SR2010No4 Mobile plant for landspreading

Deployment Application

Bwlchmawr Farm 3
Brynteg
Llanybydder
Carmarthenshire

Environmental Permitting Regulations (England and Wales) 2010

Permit: **EPR/GP3792SK**

Risk Category: **Medium**

Date: **26th March 2020**

4R Group
Control House
A1 Business Park
Knottingley Road
Knottiingley
WF11 0BU

Tel: 0113 232 2400
www.4r-group.co.uk

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	
Telephone - office	0113 232 2418
Email address	Kevin.brook@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	Mr	
First name	Kevin	
Last name	Brook	
Telephone - mobile	07595 216452	
Telephone - office	0113 232 2418	
Email address	kevin.brook@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	Ian	
Last name	Holden	
Telephone - mobile	07912 362364	

Telephone - office	0113 232 2418
Email address	Ian.holden@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: waste to land training register *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	020201	Raw effluent	Liquid	Dunbia Wales	12,500
2	020201	Partially treated effluent	Liquid	Dunbia Wales	12,500
3	020204	DAF sludge	sludge	Dunbia Wales	982
4	020106	Farm slurry	sludge	Bwlchmawr Farm	3,415
5					
6					
7					
8					
9					
10					
				Total tonnage	12,500

4g About the land you want to treat

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

Address

Bwlchmawr Farm

Brynteg

Llanybydder

Carmarthenshire

Postcode	SA40 9XA
National grid reference (12 digit)	**248664 243291**

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

Agricultural land ☒ Please give your County/ Parish/ Holding number 552940046

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 find attached**	**Separate document**	(Summary)	
2				
3				
4				
5				
6				
7				
8				
9				
10				
			Total hectares	

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	Dafydd
Last name	Davies
Address	Bwlchmawr Farm
	Brynteg
	Llanybydder
	Carmarthenshire

Postcode	SA40 9XA
Telephone - mobile	07774 731542
Telephone - office	01267 241865
Email address	annd@saqnet.co.uk

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	Fields 8153, 1057, 3854, 1325, 4105, 6467,7563,8756, 9163	DAF sludge	D Davies	6	PAN-004824
2	Fields 5569 6858 9748	DAF sludge	D Davies	16	PAN-004824
3	Remaining fields	DAF sludge	D Davies	25	PAN-004824
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	255258 243317 Tower Hill	Sludge/Effluent	Slurry store	1000
2	**248653 243286 Bwlchmawr**	Sludge/Effluent	Slurry store	1000
3	**256379 242217 Tower Hill Mountain Store**	Sludge/Effluent	Field heap	300
4				
5				
6				
7				
8				
9				
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	**PSCAPPBYPRO0766**
Amount paid	£798

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)	☒	LP1 Location Plans
Benefit statement (required for all deployments)	☒	ABS1 Agricultural Benefit Statement
Waste analysis (required for all deployments)	☒	WA1 Waste Analysis
Receiving soil analysis (required for all deployments)	☒	SA1 Soil Analysis
Site-specific risk assessment (in accordance with 4e)	☐	
Any other additional information	N/A	11. Waste to land training register

	N/A	
	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)	25/03/2020	

Location Plan
Bwlchmawr Farm 3

Site:
Bwlchmawr Farm 3
Brynteg
Llanybydder
Carmarthenshire

Land at Bwlchmawr Farm -
SA40 9XA

Client:
Dunbia Wales

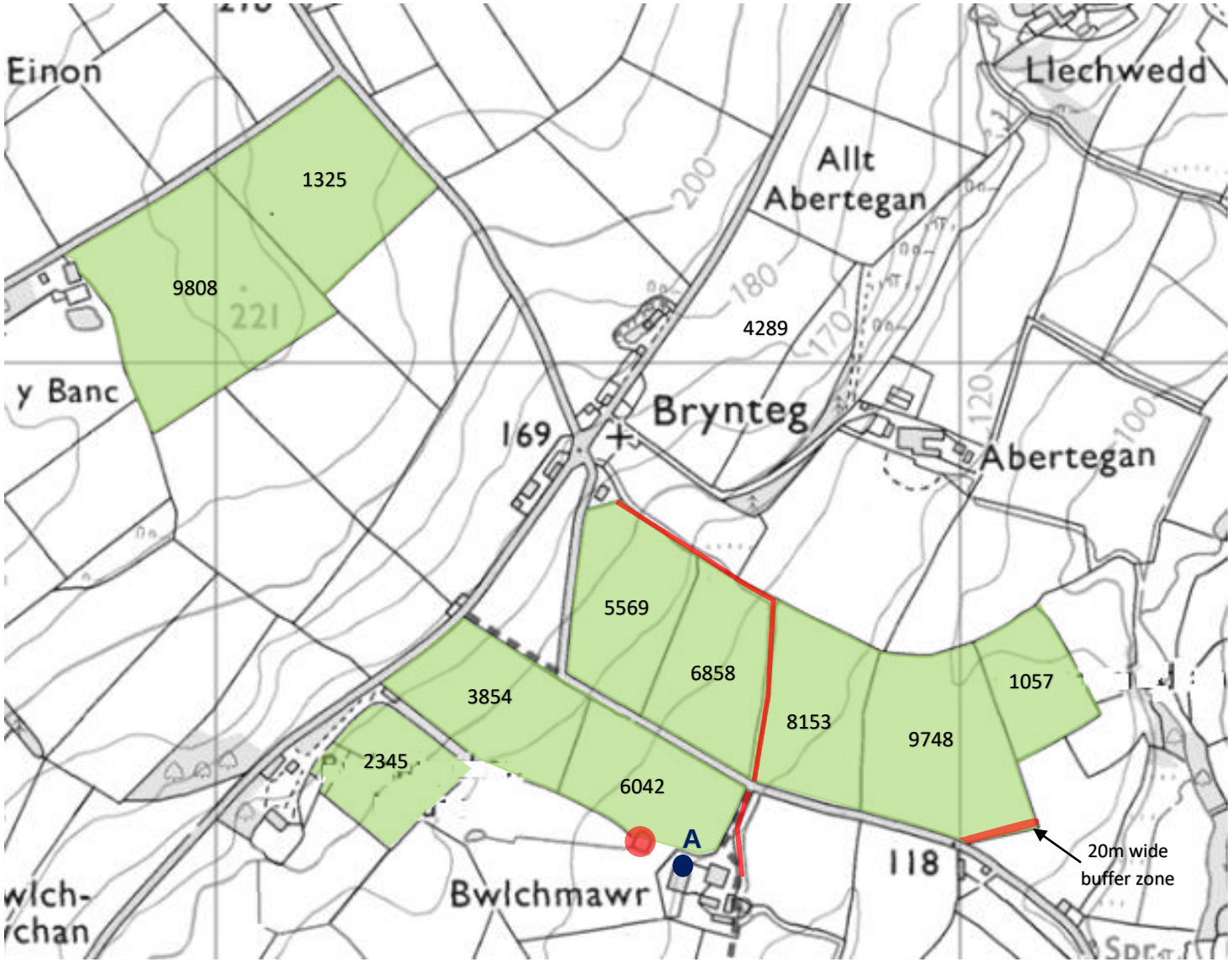
Key:

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

Location tags:

A Store 248634, 243335

Map reference: BM01



Location Plan
Bwlchmawr Farm 3

Site:
Bwlchmawr Farm 3
Brynteg
Llanybydder

Land at Towerhill Farm -
SA40 9QR

Client:
Dunbia Wales

Key:

Spreading area

Non-spreading area

Location tags

Overhead cables

Location tags:

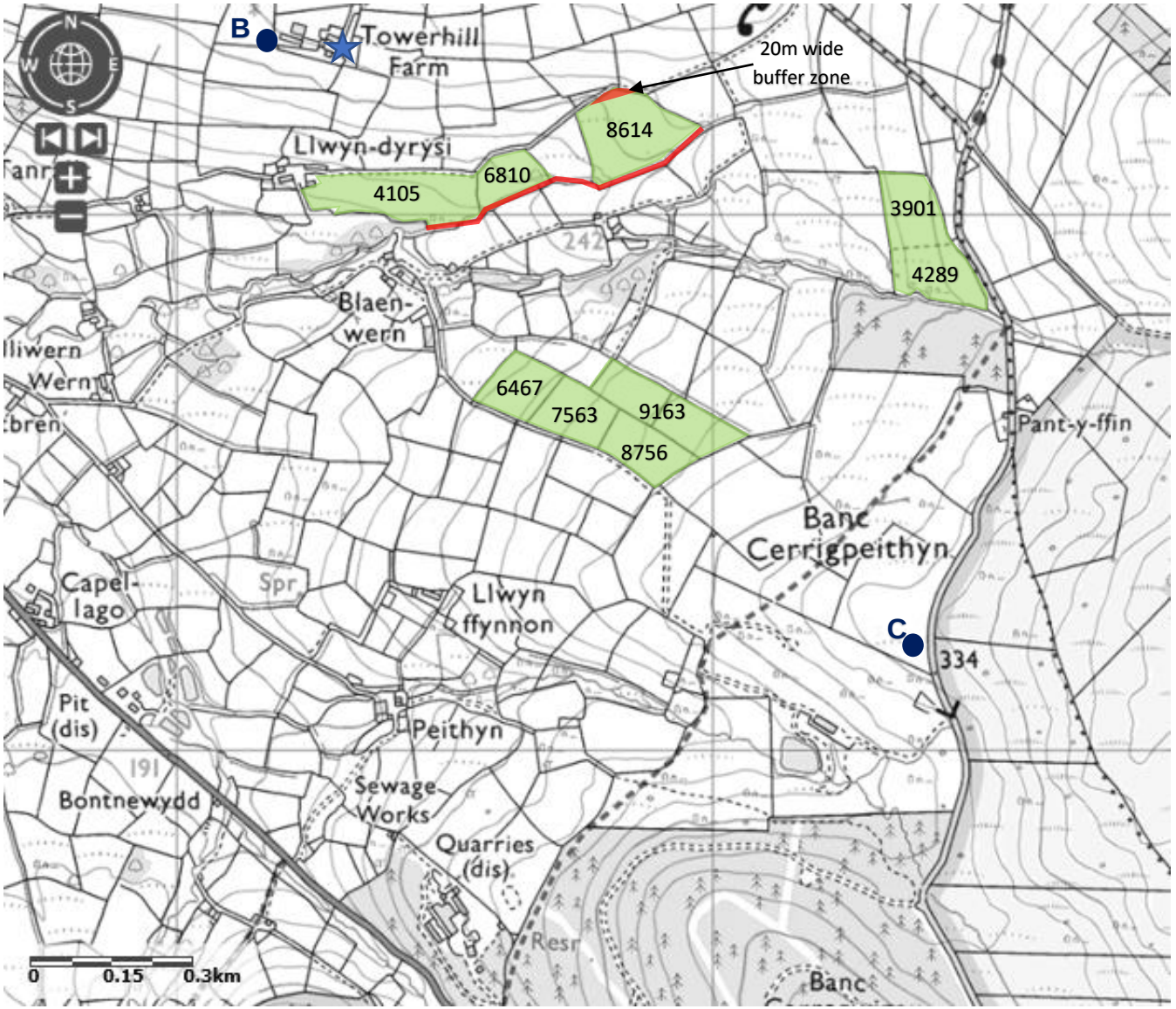
B Store 255230, 243346

C Store 256374, 242188

(C - Tower Hill Mountain Store)

Well

Map reference: BM02



Soil Analysis (mg/l & index), Rates of Application, Field and Storage Locations and Present and Future Cropping

Bwlchmawr Farm 3, Brynteg LLANYBYDDER Carmarthenshire SA40 9XA

Field Identifier	pH	Phosphorus mg/l (index)	Potassium mg/l (index)	Magnesium mg/l (index)	Area (ha)	Spreadable Area (ha)
Bwlchmawr 5569	5.7	20 (2)	65 (1)	81 (2)	3.38	3.25
6858	6.0	21 (2)	40 (0)	105 (2)	3.45	3.23
8153	5.7	17 (3)	60 (0)	68 (2)	3.24	3.24
9748	5.6	15 (1)	121 (2-)	74 (2)	4.65	4.65
1057	5.7	16 (2)	104 (1)	65 (2)	2.05	2.00
3854	5.7	35 (3)	84 (1)	72 (2)	3.40	3.36
6042	5.9	24 (2)	113 (1)	96 (2)	2.84	2.65
2345	5.8	28 (3)	93 (1)	69 (2)	3.19	3.11
9808	5.0	47 (4)	76 (1)	56 (2)	6.46	6.40
1325	5.2	49 (4)	72 (1)	59 (2)	4.48	4.40
Tower Hill 4105	6.2	18 (2)	73 (1)	112 (3)	2.50	2.00
6810	6.2	16 (2)	41 (0)	100 (2)	1.70	1.13
8614	7.0	31 (3)	52 (0)	138 (3)	3.51	3.06
6467	5.3	10 (1)	100 (1)	126 (3)	1.10	1.00
7563	5.1	13 (1)	96 (1)	95 (2)	1.30	1.25
8756	5.2	10 (1)	92 (1)	105 (3)	1.45	1.15
9163	5.3	14 (1)	110 (1)	114 (3)	1.95	1.59
4289	5.2	10 (1)	87 (1)	97 (2)	1.06	1.03
3901	5.0	10 (1)	107 (1)	117 (3)	1.50	1.50
				Total	**53.22**	**50**

Field Identifier	Field Location	Cropping (‘18 ’19)	Cropping (’19 ’20)
5569	Grid Ref = SN 248550 243670	Grass	Grass
6858	Grid Ref = SN 248670 243600	Grass	Grass
8153	Grid Ref = SN 248800 243530	Grass	Grass
9748	Grid Ref = SN 248990 243470	Grass	Grass
1057	Grid Ref = SN 249100 243580	Grass	Grass
3854	Grid Ref = SN 248370 2435500	Grass	Grass
6042	Grid Ref = SN 248580 243440	Grass	Grass
2345	Grid Ref = SN 248230 243450	Grass	Grass
9808	Grid Ref = SN 247980 244100	Grass	Grass
1325	Grid Ref = SN 248150 244250	Grass	Grass
Tower Hill 4105/6810	Grid Ref = SN 255560 243048	Grass	Grass
8614/8622	Grid Ref = SN 255860 243150	Grass	Grass
6467/7563/8756	Grid Ref = SN 255770 242610	Grass	Grass
9163	Grid Ref = SN 255900 242640	Grass	Grass
3901/4289	Grid Ref = SN 256400 242960	Grass	Grass

Agricultural Benefit Statement

For the application of beneficial wastes to fields at;

Bwlchmawr Farm 3 Brynteg Llanybydder Carmarthenshire SA40 9XA

25th March 2020

1 Person with appropriate technical expertise and permit details

This benefit statement has been compiled by K Brook who has the following qualifications and experience;

- BSc (Hons) Agricultural Science
- Member of the British Society of Soil Science
- FACTS Qualified Advisor (No. FE/0829) and Full Member of BASIS Professional Register
- Wamitab/CIWM Continuing Competence Certificate No. CCC16210
- >21 Years' experience in land application of organic materials

Verified by; C Ash – FQA (FE/6324)

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

2 Where the waste is to be spread

Table 1. Where the waste is to be spread

Farm address:	Bwlchmawr Farm, Brynteg, Llanybydder, Carmarthenshire, SA40 9XA	
Stockpile grid reference:	Refer to Table 4	
Area of the receiving land:	50 hectares of land at a dairy and sheep farm located in Llanybydder, Carmarthenshire	
Quantity to be stored at any one time:	Stackable:982t	Non-Stackable: 1,250t
Total maximum quantity to be spread:	12,500t	
Location map document reference:	Map 1, 2, 3, 4	

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	02 02 01	Raw effluent from cleaning of animal processing facility	Dunbia Llanybydder SA40 9QE	
2	02 02 01	Partially treated effluent from cleaning of animal processing facility	Dunbia Llanybydder SA40 9QE	
3	02 02 04	Sludges from the DAF facility on-site treatment of animal processing effluent	Dunbia Llanybydder SA40 9QE	
4	02 02 04	Sludges from the on-site treatment of animal processing effluent	Dunbia Llanybydder SA40 9QE	
5	02 01 06	Animal faeces, urine and manure	Bwlchmawr Farm SA40 9XA	May be spread in combination with the other wastes

4 Operational details

4.1 Cropping details

Table 3. Cropping details

Current crop including projected yield if known:	Refer to Tables 6-9 The fields will remain in grass for at least the next 3 years.
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 6-9
When do you intend to apply this waste; e.g. post harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:	All fields are cropped in continuous grass. All efforts will be made to spread when there is a higher nutrient demand, i.e., during the growing season (Mar-Sept). Spreading will only take place when ground conditions are suitable; no spreading during periods of prolonged rain, soil saturation or flooding.

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: In field heaps Non-stackable wastes: Farm slurry storage. There is a possibility in winter of storing the DAF sludge in the slurry lagoons at the farm when ground conditions are unsuitable for landspreading, when slurry may be mixed with the waste during this period of short-term storage.
Where is the waste to be stored prior to spreading?	Tank 1: 248659 243264 – Bwlchmawr Farm - lagoon Tank 2: 255216 243328 – Tower Hill Farm - lagoon Field heap 1: 256374 242188 – Tower Hill Mountain Store
Why were these storage locations chosen?	Accessible by the delivering vehicle and on stable ground. The selected stockpiles are not within 10m of any ditch, watercourse, or footpath. The locations are not in a SPZ1 or they are at least 50m from any well spring or borehole and they are a safe distance from overhead powerlines.

4.3 Waste application

Table 5. Waste application

How is the waste to be spread?	The sludges/effluent waste materials will be spread using a manure spreader and slurry tanker and a trailing hose applicator.
How do you plan to incorporate the waste following application?	The fields are grass and incorporating wastes into the surface layer of the topsoil will be achieved by chain harrowing.
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 fields within this deployment do not fall within either an SPZ 1 or SPZ 2 and have a low risk groundwater vulnerability status.

Table 6. Raw effluent

Nutrient Requirements for land at Bwlchmawr Farm 3

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P_2O_5 Req	Crop Use	**P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	*K_2O in Wst	Mg Ind	MgO Req	*MgO in Wst	Rate T/Ha	Totals Tonnes
5569	3.38	3.25	Grass	Grass	Mod	205	60	2	65	75	**43	1	260	228	36	2	0	1	250	**813**
6858	3.45	3.23	Grass	Grass	Mod	205	60	2	65	75	**43	0	260	228	36	3	0	1	250	**808**
8153	3.24	3.24	Grass	Grass	Mod	205	60	2	65	75	**43	0	260	228	36	2	0	1	250	**810**
9748	4.65	4.65	Grass	Grass	Mod	205	60	1	95	75	22	2-	170	228	36	2	0	1	250	**1163**
1057	2.05	2.00	Grass	Grass	Mod	205	60	2	65	75	**43	1	210	228	36	2	0	1	250	**500**
3854	3.4	3.36	Grass	Grass	Mod	205	60	3	20	75	**43	1	210	228	36	2	0	1	250	**840**
6042	2.84	2.65	Grass	Grass	Mod	205	60	2	65	75	**43	1	210	228	36	2	0	1	250	**663**
2345	3.19	3.11	Grass	Grass	Mod	205	60	3	20	75	**43	1	210	228	36	2	0	1	250	**778**
9808	6.46	6.40	Grass	Grass	Mod	205	60	4	0	75	**43	1	210	228	36	2	0	1	250	**1600**
1325	4.48	4.40	Grass	Grass	Mod	205	60	4	0	75	**43	1	210	228	36	2	0	1	250	**1100**
4105	2.50	2.00	Grass	Grass	Mod	205	60	2	65	75	**43	1	210	228	36	3	0	1	250	**500**
6810	1.70	1.13	Grass	Grass	Mod	205	60	2	65	75	**43	0	260	228	36	2	0	1	250	**283**
8614	3.51	3.06	Grass	Grass	Mod	205	60	3	20	75	**43	0	260	228	36	3	0	1	250	**765**
6467	1.10	1.00	Grass	Grass	Mod	205	60	1	95	75	**43	1	210	228	36	3	0	1	250	**250**
7563	1.30	1.25	Grass	Grass	Mod	205	60	1	95	75	**43	1	210	228	36	2	0	1	250	**313**
8756	1.45	1.15	Grass	Grass	Mod	205	60	1	95	75	**43	1	210	228	36	3	0	1	250	**288**
9163	1.95	1.59	Grass	Grass	Mod	205	60	1	95	75	**43	1	210	228	36	3	0	1	250	**398**
4289	1.06	1.03	Grass	Grass	Mod	205	60	1	95	75	**43	1	210	228	36	2	0	1	250	**258**
3901	1.50	1.50	Grass	Grass	Mod	205	60	1	95	75	22	1	210	228	36	3	0	1	250	**375**
Ha	**53.21**	**50**																		**12500**

Nitrogen requirements based on values for grass described in RB209 8th Ed

Phosphate and Potash requirements based on values for Grass Silage - 2 cuts **(38 t/ha)** (RB209 8th Ed)

Crop use based on Grass totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (RB209)

*N, K and Mg stated are **available** concentrations in units of kg/ha based on an application rate of 250t/ha

****Total** P content of waste used on index 3 or above

Availabilities expressed as N = ammonium-N, P = 50% of total P, K = 90% of total K, Mg = 10% of total Mg

Table 7. Partially treated effluent

Nutrient Requirements for land at Bwlchmawr Farm 3

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P_2O_5 Req	Crop Use	**P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	*K_2O in Wst	Mg Ind	MgO Req	*MgO in Wst	Rate T/Ha	Totals Tonnes
5569	3.38	3.25	Grass	Grass	Mod	205	58	2	65	75	**16	1	260	228	40	2	0	1	250	**813**
6858	3.45	3.23	Grass	Grass	Mod	205	58	2	65	75	**16	0	260	228	40	3	0	1	250	**808**
8153	3.24	3.24	Grass	Grass	Mod	205	58	2	65	75	**16	0	260	228	40	2	0	1	250	**810**
9748	4.65	4.65	Grass	Grass	Mod	205	58	1	95	75	8	2-	170	228	40	2	0	1	250	**1163**
1057	2.05	2.00	Grass	Grass	Mod	205	58	2	65	75	**16	1	210	228	40	2	0	1	250	**500**
3854	3.4	3.36	Grass	Grass	Mod	205	58	3	20	75	**16	1	210	228	40	2	0	1	250	**840**
6042	2.84	2.65	Grass	Grass	Mod	205	58	2	65	75	8	1	210	228	40	2	0	1	250	**663**
2345	3.19	3.11	Grass	Grass	Mod	205	58	3	20	75	**16	1	210	228	40	2	0	1	250	**778**
9808	6.46	6.40	Grass	Grass	Mod	205	58	4	0	75	8	1	210	228	40	2	0	1	250	**1600**
1325	4.48	4.40	Grass	Grass	Mod	205	58	4	0	75	**16	1	210	228	40	2	0	1	250	**1100**
4105	2.50	2.00	Grass	Grass	Mod	205	58	2	65	75	**16	1	210	228	40	3	0	1	250	**500**
6810	1.70	1.13	Grass	Grass	Mod	205	58	2	65	75	**16	0	260	228	40	2	0	1	250	**283**
8614	3.51	3.06	Grass	Grass	Mod	205	58	3	20	75	**16	0	260	228	40	3	0	1	250	**765**
6467	1.10	1.00	Grass	Grass	Mod	205	58	1	95	75	**16	1	210	228	40	3	0	1	250	**250**
7563	1.30	1.25	Grass	Grass	Mod	205	58	1	95	75	**16	1	210	228	40	2	0	1	250	**313**
8756	1.45	1.15	Grass	Grass	Mod	205	58	1	95	75	**16	1	210	228	40	3	0	1	250	**288**
9163	1.95	1.59	Grass	Grass	Mod	205	58	1	95	75	**16	1	210	228	40	3	0	1	250	**398**
4289	1.06	1.03	Grass	Grass	Mod	205	58	1	95	75	**16	1	210	228	40	2	0	1	250	**258**
3901	1.50	1.50	Grass	Grass	Mod	205	58	1	95	75	8	1	210	228	40	3	0	1	250	**375**
Ha	**53.21**	**50**																		**12500**

Nitrogen requirements based on values for grass described in RB209 8th Ed

Phosphate and Potash requirements based on values for Grass Silage - 2 cuts **(38 t/ha)** (RB209 8th Ed)

Crop use based on Grass totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (RB209)

*N, K and Mg stated are **available** concentrations in units of kg/ha based on application rates up to 108t/ha

**Total P content of waste used on index 2 or above

Availabilities expressed as N = ammonium-N, P = 50% of total P, K = 90% of total K, Mg = 10% of total Mg

Table 8. DAF sludge

Nutrient Requirements for land at Bwlchmawr Farm 3

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P_2O_5 Req	Crop Use	**P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	*K_2O in Wst	Mg Ind	MgO Req	*MgO in Wst	Rate T/Ha	Totals Tonnes
5569	3.38	3.25	Grass	Grass	Mod	205	34	2	65	75	**75	1	260	228	6	2	0	1	12	**39**
6858	3.45	3.23	Grass	Grass	Mod	205	34	2	65	75	**75	0	260	228	6	3	0	1	12	**39**
8153	3.24	3.24	Grass	Grass	Mod	205	34	2	65	75	**75	0	260	228	6	2	0	1	12	**39**
9748	4.65	4.65	Grass	Grass	Mod	205	34	1	95	75	94	2-	170	228	16	2	0	3	30	**140**
1057	2.05	2.00	Grass	Grass	Mod	205	34	2	65	75	**75	1	210	228	6	2	0	1	12	**24**
3854	3.4	3.36	Grass	Grass	Mod	205	34	3	20	75	**75	1	210	228	6	2	0	1	12	**40**
6042	2.84	2.65	Grass	Grass	Mod	205	85	2	65	75	94	1	210	228	16	2	0	3	30	**80**
2345	3.19	3.11	Grass	Grass	Mod	205	34	3	20	75	**75	1	210	228	6	2	0	1	12	**37**
9808	6.46	6.40	Grass	Grass	Mod	205	85	4	0	75	94	1	210	228	16	2	0	3	30	**192**
1325	4.48	4.40	Grass	Grass	Mod	205	34	4	0	75	**75	1	210	228	6	2	0	1	12	**53**
4105	2.50	2.00	Grass	Grass	Mod	205	34	2	65	75	**75	1	210	228	6	3	0	1	12	**24**
6810	1.70	1.13	Grass	Grass	Mod	205	34	2	65	75	**75	0	260	228	6	2	0	1	12	**14**
8614	3.51	3.06	Grass	Grass	Mod	205	34	3	20	75	**75	0	260	228	6	3	0	1	12	**37**
6467	1.10	1.00	Grass	Grass	Mod	205	85	1	95	75	94	1	210	228	16	3	0	1	30	**30**
7563	1.30	1.25	Grass	Grass	Mod	205	85	1	95	75	94	1	210	228	16	2	0	1	30	**38**
8756	1.45	1.15	Grass	Grass	Mod	205	85	1	95	75	94	1	210	228	16	3	0	1	30	**35**
9163	1.95	1.59	Grass	Grass	Mod	205	85	1	95	75	94	1	210	228	16	3	0	1	30	**48**
4289	1.06	1.03	Grass	Grass	Mod	205	85	1	95	75	94	1	210	228	16	2	0	1	30	**31**
3901	1.50	1.50	Grass	Grass	Mod	205	85	1	95	75	94	1	210	228	16	3	0	1	30	**45**
Ha	**53.21**	**50**																		**982**

Nitrogen requirements based on values for grass described in RB209 8th Ed

Phosphate and Potash requirements based on values for Grass Silage - 2 cuts **(38 t/ha)** (RB209 8th Ed)

Crop use based on Grass totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (RB209)

*N, K and Mg stated are **available** concentrations in units of kg/ha based on application rates up to 25t/ha

****Total** P content of waste used on index 3 or above

Availabilities expressed as N = ammonium-N, P = 50% of total P, K = 90% of total K, Mg = 10% of total Mg

Table 9. Farm slurry

Nutrient Requirements for land at Bwlchmawr Farm 3

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P_2O_5 Req	Crop Use	**P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	*K_2O in Wst	Mg Ind	MgO Req	*MgO in Wst	Rate T/Ha	Totals Tonnes
5569	3.38	3.25	Grass	Grass	Mod	205	52	2	65	75	**74	1	260	228	104	2	0	6	56	**182**
6858	3.45	3.23	Grass	Grass	Mod	205	52	2	65	75	**74	0	260	228	104	3	0	6	56	**181**
8153	3.24	3.24	Grass	Grass	Mod	205	52	2	65	75	**74	0	260	228	104	2	0	6	56	**181**
9748	4.65	4.65	Grass	Grass	Mod	205	79	1	95	75	56	2-	170	228	158	2	0	9	85	**395**
1057	2.05	2.00	Grass	Grass	Mod	205	52	2	65	75	**74	1	210	228	104	2	0	6	56	**112**
3854	3.4	3.36	Grass	Grass	Mod	205	52	3	20	75	**74	1	210	228	104	2	0	6	56	**188**
6042	2.84	2.65	Grass	Grass	Mod	205	79	2	65	75	56	1	210	228	158	2	0	9	85	**225**
2345	3.19	3.11	Grass	Grass	Mod	205	52	3	20	75	**74	1	210	228	104	2	0	6	56	**174**
9808	6.46	6.40	Grass	Grass	Mod	205	79	4	0	75	56	1	210	228	158	2	0	9	85	**544**
1325	4.48	4.40	Grass	Grass	Mod	205	52	4	0	75	**74	1	210	228	104	2	0	6	56	**246**
4105	2.50	2.00	Grass	Grass	Mod	205	52	2	65	75	**74	1	210	228	104	3	0	6	56	**112**
6810	1.70	1.13	Grass	Grass	Mod	205	52	2	65	75	**74	0	260	228	104	2	0	6	56	**63**
8614	3.51	3.06	Grass	Grass	Mod	205	52	3	20	75	**74	0	260	228	104	3	0	6	56	**171**
6467	1.10	1.00	Grass	Grass	Mod	205	79	1	95	75	56	1	210	228	158	3	0	9	85	**85**
7563	1.30	1.25	Grass	Grass	Mod	205	79	1	95	75	56	1	210	228	158	2	0	9	85	**106**
8756	1.45	1.15	Grass	Grass	Mod	205	79	1	95	75	56	1	210	228	158	3	0	9	85	**98**
9163	1.95	1.59	Grass	Grass	Mod	205	79	1	95	75	56	1	210	228	158	3	0	9	85	**135**
4289	1.06	1.03	Grass	Grass	Mod	205	79	1	95	75	56	1	210	228	158	2	0	9	85	**88**
3901	1.50	1.50	Grass	Grass	Mod	205	79	1	95	75	56	1	210	228	158	3	0	9	85	**128**
Ha	**53.21**	**50**																		**3415**

Nitrogen requirements based on values for grass described in RB209 8th Ed

Phosphate and Potash requirements based on values for Grass Silage - 2 cuts **(38 t/ha)** (RB209 8th Ed)

Crop use based on Grass totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (RB209)

*N, P, K and Mg stated are **available** concentrations in units of kg/ha based on an application rate of 73t/ha

****Total** P content of waste used on index 3 or above

Availabilities expressed as N = ammonium-N, P = 50% of total P, K = 90% of total K, Mg = 10% of total Mg

5 Compliance with NVZ regulations

Table 10. 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 ☐ N/A ☒

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 Tables 6-9

The raw effluent can be applied at the maximum permissible application rate of 250t/ha without any exceedance of total N limit (250kg/ha) or maximum permissible levels for PTEs.

For the DAF sludge and farm slurry, phosphorus is the limiting factor and at index 3 or above, application rates have been chosen to ensure the total phosphorus applied does not exceed crop offtake.</td></tr>
<tr><td>Previous applications:</td><td>Refer to Table 4 in LPD1.

Nutritional demand and off-take of the previous crop far exceeded the nutritional additions supplied to the fields from the wastes. All fields to be registered therefore require new nutritional input in order to help support the next crop. All previous applications onto these fields have been taken into consideration during assessment of the suitability and nutritional properties of the waste streams.</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 6-9 above. General soil type(s) for the fields to be registered are;

SS6 – Generally free draining, acidic, loamy soils with inherent low fertility

Table 11. 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 (**6. Soil Analyses**) shows the soils to have ample background concentrations of Mg (*i.e.* ADAS Index of 2 or more). 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

This information is further summarised against the nutrient requirements for proposed crops in Tables 6-9 above.

The limiting factor for the waste is:

Phosphorus is the limiting factor for application of DAF sludge, partially treated effluent and farm slurry. The raw effluent waste is limited by the set maximum application rate of 250 t/ha

Full characterisations of individual wastes are supplied in **Waste Analyses and waste interpretations**.

6.3 Summary of benefits

The application of the wastes will supply useful quantities of major plant nutrients including N, P, K and S and so will replace a proportion of other organic or inorganic fertilisers that would normally be applied. The

application rate is suitable for the nutrients required by the cropping plan and the existing soil nutrient status.

The raw effluent is a good source of readily available nitrogen (RAN) and provides a significant amount of P_2O_5 (at target application rate of 250 t/ha, the total amount of P_2O_5 is close to the crop offtake). It also contains useful amounts of K_2O and SO_3.

The partially treated effluent is also high in RAN and has useful quantities of P_2O_5 (16kg/ha at target application rate) as well as K_2O.

DAF sludge is high in RAN and P_2O_5, which limits the rate of application.

Farm slurry is typically high in phosphate, which limits rates of application in agricultural spreading. As the slurry may be mixed with other wastes, a **mixed application rate calculator** has been included with this deployment application to show how wastes will not be over applied when combined with farmyard slurry.

Total solid contents of the wastes are 0.59%, 0.38% and 13.5% for the raw effluent, partial effluent and DAF sludge respectively. Therefore, at the recommended rates of application, a total of 1.5, 1, and 4 tonnes of dry matter will be applied to the soil respectively.

6.4 Additional requirements

Fields with pH below 6 will require liming to sustain soil pH levels.

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 far below (*i.e.* by several fold) maximum upper limits for heavy metal applications described in the Sludge (Use in Agriculture) Regulations 1989 (SI, 1989). Refer to interpretations in **6. Waste Analyses**.

7.2 Other waste characteristics

Fats and oils contents of the wastes are <1%. Fats and oils are not therefore routinely analysed in these wastes for land spreading registrations.

All the abattoir wastes are around pH neutral, with pH values of 7.22, 7.02 and 7.21 for raw effluent, partial effluent and DAF sludge respectively. The electrical conductivities of the wastes are low to medium and are therefore unlikely to significantly alter ionic movement within the receiving soil.

Consequently, it is scarcely possible that pH of receiving soils will decrease following the application detailed here. It is therefore unlikely that availability of any naturally occurring heavy metals present in these soils will become more available after application of these wastes

Operational factors

1. Application of liquid wastes may cause potential run-off due to gradually sloping fields. Wastes will be applied using a low trajectory spread plate or dribble bar to minimise risk of run-off or leaching.

2. 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.

3. 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.

8 Sensitive human and environmental receptors

Table 12. Sensitive receptors close to the deployed area

Receptor	***Distance from Area***	***Emission Type***	***Likelihood of Emission Detection Red=High Amber=Moderate Green=Low***	***Mitigation for Red/Amber***
Bwlchbychan House	adjacent	Odour	Unlikely as away from direction of prevailing wind and access routes. Property will be accustomed to rural activities	
Roads and paths in nearby fields	variable	Odour and direct contamination to road and paths	Unlikely due to proximity to spreading areas and transient receptors.	Spreading will be carried out using CoGAP using application techniques listed above. Spreaders will be familiar with field and aware of path usage

Locations of sensitive receptors are shown in **4. Site Plans**. Prevailing winds are south-westerly.

A full **site-specific risk assessment** is provided within this application

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 purple in Table 13. 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. Machinery will be checked daily when in use, regularly serviced and spreading equipment calibrated.
5. Machinery turns will not be executed in the buffer strips.
6. Waste deliveries to field/stores will be supervised.
7. 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 circumstances where the wastes cannot be stored or spread beyond normal capacities, wastes will be diverted to an alternative deployment.

Bwlchmawr Farm Mixed Waste Interpretation

Appendix 1 -

Name of waste	Single target application rate t/ha	mixed application rate t/ha	*Nutrients kg/ha*											
			N		P		K		Mg		S			
			total	available	total	available	total	available	total	available	total	available		
Final Sludge	30	8	249.5	85.0	188.0	94.0	18.0	16.0	10.4	2.6	36.6	3.7		
			66.5	22.7	50.1	25.1	4.8	4.3	2.8	0.7	9.8	1.0		
Farm Slurry	85	20	247.0	78.5	113.0	56.4	176.0	158.0	94.0	9.4	80.1	8.0		
			58.1	18.5	26.6	13.3	41.4	37.2	22.1	2.2	18.8	1.9		
	Mixed waste total	28	124.7	41.1	76.7	38.3	46.2	41.4	24.9	2.9	28.6	2.9		
	max (crop use)	250	250		75		243							

Name of waste	*Total metals kg/ha*											
	Zn	Cu	Ni	Pb	Cd	Cr	Hg			Al	Fe	Mn
	Zinc	Copper	Nickel	Lead	Cadmium	Chromium	Mercury			Alum	Iron	Man
	0.89	0.32	0.0	0.0	0.0	0.0	0.0					
Final sludge	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Farm slurry	1.5	0.29	0.17	0.07	0.0	0.2	0.0					
	0.4	0.1	0.0	0.0	0.0	0.1	0.0	0.0		0.0	0.0	0.0
Mixed waste T	0.6	0.2	0.0	0.0	0.0	0.1	0.0	0.0		0.0	0.0	0.0
max kg/ha/yr	15	7.5	3	15	0.15	15	0.1					

ANALYTICAL REPORT

Report Number	**74874-19**	**V724**	**RICHARD EVANS**	**Client**	**DUNBIA**
Date Received	**22-OCT-2019**		**4 RECYCLING LTD**		
Date Reported	**28-OCT-2019**		**CONTROL HOUSE**		
Project	**SLUDGE**		**A1 BUSINESS PARK**		
Reference	**DUNBIA**		**KNOTTINGLEY ROAD**		
Order Number			**KNOTTINGLEY WF11 0BU**		

Laboratory Reference		**SLUR87779**	**SLUR87780**	**SLUR87781**							
Sample Reference		**RAW EFFLUENT**	**INTERMEDIAT EFFLUENT**	**FINAL EFFLUENT**							
Determinand	**Unit**	SLURRY/SLUDGE	SLURRY/SLUDGE	SLURRY/SLUDGE							
Oven Dry Solids	%	0.590	0.380	3.31							
Conductivity 1:6	uS/cm	1188	1198	1578							
Total Kjeldahl Nitrogen	% w/w	0.04	0.03	0.20							
Ammonium Nitrogen	mg/kg	240	230	532							
Total Phosphorus (P)	mg/kg	75.5	28.0	878							
Total Potassium (K)	mg/kg	132	148	295							
Total Magnesium (Mg)	mg/kg	12.6	10.5	94.3							
Total Copper (Cu)	mg/kg	0.40	<0.2	2.65							
Total Zinc (Zn)	mg/kg	0.96	<0.5	7.22							
Total Sulphur (S)	mg/kg	24.1	13.8	169							
Total Calcium (Ca)	mg/kg	42.8	<10	397							
Total Lead (Pb)	mg/kg	<0.5	<0.5	<0.5							
Total Cadmium (Cd)	mg/kg	<0.01	<0.01	<0.01							
Total Mercury (Hg)	mg/kg	<0.05	<0.05	<0.05							
Total Nickel (Ni)	mg/kg	<0.2	<0.2	0.64							
Total Chromium (Cr)	mg/kg	0.29	0.24	0.56							
Total Sodium (Na)	mg/kg	1175	1129	1229							
pH 1:6 [Fresh]		7.22	7.02	6.61							
Organic Matter LOI	% w/w	0.26	0.07	2.52							
Total Arsenic (As)	mg/kg	<0.5	<0.5	<0.5							
Oils,Fats and Grease	mg/kg	1140	800	4440							

Notes

Analysis Notes

The sample submitted was of adequate size to complete all analysis requested.
The results as reported relate only to the item(s) submitted for testing.
The results are presented on an as received basis unless otherwise stipulated.

ANALYTICAL NOTES

Report Number	**74874-19**	**V724**	**RICHARD EVANS**	**Client DUNBIA**
Date Received	**22-OCT-2019**		**4 RECYCLING LTD**	
Date Reported	**28-OCT-2019**		**CONTROL HOUSE**	
Project	**SLUDGE**		**A1 BUSINESS PARK**	
Reference	**DUNBIA**		**KNOTTINGLEY ROAD**	
Order Number			**KNOTTINGLEY WF11 0BU**	

Notes

Reported by

Myles Nicholson

Natural Resource Management, a trading division of Cawood Scientific Ltd.
Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS
Tel: 01344 886338
Fax: 01344 890972
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A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

DUNBIA
LLANBYDDER

SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

FINAL SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	80741
Sample Number	107882

Date Received	10-DEC-2019
Date Reported	20-DEC-2019

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.

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Oven Dry Matter	13.5	%
Conductivity 1:6 [Fresh]	2892	uS/cm
Total Nitrogen	6.16	% w/w
Ammonium Nitrogen	21042	mg/kg
Total Phosphorus (P)	20400	mg/kg
Total Potassium (K)	3705	mg/kg
Total Magnesium (Mg)	1604	mg/kg
Total Copper (Cu)	79.7	mg/kg
Total Zinc (Zn)	219	mg/kg
Total Sulphur (S)	3612	mg/kg

Released by ..... *Myles Nicholson* ..... Date ..... *20/12/19* .....

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DUNBIA
LLANBYDDER

SLUDGE

SLUDGE ANALYSIS RESULTS

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Date Reported	20-DEC-2019

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.

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Total Calcium (Ca)	11734	mg/kg
Total Lead (Pb)	5.76	mg/kg
Total Cadmium (Cd)	0.16	mg/kg
Total Mercury (Hg)	<0.1	mg/kg
Total Nickel (Ni)	5.09	mg/kg
Total Chromium (Cr)	8.75	mg/kg
Total Sodium (Na)	7986	mg/kg
pH 1:6 [Fresh]	7.21	
Organic Matter LOI	81.6	% w/w
Total Arsenic (As)	0.68	mg/kg

Released by *Myles Nicholson* Date *20/12/19*

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DUNBIA
LLANBYDDER

SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

FINAL SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	80741
Sample Number	107882

Date Received	10-DEC-2019
Date Reported	20-DEC-2019

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.

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Oils,Fats and Grease	17697	mg/kg

Released by *Myles Nicholson* Date *20/12/19*

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V724

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BWLCHMAWR FARM
LLAMBYDDER

MANURE ANALYSIS RESULTS

Sample Reference :

SLURRY SAMPLE

Sample Matrix : MANURE

Laboratory References	
Report Number	80740
Sample Number	107881

Date Received	10-DEC-2019
Date Reported	17-DEC-2019

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.

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Oven Dry Matter	18.3	%
Conductivity 1:6 [Fresh]	2275	uS/cm
Total Nitrogen	1.59	% w/w
Ammonium Nitrogen	5047	mg/kg
Total Phosphorus (P)	3183	mg/kg
Total Potassium (K)	9424	mg/kg
Total Magnesium (Mg)	3776	mg/kg
Total Copper (Cu)	18.9	mg/kg
Total Zinc (Zn)	96.5	mg/kg
Total Sulphur (S)	2060	mg/kg

Released by ..... *Katie Dunn* ..... Date ..... *17/12/19* .....

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BWLCHMAWR FARM
LLAMBYDDER

MANURE ANALYSIS RESULTS

Sample Reference :

SLURRY SAMPLE

Sample Matrix : MANURE

Laboratory References	
Report Number	80740
Sample Number	107881

Date Received	10-DEC-2019
Date Reported	17-DEC-2019

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.

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Total Calcium (Ca)	15160	mg/kg
Total Lead (Pb)	4.76	mg/kg
Total Cadmium (Cd)	0.11	mg/kg
Total Mercury (Hg)	<0.1	mg/kg
Total Nickel (Ni)	11.2	mg/kg
Total Chromium (Cr)	14.4	mg/kg
Total Sodium (Na)	3555	mg/kg
pH 1:6 [Fresh]	7.36	
Organic Matter LOI	35.7	% w/w
Total Arsenic (As)	3.27	mg/kg

Released by ..... *Katie Dunn* ..... Date ..... *17/12/19* .....

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Dunbia Wales

Analysis of Raw Effluent

22.10.19 **Lab ref. 74874-19**

Application rate (t/ha)	**250**
Application rate (t/acre)	**101.2**
pH	**7.22**
Dry solids (%)	**0.59**
Organic matter content (%)	**0.26**
conductivity (µS/cm)	**1188**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.04	%	0.40	100	0.24	60
Ammonium-N	240	mg/kg	0.24	60		
Phosphorus (P)	75.5	mg/kg	0.08			
Phosphate (P_2O_5)			0.17	43	0.09	22
Potassium (K)	132	mg/kg	0.13			
Potash (K_2O)			0.16	40	0.14	36
Magnesium (Mg)	12.6	mg/kg	0.01			
Magnesium (MgO)			0.02	5	0.00	1
Sulphur (S)	24.1	mg/kg	0.02			
Sulphur (SO_3)			0.06	15	0.01	2
Calcium (Ca)	42.8	mg/kg	0.04	11		
Sodium (Na)	1175	mg/kg	1.18	294		29

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	0.96	mg/kg	1.0	0.24	15.00
Copper	0.4	mg/kg	0.4	0.10	7.50
Nickel	0.2	mg/kg	0.2	0.05	3.00
Lead	0.5	mg/kg	0.5	0.13	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.29	mg/kg	0.3	0.07	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Arsenic	0.50	mg/kg	0.5	0.13	0.70
Selenium		mg/kg	0.0	0.00	0.15
Molybdenum		mg/kg	0.0	0.00	0.20
Fluoride		mg/kg	0.0	0.00	20.00
Other Elements					
Aluminium		mg/kg	0.0	0.00	
Iron		mg/kg	0.0	0.00	

To convert from kg/tonne to units/ton multiply by 2

To convert from kg/ha to units/acre multiply by 0.8

Dunbia Wales

Analysis of Intermediate Effluent

22.10.19 **Lab ref. 74874-19**

Application rate (t/ha)	**250**
Application rate (t/acre)	**101.2**
pH	**7.0**
Dry solids (%)	**0.38**
Organic matter content (%)	**0.1**
conductivity (µS/cm)	**1198**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.03	%	0.30	75	0.23	58
Ammonium-N	230	mg/kg	0.23	58		
Phosphorus (P)	28	mg/kg	0.03			
Phosphate (P_2O_5)			0.06	16	0.03	8
Potassium (K)	148	mg/kg	0.15			
Potash (K_2O)			0.18	44	0.16	40
Magnesium (Mg)	10.5	mg/kg	0.01			
Magnesium (MgO)			0.02	4	0.00	1.1
Sulphur (S)	13.8	mg/kg	0.01			
Sulphur (SO_3)			0.03	9	0.00	1
Calcium (Ca)	10	mg/kg	0.01	3		
Sodium (Na)	1129	mg/kg	1.13	282		

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	0.5	mg/kg	0.5	0.13	15.00
Copper	0.2	mg/kg	0.2	0.05	7.50
Nickel	0.2	mg/kg	0.2	0.05	3.00
Lead	0.5	mg/kg	0.5	0.13	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.24	mg/kg	0.2	0.06	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Arsenic	0.50	mg/kg	0.5	0.13	0.70
Selenium		mg/kg	0.0	0.00	0.15
Molybdenum		mg/kg	0.0	0.00	0.20
Fluoride		mg/kg	0.0	0.00	20.00
Other Elements					
Aluminium		mg/kg	0.0	0.00	
Iron		mg/kg	0.0	0.00	

To convert from kg/tonne to units/ton multiply by 2

To convert from kg/ha to units/acre multiply by 0.8

Dunbia Wales

Analysis of Final Sludge

Date: 20/12/2019 Lab report no. 80741

Application rate (t/ha)	**12**
Application rate (t/acre)	**4.8**
pH	**7.2**
Dry solids (%)	**13.5**
Organic matter (%)	**81.6**
Conductivity (µS/cm)	**2892**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	6.16	%	8.32	99.8	2.84	34.1
Ammonium-N	21042	mg/kg	2.84	34.1		
Phosphorus (P)	20400	mg/kg	2.75	33.0		
Phosphate (P_2O_5)			6.28	75.3	3.1	37.7
Potassium (K)	3705	mg/kg	0.50	6.0		
Potash (K_2O)			0.60	7.2	0.5	6.5
Magnesium (Mg)	1604	mg/kg	0.22	2.6		
Magnesium (MgO)			0.35	4.2	0.0	1.0
Sulphur (S)	3612	mg/kg	0.49	5.9		
Sulphur (SO_3)			1.22	14.6	0.1	1.5
Calcium (Ca)	11734	mg/kg	1.6	19.0		
Sodium (Na)	7986	mg/kg	1.08	12.9		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	219.0	mg/kg	29.6	0.35	15.00
Copper	80	mg/kg	10.76	0.13	7.50
Nickel	5.1	mg/kg	0.69	0.01	3.00
Lead	5.8	mg/kg	0.78	0.01	15.00
Cadmium	0.16	mg/kg	0.02	0.00	0.15
Chromium	8.8	mg/kg	1.18	0.01	15.00
Mercury	0.1	mg/kg	0.01	0.00	0.10
Arsenic	0.7	mg/kg	0.09	0.00	0.70
Selenium		mg/kg	0.00	0.00	0.15
Molybdenum		mg/kg	0.00	0.00	0.20
Fluoride		mg/kg	0.00	0.00	20.00
Other Elements					
Aluminium		mg/kg	0.00	0.00	
Iron		mg/kg	0.00	0.00	

Dunbia Wales

Analysis of Final Sludge

Date: 20/12/2019 Lab report no. 80741

Application rate (t/ha)	**30**
Application rate (t/acre)	**12.0**
pH	**7.2**
Dry solids (%)	**13.5**
Organic matter (%)	**81.6**
Conductivity (µS/cm)	**2892**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	6.16	%	8.32	249.5	2.84	85.2
Ammonium-N	21042	mg/kg	2.84	85.2		
Phosphorus (P)	20400	mg/kg	2.75	82.6		
Phosphate (P_2O_5)			6.28	188.4	3.1	94.2
Potassium (K)	3705	mg/kg	0.50	15.0		
Potash (K_2O)			0.60	18.0	0.5	16.2
Magnesium (Mg)	1604	mg/kg	0.22	6.5		
Magnesium (MgO)			0.35	10.4	0.0	2.6
Sulphur (S)	3612	mg/kg	0.49	14.6		
Sulphur (SO_3)			1.22	36.6	0.1	3.7
Calcium (Ca)	11734	mg/kg	1.6	47.5		
Sodium (Na)	7986	mg/kg	1.08	32.3		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	219.0	mg/kg	29.6	0.89	15.00
Copper	80	mg/kg	10.76	0.32	7.50
Nickel	5.1	mg/kg	0.69	0.02	3.00
Lead	5.8	mg/kg	0.78	0.02	15.00
Cadmium	0.16	mg/kg	0.02	0.00	0.15
Chromium	8.8	mg/kg	1.18	0.04	15.00
Mercury	0.1	mg/kg	0.01	0.00	0.10
Arsenic	0.7	mg/kg	0.09	0.00	0.70
Selenium		mg/kg	0.00	0.00	0.15
Molybdenum		mg/kg	0.00	0.00	0.20
Fluoride		mg/kg	0.00	0.00	20.00
Other Elements					
Aluminium		mg/kg	0.00	0.00	
Iron		mg/kg	0.00	0.00	

Dunbia Wales

Analysis of Farm Slurry

Date: 09/12/2019 Lab report no. 80740

Application rate (t/ha)	**56**
Application rate (t/acre)	**22.4**
pH	**7.36**
Dry solids (%)	**18.3**
Organic matter (%)	**35.7**
Conductivity (µS/cm)	**2275**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.59	%	2.91	162.9	0.92	51.7
Ammonium-N	5047	mg/kg	0.92	51.7		
Phosphorus (P)	3183	mg/kg	0.58	32.6		
Phosphate (P_2O_5)			1.33	74.4	0.7	37.2
Potassium (K)	9424	mg/kg	1.72	96.6		
Potash (K_2O)			2.07	115.9	1.9	104.3
Magnesium (Mg)	3776	mg/kg	0.69	38.7		
Magnesium (MgO)			1.11	61.9	0.1	6.2
Sulphur (S)	2060	mg/kg	0.38	21.1		
Sulphur (SO_3)			0.94	52.8	0.1	5.3
Calcium (Ca)	15160	mg/kg	2.8	155.4		
Sodium (Na)	3555	mg/kg	0.65	36.4		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	96.5	mg/kg	17.7	0.99	15.00
Copper	19	mg/kg	3.46	0.19	7.50
Nickel	11.2	mg/kg	2.05	0.11	3.00
Lead	4.8	mg/kg	0.87	0.05	15.00
Cadmium	0.11	mg/kg	0.02	0.00	0.15
Chromium	14.4	mg/kg	2.64	0.15	15.00
Mercury	0.1	mg/kg	0.02	0.00	0.10
Arsenic	3.27	mg/kg	0.60	0.03	0.70
Selenium		mg/kg	0.00	0.00	0.15
Molybdenum		mg/kg	0.00	0.00	0.20
Fluoride		mg/kg	0.00	0.00	20.00
Other Elements					
Aluminium		mg/kg	0.00	0.00	
Iron		mg/kg	0.00	0.00	

Dunbia Wales

Analysis of Farm Slurry

Date: 09/12/2019 Lab report no. 80740

Application rate (t/ha)	**85**
Application rate (t/acre)	**34.0**
pH	**7.36**
Dry solids (%)	**18.3**
Organic matter (%)	**35.7**
Conductivity (µS/cm)	**2275**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.59	%	2.91	247.3	0.92	78.5
Ammonium-N	5047	mg/kg	0.92	78.5		
Phosphorus (P)	3183	mg/kg	0.58	49.5		
Phosphate (P_2O_5)			1.33	112.9	0.7	56.4
Potassium (K)	9424	mg/kg	1.72	146.6		
Potash (K_2O)			2.07	175.9	1.9	158.3
Magnesium (Mg)	3776	mg/kg	0.69	58.7		
Magnesium (MgO)			1.11	94.0	0.1	9.4
Sulphur (S)	2060	mg/kg	0.38	32.0		
Sulphur (SO_3)			0.94	80.1	0.1	8.0
Calcium (Ca)	15160	mg/kg	2.8	235.8		
Sodium (Na)	3555	mg/kg	0.65	55.3		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	96.5	mg/kg	17.7	1.50	15.00
Copper	19	mg/kg	3.46	0.29	7.50
Nickel	11.2	mg/kg	2.05	0.17	3.00
Lead	4.8	mg/kg	0.87	0.07	15.00
Cadmium	0.11	mg/kg	0.02	0.00	0.15
Chromium	14.4	mg/kg	2.64	0.22	15.00
Mercury	0.1	mg/kg	0.02	0.00	0.10
Arsenic	3.27	mg/kg	0.60	0.05	0.70
Selenium		mg/kg	0.00	0.00	0.15
Molybdenum		mg/kg	0.00	0.00	0.20
Fluoride		mg/kg	0.00	0.00	20.00
Other Elements					
Aluminium		mg/kg	0.00	0.00	
Iron		mg/kg	0.00	0.00	

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Client : BWLCHMAWR FARM
BRYNTEG
LLANBYDDER
CARMARTHENSHIRE

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 19741/19

Date Received 29-Oct-19
Date Reported 30-Oct-19

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
84234/19	1	**FIELD 5569** *No cropping details given*	**5.7**	**2**	**1**	**2**	**19.6**	**65**	**81**
84235/19	2	**FIELD 6858** *No cropping details given*	**6.0**	**2**	**0**	**3**	**21.2**	**40**	**105**
84236/19	3	**FIELD 8153** *No cropping details given*	**5.7**	**2**	**0**	**2**	**17.0**	**60**	**68**
84237/19	4	**FIELD 9748** *No cropping details given*	**5.6**	**1**	**2-**	**2**	**15.0**	**121**	**74**
84238/19	5	**FIELD 1057** *No cropping details given*	**5.7**	**2**	**1**	**2**	**16.0**	**104**	**65**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

Released by ..... *Myles Nicholson* ..... On behalf of NRM Ltd Date ..... *30/10/19* .....

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DATE 30th October 2019
SAMPLES FROM BWLCHMAWR FARM, BRYNTEG, LLANBYDDER, CARMARTHENSHIRE

SAMPLED BY

Report reference 19741/19

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Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
Vegetables and Bulbs: P Index 3, K Index 2+
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.
Fertiliser recommendations are based on DEFRA RB209 (Ninth Edition - 2017). If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025:2005

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 5569	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.8**	**1.1**
084234 /		*Kg/Ha*				*Te/Ha* **7.0**	**2.6**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 6858	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.0**	**0**
084235 /		*Kg/Ha*				*Te/Ha* **4.9**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 8153	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.8**	**1.1**
084236 /		*Kg/Ha*				*Te/Ha* **7.0**	**2.6**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 9748	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **3.1**	**1.3**
084237 /		*Kg/Ha*				*Te/Ha* **7.7**	**3.1**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 1057	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.8**	**1.1**
084238 /		*Kg/Ha*				*Te/Ha* **7.0**	**2.6**

Fertiliser recommendations are based on **(Ninth Edition - 2017).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

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Please quote the above code for all enquiries

Client : BWLCMAWR FARM
BRYNTEG
LLANBYDDER

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 20084/19

Date Received 05-Nov-19
Date Reported 06-Nov-19

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
85734/19	1	**FIELD 6042** *No cropping details given*	**5.9**	**2**	**1**	**2**	**23.8**	**113**	**96**
85735/19	2	**FIELD 7833** *No cropping details given*	**5.9**	**2**	**1**	**2**	**22.6**	**86**	**75**
85736/19	3	**FIELD 3854** *No cropping details given*	**5.7**	**3**	**1**	**2**	**35.4**	**84**	**72**
85737/19	4	**FIELD 2345** *No cropping details given*	**5.8**	**3**	**1**	**2**	**27.6**	**93**	**69**
85738/19	5	**FIELD 1431** *No cropping details given*	**6.1**	**2**	**1**	**2**	**24.4**	**116**	**63**
85739/19	6	**FIELD 0920 W** *No cropping details given*	**5.8**	**2**	**1**	**1**	**16.2**	**73**	**40**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

Released by *Gina Graham* On behalf of NRM Ltd Date *06/11/19*

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Please quote the above code for all enquiries

Client : BWLCMAWR FARM
BRYNTEG
LLANBYDDER

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 20084/19

Date Received 05-Nov-19
Date Reported 06-Nov-19

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
85740/19	7	**FIELD 0920 M + S** *No cropping details given*	**6.1**	**1**	**1**	**1**	**12.2**	**90**	**36**
85741/19	8	**FIELD 0920 E** *No cropping details given*	**5.7**	**1**	**1**	**1**	**10.4**	**62**	**33**
85742/19	9	**FIELD 3808** *No cropping details given*	**5.3**	**1**	**1**	**1**	**12.0**	**91**	**33**
85743/19	10	**FIELD 8992 N** *No cropping details given*	**5.4**	**1**	**1**	**1**	**12.6**	**112**	**43**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

Released by Gina Graham On behalf of NRM Ltd Date 06/11/19

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DATE 6th November 2019
SAMPLES FROM BWLCMAWR FARM, BRYNTEG, LLANBYDDER

SAMPLED BY

Report reference 20084/19

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Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
Vegetables and Bulbs: P Index 3, K Index 2+
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.
Fertiliser recommendations are based on DEFRA RB209 (Ninth Edition - 2017). If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 6042	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.3**	**0.6**
085734 /		*Kg/Ha*				*Te/Ha* **5.6**	**1.6**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 7833	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.3**	**0.6**
085735 /		*Kg/Ha*				*Te/Ha* **5.6**	**1.6**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 3854	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.8**	**1.1**
085736 /		*Kg/Ha*				*Te/Ha* **7.0**	**2.6**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 2345	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.5**	**0.8**
085737 /		*Kg/Ha*				*Te/Ha* **6.3**	**2.1**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 1431	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **1.7**	**0**
085738 /		*Kg/Ha*				*Te/Ha* **4.2**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 0920 W	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.5**	**0.8**
085739 /		*Kg/Ha*				*Te/Ha* **6.3**	**2.1**

Fertiliser recommendations are based on **DEFRA RB209 (Ninth Edition - 2017).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Report continued.....

DATE 6th November 2019
SAMPLES FROM BWLCMAWR FARM, BRYNTEG, LLANBYDDER

SAMPLED BY

Report reference 20084/19

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Fertiliser Recommendations

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 0920 M + S	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **1.7**	**0**
085740 /		*Kg/Ha*				*Te/Ha* **4.2**	**0**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 0920 E	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.8**	**1.1**
085741 /		*Kg/Ha*				*Te/Ha* **7.0**	**2.6**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 3808	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **4.0**	**1.9**
085742 /		*Kg/Ha*				*Te/Ha* **9.8**	**4.7**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 8992 N	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **3.7**	**1.7**
085743 /		*Kg/Ha*				*Te/Ha* **9.1**	**4.2**

Fertiliser recommendations are based on **(Ninth Edition - 2017).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

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Please quote the above code for all enquiries

Client : BWLCH MAWR FARM
BRYNTEG
LLANYBYDDER
SA40 9XA

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 03535/20

Date Received 24-Feb-20
Date Reported 25-Feb-20

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details			Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details	Soil pH	P	K	Mg	P	K	Mg
16027/20	1	**FIELD 8161** *No cropping details given*	**5.3**	**3**	**1**	**2**	**43.0**	**67**	**60**
16028/20	2	**FIELD 9456** *No cropping details given*	**5.5**	**4**	**0**	**2**	**46.4**	**45**	**57**
16029/20	3	**FIELD 9808** *No cropping details given*	**5.0**	**4**	**1**	**2**	**47.4**	**76**	**56**
16030/20	4	**FIELD 1325** *No cropping details given*	**5.2**	**4**	**1**	**2**	**49.4**	**72**	**59**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

Released by Gina Graham On behalf of NRM Ltd Date 25/02/20

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DATE 25th February 2020
SAMPLES FROM BWLCH MAWR FARM, BRYNTEG, LLANYBYDDER, SA40 9XA

SAMPLED BY

Report reference 03535/20

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Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likly to be achieved on soils that are well structured and enable good rooting.
For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)
Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.
Fertiliser recommendations are based on DEFRA RB209 (Ninth Edition - 2017). If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 8161	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.0**	**1.9**
016027 /		*Kg/Ha*				*Te/Ha*	**9.8**	**4.7**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 9456	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**3.4**	**1.5**
016028 /		*Kg/Ha*				*Te/Ha*	**8.4**	**3.7**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 9808	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.8**	**2.5**
016029 /		*Kg/Ha*				*Te/Ha*	**11.9**	**6.3**

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 1325	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.2**	**2.1**
016030 /		*Kg/Ha*				*Te/Ha*	**10.5**	**5.2**

Fertiliser recommendations are based on **(Ninth Edition - 2017).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 8614

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

V724

Please quote above code for all enquiries

TOWER HILL FARM
LLANYBYDDER
CARMARTHENSHIRE

Date Received	20-MAY-2019
Date Reported	23-MAY-2019

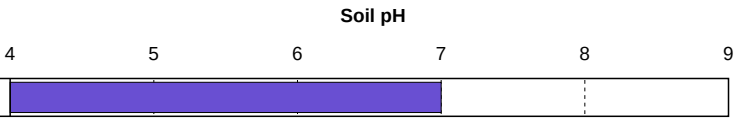
Laboratory References

Report Number	55935
Sample Number	437026

ANALYTICAL RESULTS *on 'dry matter' basis.*

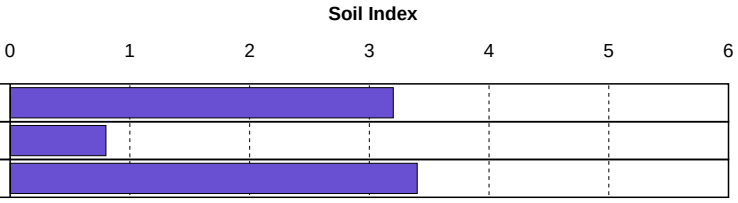
pH (1)

Determinand	Result
Soil pH	7.0



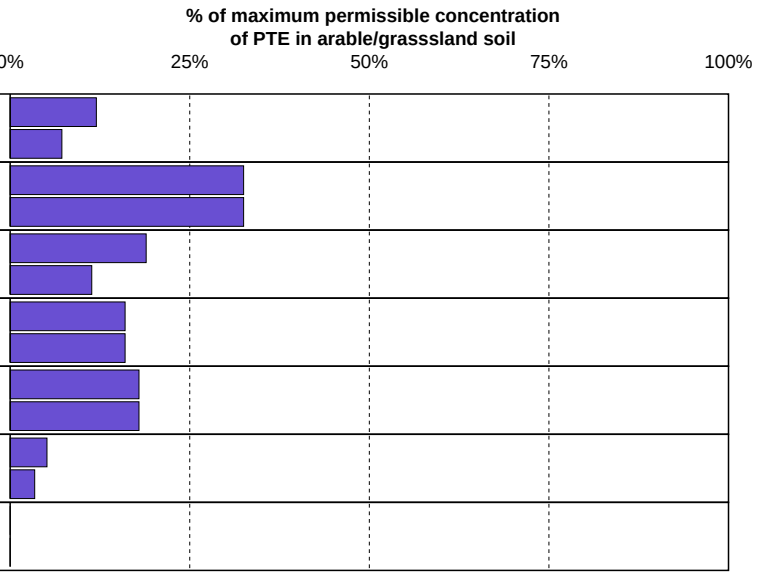
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	31.2	3
Available Potassium	52.0	0
Available Magnesium	138	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	16.2	Arable	135
		Grassland	225
Total Zinc	65.0	Arable	200
		Grassland	200
Total Nickel	14.2	Arable	75
		Grassland	125
Total Cadmium	0.48	Arable	3
		Grassland	3
Total Lead	53.8	Arable	300
		Grassland	300
Total Chromium	20.5	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 *Katie Dunn* Date *23/05/19*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 8614

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KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

TOWER HILL FARM
LLANYBYDDER
CARMARTHENSHIRE

Date Received	20-MAY-2019
Date Reported	23-MAY-2019

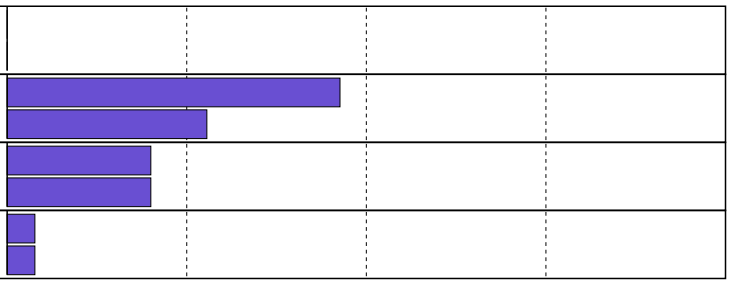
Laboratory References

Report Number	55935
Sample Number	437026

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	1.39	Arable	3
		Grassland	5
Total Arsenic	10.0	Arable	50
		Grassland	50
Fluoride	19.3	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.

Released by *Katie Dunn* Date *23/05/19*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 6810

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KNOTTINGLEY WF11 0BU

V724

Please quote above code for all enquiries

TOWER HILL FARM
LLANYBYDDER
CARMARTHENSHIRE

Date Received	20-MAY-2019
Date Reported	23-MAY-2019

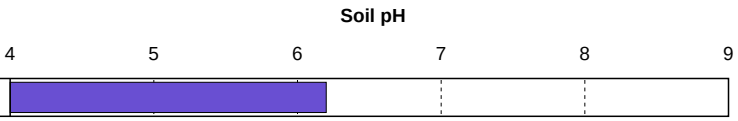
Laboratory References

Report Number	55935
Sample Number	437027

ANALYTICAL RESULTS *on 'dry matter' basis.*

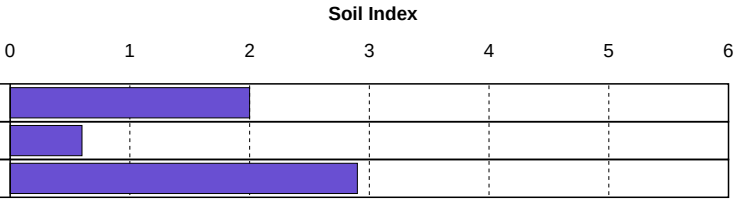
pH (1)

Determinand	Result
Soil pH	6.2



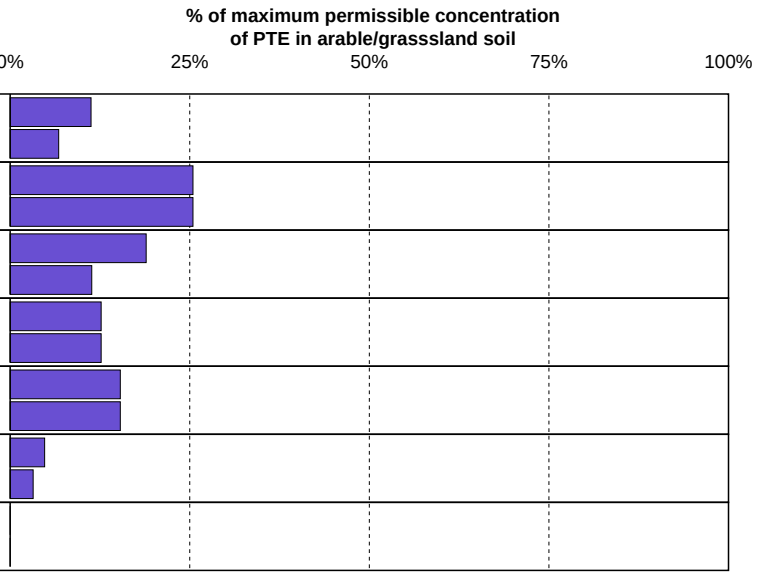
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	16.0	2
Available Potassium	40.7	0
Available Magnesium	100	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	15.2	Arable	135
		Grassland	225
Total Zinc	50.9	Arable	200
		Grassland	200
Total Nickel	14.2	Arable	75
		Grassland	125
Total Cadmium	0.38	Arable	3
		Grassland	3
Total Lead	46.0	Arable	300
		Grassland	300
Total Chromium	19.2	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 *Katie Dunn* Date *23/05/19*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 6810

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TOWER HILL FARM
LLANYBYDDER
CARMARTHENSHIRE

Date Received	20-MAY-2019
Date Reported	23-MAY-2019

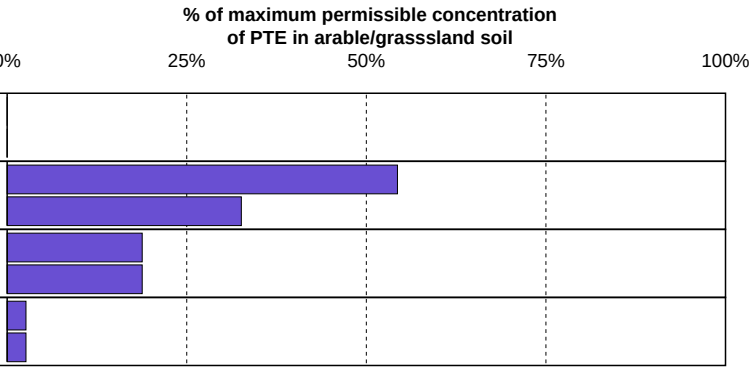
Laboratory References

Report Number	55935
Sample Number	437027

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	1.63	Arable	3
		Grassland	5
Total Arsenic	9.4	Arable	50
		Grassland	50
Fluoride	13.1	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.

Released by *Katie Dunn* Date *23/05/19*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 4105

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TOWER HILL FARM
LLANYBYDDER
CARMARTHENSHIRE

Date Received	20-MAY-2019
Date Reported	23-MAY-2019

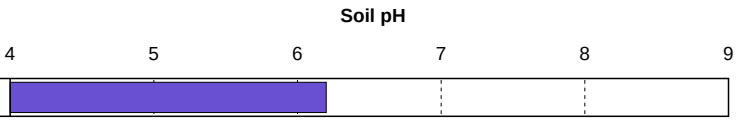
Laboratory References

Report Number	55935
Sample Number	437028

ANALYTICAL RESULTS *on 'dry matter' basis.*

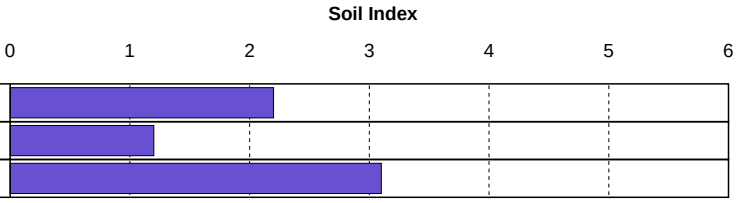
pH (1)

Determinand	Result
Soil pH	6.2



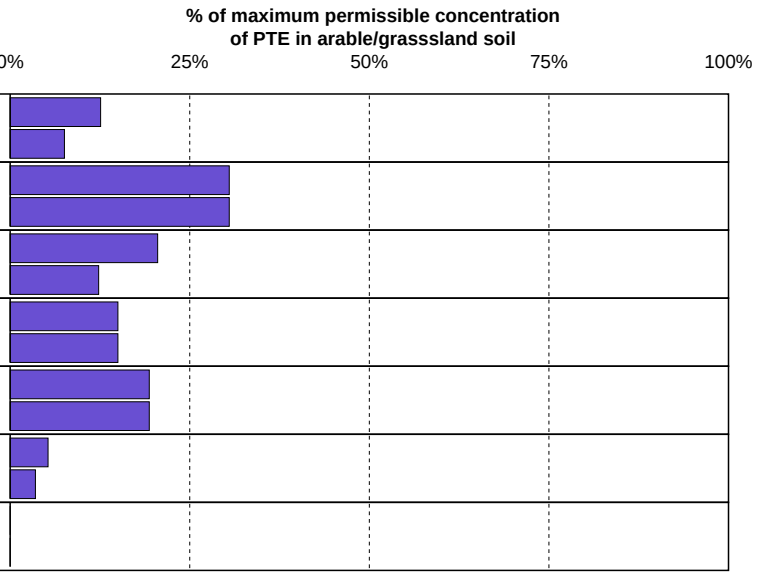
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Available Phosphorus	18.4	2
Available Potassium	72.5	1
Available Magnesium	112	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper	17.0	Arable	135
		Grassland	225
Total Zinc	61.0	Arable	200
		Grassland	200
Total Nickel	15.4	Arable	75
		Grassland	125
Total Cadmium	0.45	Arable	3
		Grassland	3
Total Lead	58.1	Arable	300
		Grassland	300
Total Chromium	21.1	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 *Katie Dunn* Date *23/05/19*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - FIELD 4105

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TOWER HILL FARM
LLANYBYDDER
CARMARTHENSHIRE

Date Received	20-MAY-2019
Date Reported	23-MAY-2019

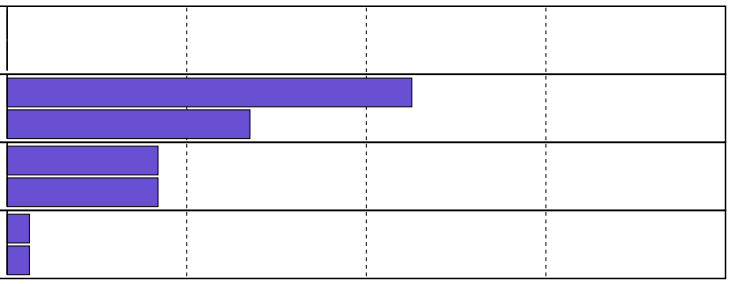
Laboratory References

Report Number	55935
Sample Number	437028

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	1.69	Arable	3
		Grassland	5
Total Arsenic	10.5	Arable	50
		Grassland	50
Fluoride	15.5	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 *Katie Dunn* Date *23/05/19*

NRM Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS
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Contact : RICHARD EVANS
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KNOTTINGLEY WF11 0BU
Tel. :

V724

Please quote the above code for all enquiries

Client : TOWER HILL
LLANYBYDDER

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 05611/20

Date Received 24-Mar-20
Date Reported 25-Mar-20

SOIL ANALYSIS REPORT

Laboratory Sample Reference	Field Details		Soil pH	Index			mg/l (Available)		
	No.	Name or O.S. Reference with Cropping Details		P	K	Mg	P	K	Mg
25170/20	1	**FIELD 3901** *No cropping details given*	**5.0**	**1**	**1**	**3**	**9.8**	**107**	**117**
25171/20	2	**FIELD 4289** *No cropping details given*	**5.2**	**1**	**1**	**2**	**10.2**	**87**	**97**
25172/20	3	**FIELD 9163** *No cropping details given*	**5.3**	**1**	**1**	**3**	**13.6**	**110**	**114**
25173/20	4	**FIELD 8756** *No cropping details given*	**5.2**	**1**	**1**	**3**	**10.4**	**92**	**105**
25174/20	5	**FIELD 7563** *No cropping details given*	**5.1**	**1**	**1**	**2**	**12.8**	**96**	**95**
25175/20	6	**FIELD 6467** *No cropping details given*	**5.3**	**1**	**1**	**3**	**10.0**	**100**	**126**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
The analytical methods used are as described in DEFRA Reference Book 427
The index values are determined from the DEFRA Fertiliser Recommendations RB209 9th Edition.

Released by Gina Graham On behalf of NRM Ltd Date 25/03/20

NRM Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS
Tel: +44 (0) 1344 886338 **Fax:** +44 (0) 1344 890972 **Email:** enquiries@nrm.uk.com **www.**nrm.uk.com

DATE 25th March 2020
SAMPLES FROM TOWER HILL, LLANYBYDDER

SAMPLED BY

Report reference 05611/20

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

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
Efficient use of P and K is most likly to be achieved on soils that are well structured and enable good rooting.
For visual evaluation of soil structure (VESS), a score on 1 or 2 would be considered adequate.
Don't forget to deduct nutrients applied as organic manures.
For Nitrogen recommendations please refer to the RB209 9th edition or seek advice from an FACTS qualified adviser.
Target Indices:
Arable, Forage, Grassland and Potato Crops: P Index 2, K Index 2-
(In rotations where most crops are Autumn-sown, soils are in good condition and P is applied annually, high index 1 can be an adequate target.)
Vegetables and Bulbs: P Index 3, K Index 2+
(If vegetables are only grown occasionally as part of an arable rotation, it would be most economic to target index 2 for arable and forage crops.)
Fruit Vines and Hops: P Index 2, K Index 2, Mg Index 2
(Note: Cider apples respond to K Index 3, Mg Index 3)
A lime recommendation is usually for a 20cm depth of cultivated soil or a 15cm depth of grassland soil. Where soil is acid below 20 cm and soils are ploughed for arable crops, a proportionately larger quantity of lime should be applied. However, if more than 10 t/ha is needed, half should be deeply cultivated into the soil and ploughed down, with the remainder applied to the surface and worked in.
For established grassland or other situations where there is no, or only minimal soil cultivation, no more than 7.5 t/ha of lime should be applied in one application.
In these situations, applications of lime change the pH below the surface very slowly. Consequently, the underlying soil should not be allowed to become too acidic because this will affect the root growth and thus limit nutrient and water uptake, which will adversely affect yield.

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 3901	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.8**	**2.5**
025170 /		*Kg/Ha*				*Te/Ha*	**11.9**	**6.3**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 4289	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.2**	**2.1**
025171 /		*Kg/Ha*				*Te/Ha*	**10.5**	**5.2**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 9163	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.0**	**1.9**
025172 /		*Kg/Ha*				*Te/Ha*	**9.8**	**4.7**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 8756	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.2**	**2.1**
025173 /		*Kg/Ha*				*Te/Ha*	**10.5**	**5.2**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 7563	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.5**	**2.3**
025174 /		*Kg/Ha*				*Te/Ha*	**11.2**	**5.8**

Fertiliser recommendations are based on **DEFRA RB209 (Ninth Edition - 2017).** If a nutrient is deficient and no recommendation is given, either no recommendation is given in RB209 or we have insufficient data to give a recommendation. Apply Lime to the nearest half Ton / Tonne.
NRM is a UKAS accredited laboratory to ISO/IEC 17025

Report continued.....

DATE 25th March 2020
SAMPLES FROM TOWER HILL, LLANYBYDDER

SAMPLED BY

Report reference 05611/20

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
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Tel:
Fax:

Fertiliser Recommendations

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 6467	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **4.0**	**1.9**
025175 /		*Kg/Ha*				*Te/Ha* **9.8**	**4.7**

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This is to certify that

Richard Evans

Has successfully completed

Recycling Waste to Land Training

Including: Environmental Permitting, How to Comply with your Land Spreading Permit, 4R's Environmental Management System, Requirements of Technically Competent Managers and Nominated Competent Persons, and Adherence to Quality Protocols

At: 4R Newent Office

Date: 22/02/18

Trainer's Name: Dr Becky Wheeler

Training Organisation: In-House

Renewal Date: Ongoing

4R Group Ltd is an ISO 9001:2008, ISO 14001:2004 and OHSAS 18001:2007 Certified organisation.