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
2 About you
3 Contact details
4 About the deployment
5 Payment
6 Supporting documents
7 Data Protection Act 1998
8 Confidentiality and national security
9 Declaration

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	Miss	
First name	Vanessa	
Last name	McDonnell	
Telephone - mobile	07940 720800	
Telephone - office	0113 232 2418	
Email address	Vanessa.mcdonnell@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: 7. WTL Training Reg *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	020204	Effluent	LQ	Dunbia Wales Raw EF	12,500
2	020204	Effluent	LQ	Dunbia Wales Intermediate EF	12,500
3	020204	Sludges	LQ	Dunbia Wales Final EF	4,782
4	020204	Sludges	SL	Dunbia Wales Final SL	765
5	020106	Farm Slurry	LQ	Bwlchmawr Farm	3,535
6	190902	WTW effluents	LQ	DCWW Strata Florida	1,390
7	190902	WTW effluents	LQ	DCWW Bontgoch	12,500
8		Calculated as single waste streams.			
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 5

	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 55 294 0046

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	**See 1A. LPD1 Supplementation.**			
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	Daffyd	
Last name	Davies	
Address	Bwlchmawr Farm 5	

	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	N/A

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	Bwlchmawr Farm Fields	Farm slurry	D Davies	20t/ha	
2					
3					
4					

5					
6					
7					
8					
9					
10					

4l Waste storage

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

No ☐ *Go to section 5*

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

Table 5 – waste storage details

	Grid reference (12 digit)	**Waste type being stored** (6 digit List of Waste code)	**Storage method**	**Quantity stored at any one time** (in tonnes)
1	**257927 242021**	Solid	Field Stockpile A	765
2	258535 242130	Solid	Field Stockpile B	765
3	248846 243380	Solid	Field Stockpile C	765
4	247753 242799	Solid	Field Stockpile D	765
5	248653 243286	Liquid	Lagoon E	1,250
6				
7				
8				
9		No more than 675t will be stockpiled at any one time, or 1,250t in a slurry store.		
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	**PSCAPPBYPRO0690**
Amount paid	£1018.00

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)	☒	2. Spreading Area
Benefit statement (required for all deployments)	☒	3. Agricultural Benefit Statement
Waste analysis (required for all deployments)	☒	4. Waste Analyses

Receiving soil analysis (required for all deployments)	☒	5. Soil Analyses
Site-specific risk assessment (in accordance with 4e)	☒	6. Site-specific risk assessment
Any other additional information	N/A	7. WTL Training Reg
	N/A	**8. WAMITAB Certificate**
	N/A	9. Appendix 1 Mixed Waste Application Calculator
	N/A	**1A. LPD1 Supplementation**

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)	22/11/2019	

B.3 Please give details of the parcels of land to be treated

Please fill in table B3.3 below. The total area to be treated must be no more than 50 hectares or 100 hectares for a single waste stream for a single crop on a single continuous parcel of land (field) under the control of a single land occupier.

Field name/number/ref	Size (hectares)	Grid reference (centre of fields)	Waste type(s) to be spread (loW)	Is the field within a SGZs for nitrate (Yes/No)
1	5.07	258074 242029	02 05 02	No
2	5.75	258124 241836	02 05 02	No
3	6.82	258111 241599	02 05 02	No
4	2.1	258365 241636	02 05 02	No
5	2.3	258476 242040	02 05 02	No
6	2.3	258531 241931	02 05 02	No
7	2.3	258583 241809	02 05 02	No
8	2.6	258661 241684	02 05 02	No
9	1.9	258708 241559	02 05 02	No
10	1.9	258738 241454	02 05 02	No
11	1.6	258764 241364	02 05 02	No
8992	4.3	247820 242914	02 05 02	No
3808	3.8	248392 243107	02 05 02	No
7833	1.9	248780 243337	02 05 02	No
1431	2.05	248135 243316	02 05 02	No
0920E	3.3	248278 243261	02 05 02	No
			Total Area -	50ha

Location Plan

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Site:
Bwlchmawr Farm 5
Brynteg
Llanybydder
Carmarthenshire
SA40 9XA

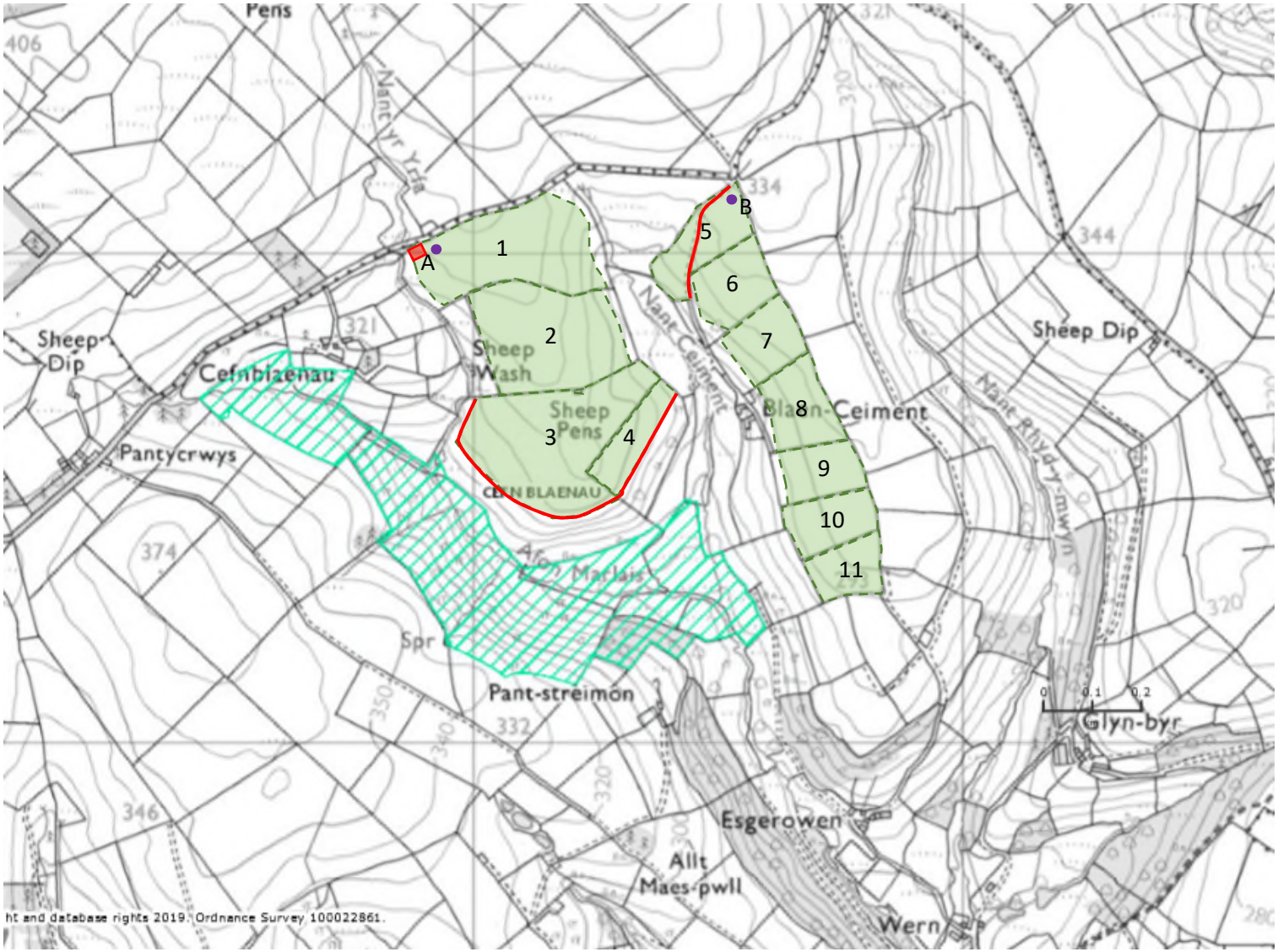
Client:
Dunbia Llanybydder

Key:

- Spreading area
- Non-spreading area
- Location tags
- Field Boundary
- SSSI Cefn Blaenau

Location tags:

Stockpile A 257927 242021
Stockpile B 258535 242130



Location Plan

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Site:
Bwlchmawr Farm 5
Brynteg
Llanybydder
Carmarthenshire
SA40 9XA

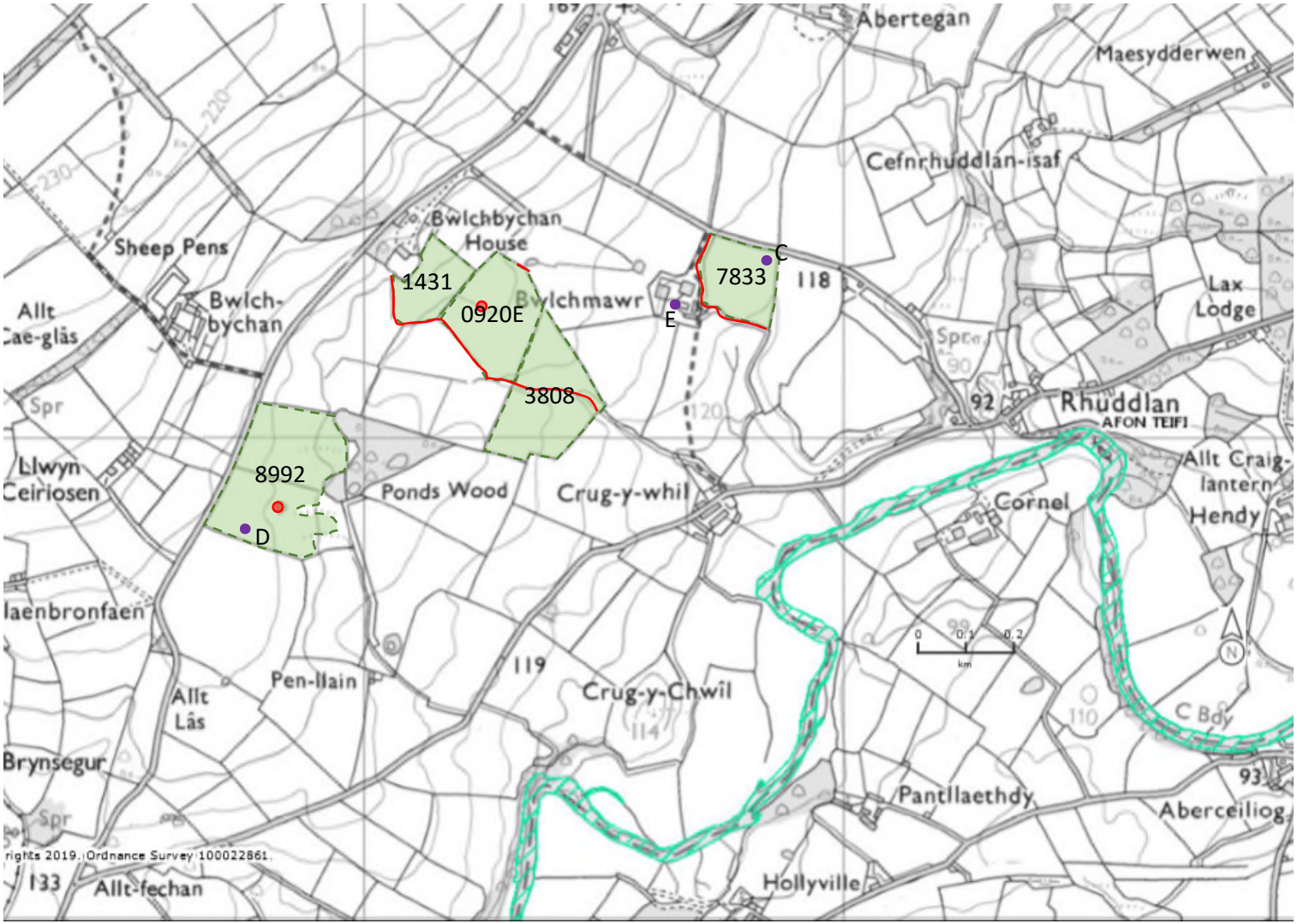
Client:
Dunbia Llanybydder

Key:

- Spreading area
- Non-spreading area
- Location tags
- Field Boundary
- SSSI Afon Teifi

Location tags:

Stockpile C 248846 243380
Stockpile D 247753 242799
Lagoon E 248653 243286



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Agricultural Benefit Statement

For the application of beneficial wastes to fields at;

Bwlchmawr Farm 5 Brynteg Llanybydder

Carmarthenshire SA40 9XA

20th November 2019

1 Person with appropriate technical expertise and permit details

This benefit statement has been compiled by Vanessa McDonnell (Junior Environmental Consultant) who has the following qualifications and experience;

- Level 3 Diploma in Agriculture
- Foundation Degree in Agriculture with Land Management
- CIWM Environmental Permitting and Exemptions

Verified by; Kevin Brook FE/0829

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 5, Brynteg, Llanybydder, Carmarthenshire, SA40 9XA	
Stockpile grid reference:	Please refer to table 4.	
Area of the receiving land:	50ha	
Quantity to be stored at any one time:	Stackable (temporary field stockpile): 765t	Non-Stackable: 1,250t
Total maximum quantity to be spread:	12,500t	
Location map document reference:	2. Spreading Area	

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	020204	LIQUID Sludges from on-site effluent treatment plant from abattoirs.	Dunbia Wales Raw Effluent	
2	020204	LIQUID Sludges from on-site effluent treatment plant from abattoirs.	Dunbia Wales Intermediate Effluent	
3	020204	LIQUID Sludges from on-site effluent treatment plant from abattoirs.	Dunbia Wales Final Effluent	
4	020204	Sludges from on-site effluent treatment plant from abattoirs.	Dunbia Wales Final DAF Sludge	
5	020106	Farm Slurry	Bwlchmawr Farm	
6	190902	Sludges from on-site effluent treatment plant from abattoirs.	DCWW Strata Florida	
7	190902	Sludges from on-site effluent treatment plant from abattoirs.	DCWW Bontgoch	

4 Operational details

4.1 Cropping details

Table 3. Cropping details

Current crop including projected yield if known:	Please refer to tables 6-12
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:	Please refer to tables 6-12
When do you intend to apply this waste; e.g. post harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:	When the ground and weather conditions are suitable, and during peak nutrient requirements throughout the growing season. For example – March-April prior to first cut silage, May-June after first cut, July-September after second cut and other times of the year when ground conditions allow for grazing. The grass will be left for a minimum of 3 weeks before it is used for grazing or cutting. The NRW will be notified 48 hours prior to spreading.

	No more than 50m3/ha of material will be applied in a single application (CoGAP).

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: Field stockpiles Non-stackable wastes: Lagoon
Where is the waste to be stored prior to spreading?	See above.
Why were these storage locations chosen?	Accessible by delivering vehicle, away from surface water/ditches/BHs *etc.* 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 and why is it to be spread that way?	The solid wastes will be spread using a conventional farm manure spreader and the liquid wastes will be either injected or surface applied, whatever is optimal according to ground conditions and availability.
How do you plan to incorporate the waste following application?	An appropriate lay-off period will be in place before any cutting or grazing is done to the grass.
With liquid wastes is there any mole draining or sub-soiling planned? *Are there land drains in the field?*	No mole draining, or sub soiling planned. There are land drains in the fields.
Other relevant operational information:	Spreading the wastes will be carried out in accordance with the Code of Good Agricultural Practice for the Protection of Water, Soil, and Air for Wales (2011) and the permit holder Environmental Management System (EMS). There is a slight over application of phosphate for the final effluent and final sludge, the reason for this is to help build up soil reserves (TGN PG138). If more than one waste was to be applied to a field, application rates would be reduced to ensure we do not exceed the total maximum 250t/ha rate, nor do we exceed nutritional requirements or offtakes – whichever greater.

	Please see attached Appendix 1 – Mixed Waste Application Calculator.

Table 6. Dunbia Wales – Raw Effluent

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	6.30	5.07	Grass	Grass	5.5	M	250	60	1	110	90	*22	1	290	282	*36	2	0	*1	250	**1268**
2	7.30	5.75	Grass	Grass	5.4	M	250	60	0	140	90	*22	0	340	282	*36	2	0	*1	250	**1438**
3	12.2	6.82	Grass	Grass	5.6	M	250	60	1	110	90	*22	1	290	282	*36	2	0	*1	250	**1705**
4	4.10	2.10	Grass	Grass	5.5	M	250	60	0	140	90	*22	1	290	282	*36	2	0	*1	250	**525**
5	2.30	2.30	Grass	Grass	5.4	M	250	60	0	140	90	*22	1	290	282	*36	2	0	*1	250	**575**
6	2.30	2.30	Grass	Grass	5.3	M	250	60	0	140	90	*22	1	290	282	*36	2	0	*1	250	**575**
7	2.30	2.30	Grass	Grass	5.6	M	250	60	1	110	90	*22	1	290	282	*36	2	0	*1	250	**575**
8	2.60	2.60	Grass	Grass	5.7	M	250	60	0	140	90	*22	1	290	282	*36	2	0	*1	250	**650**
9	1.90	1.90	Grass	Grass	5.4	M	250	60	0	140	90	*22	1	290	282	*36	2	0	*1	250	**475**
10	1.90	1.90	Grass	Grass	6.1	M	250	60	1	110	90	*22	2-	250	282	**40	4	0	*1	250	**475**
11	1.60	1.60	Grass	Grass	6.3	M	250	60	1	110	90	*22	1	290	282	*36	3	0	*1	250	**400**
8992	6.60	4.30	Grass	Grass	5.4	M	250	60	1	110	90	*22	1	290	282	*36	1	0	*1	250	**1075**
3808	4.10	3.80	Grass	Grass	5.3	M	250	60	1	110	90	*22	1	290	282	*36	1	0	*1	250	**950**
7833	2.20	1.90	Grass	Grass	5.9	M	250	60	2	80	90	**43	1	290	282	*36	2	0	*1	250	**475**
1431	2.05	2.06	Grass	Grass	6.1	M	250	60	2	80	90	**43	1	290	282	*36	2	0	*1	250	**515**
0920E	3.60	3.30	Grass	Grass	5.7	M	250	60	1	110	90	*22	1	290	282	*36	1	0	*1	250	**825**
Ha	**63.35**	**50**																			**12500**

Nutrient requirement based on values described in the nutrient management guide (RB209).
Phosphate and Potash requirements based on **Grass Silage, 3 Cuts (47t/ha)** (target DM yield 9-12t/ha)
Expected Grazing yield of 4-5t/ha
Crop use based on **Grass** totalling **47t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake, inc 10kg P2O5 for aftermath grazing
*N, P2O5, K2O and Mg stated are **Available** concentrations in kg/ha
****Total** P2O5 and K2O stated where soil indices ≥2
Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 10%
Total N supplied at an application rate of 250t/ha is 100kg/ha

Table 7. Dunbia Wales – Intermediate Effluent

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	6.30	5.07	Grass	Grass	5.5	M	250	58	1	110	90	*8	1	290	282	*40	2	0	*1	250	**1268**
2	7.30	5.75	Grass	Grass	5.4	M	250	58	0	140	90	*8	0	340	282	*40	2	0	*1	250	**1438**
3	12.2	6.82	Grass	Grass	5.6	M	250	58	1	110	90	*8	1	290	282	*40	2	0	*1	250	**1705**
4	4.10	2.10	Grass	Grass	5.5	M	250	58	0	140	90	*8	1	290	282	*40	2	0	*1	250	**525**
5	2.30	2.30	Grass	Grass	5.4	M	250	58	0	140	90	*8	1	290	282	*40	2	0	*1	250	**575**
6	2.30	2.30	Grass	Grass	5.3	M	250	58	0	140	90	*8	1	290	282	*40	2	0	*1	250	**575**
7	2.30	2.30	Grass	Grass	5.6	M	250	58	1	110	90	*8	1	290	282	*40	2	0	*1	250	**575**
8	2.60	2.60	Grass	Grass	5.7	M	250	58	0	140	90	*8	1	290	282	*40	2	0	*1	250	**650**
9	1.90	1.90	Grass	Grass	5.4	M	250	58	0	140	90	*8	1	290	282	*40	2	0	*1	250	**475**
10	1.90	1.90	Grass	Grass	6.1	M	250	58	1	110	90	*8	2-	250	282	**44	4	0	*1	250	**475**
11	1.60	1.60	Grass	Grass	6.3	M	250	58	1	110	90	*8	1	290	282	*40	3	0	*1	250	**400**
8992	6.60	4.30	Grass	Grass	5.4	M	250	58	1	110	90	*8	1	290	282	*40	1	0	*1	250	**1075**
3808	4.10	3.80	Grass	Grass	5.3	M	250	58	1	110	90	*8	1	290	282	*40	1	0	*1	250	**950**
7833	2.20	1.90	Grass	Grass	5.9	M	250	58	2	80	90	**16	1	290	282	*40	2	0	*1	250	**475**
1431	2.05	2.06	Grass	Grass	6.1	M	250	58	2	80	90	**16	1	290	282	*40	2	0	*1	250	**515**
0920E	3.60	3.30	Grass	Grass	5.7	M	250	58	1	110	90	*8	1	290	282	*40	1	0	*1	250	**825**
Ha	**63.35**	**50**																			**12500**

Nutrient requirement based on values described in the nutrient management guide (RB209).
Phosphate and Potash requirements based on **Grass Silage, 3 Cuts (47t/ha)** (target DM yield 9-12t/ha)
Expected Grazing yield of 4-5t/ha
Crop use based on **Grass** totalling **47t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake, inc 10kg P2O5 for aftermath grazing
*N, P2O5, K2O and Mg stated are **Available** concentrations in kg/ha
****Total** P2O5 and K2O stated where soil indices ≥2
Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 10%
Total N supplied at an application rate of 250t/ha is 75kg/ha

Table 8. Dunbia Wales – Final Effluent

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	6.30	5.07	Grass	Grass	5.5	M	250	53	1	110	90	*100	1	290	282	*32	2	0	*4	100	**507**
2	7.30	5.75	Grass	Grass	5.4	M	250	53	0	140	90	*100	0	340	282	*32	2	0	*4	100	**575**
3	12.2	6.82	Grass	Grass	5.6	M	250	53	1	110	90	*100	1	290	282	*32	2	0	*4	100	**682**
4	4.10	2.10	Grass	Grass	5.5	M	250	53	0	140	90	*100	1	290	282	*32	2	0	*4	100	**210**
5	2.30	2.30	Grass	Grass	5.4	M	250	53	0	140	90	*100	1	290	282	*32	2	0	*4	100	**230**
6	2.30	2.30	Grass	Grass	5.3	M	250	53	0	140	90	*100	1	290	282	*32	2	0	*4	100	**230**
7	2.30	2.30	Grass	Grass	5.6	M	250	53	1	110	90	*100	1	290	282	*32	2	0	*4	100	**230**
8	2.60	2.60	Grass	Grass	5.7	M	250	53	0	140	90	*100	1	290	282	*32	2	0	*4	100	**260**
9	1.90	1.90	Grass	Grass	5.4	M	250	53	0	140	90	*100	1	290	282	*32	2	0	*4	100	**190**
10	1.90	1.90	Grass	Grass	6.1	M	250	53	1	110	90	*100	2-	250	282	**35	4	0	*4	100	**190**
11	1.60	1.60	Grass	Grass	6.3	M	250	53	1	110	90	*100	1	290	282	*32	3	0	*4	100	**160**
8992	6.60	4.30	Grass	Grass	5.4	M	250	53	1	110	90	*100	1	290	282	*32	1	0	*4	100	**430**
3808	4.10	3.80	Grass	Grass	5.3	M	250	53	1	110	90	*100	1	290	282	*32	1	0	*4	100	**380**
7833	2.20	1.90	Grass	Grass	5.9	M	250	24	2	80	90	**90	1	290	282	*14	2	0	*2	45	**86**
1431	2.05	2.06	Grass	Grass	6.1	M	250	24	2	80	90	**90	1	290	282	*14	2	0	*2	45	**93**
0920E	3.60	3.30	Grass	Grass	5.7	M	250	53	1	110	90	*100	1	290	282	*32	1	0	*4	100	**330**
Ha	**63.35**	**50**																			**4782**

Nutrient requirement based on values described in the nutrient management guide (RB209).
Phosphate and Potash requirements based on **Grass Silage, 3 Cuts (47t/ha)** (target DM yield 9-12t/ha)
Expected Grazing yield of 4-5t/ha
Crop use based on **Grass** totalling **47t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake, inc 10kg P2O5 for aftermath grazing
*N, P2O5, K2O and Mg stated are **Available** concentrations in kg/ha
****Total** P2O5 and K2O stated where soil indices ≥2
Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 10%
Total N supplied at an application rate of 100t/ha is 200kg/ha

Table 9. Dunbia Wales – Final DAF Sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	6.30	5.07	Grass	Grass	5.5	M	250	13	1	110	90	**113	1	290	282	*12	2	0	*3	15	**76**
2	7.30	5.75	Grass	Grass	5.4	M	250	16	0	140	90	**136	0	340	282	*14	2	0	*4	18	**104**
3	12.2	6.82	Grass	Grass	5.6	M	250	13	1	110	90	**113	1	290	282	*12	2	0	*3	15	**102**
4	4.10	2.10	Grass	Grass	5.5	M	250	16	0	140	90	**136	1	290	282	*14	2	0	*4	18	**38**
5	2.30	2.30	Grass	Grass	5.4	M	250	16	0	140	90	**136	1	290	282	*14	2	0	*4	18	**41**
6	2.30	2.30	Grass	Grass	5.3	M	250	16	0	140	90	**136	1	290	282	*14	2	0	*4	18	**41**
7	2.30	2.30	Grass	Grass	5.6	M	250	13	1	110	90	**113	1	290	282	*12	2	0	*3	15	**35**
8	2.60	2.60	Grass	Grass	5.7	M	250	16	0	140	90	**136	1	290	282	*14	2	0	*4	18	**47**
9	1.90	1.90	Grass	Grass	5.4	M	250	16	0	140	90	**136	1	290	282	*14	2	0	*4	18	**34**
10	1.90	1.90	Grass	Grass	6.1	M	250	13	1	110	90	**113	2-	250	282	**13	4	0	*3	15	**29**
11	1.60	1.60	Grass	Grass	6.3	M	250	13	1	110	90	**113	1	290	282	*12	3	0	*3	15	**24**
8992	6.60	4.30	Grass	Grass	5.4	M	250	13	1	110	90	**113	1	290	282	*12	1	0	*3	15	**65**
3808	4.10	3.80	Grass	Grass	5.3	M	250	13	1	110	90	**113	1	290	282	*12	1	0	*3	15	**57**
7833	2.20	1.90	Grass	Grass	5.9	M	250	5	2	80	90	**91	1	290	282	*5	2	0	*1	6	**11**
1431	2.05	2.06	Grass	Grass	6.1	M	250	5	2	80	90	**91	1	290	282	*5	2	0	*1	6	**12**
0920E	3.60	3.30	Grass	Grass	5.7	M	250	13	1	110	90	**113	1	290	282	*12	1	0	*3	15	**50**
Ha	**63.35**	**50**																			**765**

Nutrient requirement based on values described in the nutrient management guide (RB209).
Phosphate and Potash requirements based on **Grass Silage, 3 Cuts (47t/ha)** (target DM yield 9-12t/ha)
Expected Grazing yield of 4-5t/ha
Crop use based on **Grass** totalling **47t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake, inc 10kg P2O5 for aftermath grazing
*N, P2O5, K2O and Mg stated are **Available** concentrations in kg/ha
****Total** P2O5 and K2O stated where soil indices ≥2
Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 10%
Total N supplied at an application rate of 18t/ha is 212kg/ha

Table 10. Bwlchmawr Farm Slurry

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	6.30	5.07	Grass	Grass	5.5	M	250	75	1	110	90	*74	1	290	282	*186	2	0	*21	73	**370**
2	7.30	5.75	Grass	Grass	5.4	M	250	75	0	140	90	*74	0	340	282	*186	2	0	*21	73	**420**
3	12.2	6.82	Grass	Grass	5.6	M	250	75	1	110	90	*74	1	290	282	*186	2	0	*21	73	**498**
4	4.10	2.10	Grass	Grass	5.5	M	250	75	0	140	90	*74	1	290	282	*186	2	0	*21	73	**153**
5	2.30	2.30	Grass	Grass	5.4	M	250	75	0	140	90	*74	1	290	282	*186	2	0	*21	73	**168**
6	2.30	2.30	Grass	Grass	5.3	M	250	75	0	140	90	*74	1	290	282	*186	2	0	*21	73	**168**
7	2.30	2.30	Grass	Grass	5.6	M	250	75	1	110	90	*74	1	290	282	*186	2	0	*21	73	**168**
8	2.60	2.60	Grass	Grass	5.7	M	250	75	0	140	90	*74	1	290	282	*186	2	0	*21	73	**190**
9	1.90	1.90	Grass	Grass	5.4	M	250	75	0	140	90	*74	1	290	282	*186	2	0	*21	73	**139**
10	1.90	1.90	Grass	Grass	6.1	M	250	75	1	110	90	*74	2-	250	282	**207	4	0	*21	73	**139**
11	1.60	1.60	Grass	Grass	6.3	M	250	75	1	110	90	*74	1	290	282	*186	3	0	*21	73	**117**
8992	6.60	4.30	Grass	Grass	5.4	M	250	75	1	110	90	*74	1	290	282	*186	1	0	*21	73	**314**
3808	4.10	3.80	Grass	Grass	5.3	M	250	75	1	110	90	*74	1	290	282	*186	1	0	*21	73	**277**
7833	2.20	1.90	Grass	Grass	5.9	M	250	45	2	80	90	**90	1	290	282	*112	2	0	*13	44	**84**
1431	2.05	2.06	Grass	Grass	6.1	M	250	45	2	80	90	**90	1	290	282	*112	2	0	*13	44	**91**
0920E	3.60	3.30	Grass	Grass	5.7	M	250	75	1	110	90	*74	1	290	282	*186	1	0	*21	73	**241**
Ha	**63.35**	**50**																			**3535**

Nutrient requirement based on values described in the nutrient management guide (RB209).
Phosphate and Potash requirements based on **Grass Silage, 3 Cuts (47t/ha)** (target DM yield 9-12t/ha)
Expected Grazing yield of 4-5t/ha
Crop use based on **Grass** totalling **47t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake, inc 10kg P2O5 for aftermath grazing
*N, P2O5, K2O and Mg stated are **Available** concentrations in kg/ha
****Total** P2O5 and K2O stated where soil indices ≥2
Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 10%
Total N supplied at an application rate of 73t/ha is 248kg/ha

Table 11. DCWW Strata Florida

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	6.30	5.07	Grass	Grass	5.5																**0**
2	7.30	5.75	Grass	Grass	5.4																**0**
3	12.2	6.82	Grass	Grass	5.6																**0**
4	4.10	2.10	Grass	Grass	5.5																**0**
5	2.30	2.30	Grass	Grass	5.4																**0**
6	2.30	2.30	Grass	Grass	5.3																**0**
7	2.30	2.30	Grass	Grass	5.6																**0**
8	2.60	2.60	Grass	Grass	5.7																**0**
9	1.90	1.90	Grass	Grass	5.4																**0**
10	1.90	1.90	Grass	Grass	6.1	M	250	13	1	110	90	*11	2-	250	282	**5	4	0	*1	250	**475**
11	1.60	1.60	Grass	Grass	6.3	M	250	13	1	110	90	*11	1	290	282	*1	3	0	*1	250	**400**
8992	6.60	4.30	Grass	Grass	5.4																**0**
3808	4.10	3.80	Grass	Grass	5.3																**0**
7833	2.20	1.90	Grass	Grass	5.9																**0**
1431	2.05	2.05	Grass	Grass	6.1	M	250	13	2	80	90	**54	1	290	282	*1	2	0	*1	250	**513**
0920E	3.60	3.30	Grass	Grass	5.7																**0**
Ha	**63.35**	**50**																			**1388**

Nutrient requirement based on values described in the nutrient management guide (RB209).
Phosphate and Potash requirements based on **Grass Silage, 3 Cuts (47t/ha)** (target DM yield 9-12t/ha)
Expected Grazing yield of 4-5t/ha
Crop use based on **Grass** totalling **47t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake, inc 10kg P2O5 for aftermath grazing
*N, P2O5, K2O and Mg stated are **Available** concentrations in kg/ha
****Total** P2O5 and K2O stated where soil indices ≥2
Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%
Total N supplied at an application rate of 250t/ha is 100kg/ha

Table 12. DCWW Bontgoch

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1	6.30	5.07	Grass	Grass	5.5	M	250	13	1	110	90	*50	1	290	282	*1	2	0	*2	250	**1268**
2	7.30	5.75	Grass	Grass	5.4	M	250	13	0	140	90	*50	0	340	282	*1	2	0	*2	250	**1438**
3	12.2	6.82	Grass	Grass	5.6	M	250	13	1	110	90	*50	1	290	282	*1	2	0	*2	250	**1705**
4	4.10	2.10	Grass	Grass	5.5	M	250	13	0	140	90	*50	1	290	282	*1	2	0	*2	250	**525**
5	2.30	2.30	Grass	Grass	5.4	M	250	13	0	140	90	*50	1	290	282	*1	2	0	*2	250	**575**
6	2.30	2.30	Grass	Grass	5.3	M	250	13	0	140	90	*50	1	290	282	*1	2	0	*2	250	**575**
7	2.30	2.30	Grass	Grass	5.6	M	250	13	1	110	90	*50	1	290	282	*1	2	0	*2	250	**575**
8	2.60	2.60	Grass	Grass	5.7	M	250	13	0	140	90	*50	1	290	282	*1	2	0	*2	250	**650**
9	1.90	1.90	Grass	Grass	5.4	M	250	13	0	140	90	*50	1	290	282	*1	2	0	*2	250	**475**
10	1.90	1.90	Grass	Grass	6.1	M	250	13	1	110	90	*50	2-	250	282	**3	4	0	*2	250	**475**
11	1.60	1.60	Grass	Grass	6.3	M	250	13	1	110	90	*50	1	290	282	*1	3	0	*2	250	**400**
8992	6.60	4.30	Grass	Grass	5.4	M	250	13	1	110	90	*50	1	290	282	*1	1	0	*2	250	**1075**
3808	4.10	3.80	Grass	Grass	5.3	M	250	13	1	110	90	*50	1	290	282	*1	1	0	*2	250	**950**
7833	2.20	1.90	Grass	Grass	5.9	M	250	13	2	80	90	**100	1	290	282	*1	2	0	*2	250	**475**
1431	2.05	2.06	Grass	Grass	6.1	M	250	13	2	80	90	**100	1	290	282	*1	2	0	*2	250	**515**
0920E	3.60	3.30	Grass	Grass	5.7	M	250	13	1	110	90	*50	1	290	282	*1	1	0	*2	250	**825**
Ha	**63.35**	**50.00**																			**12500**

Nutrient requirement based on values described in the nutrient management guide (RB209).
Phosphate and Potash requirements based on **Grass Silage, 3 Cuts (47t/ha)** (target DM yield 9-12t/ha)
Expected Grazing yield of 4-5t/ha
Crop use based on **Grass** totalling **47t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake, inc 10kg P2O5 for aftermath grazing
*N, P2O5, K2O and Mg stated are **Available** concentrations in kg/ha
****Total** P2O5 and K2O stated where soil indices ≥2
Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%
Total N supplied at an application rate of 250t/ha is 100kg/ha

5 Compliance with NVZ regulations

Table 13. Compliance with NVZ regulations

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

Applicable to: N/A

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>Please refer to tables 6-12</td></tr>
<tr><td>Previous applications:</td><td>Please refer to table B3.4 of the LPD1.</td></tr>
</table>

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

6.1 Receiving soils

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

The soil type for all fields are freely draining acid loamy soils.

Table 14. Soil type

Light sand soils	Soils which are sand, loamy sand or sandy loam to 40cm depth and are sand or loamy sand between 40 and 80 cm, or over sandstone rock.	☐
Shallow soils	Soils over impermeable subsoils and those where the parent rock (chalk, limestone or other rock) is within 40cm of the soil surface. Sandy soils developed over sandstone rock should be regarded as light sand soils.	☐

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

The soil analyses (**Soil Analyses**) shows the soils to have ample background concentrations of Mg (*i.e.* ADAS Index of 2-4). 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

Total and available nutrient additions supplied, as well as nutrient requirements for the proposed crop at the recommended application rates for each waste stream are presented in Tables 6-13.

Limiting Factors -

- Maximum application rate of 250t/ha – Raw Effluent, Intermediate Effluent, DCWW Bontgoch & DCWW Strata.
- Phosphate – Final Effluent, Final Effluent & Farm Slurry.
- Nitrogen – Farm Slurry

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

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.

6.4 Additional requirements

Silage crop may require additional N and K to achieve optimum yield/off-take. Fields with a 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 **Waste Analyses**.

7.2 Other waste characteristics

Any fats and oils contents of the wastes are known to be negligible and analysis of the DAF sludge shows a level significantly below 1%..

The pH of the wastes is between 5.36 and 7.59. The electrical conductivity of the waste is low to moderate (*c*. 37 and 2,775 µS cm) and are therefore unlikely to significantly alter ionic movement within the receiving soil.

It is unlikely that soil pH will decrease following the application detailed here due to the extensive buffering capacity of the receiving soils. The pH levels of the majority of receiving soils at Bwlchmawr Farm 5 are between 5.3 and 6.1, therefore it is unlikely that availability of any naturally occurring heavy metals present in these soils will become more available after application of these wastes. The bioavailability of metals would increase should the soil become more acidic however it is considered that this is unlikely to occur before the soil requires re-evaluation for waste applications in the future.

7.3 Operational factors

1. Wastes will be applied at low trajectory and will have little visual impact as they are not brightly coloured.
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.
4. Soil and waste sampling methods will be consistent with those set out in the RB209, and the analysis for PTEs are consistent with the code of good agricultural practice and TGN 8.01.
5. With regards to odour management for any potentially odorous material – the materials will only be disturbed when the material is being spread, and application to land will be done under permit conditions, following procedures in our permit EMS to minimise risk of odour emissions.

8 Sensitive human and environmental receptors

Table 15. 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 toe field 1431	Odour	High risk due to the proximity to the site.	Spreading will be carried out using CoGAP using application techniques listed above.

Locations of sensitive receptors are shown in **Spreading Area**. Prevailing winds are south-westerly.

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

Mitigation measures to safeguard site-specific high and moderate likelihood of emission detection by sensitive receptors are shown in purple in Table 15. 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 subsoiled.
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 the 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 prolonged adverse weather, waste will not be collected from the producer unless suitably permitted storage is available or ground/weather conditions become favourable for land application.

In circumstances where the wastes cannot be stored or spread beyond normal capacities, wastes will be diverted to local AD feedstock or an alternative deployment.

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.

Document Control **This test report shall not be reproduced, except in full, without the written approval of the laboratory.**

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

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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	**7.2**
Dry solids (%)	**0.59**
Organic matter content (%)	**0.3**
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		

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 Effluent

22.10.19 **Lab ref. 74874-19**

Application rate (t/ha)	**45**
Application rate (t/acre)	**18.2**
pH	**6.6**
Dry solids (%)	**3.31**
Organic matter content (%)	**2.5**
conductivity (µS/cm)	**1578**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.2	%	2.00	90	0.53	24
Ammonium-N	532	mg/kg	0.53	24		
Phosphorus (P)	878	mg/kg	0.88			
Phosphate (P_2O_5)			2.00	90	1.00	45
Potassium (K)	295	mg/kg	0.30			
Potash (K_2O)			0.35	16	0.32	14
Magnesium (Mg)	94.3	mg/kg	0.09			
Magnesium (MgO)			0.15	7	0.02	1.7
Sulphur (S)	169	mg/kg	0.17			
Sulphur (SO_3)			0.42	19	0.04	2
Calcium (Ca)	397	mg/kg	0.40	18		
Sodium (Na)	1229	mg/kg	1.23	55		

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	7.22	mg/kg	7.2	0.32	15.00
Copper	2.65	mg/kg	2.7	0.12	7.50
Nickel	0.6	mg/kg	0.6	0.03	3.00
Lead	0.5	mg/kg	0.5	0.02	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.56	mg/kg	0.6	0.03	15.00
Mercury	0.05	mg/kg	0.1	0.00	0.10
Arsenic	0.50	mg/kg	0.5	0.02	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 Effluent

22.10.19 **Lab ref. 74874-19**

Application rate (t/ha)	**100**
Application rate (t/acre)	**40.5**
pH	**6.6**
Dry solids (%)	**3.31**
Organic matter content (%)	**2.5**
conductivity (µS/cm)	**1578**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.2	%	2.00	200	0.53	53
Ammonium-N	532	mg/kg	0.53	53		
Phosphorus (P)	878	mg/kg	0.88			
Phosphate (P_2O_5)			2.00	200	1.00	100
Potassium (K)	295	mg/kg	0.30			
Potash (K_2O)			0.35	35	0.32	32
Magnesium (Mg)	94.3	mg/kg	0.09			
Magnesium (MgO)			0.15	15	0.02	3.8
Sulphur (S)	169	mg/kg	0.17			
Sulphur (SO_3)			0.42	42	0.04	4
Calcium (Ca)	397	mg/kg	0.40	40		
Sodium (Na)	1229	mg/kg	1.23	123		

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	7.22	mg/kg	7.2	0.72	15.00
Copper	2.65	mg/kg	2.7	0.27	7.50
Nickel	0.6	mg/kg	0.6	0.06	3.00
Lead	0.5	mg/kg	0.5	0.05	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.56	mg/kg	0.6	0.06	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Arsenic	0.50	mg/kg	0.5	0.05	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

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

V724

Please quote above code for all enquiries

DUNBIA LLANYBYDDER

FINAL SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

FINAL SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	77774
Sample Number	107311

Date Received	14-NOV-2019
Date Reported	19-NOV-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	25.0	%
Conductivity 1:6 [Fresh]	634	uS/cm
Total Nitrogen	4.70	% w/w
Ammonium Nitrogen	3562	mg/kg
Total Phosphorus (P)	26488	mg/kg
Total Potassium (K)	2922	mg/kg
Total Magnesium (Mg)	1983	mg/kg
Total Copper (Cu)	71.5	mg/kg
Total Zinc (Zn)	262	mg/kg
Total Sulphur (S)	3734	mg/kg

Released by ..... *Myles Nicholson* ..... Date ..... *19/11/19* .....

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DUNBIA LLANYBYDDER

FINAL SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

FINAL SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	77774
Sample Number	107311

Date Received	14-NOV-2019
Date Reported	19-NOV-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)	16617	mg/kg
Total Lead (Pb)	2.09	mg/kg
Total Cadmium (Cd)	0.16	mg/kg
Total Mercury (Hg)	<0.1	mg/kg
Total Nickel (Ni)	5.75	mg/kg
Total Chromium (Cr)	10.1	mg/kg
Total Sodium (Na)	2522	mg/kg
pH 1:6 [Fresh]	6.90	
Organic Matter LOI	77.4	% w/w
Total Arsenic (As)	<0.5	mg/kg

Released by ..... *Myles Nicholson* ..... Date ..... *19/11/19* .....

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DUNBIA LLANYBYDDER

FINAL SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

FINAL SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	77774
Sample Number	107311

Date Received	14-NOV-2019
Date Reported	19-NOV-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	6150	mg/kg

Released by *Myles Nicholson* Date *19/11/19*

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Dunbia Wales

Analysis of Final Sludge

Date: 14/11/2019 Lab report no. 77774

Application rate (t/ha)	**6**
Application rate (t/acre)	**2.4**
pH	**6.9**
Dry solids (%)	**25.0**
Organic matter (%)	**77.4**
Conductivity (µS/cm)	**634**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	4.70	%	11.75	70.5	0.89	5.3
Ammonium-N	3562	mg/kg	0.89	5.3		
Phosphorus (P)	26488	mg/kg	6.62	39.7		
Phosphate (P_2O_5)			15.10	90.6	7.5	45.3
Potassium (K)	2922	mg/kg	0.73	4.4		
Potash (K_2O)			0.88	5.3	0.8	4.7
Magnesium (Mg)	1983	mg/kg	0.50	3.0		
Magnesium (MgO)			0.79	4.8	0.1	1.2
Sulphur (S)	3734	mg/kg	0.93	5.6		
Sulphur (SO_3)			2.33	14.0	0.2	1.4
Calcium (Ca)	16617	mg/kg	4.2	24.9		
Sodium (Na)	2522	mg/kg	0.63	3.8		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	262.0	mg/kg	65.5	0.39	15.00
Copper	72	mg/kg	17.88	0.11	7.50
Nickel	5.8	mg/kg	1.44	0.01	3.00
Lead	2.1	mg/kg	0.52	0.00	15.00
Cadmium	0.16	mg/kg	0.04	0.00	0.15
Chromium	10.1	mg/kg	2.53	0.02	15.00
Mercury	0.1	mg/kg	0.03	0.00	0.10
Arsenic	0.5	mg/kg	0.13	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: 14/11/2019 Lab report no. 77774

Application rate (t/ha)	**15**
Application rate (t/acre)	**6.0**
pH	**6.9**
Dry solids (%)	**25.0**
Organic matter (%)	**77.4**
Conductivity (µS/cm)	**634**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	4.70	%	11.75	176.3	0.89	13.4
Ammonium-N	3562	mg/kg	0.89	13.4		
Phosphorus (P)	26488	mg/kg	6.62	99.3		
Phosphate (P_2O_5)			15.10	226.5	7.5	113.2
Potassium (K)	2922	mg/kg	0.73	11.0		
Potash (K_2O)			0.88	13.1	0.8	11.8
Magnesium (Mg)	1983	mg/kg	0.50	7.4		
Magnesium (MgO)			0.79	11.9	0.1	3.0
Sulphur (S)	3734	mg/kg	0.93	14.0		
Sulphur (SO_3)			2.33	35.0	0.2	3.5
Calcium (Ca)	16617	mg/kg	4.2	62.3		
Sodium (Na)	2522	mg/kg	0.63	9.5		

POTENTIALLY TOXIC ELEMENTS

			Amount		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	262.0	mg/kg	65.5	0.98	15.00
Copper	72	mg/kg	17.88	0.27	7.50
Nickel	5.8	mg/kg	1.44	0.02	3.00
Lead	2.1	mg/kg	0.52	0.01	15.00
Cadmium	0.16	mg/kg	0.04	0.00	0.15
Chromium	10.1	mg/kg	2.53	0.04	15.00
Mercury	0.1	mg/kg	0.03	0.00	0.10
Arsenic	0.5	mg/kg	0.13	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	

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Brynteg
Llanybydder
Carmarthenshire
SA40 9XA

FARM SLURRY

SLURRY

Sample Reference :

FARM SLURRY

Sample Matrix : SLURRY

Laboratory References	
Report Number	34244
Sample Number	75897

Date Received	14-NOV-2018
Date Reported	20-NOV-2018

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Oven Dry Solids	9.10	%
Conductivity 1:6	2775	uS/cm
Total Nitrogen	0.34	% w/w
Ammonium Nitrogen	1023	mg/kg
Total Phosphorus (P)	894	mg/kg
Total Potassium (K)	2365	mg/kg
Total Magnesium (Mg)	728	mg/kg
Total Copper (Cu)	5.17	mg/kg
Total Zinc (Zn)	22.9	mg/kg
Total Sulphur (S)	512	mg/kg

Released by ..... *Darren Whitbread* ..... Date ..... *20/11/18* .....

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Llanybydder
Carmarthenshire
SA40 9XA

FARM SLURRY

SLURRY

Sample Reference :

FARM SLURRY

Sample Matrix : SLURRY

Laboratory References	
Report Number	34244
Sample Number	75897

Date Received	14-NOV-2018
Date Reported	20-NOV-2018

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Calcium (Ca)	2400	mg/kg
Total Lead (Pb)	<0.5	mg/kg
Total Cadmium (Cd)	0.03	mg/kg
Total Mercury (Hg)	<0.05	mg/kg
Total Nickel (Ni)	0.59	mg/kg
Total Chromium (Cr)	0.39	mg/kg
Total Sodium (Na)	802	mg/kg
pH 1:6 [Fresh]	7.59	
Total Arsenic (As)	<0.5	mg/kg

Released by ..... *Darren Whitbread* ..... Date ..... *20/11/18* .....

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Dunbia Wales

Analysis of Farm Slurry

14/11/2018 **Lab ref. 34244**

Application rate (t/ha)	**44**
Application rate (t/acre)	**17.8**
pH	**7.6**
Dry solids (%)	**9.10**
Organic matter content (%)	
conductivity (µS/cm)	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.34	%	3.40	150	1.02	45
Ammonium-N	1023	mg/kg	1.02	45		
Phosphorus (P)	894	mg/kg	0.89			
Phosphate (P_2O_5)			2.04	90	1.02	45
Potassium (K)	2365	mg/kg	2.37			
Potash (K_2O)			2.84	125	2.55	112
Magnesium (Mg)	728	mg/kg	0.73			
Magnesium (MgO)			1.16	51	0.12	12.8
Sulphur (S)	512	mg/kg	0.51			
Sulphur (SO_3)			1.28	56	0.13	6
Calcium (Ca)	2400	mg/kg	2.40	106		
Sodium (Na)	802	mg/kg	0.80	35		

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	22.9	mg/kg	22.9	1.01	15.00
Copper	5.17	mg/kg	5.2	0.23	7.50
Nickel	0.6	mg/kg	0.6	0.03	3.00
Lead	0.5	mg/kg	0.5	0.02	15.00
Cadmium	0.03	mg/kg	0.0	0.00	0.15
Chromium	0.39	mg/kg	0.4	0.02	15.00
Mercury	0.05	mg/kg	0.1	0.00	0.10
Arsenic	0.50	mg/kg	0.5	0.02	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 Farm Slurry

14/11/2018 **Lab ref. 34244**

Application rate (t/ha)	**73**
Application rate (t/acre)	**29.6**
pH	**7.6**
Dry solids (%)	**9.10**
Organic matter content (%)	
conductivity (µS/cm)	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.34	%	3.40	248	1.02	75
Ammonium-N	1023	mg/kg	1.02	75		
Phosphorus (P)	894	mg/kg	0.89			
Phosphate (P_2O_5)			2.04	149	1.02	74
Potassium (K)	2365	mg/kg	2.37			
Potash (K_2O)			2.84	207	2.55	186
Magnesium (Mg)	728	mg/kg	0.73			
Magnesium (MgO)			1.16	85	0.12	21.3
Sulphur (S)	512	mg/kg	0.51			
Sulphur (SO_3)			1.28	93	0.13	9
Calcium (Ca)	2400	mg/kg	2.40	175		
Sodium (Na)	802	mg/kg	0.80	59		

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	22.9	mg/kg	22.9	1.67	15.00
Copper	5.17	mg/kg	5.2	0.38	7.50
Nickel	0.6	mg/kg	0.6	0.04	3.00
Lead	0.5	mg/kg	0.5	0.04	15.00
Cadmium	0.03	mg/kg	0.0	0.00	0.15
Chromium	0.39	mg/kg	0.4	0.03	15.00
Mercury	0.05	mg/kg	0.1	0.00	0.10
Arsenic	0.50	mg/kg	0.5	0.04	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

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STRATA FLORIDA
TREGARON

SLUDGE

SLUDGE

Laboratory References	
Report Number	45285
Sample Number	79539

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Date Received	26-FEB-2019
Date Reported	01-MAR-2019

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Oven Dry Solids	2.90	%
Conductivity 1:6	37.1	uS/cm
Total Nitrogen	<0.04	% w/w
Ammonium Nitrogen	<50	mg/kg
Total Phosphorus (P)	95.4	mg/kg
Total Potassium (K)	16.2	mg/kg
Total Magnesium (Mg)	<10	mg/kg
Total Copper (Cu)	0.71	mg/kg
Total Zinc (Zn)	3.82	mg/kg
Total Sulphur (S)	166	mg/kg

Released by *Darren Whitbread* Date *01/03/19*

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STRATA FLORIDA
TREGARON

SLUDGE

SLUDGE

Laboratory References	
Report Number	45285
Sample Number	79539

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Date Received	26-FEB-2019
Date Reported	01-MAR-2019

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Calcium (Ca)	43.4	mg/kg
Total Iron (Fe)	784	mg/kg
Total Lead (Pb)	1.59	mg/kg
Total Cadmium (Cd)	0.01	mg/kg
Total Mercury (Hg)	<0.05	mg/kg
Total Nickel (Ni)	0.32	mg/kg
Total Chromium (Cr)	0.30	mg/kg
Total Sodium (Na)	31.1	mg/kg
pH 1:6 [Fresh]	5.36	
Organic Matter LOI	1.85	% w/w

Released by ..... *Darren Whitbread* ..... Date ..... *01/03/19* .....

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STRATA FLORIDA
TREGARON

SLUDGE

SLUDGE

Laboratory References	
Report Number	45285
Sample Number	79539

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Date Received	26-FEB-2019
Date Reported	01-MAR-2019

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Lime Equivalent as CaCO3	<2	% w/w
Total Aluminium	3398	mg/kg
Total Arsenic (As)	1.35	mg/kg
Neutralising Value as CaO [TNV]	<1	% w/w

Released by ..... *Darren Whitbread* ..... Date ..... *01/03/19* .....

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DCWW Strata Florida

Analysis of WTW Liquid

26.02.19 **Lab ref. 45285**

Application rate (t/ha)	**250**
Application rate (t/acre)	**101.2**
pH	**5.4**
Dry solids (%)	**2.90**
Organic matter content (%)	**1.9**
conductivity (µS/cm)	**37**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.04	%	0.40	100	0.05	13
Ammonium-N	50	mg/kg	0.05	13		
Phosphorus (P)	95.4	mg/kg	0.10			
Phosphate (P_2O_5)			0.22	54	0.11	27
Potassium (K)	16.2	mg/kg	0.02			
Potash (K_2O)			0.02	5	0.02	4
Magnesium (Mg)	10	mg/kg	0.01			
Magnesium (MgO)			0.02	4	0.00	1.0
Sulphur (S)	166	mg/kg	0.17			
Sulphur (SO_3)			0.42	104	0.04	10
Calcium (Ca)	43.4	mg/kg	0.04	11		
Sodium (Na)	31.1	mg/kg	0.03	8		

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	3.82	mg/kg	3.8	0.96	15.00
Copper	0.71	mg/kg	0.7	0.18	7.50
Nickel	0.3	mg/kg	0.3	0.08	3.00
Lead	1.6	mg/kg	1.6	0.40	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.30	mg/kg	0.3	0.08	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Arsenic	1.35	mg/kg	1.4	0.34	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	3398.00	mg/kg	3398.0	849.50	
Iron	784	mg/kg	784.0	196.00	

To convert from kg/tonne to units/ton multiply by 2
To convert from kg/ha to units/acre multiply by 0.8

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BONTGOCH WTW
BONTGOCH

SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	45286
Sample Number	79540

Date Received	26-FEB-2019
Date Reported	01-MAR-2019

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Oven Dry Solids	1.78	%
Conductivity 1:6	57.2	uS/cm
Total Nitrogen	<0.04	% w/w
Ammonium Nitrogen	<50	mg/kg
Total Phosphorus (P)	176	mg/kg
Total Potassium (K)	<10	mg/kg
Total Magnesium (Mg)	24.7	mg/kg
Total Copper (Cu)	0.60	mg/kg
Total Zinc (Zn)	9.22	mg/kg
Total Sulphur (S)	59.8	mg/kg

Released by ..... *J Doyle* ..... Date ..... *01/03/19* .....

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Please quote above code for all enquiries

BONTGOCH WTW
BONTGOCH

SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	45286
Sample Number	79540

Date Received	26-FEB-2019
Date Reported	01-MAR-2019

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Calcium (Ca)	282	mg/kg
Total Iron (Fe)	6035	mg/kg
Total Lead (Pb)	0.82	mg/kg
Total Cadmium (Cd)	0.04	mg/kg
Total Mercury (Hg)	<0.05	mg/kg
Total Nickel (Ni)	1.23	mg/kg
Total Chromium (Cr)	0.59	mg/kg
Total Sodium (Na)	<10	mg/kg
pH 1:6 [Fresh]	5.80	
Organic Matter LOI	0.72	% w/w

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Sample Matrix : SLUDGE

Laboratory References	
Report Number	45286
Sample Number	79540

Date Received	26-FEB-2019
Date Reported	01-MAR-2019

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Lime Equivalent as CaCO3	<2	% w/w
Total Aluminium	148	mg/kg
Total Arsenic (As)	<0.5	mg/kg
Neutralising Value as CaO [TNV]	<1	% w/w

Released by ..... *J Doyle* ..... Date ..... *01/03/19* .....

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DCWW Bontgoch

Analysis of WTW Liquid

26.02.19 **Lab ref. 45286**

Application rate (t/ha)	**250**
Application rate (t/acre)	**101.2**
pH	**5.8**
Dry solids (%)	**1.78**
Organic matter content (%)	**0.7**
conductivity (µS/cm)	**57**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.04	%	0.40	100	0.05	13
Ammonium-N	50	mg/kg	0.05	13		
Phosphorus (P)	176	mg/kg	0.18			
Phosphate (P_2O_5)			0.40	100	0.20	50
Potassium (K)	10	mg/kg	0.01			
Potash (K_2O)			0.01	3	0.01	3
Magnesium (Mg)	24.7	mg/kg	0.02			
Magnesium (MgO)			0.04	10	0.00	2.5
Sulphur (S)	59.8	mg/kg	0.06			
Sulphur (SO_3)			0.15	37	0.01	4
Calcium (Ca)	282	mg/kg	0.28	71		
Sodium (Na)	10	mg/kg	0.01	3		

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	9.22	mg/kg	9.2	2.31	15.00
Copper	0.6	mg/kg	0.6	0.15	7.50
Nickel	1.2	mg/kg	1.2	0.31	3.00
Lead	0.8	mg/kg	0.8	0.21	15.00
Cadmium	0.04	mg/kg	0.0	0.01	0.15
Chromium	0.59	mg/kg	0.6	0.15	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	148.00	mg/kg	148.0	37.00	
Iron	6035	mg/kg	6035.0	1508.75	

To convert from kg/tonne to units/ton multiply by 2
To convert from kg/ha to units/acre multiply by 0.8

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Client : MAES LLAN
LLANYBYDDER

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 19430/19

Date Received 22-Oct-19
Date Reported 23-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
82779/19	1	**FIELD 1** *No cropping details given*	**5.5**	**1**	**1**	**2**	**11.0**	**76**	**64**
82780/19	2	**FIELD 2** *No cropping details given*	**5.4**	**0**	**0**	**2**	**8.6**	**48**	**71**
82781/19	3	**FIELD 3** *No cropping details given*	**5.6**	**1**	**1**	**2**	**9.8**	**77**	**88**
82782/19	4	**FIELD 4** *No cropping details given*	**5.5**	**0**	**1**	**2**	**9.4**	**77**	**98**
82783/19	5	**FIELD 5** *No cropping details given*	**5.4**	**0**	**1**	**2**	**8.6**	**95**	**89**
82784/19	6	**FIELD 6** *No cropping details given*	**5.3**	**0**	**1**	**2**	**8.8**	**64**	**87**

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 *23/10/19*

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Client : MAES LLAN
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Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 19430/19

Date Received 22-Oct-19
Date Reported 23-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
82785/19	7	**FIELD 7** *No cropping details given*	**5.6**	**1**	**1**	**2**	**9.6**	**67**	**82**
82786/19	8	**FIELD 8** *No cropping details given*	**5.7**	**0**	**1**	**2**	**8.2**	**62**	**87**
82787/19	9	**FIELD 9** *No cropping details given*	**5.4**	**0**	**1**	**2**	**9.2**	**87**	**87**
82788/19	10	**FIELD 10** *No cropping details given*	**6.1**	**1**	**2-**	**4**	**10.2**	**130**	**183**

If general fertiliser and lime recommendations have been requested, these are given on the following sheets.
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DATE 23rd October 2019
SAMPLES FROM MAES LLAN, LLANYBYDDER

SAMPLED BY

Report reference 19430/19

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Fertiliser Recommendations

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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 1	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**3.4**	**1.5**
082779 /		*Kg/Ha*				*Te/Ha*	**8.4**	**3.7**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 2	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**3.7**	**1.7**
082780 /		*Kg/Ha*				*Te/Ha*	**9.1**	**4.2**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 3	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**3.1**	**1.3**
082781 /		*Kg/Ha*				*Te/Ha*	**7.7**	**3.1**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 4	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**3.4**	**1.5**
082782 /		*Kg/Ha*				*Te/Ha*	**8.4**	**3.7**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 5	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**3.7**	**1.7**
082783 /		*Kg/Ha*				*Te/Ha*	**9.1**	**4.2**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*		*Lime (Arable)*	*(Grass)*
FIELD 6	**Not Given / Not Given**	*Units/Acre*				*T/Ac*	**4.0**	**1.9**
082784 /		*Kg/Ha*				*Te/Ha*	**9.8**	**4.7**

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.
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Report continued.....

DATE 23rd October 2019
SAMPLES FROM MAES LLAN, LLANYBYDDER

SAMPLED BY

Report reference 19430/19

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Fertiliser Recommendations

Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 7	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **3.1**	**1.3**
082785 /		*Kg/Ha*				*Te/Ha* **7.7**	**3.1**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 8	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **2.8**	**1.1**
082786 /		*Kg/Ha*				*Te/Ha* **7.0**	**2.6**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 9	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **3.7**	**1.7**
082787 /		*Kg/Ha*				*Te/Ha* **9.1**	**4.2**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 10	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **1.7**	**0**
082788 /		*Kg/Ha*				*Te/Ha* **4.2**	**0**

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V724

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Client : MAES LLAN
LLANYBYDDER

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 19431/19

Date Received 22-Oct-19
Date Reported 23-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
82789/19	1	**FIELD 11** *No cropping details given*	**6.3**	**1**	**1**	**3**	**9.6**	**92**	**117**

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Released by Gina Graham On behalf of NRM Ltd Date 23/10/19

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DATE 23rd October 2019
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SAMPLED BY

Report reference 19431/19

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Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
FIELD 11	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **1.1**	**0**
082789 /		*Kg/Ha*				*Te/Ha* **2.8**	**0**

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V724

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
85735/19	2	**FIELD 7833** *No cropping details given*	**5.9**	**2**	**1**	**2**	**22.6**	**86**	**75**
85738/19	5	**FIELD 1431** *No cropping details given*	**6.1**	**2**	**1**	**2**	**24.4**	**116**	**63**

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

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Date Received 05-Nov-19
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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
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**

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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**

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Report continued.....

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

SAMPLED BY

Report reference 20084/19

RICHARD EVANS
4 RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
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Tel:
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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**

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Risk Assessment

Risk assessment for land spreading activity at Bwlchmawr Farm 5, Brynteg, Llanybydder, Carmarthenshire, SA40 9XA

Risk assessment carried out by Miss V McDonnell, 30th October 2019.

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
Surface water – ditches, watercourses and ponds	Nutrients, aluminium, and organic matter	Surface water pollution	Surface run-off	Medium	High	Medium	Proximity of ditches and under drainage. Low pollution potential of material.	Comply with CoGAP, Cross Compliance and EPR. No spreading areas to be observed as per attached plans. Follow PQA.	Low
Groundwater	Nutrients, Aluminium, PTEs	Groundwater pollution	In appropriate application.	Medium	Medium	Low	Paper sludge and digestates have very low concentrations of PTEs. and nutrients. Rate and timing of application as per PQA.	Comply with CoGAP and EPR. Follow PQA.	Low
Soils	Physical damage to soil structure	Damage to soil structure and poor subsequent crop yields	Delivery and spreading activity	Low	Medium to high	Low	Delivery and spreading to be undertaken when e ground conditions are suitable.	Comply with Soil Code and Cross Compliance Criteria. Apply only in suitable conditions. Follow PQA.	Low
Soils	Nutrients, Aluminium, and PTEs	Build up of nutrients. and/or PTEs	Spreading activity	High	Medium to high	Low	Paper sludge analysis. Soil analysis. Appropriate rates of application.	Apply per PQA, RB209 and Soil Code.	Low

Risk Assessment (continued)

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
Local human population and wildlife	Spreading activities – physical	Harm to humans or animals	Trespass, accidental contact	Low	Medium	Low	Agricultural areas with limited public access.	Application during appropriate conditions and awareness of access issues.	Low
Local human population	Odour during spreading activity	Odour issues/complaints	Airborne compounds	Low	Medium	Medium	Potential to produce odour during spreading. Odour dissipates rapidly. Waste will be incorporated immediately.	The 4R Group odour management plan will be followed.	Low
Local human population	Releases of airborne dusts/ particulate matter	Harm to human health - respiratory irritation and illness.	Air transport then inhalation	Low	Medium	Low	Waste has a low potential to produce airborne dust and particulate matter.	Waste will be applied in accordance with CoGAP and EMS.	Low
Local human population	As above	Nuisance dust on cars, clothing etc.	Deposition from air	Low	Low	Low	As above	As above	Low
Local human population	Emissions; litter	Nuisance loss of amenity and harm to pet health	Transport through air	Low	Low	Low	Waste does not contain litter as it derives from a controlled manufacturing process.	Waste will be applied per Codes of Good Agricultural Practice and SR2010No4 EMS.	Low
Local human population	Noise	Noise complaints	Noise from delivery, and spreading	Low	Low to Medium	Low	Agricultural machinery in agricultural areas.	Avoid sensitive spreading periods e.g. e.g. bank holidays and weekends. Delivery during daylight hours.	Low
Local human population	Pests (e.g. flies)	Harm to human health, nuisance, loss of amenity	Air transport and over land	Low	Low	Low	Waste does not attract scavenging animals and flies.	Wastes will be stored, transported and spread in accordance with conditions set in SR2010No4 permit, CoGAP and Duty of Care.	Low

Risk Assessment (continued)

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
Local human population and local environment	Emissions; litter and mud on local roads	Nuisance, loss of amenity, risk of accident	Vehicles entering and leaving site	Medium	Medium	Medium	Road safety. Tractors/ spreaders trailing mud and debris from fields.	Operation will not cause any additional effects on surrounding roads than normal agricultural practice occurring in the surrounding area. Application of waste will condition the soil and improve workability, which reduces environmental impact associated with spreading.	Low
Hedgerows and trees	Physical damage from spreading equipment	Ecological & landscape	Physical damage from spreading equipment	Low	Low	Low	Professional contractors employed instructed to take care around trees.	Leave a 2m buffer zone adjacent to trees and hedgerows.	Low
Afon Teifi SSSI	Emissions	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Any	Medium	Medium	Low	Potential to produce odour during spreading. Odour dissipates rapidly. Waste will be incorporated immediately.	Comply with CoGAP, Cross Compliance and EPR. Follow PQA, EMS.	Low
Cefn Blaenau SSSI	Emissions	Harm to protected site through toxic contamination, nutrient enrichment, disturbance etc.	Any	Medium	Medium	Low	Potential to produce odour during spreading. Odour dissipates rapidly. Waste will be incorporated immediately.	Comply with CoGAP, Cross Compliance and EPR. Follow PQA, EMS.	Low

4R Group Ltd
PF003.14 Equipment training register

TRAINING REGISTER

Project/Location: Control House

Type of training received: Task Specific ☐ General ☒

4 Recycling Representative: Dr P Gibbs.- Subject: Waste to Land – EMS, Compliance, BAS, EPR, Quality Protocols TCMs, NCPs, Material Value

This section of the form must be completed by those personnel attending the training.

I confirm that I have attended and understand the training detailed above.

If receiving task specific training in relation to the above subject relating to 4Recycling activities. I had the opportunity to discuss all of these matters and raise questions at that time.

Name (Print)	Signature	Employer	Trained By	Date
Ian Holden		4R Group	Dr Paul Gibbs	15/06/16
Graham Jackson		4R Group	Dr Paul Gibbs	15/06/16
Chris Barr		4R Group	Dr Paul Gibbs	15/06/16
Anthony James		4R Group	Dr Paul Gibbs	15/06/16

wamitab

Certificate No. CCC18238

Continuing Competence Certificate

This certificate confirms that

Ian Holden

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 28/06/2018

LNH	Landfill - Non Hazardous Waste
TSNH	Transfer - Non Hazardous Waste
TMNH	Treatment - Non Hazardous Waste

Expiry Date: 28/06/2020

Awarded: 28/06/2018

Authorised

WAMITAB Chief Executive Officer

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

00111030

Wastes	Single app rate t/ha	Mixed app rate t/ha	*Nutrients kg/ha*											
			N		P		K		Mg		S		Na	
			total	available	total	available	total	available	total	available	total	available		available
Raw Effluent	250	170	100.0	60.0	43.0	22.0	40.0	36.0	5.0	1.0	15.0	2.0	294.0	29.0
			68.0	40.8	29.2	15.0	27.2	24.5	3.4	0.7	10.2	1.4	199.9	19.7
Slurry	73	15	248.0	75.0	149.0	74.0	207.0	186.0	85.0	21.3	93.0	9.0	59.0	6.0
			51.0	15.4	30.6	15.2	42.5	38.2	17.5	4.4	19.1	1.8	12.1	1.2
Final Effluent	45	15	90.0	24.0	90.0	45.0	16.0	14.0	7.0	1.7	19.0	2.0	55.0	6.0
			30.0	8.0	30.0	15.0	5.3	4.7	2.3	0.6	6.3	0.7	18.3	2.0
	Mixed waste total	200	149.0	64.2	89.9	45.2	75.1	67.4	23.2	5.6	35.6	3.9	230.4	23.0
		OK	OK		OK									
	max	250	250		90									

Name of waste	*Total metals kg/ha*										
	As	Cu	Cd	Hg	Ni	Pb	Sb	Zn	Al	Fe	Mn
	Arsenic	Copper	Cadium	Mercury	Nickel	Lead	Antimony	Zinc	Aluminium	Iron	Manganese
Raw Effluent	0.1	0.1	0.0	0.0	0.1	0.1	0.0	0.2	0.0	0.0	0.0
	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.2	0.0	0.0	0.0
Slurry	0.0	0.4	0.0	0.0	0.0	0.0	0.0	1.7	0.0	0.0	0.0
	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Final Effluent	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0
	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
Mixed waste total	0.1	0.2	0.0	0.0	0.1	0.1	0.0	0.6	0.0	0.0	0.0
	OK	OK	OK	OK	OK	OK		OK			
max kg/ha/yr	0.7	7.5	0.15	0.1	3	15		15			