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

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

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

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

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

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

Contents

1 About the permit

1a Discussions before your application

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

Case or document reference

1b Permit number

Permit number this application relates to **GP3792SK**

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

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

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

SR2010No6 Mobile plant for landspreading of sewage sludge ☐

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

2 About you

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

Organisation name (if relevant) 4Recycling Ltd.

Title

First name

Last name

Address Control House

	A1 Business Park
	Knottingley
	West Yorkshire
Postcode	WF11 0BU
Telephone - mobile	07824 323 318
Telephone - office	01132 322 418
Email address	info@4r-group.co.uk

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

Document reference	

3 Contact details

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

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

4 About the deployment

4a Multiple deployments for one area of land

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

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

No ☒ *Go to section 4b*

Yes ☐ How many deployments are in the batch?

4b Nominated competent person

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

Title	Mr	
First name	Ian	
Last name	Holden	

Telephone - mobile	07912362364
Telephone - office	
Email address	Ian.holden@4r-group.co.uk / info@4r-group.co.uk

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

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

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

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

Document reference: Ian Holden WAMITAB CCC *Go to section 4c*

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

CIWM / WAMITAB ☒

ESA / EU ☐

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

4c Which risk band does the activity fall within?

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

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

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

Table 1 – risk band

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

4d Additional information on sensitive receptors

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

bespoke permit?

No ☒

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

4e Site specific risk assessment

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

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

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

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

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

4f About the waste

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

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

Table 2 – waste types

	List of Waste code (6 digit)	**Waste description**	**Physical form**	**Waste producer**	**Total amount being spread/used** (tonnes)
e.g.	03 03 05	De-inked paper	Sludge	Smith's Newsprint	500
1	19 09 02	Water Treatment Sludge	Sludge cake	DCWW Alwen	7463
2	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Bala	10975
3	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Bryn Cowlyd	10975
4	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Cefni	10975
5	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Cilfor	10975
6	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Garreglwyd	10975
7	19 09 02	Water Treatment Sludge	Sludge cake	DCWW Glascoed	3382
8	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Llyn Conwy	10975
9	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Mynydd Llandegai	7658
10	19 09 02	Water Treatment Sludge	Liquid sludge	DCWW Rhiwgoch	10975
				Total tonnage	10975

4g About the land you want to treat

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

Address

Cernyfed Farm

Cyffyliog

Ruthin

	Denbighshire
Postcode	LL15 2DY
National grid reference (12 digit)	303815,358442

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

Agricultural land ☒ Please give your County/ Parish/ Holding number 56/066/0033

Non-agricultural land ☐

4h The parcels of land you want to treat

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

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

Table 3 – parcels of land

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

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	William
Last name	Jones
Address	Cernyfed Farm
	Cyffyliog
	Ruthin

	Denbighshire
Postcode	LL15 2DY
Telephone - mobile	07881 404 313
Telephone - office	
Email address	

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

Document reference	

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

Yes ☒ *Go to section 4k*

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

Explanation

4k Previous land treatment

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

No ☒ *Go to section 4l*

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

Table 4 – previous land treatment

	Field name/ number/ reference	**Describe the waste spread** (in last 12 months)	**Person/ company who spread the waste**	**Quantity spread per hectare** (in tonnes)	**Deployment/ other reference** (if known)
e.g.	East field	Digested sewage sludge cake	Eastern Waters	20	PAN 000000
1					
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	303533,358144	19 09 02 (sludge cake)	Stacked heap	3,000
2	303990,358369	19 09 02 (sludge cake)	Stacked heap	3,000
3				
4				
5				
6				
7				
8				
9				
10				

5 Payment

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

Electronic transfer (for example, BACS)	☒	*Go to section 5b*
Cheque	☐	*Go to section 5c*
Postal order	☐	*Go to section 5d*
Credit or debit card	☐	*Go to section 5e*

5b Paying by electronic transfer

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

Company name: Natural Resources Wales

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

Bank: RBS

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

Sort code: 60-70-80

Account number: 10014438

Reference number

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

For example, for a company named Joe Bloggs Ltd, the reference number might be EPDEPJOEBL0001.

(Remember you can use any four-digit number at the end.)

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

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

BACS reference	PSCAPPBYPRO0710
Amount paid	£779.00

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)	☒	CF1 Maps
Benefit statement (required for all deployments)	☒	CF ABS
Waste analysis (required for all deployments)	☒	Waste Analysis
Receiving soil analysis (required for all deployments)	☒	Soil Analysis
Site-specific risk assessment (in accordance with 4e)	☐	
Any other additional information	N/A	LPD1 Supplement
	N/A	Ian Holden Wamitab Certificate
	N/A	

	N/A	

7 The data Protection Act 1998

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

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

We may also process or release the information to:

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

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

8 Confidentiality and national security

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

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

Please treat the information in my application as confidential. ☐

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

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

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

9 Declaration

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

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

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

To simplify and speed up the application process we recommend that the declaration is filled in by an officer

of a company or one of the partners in a Limited Liability Partnership (LLP).

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

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

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

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

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

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

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

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

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

9c Sign to confirm you understand the declaration.

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

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

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

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

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

Title	Mr	
First name	Jon	
Last name	Smith	
On behalf of (if relevant)		
Today's date (DD/MM/YYYY)	17/11/2019	

LPD1 Supplement

4h The parcels of land you want to treat.

Table 3 – parcels of land				
	Field name/ number/ reference	**Grid reference – centre of field** (12 digit)	**Waste types to be spread/used** (List of waste code) separate using commas	**Size** (hectares)
1	**3A**	**303327,357953**	19 09 02	2.9
2	**4A**	**303438,357830**	19 09 02	2.1
3	**5B**	**303542,357915**	19 09 02	1.2
4	**6B**	**303440,358074**	19 09 02	3.0
5	**8B**	**303362,358225**	19 09 02	2.6
6	**9B**	**303482,358258**	19 09 02	3.0
7	**7C**	**303569,358084**	19 09 02	2.6
8	**10C**	**303604,358430**	19 09 02	4.3
9	**11C**	**303608,358292**	19 09 02	2.5
10	**12D**	**303763,358355**	19 09 02	1.5
11	**13D**	**303747,358468**	19 09 02	0.9
12	**20D**	**303723,358051**	19 09 02	2.0
13	**21D**	**303741,358157**	19 09 02	1.6
14	**23D**	**303850,358099**	19 09 02	2.1
15	**18E**	**304171,358397**	19 09 02	1.3
16	**19E**	**304278,358383**	19 09 02	1.8
17	**22E**	**303963,358248**	19 09 02	3.2
18	**24E**	**304063,358149**	19 09 02	3.5
19	**25E**	**304181,358224**	19 09 02	1.8

Location Plan
Cernyfed Farm

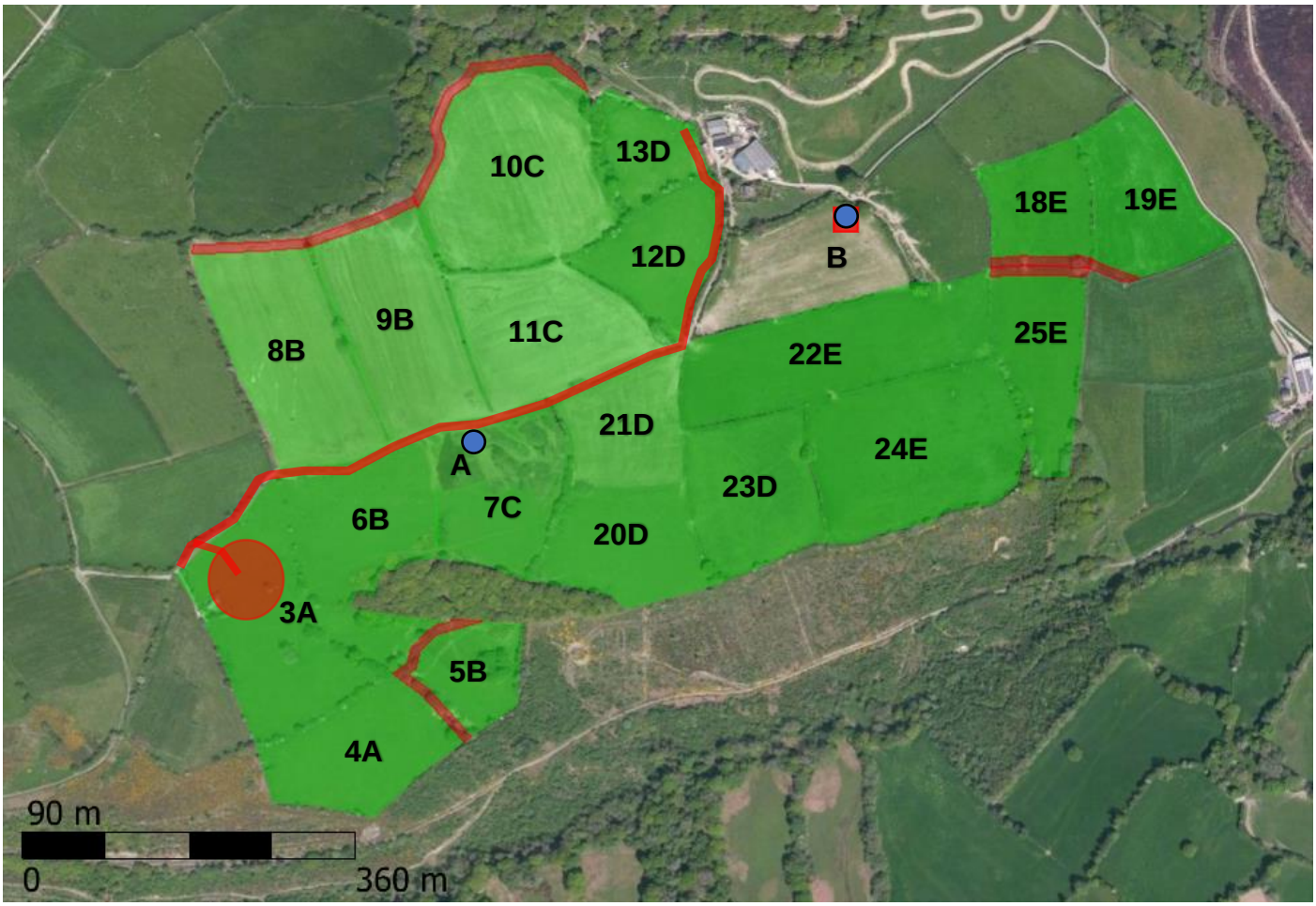
Client:
Dŵr Cymru / Welsh Water

Site:
Cernyfed Farm
Cyffylliog
RUTHIN
LL15 2DY

Key:
- Spreading area
- Non-spreading area
- Location tags
- Footpath

Location tags: **Stockpiles:** **A** 303533,358144 **B** 303990,358369

Map reference: CF1



Agricultural Benefit Statement

For the application of beneficial wastes to fields at;

Cernyfed Farm 1, Cyffylliog, Ruthin. LL15 2DY

11th December 2019

1 Person with appropriate technical expertise and permit details

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

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

Verified by; Adam Stone, FQA (No. FE/6321)

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

2 Where the waste is to be spread

Table 1. Where the waste is to be spread

Farm address:	Cernyfed Farm, Cyffylliog, Ruthin. LL15 2DY	
Stockpile grid reference:	Refer to Table 4	
Area of the receiving land:	43.9 ha	
Quantity to be stored at any one time:	Stackable: 3,000t	Non-Stackable: Spread on delivery
Total maximum quantity to be spread:	10,975t	
Location map document reference:	CF1	

3 What is the waste to be spread

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

Waste	***EWC Code***	***Description***	***Waste Producer***	***Additional Information***
1	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Alwen	Stackable ferric sludge cake
2	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Bala	Non-stackable alum liquid sludge
3	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Bryn Cowlyd	Non-stackable ferric sludge
4	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Cefni	Non-stackable alum liquid sludge
5	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Cilfor	Non-stackable alum liquid sludge
6	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Garreglwyd	Non-stackable ferric liquid sludge
7	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Glascoed	Stackable ferric sludge
8	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Llyn Conwy	Non-stackable ferric liquid sludge
9	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Mynydd Llandegai	Non-stackable alum liquid sludge
10	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Rhiwgoch	Non-stackable ferric liquid sludge

4 Operational details

4.1 Cropping details

Table 3. Cropping details

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

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

4.2 Waste storage

Table 4. Waste storage

How is the waste to be stored? *e.g. mobile tank, field heap, spread on delivery*	**Stackable wastes**: Field heaps **Non-stackable wastes**: Spread on delivery
Where is the waste to be stored prior to spreading?	Field heap A: 303533,358144 Field heap B: 303990,358369
Why were these storage locations chosen?	The storage location is accessible by delivering vehicle next to the track/road so there will be minimal damage to fields by delivering vehicles. The storage location is not within 10m of any ditch, watercourse, or footpath, not within a SPZ1, and is at least 50m from any well spring or borehole. It is also a safe distance from overhead powerlines.

4.3 Waste application

Table 5. Waste application

How is the waste to be spread and why is it to be spread that way?	The cake will be spread using conventional rear discharge spreaders as this equipment is readily available to the farmer/contractor and the most appropriate for the material and application rates used. The liquid wastes will be spread using either a dribble bar or injected – whatever is optimal according to ground conditions and availability.

How do you plan to incorporate the waste following application?	There is no requirement for further incorporation of wastes on grass fields due to low ammonia content and minimal odour.
With liquid wastes is there any mole draining or sub-soiling planned? *Are there land drains in the field?*	No Yes
Other relevant operational information:	The wastes may be applied separately or in combination. If the wastes are applied in combination the total combined amount applied will not exceed 250t/ha, the total nitrogen loading will be less than 250kg/ha, and the amount of available nitrogen and total or available phosphate and potash (whichever is appropriate) will not exceed the fertiliser recommendation or the amount removed in crop offtake, whichever is the greater. All fields are pH 6 or above so alum-based sludge (DCWW Bala, Cefni, Cilfor, Mynydd Llandegai) can be spread across all fields.

Table 6. DCWW Alwen cake

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	1.3	1	103	49	21	2+	100	158	0.7	3	0	1.2	170	**493**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	1.3	1	103	49	21	2+	100	158	0.7	3	0	1.2	170	**357**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	3	50	158	0.7	4	0	1.2	170	**204**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	3	50	158	0.7	4	0	1.2	170	**510**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	3	50	158	0.7	4	0	1.2	170	**442**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	3	50	158	0.7	4	0	1.2	170	**510**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**442**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**731**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**425**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**255**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**153**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**340**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**272**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	1.3	1	103	49	21	2-	140	158	0.7	2	0	1.2	170	**357**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	2-	140	158	0.7	2	0	1.2	170	**221**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	2-	140	158	0.7	2	0	1.2	170	**306**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	2-	140	158	0.7	2	0	1.2	170	**544**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	2-	140	158	0.7	2	0	1.2	170	**595**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	1.3	2	50	49	41*	2-	140	158	0.7	2	0	1.2	170	**306**
Ha	**45.7**	**43.9**																			**7,463**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 170 t/ha is 249 kg/ha

Table 7. DCWW Bala liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	4	1	103	49	6	2+	100	158	0.2	3	0	4	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	4	1	103	49	6	2+	100	158	0.2	3	0	4	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	3	50	158	0.2	4	0	4	250	**300**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	3	50	158	0.2	4	0	4	250	**750**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	3	50	158	0.2	4	0	4	250	**650**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	3	50	158	0.2	4	0	4	250	**750**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	4	1	103	49	6	2-	140	158	0.2	2	0	4	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	2-	140	158	0.2	2	0	4	250	**325**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	2-	140	158	0.2	2	0	4	250	**450**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	2-	140	158	0.2	2	0	4	250	**800**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	2-	140	158	0.2	2	0	4	250	**875**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	4	2	50	49	12*	2-	140	158	0.2	2	0	4	250	**450**
Ha	**45.7**	**43.9**																			**10,975**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 91 kg/ha

Table 8. DCWW Bryn Cowlyd liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	6	1	103	49	5	2+	100	158	0.3	3	0	2	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	6	1	103	49	5	2+	100	158	0.3	3	0	2	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	3	50	158	0.3	4	0	2	250	**300**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	3	50	158	0.3	4	0	2	250	**750**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	3	50	158	0.3	4	0	2	250	**650**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	3	50	158	0.3	4	0	2	250	**750**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	6	1	103	49	5	2-	140	158	0.3	2	0	2	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	2-	140	158	0.3	2	0	2	250	**325**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	2-	140	158	0.3	2	0	2	250	**450**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	2-	140	158	0.3	2	0	2	250	**800**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	2-	140	158	0.3	2	0	2	250	**875**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	6	2	50	49	11*	2-	140	158	0.3	2	0	2	250	**450**
Ha	**45.7**	**43.9**																			**10,975**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 127 kg/ha

Table 9. DCWW Cefni liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	7	1	103	49	22	2+	100	158	0.3	3	0	2.8	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	7	1	103	49	22	2+	100	158	0.3	3	0	2.8	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	3	50	158	0.3	4	0	2.8	250	**300**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	3	50	158	0.3	4	0	2.8	250	**750**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	3	50	158	0.3	4	0	2.8	250	**650**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	3	50	158	0.3	4	0	2.8	250	**750**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	7	1	103	49	22	2-	140	158	0.3	2	0	2.8	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	2-	140	158	0.3	2	0	2.8	250	**325**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	2-	140	158	0.3	2	0	2.8	250	**450**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	2-	140	158	0.3	2	0	2.8	250	**800**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	2-	140	158	0.3	2	0	2.8	250	**875**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	7	2	50	49	44*	2-	140	158	0.3	2	0	2.8	250	**450**
Ha	**45.7**	**43.9**																			**10,975**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 198 kg/ha

Table 10. DCWW Cilfor liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	7	1	103	49	10	2+	100	158	0.2	3	0	1	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	7	1	103	49	10	2+	100	158	0.2	3	0	1	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	3	50	158	0.2	4	0	1	250	**300**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	3	50	158	0.2	4	0	1	250	**750**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	3	50	158	0.2	4	0	1	250	**650**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	3	50	158	0.2	4	0	1	250	**750**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	7	1	103	49	10	2-	140	158	0.2	2	0	1	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	2-	140	158	0.2	2	0	1	250	**325**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	2-	140	158	0.2	2	0	1	250	**450**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	2-	140	158	0.2	2	0	1	250	**800**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	2-	140	158	0.2	2	0	1	250	**875**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	7	2	50	49	20*	2-	140	158	0.2	2	0	1	250	**450**
Ha	**45.7**	**43.9**																			**10,975**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 98 kg/ha

Table 11. DCWW Garreglwyd liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	1.5	1	103	49	3	2+	100	158	0.1	3	0	0.6	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	1.5	1	103	49	3	2+	100	158	0.1	3	0	0.6	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	3	50	158	0.1	4	0	0.6	250	**300**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	3	50	158	0.1	4	0	0.6	250	**750**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	3	50	158	0.1	4	0	0.6	250	**650**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	3	50	158	0.1	4	0	0.6	250	**750**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	1.5	1	103	49	3	2-	140	158	0.1	2	0	0.6	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	2-	140	158	0.1	2	0	0.6	250	**325**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	2-	140	158	0.1	2	0	0.6	250	**450**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	2-	140	158	0.1	2	0	0.6	250	**800**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	2-	140	158	0.1	2	0	0.6	250	**875**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	1.5	2	50	49	6*	2-	140	158	0.1	2	0	0.6	250	**450**
Ha	**45.7**	**43.9**																			**10,975**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 46 kg/ha

Table 12. DCWW Glascoed cake

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	11	1	103	49	44	2+	100	158	0.6	3	0	7	98	**284**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	11	1	103	49	44	2+	100	158	0.6	3	0	7	98	**206**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	3	50	158	0.3	4	0	4	55	**66**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	3	50	158	0.3	4	0	4	55	**165**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	3	50	158	0.3	4	0	4	55	**143**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	3	50	158	0.3	4	0	4	55	**165**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**255**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**421**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**245**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**147**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**88**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**196**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**157**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	11	1	103	49	44	2-	140	158	0.6	2	0	7	98	**206**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	2-	140	158	0.3	2	0	4	55	**72**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	2-	140	158	0.3	2	0	4	55	**99**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	2-	140	158	0.3	2	0	4	55	**176**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	2-	140	158	0.3	2	0	4	55	**193**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	6	2	50	49	49*	2-	140	158	0.3	2	0	4	55	**99**
Ha	**45.7**	**43.9**																			**3,382**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 98 t/ha is 249.7 kg/ha

Table 13. DCWW Llyn Conwy liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	1.5	1	103	49	5	2+	100	158	0.2	3	0	0.9	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	1.5	1	103	49	5	2+	100	158	0.2	3	0	0.9	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	3	50	158	0.2	4	0	0.9	250	**300**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	3	50	158	0.2	4	0	0.9	250	**750**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	3	50	158	0.2	4	0	0.9	250	**650**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	3	50	158	0.2	4	0	0.9	250	**750**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	1.5	1	103	49	5	2-	140	158	0.2	2	0	0.9	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	2-	140	158	0.2	2	0	0.9	250	**325**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	2-	140	158	0.2	2	0	0.9	250	**450**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	2-	140	158	0.2	2	0	0.9	250	**800**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	2-	140	158	0.2	2	0	0.9	250	**875**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	1.5	2	50	49	10*	2-	140	158	0.2	2	0	0.9	250	**450**
Ha	**45.7**	**43.9**																			**10,975**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 80 kg/ha

Table 14. DCWW Mynyd Llandegai liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	4	1	103	49	66	2+	100	158	0.2	3	0	2	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	4	1	103	49	66	2+	100	158	0.2	3	0	2	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	3	50	158	0.1	4	0	0.8	95	**114**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	3	50	158	0.1	4	0	0.8	95	**285**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	3	50	158	0.1	4	0	0.8	95	**247**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	3	50	158	0.1	4	0	0.8	95	**285**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	4	1	103	49	66	2-	140	158	0.2	2	0	2	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	2-	140	158	0.1	2	0	0.8	95	**124**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	2-	140	158	0.1	2	0	0.8	95	**171**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	2-	140	158	0.1	2	0	0.8	95	**304**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	2-	140	158	0.1	2	0	0.8	95	**333**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	1	2	50	49	50*	2-	140	158	0.1	2	0	0.8	95	**171**
Ha	**45.7**	**43.9**																			**7,658**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 98 kg/ha

Table 15. DCWW Rhiwgoch liquid

Field no	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	N SNS	N Req	N in Wst	P Ind	P_2O_5 Req	Crop Use	*P_2O_5 in Wst	K Ind	K_2O Req	Crop Use	K_2O in Wst	Mg Ind	MgO Req	MgO in Wst	Rate T/Ha	Totals Tonnes
3(A)	3.1	2.9	Grass	Grass	6.5	Mod	190	1.5	1	103	49	2	2+	100	158	0.1	3	0	0.5	250	**725**
4(A)	2.3	2.1	Grass	Grass	6.5	Mod	190	1.5	1	103	49	2	2+	100	158	0.1	3	0	0.5	250	**525**
5(B)	1.2	1.2	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	3	50	158	0.1	4	0	0.5	250	**300**
6(B)	3.0	3.0	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	3	50	158	0.1	4	0	0.5	250	**750**
8(B)	3.0	2.6	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	3	50	158	0.1	4	0	0.5	250	**650**
9(B)	3.4	3.0	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	3	50	158	0.1	4	0	0.5	250	**750**
7(C)	2.6	2.6	Grass	Grass	6.9	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**650**
10(C)	4.3	4.3	Grass	Grass	6.9	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**1,075**
11(C)	2.5	2.5	Grass	Grass	6.9	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**625**
12(D)	1.5	1.5	Grass	Grass	6.8	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**375**
13(D)	0.9	0.9	Grass	Grass	6.8	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**225**
20(D)	2.0	2.0	Grass	Grass	6.8	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**500**
21(D)	1.6	1.6	Grass	Grass	6.8	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**400**
23(D)	2.1	2.1	Grass	Grass	6.8	Mod	190	1.5	1	103	49	2	2-	140	158	0.1	2	0	0.5	250	**525**
18(E)	1.3	1.3	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	2-	140	158	0.1	2	0	0.5	250	**325**
19(E)	2.0	1.8	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	2-	140	158	0.1	2	0	0.5	250	**450**
22(E)	3.2	3.2	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	2-	140	158	0.1	2	0	0.5	250	**800**
24(E)	3.5	3.5	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	2-	140	158	0.1	2	0	0.5	250	**875**
25(E)	2.2	1.8	Grass	Grass	6.7	Mod	190	1.5	2	50	49	5*	2-	140	158	0.1	2	0	0.5	250	**450**
Ha	**45.7**	**43.9**																			**10,975**

N, P, and K requirements based on values for 1 cut of grass for silage with aftermath grazing (target DM yield 9-12 t/ha) (Defra 2017)

In a 1 cut system, 2/3 of the recommended P and K requirement for grazed grass is added for aftermath grazing

Grass crop use based on 1 cut silage (23t FW/ha), totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake (Defra 2017)

In a 1 cut system, 10kg/ha extra P and 20kg/ha extra K are added to allow for offtake from aftermath grazing

Available nutrient content of waste used on N, P, K, or Mg

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

Total N at application rate of 250 t/ha is 46 kg/ha

5 Compliance with NVZ regulations

Table 16. Compliance with NVZ regulations

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

Applicable to:

If yes, please indicate the appropriate period:

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

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

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

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

6.1 Receiving soils

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

Table 17. Soil type

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

The soil analyses (**Soil Analysis**) shows the soils to have sufficient background concentrations of Mg (*i.e.* ADAS Index 2-4). It is therefore unlikely that the crop will require any additional input of Mg over the course of the cropping cycle.

6.2 Waste characterisation

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

The limiting factors for the different wastes are as follows;

- Alwen – Total N and P2O5 on fields with Index 2
- Bala – Max rate of 250 t/ha
- Bryn Cowlyd - Max rate of 250 t/ha
- Cefni - Max rate of 250 t/ha
- Cilfor - Max rate of 250 t/ha
- Gerradllwyd - Max rate of 250 t/ha
- Glascoed – Total N
- Llyn Conwy - Max rate of 250 t/ha
- Mynydd Llandegai – P2O5
- Rhiwgoch - Max rate of 250 t/ha

6.3 Summary of benefits

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

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

6.4 Additional requirements

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

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

7.1 Potentially Toxic Elements (PTEs)

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

7.2 Other waste characteristics

The pH levels in the wastes range from 4.3 to 6.7

It is unlikely that soil pH will decrease following the application detailed here due to the extensive buffering capacity of the receiving soils. The pH levels of the receiving soils are ≥ 6.0 therefore it is unlikely that availability of any naturally occurring heavy metals present in these soils will become more available after application of these wastes.

7.3 Operational factors

1. Solid wastes will be spread using conventional rear discharge spreaders.
2. Liquid wastes will be surface spread, applied using a low trajectory splash plate.
3. Potential compaction of receiving soil will be mitigated by suitable adjustment of tyres/tyre pressure to match soil conditions, direction of spreading and load to be spread.
4. Wastes will be applied when ground and weather conditions are suitable, following CoGAP to avoid soil damage including wheel ruts, compaction, structural damage, erosion and run-off.

8 Sensitive human and environmental receptors

Locations of sensitive receptors are shown in **CF1 Maps**. 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 above. Generic measures (in addition to permit requirements and following the EMS) to reduce potential negative impacts of the proposed spreading operation will be as follows;

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

10 Contingency planning

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

Contact : JOLYON PRIDDING
4RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU
Tel. : 01132 322400

V537

Please quote the above code for all enquiries

Client : CERNYFED

Sample Matrix : Agricultural Soil

Laboratory Reference
Card Number 21204/19

Date Received 05-Dec-19
Date Reported 06-Dec-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
91096/19	1	**CERNYFED A** *No cropping details given*	**6.5**	**1**	**2+**	**3**	**15.4**	**195**	**136**
91097/19	2	**CERNYFED B** *No cropping details given*	**6.7**	**2**	**3**	**4**	**18.2**	**249**	**190**
91098/19	3	**CERNYFED C** *No cropping details given*	**6.9**	**1**	**2-**	**2**	**14.8**	**167**	**98**
91099/19	4	**CERNYFED D** *No cropping details given*	**6.8**	**1**	**2-**	**2**	**15.0**	**141**	**74**
91100/19	5	**CERNYFED E** *No cropping details given*	**6.7**	**2**	**2-**	**2**	**16.0**	**167**	**78**

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

Released by Gina Graham On behalf of NRM Ltd Date 06/12/19

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

DATE 6th December 2019
SAMPLES FROM CERNYFED

SAMPLED BY

Report reference 21204/19

JOLYON PRIDDING
4RECYCLING LTD
CONTROL HOUSE
A1 BUSINESS PARK
KNOTTINGLEY ROAD
KNOTTINGLEY WF11 0BU
Tel: 01132 322400
Fax:

Fertiliser Recommendations

The phosphate and potash recommendations shown below, are those required to replace the offtake and maintain target soil indices. The larger recommended applications for soils below target index will allow the soil to build up to this target index over a number of years. Not applying fertiliser to soils which are above target index will allow the soil to run down over a number of years to the target index.
The recommendation should be increased or decreased where yields are substantially more or less than that specified. The amount to apply can be calculated using the expected yield and values for the offtake of phosphate and potash per tonne of yield given in the RB209 9th edition.
All recommendations are given for the mid-point of each Index.
Where a soil analysis value (as given by the laboratory) is close to the range of an adjacent Index, the recommendation may be reduced or increased slightly taking account of the recommendation given for the adjacent Index. Small adjustments of less than 10 kg/ha are generally not justified.
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)*
CERNYFED A	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
091096 /		*Kg/Ha*				*Te/Ha* **0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
CERNYFED B	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
091097 /		*Kg/Ha*				*Te/Ha* **0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
CERNYFED C	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
091098 /		*Kg/Ha*				*Te/Ha* **0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
CERNYFED D	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
091099 /		*Kg/Ha*				*Te/Ha* **0**	**0**
Field Name / Ref / Soil Type	*Last Crop / Next Crop*		*P2O5*	*K2O*	*MgO*	*Lime (Arable)*	*(Grass)*
CERNYFED E	**Not Given / Not Given**	*Units/Acre*				*T/Ac* **0**	**0**
091100 /		*Kg/Ha*				*Te/Ha* **0**	**0**

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

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	798055	**Location -**	ALWEN CENTRIFUGE CAKE
Date Sampled -	21-Oct-19	**Time Taken -**	10:36
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520513
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		123	
288	ALUMINIUM (DRY WT)	MG/KG		2550	
357	ARSENIC (DRY WT)	MG/KG		15.2	
403	Manganese	MG/L		1230	
4620	pH	PH UNITS		4.3	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.28	
8241	LOSS ON IGNITION	%		43.8	
9233	Ammoniacal nitrogen	MG/KG	LT	34.3	
9234	Sulphur	MG/KG		10400	
9271	Cadmium	MG/KG		0.23	
9272	CHROMIUM TOTAL	MG/KG		9.38	
9273	Copper	MG/KG	LT	1.61	
9275	Nickel	MG/KG		28.1	
9276	LEAD TOTAL	MG/KG		26.9	
9277	ZINC TOTAL	MG/KG		180	
9278	IRON TOTAL	MG/KG		388000	
9281	% Dry solids	%		17.9	
9282	% Minerals	%		56.2	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.0586	
9285	% N (dry weight)	%		0.82	

Alwen cake

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**170**	Lab ref no. S 6520513
Application rate (t/acre)	**68**	
pH	**4.3**	
Dry solids (%)	**17.9**	
Organic matter content (%)	**43.8**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.82	%	1.47	249.5	0.008	1.3
Ammonium-N	43.3	mg/kg	0.01	1.3		
Phosphorus (P)	0.059	%	0.11			
Phosphate (P_2O_5)			0.24	41.1	0.048	20.6
Potassium (K)	0.009	%	0.02			
Potash (K_2O)			0.02	3.3	0.004	0.7
Magnesium (Mg)	123	mg/kg	0.02			
Magnesium (MgO)			0.04	6.2	0.007	1.2
Sulphur (S)	10400	mg/kg	1.86			
Sulphur (SO_3)			4.65	791.2	0.465	79.1

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	180	mg/kg	0.03	5.48	15.00
Copper	1.61	mg/kg	0.00	0.05	7.50
Nickel	28.10	mg/kg	0.01	0.86	3.00
Lead	26.90	mg/kg	0.00	0.82	15.00
Cadmium	0.23	mg/kg	0.00	0.01	0.15
Chromium	9.4	mg/kg	0.00	0.29	15.00
Arsenic	15.2	mg/kg	0.00	0.46	0.70
Mercury	0.28	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	388000	mg/kg	69.45	11807	
Aluminium	2550	mg/kg	0.46	78	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	798001	**Location -**	Bala Sludge
Date Sampled -	22-Oct-19	**Time Taken -**	10:34
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520510
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		1420	
288	ALUMINIUM (DRY WT)	MG/KG		188000	
357	ARSENIC (DRY WT)	MG/KG		14.9	
403	Manganese	MG/L		875	
4620	pH	PH UNITS		6.5	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.59	
8241	LOSS ON IGNITION	%		39	
9233	Ammoniacal nitrogen	MG/KG		501	
9234	Sulphur	MG/KG		6550	
9271	Cadmium	MG/KG		0.52	
9272	CHROMIUM TOTAL	MG/KG		7.56	
9273	Copper	MG/KG		19.7	
9275	Nickel	MG/KG	LT	2.53	
9276	LEAD TOTAL	MG/KG	LT	3.82	
9277	ZINC TOTAL	MG/KG		305	
9278	IRON TOTAL	MG/KG		2980	
9281	% Dry solids	%		3.41	
9282	% Minerals	%		61	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.0632	
9285	% N (dry weight)	%		1.07	

Bala liquid

Analysis of Water Treatment Works Sludge

Date: 22.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520510
Application rate (t/acre)	**100**	
pH	**6.5**	
Dry solids (%)	**3.4**	
Organic matter content (%)	**39.0**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.07	%	0.36	91.2	0.017	4.3
Ammonium-N	501	mg/kg	0.02	4.3		
Phosphorus (P)	0.063	%	0.02			
Phosphate (P_2O_5)			0.05	12.3	0.010	6.1
Potassium (K)	0.009	%	0.00			
Potash (K_2O)			0.00	0.9	0.001	0.2
Magnesium (Mg)	1420	mg/kg	0.05			
Magnesium (MgO)			0.08	20.1	0.016	4.0
Sulphur (S)	6550	mg/kg	0.22			
Sulphur (SO_3)			0.56	139.6	0.056	14.0

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	305	mg/kg	0.01	2.60	15.00
Copper	19.7	mg/kg	0.00	0.17	7.50
Nickel	2.53	mg/kg	0.00	0.02	3.00
Lead	3.82	mg/kg	0.00	0.03	15.00
Cadmium	0.52	mg/kg	0.00	0.00	0.15
Chromium	7.6	mg/kg	0.00	0.06	15.00
Arsenic	14.9	mg/kg	0.00	0.13	0.70
Mercury	0.59	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	2980	mg/kg	0.10	25	
Aluminium	188000	mg/kg	6.41	1603	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	23600	**Location -**	BRYN COWLYD WTW - SLUDGE Byproduct
Date Sampled -	21-Oct-19	**Time Taken -**	10:41
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520522
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		367	
288	ALUMINIUM (DRY WT)	MG/KG		3170	
357	ARSENIC (DRY WT)	MG/KG	LT	9.4	
403	Manganese	MG/L		1340	
4620	pH	PH UNITS		6.6	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.32	
8241	LOSS ON IGNITION	%		34.9	
9233	Ammoniacal nitrogen	MG/KG		348	
9234	Sulphur	MG/KG		2020	
9271	Cadmium	MG/KG		0.3	
9272	CHROMIUM TOTAL	MG/KG		10.1	
9273	Copper	MG/KG	LT	7.8	
9275	Nickel	MG/KG		33.7	
9276	LEAD TOTAL	MG/KG		11.8	
9277	ZINC TOTAL	MG/KG		247	
9278	IRON TOTAL	MG/KG		329000	
9281	% Dry solids	%		6.41	
9282	% Minerals	%		65.1	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.0311	
9285	% N (dry weight)	%		0.79	

Bryn Cowlyd liquid

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520522
Application rate (t/acre)	**100**	
pH	**6.6**	
Dry solids (%)	**6.4**	
Organic matter content (%)	**34.9**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.79	%	0.51	126.6	0.022	5.6
Ammonium-N	348	mg/kg	0.02	5.6		
Phosphorus (P)	0.03	%	0.02			
Phosphate (P_2O_5)			0.04	11.0	0.009	5.5
Potassium (K)	0.009	%	0.01			
Potash (K_2O)			0.01	1.7	0.001	0.3
Magnesium (Mg)	367	mg/kg	0.02			
Magnesium (MgO)			0.04	9.8	0.008	2.0
Sulphur (S)	2020	mg/kg	0.13			
Sulphur (SO_3)			0.32	80.9	0.032	8.1

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	247	mg/kg	0.02	3.96	15.00
Copper	7.8	mg/kg	0.00	0.12	7.50
Nickel	33.70	mg/kg	0.00	0.54	3.00
Lead	11.80	mg/kg	0.00	0.19	15.00
Cadmium	0.30	mg/kg	0.00	0.00	0.15
Chromium	10.1	mg/kg	0.00	0.16	15.00
Arsenic	9.4	mg/kg	0.00	0.15	0.70
Mercury	0.32	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	329000	mg/kg	21.09	5272	
Aluminium	3170	mg/kg	0.20	51	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	622914	**Location -**	CEFNI WTW SLUDGE
Date Sampled -	20-Oct-19	**Time Taken -**	09:59
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520446
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		588	
288	ALUMINIUM (DRY WT)	MG/KG		192000	
357	ARSENIC (DRY WT)	MG/KG		13.2	
403	Manganese	MG/L		2430	
4620	pH	PH UNITS		6.6	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.36	
8241	LOSS ON IGNITION	%		50.9	
9233	Ammoniacal nitrogen	MG/KG		508	
9234	Sulphur	MG/KG		15400	
9271	Cadmium	MG/KG		0.2	
9272	CHROMIUM TOTAL	MG/KG		4.74	
9273	Copper	MG/KG		30.7	
9275	Nickel	MG/KG		16.9	
9276	LEAD TOTAL	MG/KG	LT	2.31	
9277	ZINC TOTAL	MG/KG		19.2	
9278	IRON TOTAL	MG/KG		3020	
9281	% Dry solids	%		5.66	
9282	% Minerals	%		49.1	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.134	
9285	% N (dry weight)	%		1.39	

Cefni liquid

Analysis of Water Treatment Works Sludge

Date: 20.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520446
Application rate (t/acre)	**100**	
pH	**6.6**	
Dry solids (%)	**5.7**	
Organic matter content (%)	**50.9**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.39	%	0.79	198.1	0.029	7.2
Ammonium-N	508	mg/kg	0.03	7.2		
Phosphorus (P)	0.134	%	0.08			
Phosphate (P_2O_5)			0.17	43.7	0.035	21.9
Potassium (K)	0.009	%	0.01			
Potash (K_2O)			0.01	1.6	0.001	0.3
Magnesium (Mg)	588	mg/kg	0.03			
Magnesium (MgO)			0.06	13.9	0.011	2.8
Sulphur (S)	15400	mg/kg	0.88			
Sulphur (SO_3)			2.19	548.6	0.219	54.9

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	19.2	mg/kg	0.00	0.27	15.00
Copper	30.7	mg/kg	0.00	0.44	7.50
Nickel	16.90	mg/kg	0.00	0.24	3.00
Lead	2.31	mg/kg	0.00	0.03	15.00
Cadmium	0.20	mg/kg	0.00	0.00	0.15
Chromium	4.7	mg/kg	0.00	0.07	15.00
Arsenic	13.2	mg/kg	0.00	0.19	0.70
Mercury	0.36	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	3020	mg/kg	0.17	43	
Aluminium	192000	mg/kg	10.94	2736	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	631625	**Location -**	CILFOR WTW SLUDGE
Date Sampled -	21-Oct-19	**Time Taken -**	10:27
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520498
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		444	
288	ALUMINIUM (DRY WT)	MG/KG		170000	
357	ARSENIC (DRY WT)	MG/KG		45.6	
403	Manganese	MG/L		535	
4620	pH	PH UNITS		6.5	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.73	
8241	LOSS ON IGNITION	%		52.2	
9233	Ammoniacal nitrogen	MG/KG		1070	
9234	Sulphur	MG/KG		7860	
9271	Cadmium	MG/KG		0.34	
9272	CHROMIUM TOTAL	MG/KG	LT	2.46	
9273	Copper	MG/KG		28.3	
9275	Nickel	MG/KG	LT	3.11	
9276	LEAD TOTAL	MG/KG	LT	4.7	
9277	ZINC TOTAL	MG/KG		44.9	
9278	IRON TOTAL	MG/KG		4620	
9281	% Dry solids	%		2.77	
9282	% Minerals	%		47.8	
9283	% K (dry weight)	%		0.0105	
9284	% P (dry weight)	%		0.126	
9285	% N (dry weight)	%		1.41	

Cilfor liquid

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520498
Application rate (t/acre)	**100**	
pH	**6.5**	
Dry solids (%)	**2.8**	
Organic matter content (%)	**52.2**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.41	%	0.39	97.6	0.030	7.4
Ammonium-N	1070	mg/kg	0.03	7.4		
Phosphorus (P)	0.126	%	0.03			
Phosphate (P_2O_5)			0.08	20.0	0.016	10.0
Potassium (K)	0.01	%	0.00			
Potash (K_2O)			0.00	0.8	0.001	0.2
Magnesium (Mg)	444	mg/kg	0.01			
Magnesium (MgO)			0.02	5.1	0.004	1.0
Sulphur (S)	7860	mg/kg	0.22			
Sulphur (SO_3)			0.54	136.1	0.054	13.6

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	45	mg/kg	0.00	0.31	15.00
Copper	28.3	mg/kg	0.00	0.20	7.50
Nickel	3.11	mg/kg	0.00	0.02	3.00
Lead	4.70	mg/kg	0.00	0.03	15.00
Cadmium	0.34	mg/kg	0.00	0.00	0.15
Chromium	2.5	mg/kg	0.00	0.02	15.00
Arsenic	45.6	mg/kg	0.00	0.32	0.70
Mercury	0.73	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	4620	mg/kg	0.13	32	
Aluminium	170000	mg/kg	4.71	1177	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	698171	**Location -**	GARREGLWYD WTW SLUDGE
Date Sampled -	21-Oct-19	**Time Taken -**	10:19
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520481
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		425	
288	ALUMINIUM (DRY WT)	MG/KG		3560	
357	ARSENIC (DRY WT)	MG/KG		82.7	
403	Manganese	MG/L		1480	
4620	pH	PH UNITS		4.9	
7774	WTW MERCURY TOTAL	MG/KG	LT	1.26	
8241	LOSS ON IGNITION	%		49.6	
9233	Ammoniacal nitrogen	MG/KG	LT	386	
9234	Sulphur	MG/KG		8750	
9271	Cadmium	MG/KG		0.6	
9272	CHROMIUM TOTAL	MG/KG	LT	4.28	
9273	Copper	MG/KG		44.3	
9275	Nickel	MG/KG	LT	5.41	
9276	LEAD TOTAL	MG/KG		20.3	
9277	ZINC TOTAL	MG/KG		166	
9278	IRON TOTAL	MG/KG		387000	
9281	% Dry solids	%		1.59	
9282	% Minerals	%		50.4	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.0566	
9285	% N (dry weight)	%		1.16	

Gerreglwyd liquid

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520481
Application rate (t/acre)	**100**	
pH	**4.9**	
Dry solids (%)	**1.6**	
Organic matter content (%)	**49.6**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.16	%	0.18	46.1	0.006	1.5
Ammonium-N	386	mg/kg	0.01	1.5		
Phosphorus (P)	0.06	%	0.01			
Phosphate (P_2O_5)			0.02	5.5	0.004	2.7
Potassium (K)	0.009	%	0.00			
Potash (K_2O)			0.00	0.4	0.000	0.1
Magnesium (Mg)	425	mg/kg	0.01			
Magnesium (MgO)			0.01	2.8	0.002	0.6
Sulphur (S)	8750	mg/kg	0.14			
Sulphur (SO_3)			0.35	87.0	0.035	8.7

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	166	mg/kg	0.00	0.66	15.00
Copper	44.3	mg/kg	0.00	0.18	7.50
Nickel	5.41	mg/kg	0.00	0.02	3.00
Lead	20.30	mg/kg	0.00	0.08	15.00
Cadmium	0.60	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	82.7	mg/kg	0.00	0.33	0.70
Mercury	1.26	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	387000	mg/kg	6.15	1538	
Aluminium	3560	mg/kg	0.06	14	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	798039	**Location -**	GLASCOED CENTRIFUGE SLUDGE
Date Sampled -	21-Oct-19	**Time Taken -**	10:37
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520516
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		803	
288	ALUMINIUM (DRY WT)	MG/KG		2690	
357	ARSENIC (DRY WT)	MG/KG	LT	14.2	
403	Manganese	MG/L		1510	
4620	pH	PH UNITS		6.6	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.19	
8241	LOSS ON IGNITION	%		32.8	
9233	Ammoniacal nitrogen	MG/KG		430	
9234	Sulphur	MG/KG		2600	
9271	Cadmium	MG/KG	LT	0.09	
9272	CHROMIUM TOTAL	MG/KG		7.5	
9273	Copper	MG/KG		23.7	
9275	Nickel	MG/KG		43.2	
9276	LEAD TOTAL	MG/KG		23.5	
9277	ZINC TOTAL	MG/KG		218	
9278	IRON TOTAL	MG/KG		422000	
9281	% Dry solids	%		26	
9282	% Minerals	%		67.2	
9283	% K (dry weight)	%		0.00969	
9284	% P (dry weight)	%		0.151	
9285	% N (dry weight)	%		0.98	

Glascoed cake

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**98**	Lab ref no. S 6520481
Application rate (t/acre)	**39**	
pH	**6.6**	
Dry solids (%)	**26.0**	
Organic matter content (%)	**32.8**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.98	%	2.55	249.7	0.112	11.0
Ammonium-N	430	mg/kg	0.11	11.0		
Phosphorus (P)	0.151	%	0.39			
Phosphate (P_2O_5)			0.90	88.1	0.180	44.1
Potassium (K)	0.01	%	0.03			
Potash (K_2O)			0.03	3.1	0.006	0.6
Magnesium (Mg)	803	mg/kg	0.21			
Magnesium (MgO)			0.35	34.0	0.069	6.8
Sulphur (S)	2600	mg/kg	0.68			
Sulphur (SO_3)			1.69	165.6	0.169	16.6

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	218	mg/kg	0.06	5.55	15.00
Copper	23.7	mg/kg	0.01	0.60	7.50
Nickel	43.20	mg/kg	0.01	1.10	3.00
Lead	23.50	mg/kg	0.01	0.60	15.00
Cadmium	0.09	mg/kg	0.00	0.00	0.15
Chromium	7.5	mg/kg	0.00	0.19	15.00
Arsenic	14.2	mg/kg	0.00	0.36	0.70
Mercury	0.19	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	422000	mg/kg	109.72	10753	
Aluminium	2690	mg/kg	0.70	69	

Glascoed cake

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**55**	Lab ref no. S 6520481
Application rate (t/acre)	**22**	
pH	**6.6**	
Dry solids (%)	**26.0**	
Organic matter content (%)	**32.8**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.98	%	2.55	140.1	0.112	6.1
Ammonium-N	430	mg/kg	0.11	6.1		
Phosphorus (P)	0.151	%	0.39			
Phosphate (P_2O_5)			0.90	49.4	0.180	24.7
Potassium (K)	0.01	%	0.03			
Potash (K_2O)			0.03	1.7	0.006	0.3
Magnesium (Mg)	803	mg/kg	0.21			
Magnesium (MgO)			0.35	19.1	0.069	3.8
Sulphur (S)	2600	mg/kg	0.68			
Sulphur (SO_3)			1.69	93.0	0.169	9.3

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	218	mg/kg	0.06	3.12	15.00
Copper	23.7	mg/kg	0.01	0.34	7.50
Nickel	43.20	mg/kg	0.01	0.62	3.00
Lead	23.50	mg/kg	0.01	0.34	15.00
Cadmium	0.09	mg/kg	0.00	0.00	0.15
Chromium	7.5	mg/kg	0.00	0.11	15.00
Arsenic	14.2	mg/kg	0.00	0.20	0.70
Mercury	0.19	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	422000	mg/kg	109.72	6035	
Aluminium	2690	mg/kg	0.70	38	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	698086	**Location -**	LLYN CONWY SLUDGE
Date Sampled -	21-Oct-19	**Time Taken -**	10:39
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520519
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		348	
288	ALUMINIUM (DRY WT)	MG/KG		2970	
357	ARSENIC (DRY WT)	MG/KG		49.5	
403	Manganese	MG/L		1780	
4620	pH	PH UNITS		4.9	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.66	
8241	LOSS ON IGNITION	%		45.1	
9233	Ammoniacal nitrogen	MG/KG	LT	202	
9234	Sulphur	MG/KG		9270	
9271	Cadmium	MG/KG		1.05	
9272	CHROMIUM TOTAL	MG/KG		7.62	
9273	Copper	MG/KG		24.8	
9275	Nickel	MG/KG		36	
9276	LEAD TOTAL	MG/KG		26.2	
9277	ZINC TOTAL	MG/KG		255	
9278	IRON TOTAL	MG/KG		368000	
9281	% Dry solids	%		3.02	
9282	% Minerals	%		54.9	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.0555	
9285	% N (dry weight)	%		1.06	

Llyn Conwy liquid

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520519
Application rate (t/acre)	**100**	
pH	**4.9**	
Dry solids (%)	**3.0**	
Organic matter content (%)	**45.1**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.06	%	0.32	80.0	0.006	1.5
Ammonium-N	202	mg/kg	0.01	1.5		
Phosphorus (P)	0.06	%	0.02			
Phosphate (P_2O_5)			0.04	10.4	0.008	5.2
Potassium (K)	0.009	%	0.00			
Potash (K_2O)			0.00	0.8	0.001	0.2
Magnesium (Mg)	348	mg/kg	0.01			
Magnesium (MgO)			0.02	4.4	0.003	0.9
Sulphur (S)	9270	mg/kg	0.28			
Sulphur (SO_3)			0.70	175.0	0.070	17.5

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	255	mg/kg	0.01	1.93	15.00
Copper	24.8	mg/kg	0.00	0.19	7.50
Nickel	36.00	mg/kg	0.00	0.27	3.00
Lead	26.20	mg/kg	0.00	0.20	15.00
Cadmium	1.05	mg/kg	0.00	0.01	0.15
Chromium	7.6	mg/kg	0.00	0.06	15.00
Arsenic	49.5	mg/kg	0.00	0.37	0.70
Mercury	0.66	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	368000	mg/kg	11.11	2778	
Aluminium	2970	mg/kg	0.09	22	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	698028	**Location -**	MYNYDD LLANDEGAI SLUDGE
Date Sampled -	21-Oct-19	**Time Taken -**	10:13
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520469
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		780	
288	ALUMINIUM (DRY WT)	MG/KG		191000	
357	ARSENIC (DRY WT)	MG/KG		21.4	
403	Manganese	MG/L		974	
4620	pH	PH UNITS		6.7	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.64	
8241	LOSS ON IGNITION	%		48.6	
9233	Ammoniacal nitrogen	MG/KG		448	
9234	Sulphur	MG/KG		7010	
9271	Cadmium	MG/KG		0.6	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG		64.8	
9275	Nickel	MG/KG	LT	2.75	
9276	LEAD TOTAL	MG/KG	LT	4.15	
9277	ZINC TOTAL	MG/KG		139	
9278	IRON TOTAL	MG/KG		3760	
9281	% Dry solids	%		3.15	
9282	% Minerals	%		51.4	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.734	
9285	% N (dry weight)	%		1.24	

Mynydd Llandegai liquid

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**95**	Lab ref no. S 6520469
Application rate (t/acre)	**38**	
pH	**6.7**	
Dry solids (%)	**3.2**	
Organic matter content (%)	**48.6**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.24	%	0.39	37.1	0.014	1.3
Ammonium-N	448	mg/kg	0.01	1.3		
Phosphorus (P)	0.734	%	0.23			
Phosphate (P_2O_5)			0.53	50.3	0.106	25.1
Potassium (K)	0.009	%	0.00			
Potash (K_2O)			0.00	0.3	0.001	0.1
Magnesium (Mg)	780	mg/kg	0.02			
Magnesium (MgO)			0.04	3.9	0.008	0.8
Sulphur (S)	7010	mg/kg	0.22			
Sulphur (SO_3)			0.55	52.4	0.055	5.2

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	139	mg/kg	0.00	0.42	15.00
Copper	64.8	mg/kg	0.00	0.19	7.50
Nickel	2.75	mg/kg	0.00	0.01	3.00
Lead	4.15	mg/kg	0.00	0.01	15.00
Cadmium	0.60	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.01	15.00
Arsenic	21.4	mg/kg	0.00	0.06	0.70
Mercury	0.64	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	3760	mg/kg	0.12	11	
Aluminium	191000	mg/kg	6.02	572	

Mynydd Llandegai liquid

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520469
Application rate (t/acre)	**100**	
pH	**6.7**	
Dry solids (%)	**3.2**	
Organic matter content (%)	**48.6**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.24	%	0.39	97.7	0.014	3.5
Ammonium-N	448	mg/kg	0.01	3.5		
Phosphorus (P)	0.734	%	0.23			
Phosphate (P_2O_5)			0.53	132.4	0.106	66.2
Potassium (K)	0.009	%	0.00			
Potash (K_2O)			0.00	0.9	0.001	0.2
Magnesium (Mg)	780	mg/kg	0.02			
Magnesium (MgO)			0.04	10.2	0.008	2.0
Sulphur (S)	7010	mg/kg	0.22			
Sulphur (SO_3)			0.55	138.0	0.055	13.8

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	139	mg/kg	0.00	1.09	15.00
Copper	64.8	mg/kg	0.00	0.51	7.50
Nickel	2.75	mg/kg	0.00	0.02	3.00
Lead	4.15	mg/kg	0.00	0.03	15.00
Cadmium	0.60	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.03	15.00
Arsenic	21.4	mg/kg	0.00	0.17	0.70
Mercury	0.64	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	3760	mg/kg	0.12	30	
Aluminium	191000	mg/kg	6.02	1504	

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	618214	**Location -**	RHIW GOCH WTW SLUDGE
Date Sampled -	21-Oct-19	**Time Taken -**	10:15
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 6520475
Sampler -	EXTA	**No Results -**	21
Type -			

Sample Results

Code	Determinand Name	Units		Result	Limit
238	Magnesium	MG/KG		415	
288	ALUMINIUM (DRY WT)	MG/KG		3200	
357	ARSENIC (DRY WT)	MG/KG		83.9	
403	Manganese	MG/L		1400	
4620	pH	PH UNITS		4.9	
7774	WTW MERCURY TOTAL	MG/KG	LT	1.28	
8241	LOSS ON IGNITION	%		48.1	
9233	Ammoniacal nitrogen	MG/KG	LT	391	
9234	Sulphur	MG/KG		8490	
9271	Cadmium	MG/KG		0.7	
9272	CHROMIUM TOTAL	MG/KG	LT	4.36	
9273	Copper	MG/KG		41.4	
9275	Nickel	MG/KG	LT	5.51	
9276	LEAD TOTAL	MG/KG		16	
9277	ZINC TOTAL	MG/KG		160	
9278	IRON TOTAL	MG/KG		371000	
9281	% Dry solids	%		1.56	
9282	% Minerals	%		51.9	
9283	% K (dry weight)	%	LT	0.0087	
9284	% P (dry weight)	%		0.0489	
9285	% N (dry weight)	%		1.18	

Rhiwgoch liquid

Analysis of Water Treatment Works Sludge

Date: 21.10.2019

Application rate (t/ha)	**250**	Lab ref no. S 6520475
Application rate (t/acre)	**100**	
pH	**4.9**	
Dry solids (%)	**1.6**	
Organic matter content (%)	**48.1**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.18	%	0.18	46.0	0.006	1.5
Ammonium-N	391	mg/kg	0.01	1.5		
Phosphorus (P)	0.05	%	0.01			
Phosphate (P_2O_5)			0.02	4.5	0.004	2.2
Potassium (K)	0.009	%	0.00			
Potash (K_2O)			0.00	0.4	0.000	0.1
Magnesium (Mg)	415	mg/kg	0.01			
Magnesium (MgO)			0.01	2.7	0.002	0.5
Sulphur (S)	8490	mg/kg	0.13			
Sulphur (SO_3)			0.33	82.8	0.033	8.3

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	160	mg/kg	0.00	0.62	15.00
Copper	41.4	mg/kg	0.00	0.16	7.50
Nickel	5.51	mg/kg	0.00	0.02	3.00
Lead	16.00	mg/kg	0.00	0.06	15.00
Cadmium	0.70	mg/kg	0.00	0.00	0.15
Chromium	4.4	mg/kg	0.00	0.02	15.00
Arsenic	83.9	mg/kg	0.00	0.33	0.70
Mercury	1.28	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	371000	mg/kg	5.79	1447	
Aluminium	3200	mg/kg	0.05	12	