practice occurring in the surrounding area	Low
Hedgerows and trees	Physical damage from	Ecological & landscape	Physical damage from spreading equipment	Low	Low	Low	Professional contractors employed instructed to take care around trees	Leave a 2m minimum buffer zone adjacent to trees and hedgerows	Low

Risk Assessment (continued)

	spreading equipment								
Banc y Warren - SSSI	Nutrients PTEs Dusts	Ecological	Surface run-off Airborne compounds	Low	High	Low	Proximity of protected site. SSSI borders fields 4 and 5 Particularly sensitive nature of site (landforms and sediments) Waste streams have low potential to produce airborne dust and particulate matter Site is uphill from spreading area Delivery to storage area is >130m away from designated area	Apply according to PQA Avoid sensitive spreading periods e.g. breeding season 20m non-spread buffer zone applied to SSSI boundary	Low