

**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.

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## 1 About the permit

### 1a Discussions before your application

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

Case or document reference

### 1b Permit number

Permit number this application relates to

GP3792SK

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

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

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

SR2010No6 Mobile plant for landspreading of sewage sludge

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

## 2 About you

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

Organisation name (if relevant)

ByProduct Recovery Ltd

Title



First name

Last name

Address

Control House

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

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

Document reference	
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### 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	Adam	
Last name	Stone	
Telephone - mobile	07508 322259	
Telephone - office		
Email address	adam.stone@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	Chris	
Last name	Barr	

Telephone - mobile	07867 808891
Telephone - office	
Email address	chris.barr@4r-group.co.uk / info@4r-group.co.uk

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

- An approved technical scheme  *Go to section 4b3*
- Documented in-house training  You must provide evidence – see below.

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

Document reference	4R - Waste to Land Training Register 15.06.16	<i>Go to section 4c</i>
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**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	High risk location	
	- Not in an SPZ 2, and/or - Over 500 meters from: • European site, and/or • Ramsar, and/or • SSSI	- In a Source Protection Zone 2, and/or - 500 meters or less from: • European site, and/or • Ramsar, and/or • SSSI <b>You must submit a site specific risk assessment.</b>	
SR2010No4 List A wastes (Lower risk)	Low risk deployment <input type="checkbox"/>	Medium risk (2) deployment <input type="checkbox"/>	
SR2010No4 List B wastes (Higher risk)	Medium risk (1) deployment <input type="checkbox"/>	High risk deployment <input checked="" type="checkbox"/>	
SR2010No5 (Any waste listed)	Medium risk (1) deployment <input type="checkbox"/>	High risk deployment <input type="checkbox"/>	
SR2010No6 (Any waste listed)	Medium risk (1) deployment <input type="checkbox"/>	High risk deployment <input type="checkbox"/>	
Bespoke mobile plant permit	Low risk deployment <input type="checkbox"/>	Medium risk deployment <input type="checkbox"/>	High risk deployment <input type="checkbox"/>

**4d Additional information on sensitive receptors**

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

No

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

#### 4e Site specific risk assessment

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

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

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

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

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

#### 4f About the waste

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

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

Table 2 – waste types					
	List of Waste code (6 digit)	Waste description	Physical form	Waste producer	Total amount being spread/used (tonnes)
e.g.	03 03 05	De-inked paper	Sludge	Smith's Newsprint	500
1	19 09 02	Potable water treatment sludge	Sludge cake	DCWW Alwen	8478
2	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Bryn Cowlyd	10925
3	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Cefni	3045
4	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Cwellyn	3175
5	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Dolbenmaen	3175
6	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Garreglwyd	10925
7	19 09 02	Potable water treatment sludge	Sludge cake	DCWW Glascoed	6745
8	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Llyn Conwy	10925
9	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Mynydd Llandegai	3175
10	19 09 02	Potable water treatment sludge	Liquid sludge	DCWW Rhiw Goch	10925
<b>Total tonnage</b>					10925

#### 4g About the land you want to treat

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

Address   
  
  
  
 Postcode   
 National grid reference (12 digit)

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

Agricultural land  Please give your County/ Parish/ Holding number   
 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	5194	SH 92983 51969	19 09 02	9.3
2	5154	SH 92872 51667	19 09 02	10.7
3	4964	SH 93157 49652	19 09 02	5.5
4	4944	SH 92944 49340	19 09 02	11.0
5	4939	SH 93347 49457	19 09 02	7.2
6				
7				
8				
9				
10				
<b>Total hectares</b>				43.7

**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    
 First name

Last name	Kynaston
Address	Clust-y-Blaidd
	Cerrigydrudion
	Corwen
	Conwy
Postcode	LL21 0RU
Telephone - mobile	
Telephone - office	01490 420532
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	
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**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.

<b>Explanation</b>

**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			Farmer		
2					

3					
4					
5					
6					
7					
8					
9					
10					

#### 4I 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	SH 92860 52060	19 09 02	Field stockpile	3000
2	SH 92941 51660	19 09 02	Field stockpile	3000
3	SH 92793 51428	19 09 02	Field stockpile	3000
4	SH 93046 49739	19 09 02	Field stockpile	3000
5	SH 93074 49320	19 09 02	Field stockpile	3000
6				
7				
8				
9	No more than 3000t of	cake will be stored across	all storage locations at any	one time.
10	Liquids will be spread on	delivery.		

#### 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](mailto:banking.team@naturalresourceswales.gov.uk) / [banking.team@cyfoethnaturiolcymru.gov.uk](mailto:banking.team@cyfoethnaturiolcymru.gov.uk) or fax it to 0300 065 3001 and enter it in the space provided below.

BACS reference	<input type="text" value="PSCAPPBYPRO0477"/>
Amount paid	<input type="text" value="£994.00"/>

### 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	<input type="text"/>
Amount paid	<input type="text"/>

### 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.

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

### 6c Checklist for all types of deployment application.

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

<b>Table 7</b>		
<b>Item</b>	<b>Complete</b>	<b>Your document reference/ description</b>
Location map (required for all deployments)	<input checked="" type="checkbox"/>	CyB Maps
Benefit statement (required for all deployments)	<input checked="" type="checkbox"/>	CyB ABS

Waste analysis (required for all deployments)	<input checked="" type="checkbox"/>	Waste Analysis
Receiving soil analysis (required for all deployments)	<input checked="" type="checkbox"/>	Soil Analysis
Site-specific risk assessment (in accordance with 4e)	<input checked="" type="checkbox"/>	CyB SSRA
Any other additional information	N/A	4R - Waste to Land Training Register 15.06.16
	N/A	
	N/A	
	N/A	

## 7 The data Protection Act 1998

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

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

We may also process or release the information to:

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

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

## 8 Confidentiality and national security

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

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

Please treat the information in my application as confidential.

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

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

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

## 9 Declaration

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

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

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

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

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

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

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

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

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

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

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

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

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

#### 9c Sign to confirm you understand the declaration.

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

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

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

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

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

Title	Mr	
First name	Jon	
Last name	Smith	
On behalf of (if relevant)		
Today's date (DD/MM/YYYY)	20/12/2018	



# Location Plan

## Clust-y-Blaidd

### Sites:

Clust-y-Blaidd  
Cerrigydrudion  
Corwen  
Conwy  
LL21 0RU

### Client:

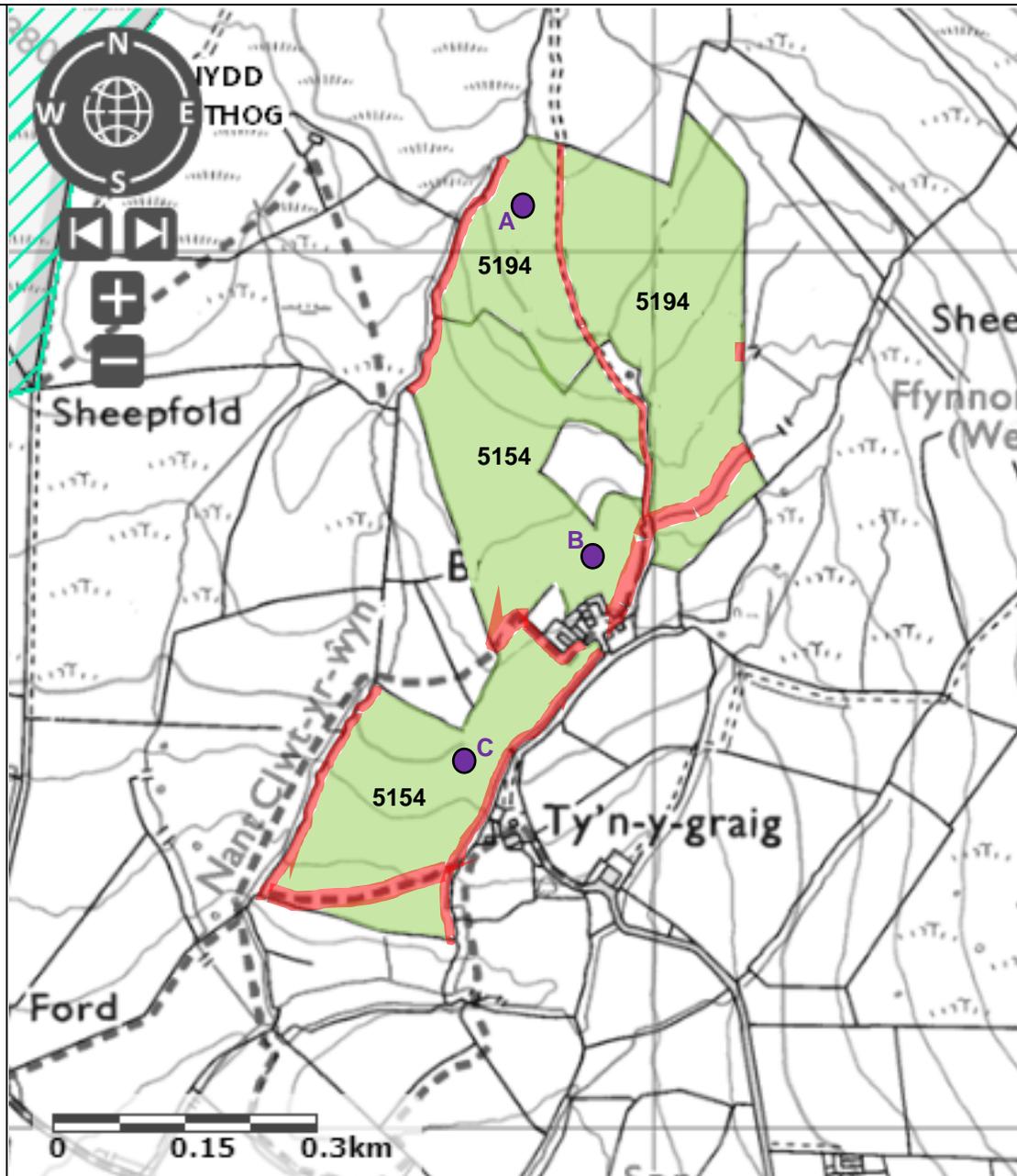
Dŵr Cymru / Welsh Water

### Key:

-  Spreading area
-  Non-spreading area
-  Mynydd Hiraethog SSSI
-  Location tags

### Location tags:

- Stockpiles
- A. SH 92860 52060
  - B. SH 92941 51660
  - C. SH 92793 51428





# Location Plan Clust-y-Blaidd

### Sites:

Clust-y-Blaidd  
Cerrigydrudion  
Corwen  
Conwy  
LL21 0RU

### Client:

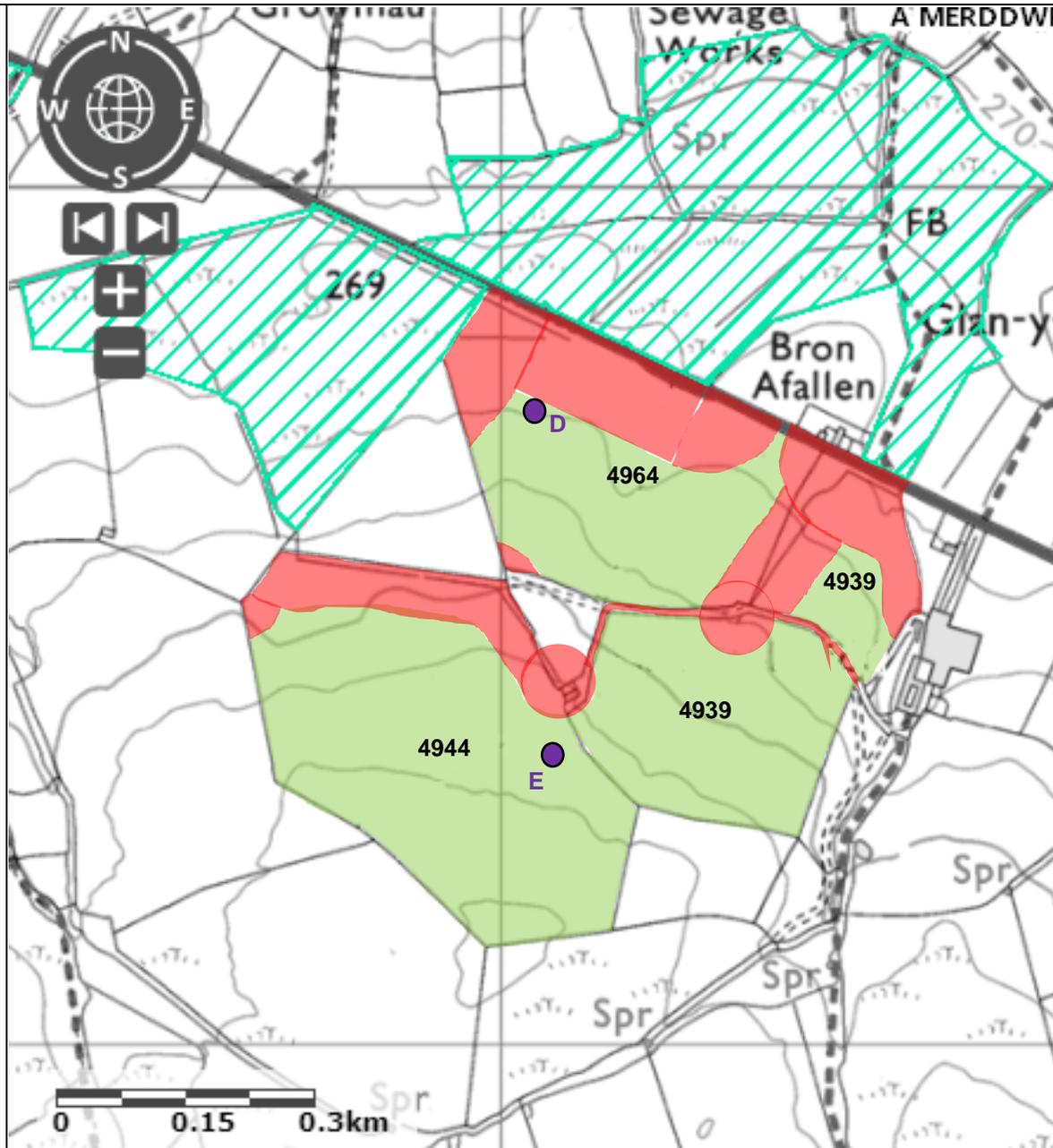
Dŵr Cymru / Welsh Water

### Key:

-  Spreading area
-  Non-spreading area
-  Corsydd Nug a Merddwr SSSI
-  Location tags

### Location tags:

- Stockpiles
- D. SH 93046 49739
  - E. SH 93074 49320



# Agricultural Benefit Statement

**For the application of beneficial wastes to fields at;  
Clust-y-Blaidd, Cerrigydrudion, Corwen, Conwy. LL21 0RU**

20<sup>th</sup> December 2018

## 1 Person with appropriate technical expertise and permit details

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

- MSc Geoenvironmental Engineering
- BSc (Hons) Physical Geography
- Grad MCIWM

Verified by; Dr. Becky Wheeler CSci, FQA FE/4686

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

<i>Farm address:</i>	Clust-y-Blaidd, Cerrigydrudion, Corwen, Conwy. LL21 0RU	
<i>Stockpile grid reference:</i>	Refer to Table 4	
<i>Area of the receiving land:</i>	43.7 ha	
<i>Quantity to be stored at any one time:</i>	Stackable: 3,000t	Non-Stackable: Spread on delivery
<i>Total maximum quantity to be spread:</i>	10,925t	
<i>Location map document reference:</i>	CyB Maps	

### 3 What is the waste to be spread

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

<b>Waste</b>	<b>EWC Code</b>	<b>Description</b>	<b>Waste Producer</b>	<b>Additional Information</b>
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 Bryn Cowlyd	Non-stackable ferric liquid sludge
3	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Cefni	Non-stackable alum liquid sludge
4	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Cwellyn	Non-stackable alum liquid sludge
5	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Dolbenmaen	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 cake
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 Rhiw Goch	Non-stackable ferric liquid sludge

### 4 Operational details

#### 4.1 Cropping details

Table 3. Cropping details

<i>Current crop including projected yield if known:</i>	Refer to Tables 6-15
<i>Is straw removed?</i>	Y <input type="checkbox"/> N <input type="checkbox"/> N/A <input checked="" type="checkbox"/>

<p><i>Following crop and any sensitive crops within rotation which you are amending the soil for in good time:</i></p>	<p>Refer to Tables 6-15</p>
<p><i>When do you intend to apply this waste; e.g. post harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:</i></p>	<p>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.</p> <p>Liquid sludges will be spread on delivery.</p> <p>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.</p>

## 4.2 Waste storage

Table 4. Waste storage

<p><i>How is the waste to be stored?</i></p> <p><i>e.g. mobile tank, field heap, spread on delivery</i></p>	<p>Stackable wastes: field stockpiles</p> <p>Non-stackable wastes: spread on delivery</p>
<p><i>Where is the waste to be stored prior to spreading?</i></p>	<p>Field stockpiles:</p> <p>A. SH 92860 52060</p> <p>B. SH 92941 51660</p> <p>C. SH 92793 51428</p> <p>D. SH 93046 49739</p> <p>E. SH 93074 49320</p>
<p><i>Why were these storage locations chosen?</i></p>	<p>The storage locations are accessible by delivering vehicle, near field entrances so the potential damage to fields by delivering vehicles is minimal.</p> <p>The storage locations are not within 10m of any ditch, watercourse, or footpath, not within a SPZ1, are at least 50m from any well spring or borehole, and 100m from SSSIs. They are also a safe distance from overhead powerlines.</p>

### 4.3 Waste application

Table 5. Waste application

<p><i>How is the waste to be spread and why is it to be spread that way?</i></p>	<p>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.</p> <p>Liquid sludges will be surface spread by tractor and tanker using a low-trajectory splash plate.</p>
<p><i>How do you plan to incorporate the waste following application?</i></p>	<p>There is no requirement for further incorporation of wastes on grass fields due to low ammonia content and minimal odour.</p>
<p><i>With liquid wastes is there any mole draining or sub-soiling planned?</i></p> <p><i>Are there land drains in the field?</i></p>	<p>No</p> <p>No</p>
<p><i>Other relevant operational information:</i></p>	<p>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.</p> <p>Only fields with soil pH 6 or above will receive alum-based sludge (DCWW Cefni, Cwellyn, Dolbenmaen, and Mynydd Llandegai).</p>

Table 6. DCWW Alwen

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190	3.8	2	53	49	**21	2-	140	158	0.5	2	0	1.3	5.6	194	<b>1,804</b>
5154	12.1	10.7	Grass	Grass	Mod	190	3.8	1	103	49	4.1	2-	140	158	0.5	2	0	1.3	5.3	194	<b>2,076</b>
4964	9.8	5.5	Grass	Grass	Mod	190	3.8	2	53	49	**21	2-	140	158	0.5	3	0	1.3	<b>6.3</b>	194	<b>1,067</b>
4944	13.4	11.0	Grass	Grass	Mod	190	3.8	3	20	49	**21	2+	120	158	0.5	3	0	1.3	5.8	194	<b>2,134</b>
4939	9.6	7.2	Grass	Grass	Mod	190	3.8	3	20	49	**21	2+	120	158	0.5	3	0	1.3	<b>6.1</b>	194	<b>1,397</b>
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>8,478</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 7. DCWW Bryn Cowlyd

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Spred Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190	13	2	53	49	**32	2-	140	158	1.3	2	0	3.4	5.6	250	<b>2,325</b>
5154	12.1	10.7	Grass	Grass	Mod	190	13	1	103	49	6.5	2-	140	158	1.3	2	0	3.4	5.3	250	<b>2,675</b>
4964	9.8	5.5	Grass	Grass	Mod	190	13	2	53	49	**32	2-	140	158	1.3	3	0	3.4	<b>6.3</b>	250	<b>1,375</b>
4944	13.4	11.0	Grass	Grass	Mod	190	13	3	20	49	**32	2+	120	158	1.3	3	0	3.4	5.8	250	<b>2,750</b>
4939	9.6	7.2	Grass	Grass	Mod	190	13	3	20	49	**32	2+	120	158	1.3	3	0	3.4	<b>6.1</b>	250	<b>1,800</b>
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>10,925</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 8. DCWW Cefni

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190		2	53	49		2-	140	158		2	0		5.6		
5154	12.1	10.7	Grass	Grass	Mod	190		1	103	49		2-	140	158		2	0		5.3		
4964	9.8	5.5	Grass	Grass	Mod	190	6.0	2	53	49	**53	2-	140	158	1.1	3	0	3.1	6.3	250	1,375
4944	13.4	11.0	Grass	Grass	Mod	190		3	20	49		2+	120	158		3	0		5.8		
4939	9.6	7.2	Grass	Grass	Mod	190	5.6	3	20	49	**49	2+	120	158	1.0	3	0	2.9	6.1	232	1,670
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>3,045</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 9. DCWW Cwellyn

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190		2	53	49		2-	140	158		2	0		5.6		
5154	12.1	10.7	Grass	Grass	Mod	190		1	103	49		2-	140	158		2	0		5.3		
4964	9.8	5.5	Grass	Grass	Mod	190	4.9	2	53	49	**16	2-	140	158	0.3	3	0	1.6	6.3	250	1,375
4944	13.4	11.0	Grass	Grass	Mod	190		3	20	49		2+	120	158		3	0		5.8		
4939	9.6	7.2	Grass	Grass	Mod	190	4.9	3	20	49	**16	2+	120	158	0.3	3	0	1.6	6.1	250	1,800
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>3,175</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 10. DCWW Dolbenmaen

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190		2	53	49		2-	140	158		2	0		5.6		
5154	12.1	10.7	Grass	Grass	Mod	190		1	103	49		2-	140	158		2	0		5.3		
4964	9.8	5.5	Grass	Grass	Mod	190	4.9	2	53	49	**13	2-	140	158	0.1	3	0	0.2	6.3	250	1,375
4944	13.4	11.0	Grass	Grass	Mod	190		3	20	49		2+	120	158		3	0		5.8		
4939	9.6	7.2	Grass	Grass	Mod	190	4.9	3	20	49	**13	2+	120	158	0.1	3	0	0.2	6.1	250	1,800
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>3,175</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 11. DCWW Garreglwyd

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190	4.9	2	53	49	**2.1	2-	140	158	0.1	2	0	1.2	5.6	250	<b>2,325</b>
5154	12.1	10.7	Grass	Grass	Mod	190	4.9	1	103	49	0.4	2-	140	158	0.1	2	0	1.2	5.3	250	<b>2,675</b>
4964	9.8	5.5	Grass	Grass	Mod	190	4.9	2	53	49	**2.1	2-	140	158	0.1	3	0	1.2	<b>6.3</b>	250	<b>1,375</b>
4944	13.4	11.0	Grass	Grass	Mod	190	4.9	3	20	49	**2.1	2+	120	158	0.1	3	0	1.2	5.8	250	<b>2,750</b>
4939	9.6	7.2	Grass	Grass	Mod	190	4.9	3	20	49	**2.1	2+	120	158	0.1	3	0	1.2	<b>6.1</b>	250	<b>1,800</b>
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>10,925</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 12. DCWW Glascoed

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190	6.0	2	53	49	**53	2-	140	158	0.7	2	0	4.4	5.6	156	<b>1,451</b>
5154	12.1	10.7	Grass	Grass	Mod	190	6.5	1	103	49	11	2-	140	158	0.7	2	0	4.7	5.3	168	<b>1,798</b>
4964	9.8	5.5	Grass	Grass	Mod	190	6.0	2	53	49	**53	2-	140	158	0.7	3	0	4.4	<b>6.3</b>	156	<b>858</b>
4944	13.4	11.0	Grass	Grass	Mod	190	5.6	3	20	49	**49	2+	120	158	0.6	3	0	4.4	5.8	145	<b>1,595</b>
4939	9.6	7.2	Grass	Grass	Mod	190	5.6	3	20	49	**49	2+	120	158	0.6	3	0	4.4	<b>6.1</b>	145	<b>1,044</b>
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>6,745</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 13. DCWW Llyn Conwy

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190	1.8	2	53	49	**28	2-	140	158	0.5	2	0	0.8	5.6	250	<b>2,325</b>
5154	12.1	10.7	Grass	Grass	Mod	190	1.8	1	103	49	5.5	2-	140	158	0.5	2	0	0.8	5.3	250	<b>2,675</b>
4964	9.8	5.5	Grass	Grass	Mod	190	1.8	2	53	49	**28	2-	140	158	0.5	3	0	0.8	<b>6.3</b>	250	<b>1,375</b>
4944	13.4	11.0	Grass	Grass	Mod	190	1.8	3	20	49	**28	2+	120	158	0.5	3	0	0.8	5.8	250	<b>2,750</b>
4939	9.6	7.2	Grass	Grass	Mod	190	1.8	3	20	49	**28	2+	120	158	0.5	3	0	0.8	<b>6.1</b>	250	<b>1,800</b>
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>10,925</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 14. DCWW Mynydd Llandegai

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190		2	53	49		2-	140	158		2	0		5.6		
5154	12.1	10.7	Grass	Grass	Mod	190		1	103	49		2-	140	158		2	0		5.3		
4964	9.8	5.5	Grass	Grass	Mod	190	4.9	2	53	49	**10	2-	140	158	0.1	3	0	0.4	6.3	250	1,375
4944	13.4	11.0	Grass	Grass	Mod	190		3	20	49		2+	120	158		3	0		5.8		
4939	9.6	7.2	Grass	Grass	Mod	190	4.9	3	20	49	**10	2+	120	158	0.1	3	0	0.4	6.1	250	1,800
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>3,175</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

Table 15. DCWW Rhiw Goch

**Nutrient Requirements for land at Clust-y-Blaidd**

Field no	Total Area	Sprd Area	Current Crop	Next Crop	N SNS	N Req	*N in Wst	P Ind	P <sub>2</sub> O <sub>5</sub> Req	Crop Use	*P <sub>2</sub> O <sub>5</sub> in Wst	K Ind	K <sub>2</sub> O Req	Crop Use	*K <sub>2</sub> O in Wst	Mg Ind	MgO Req	*MgO in Wst	pH	Rate T/Ha	Totals Tonnes
5194	10.0	9.3	Grass	Grass	Mod	190	4.9	2	53	49	**3.2	2-	140	158	0.1	2	0	0.2	5.6	250	<b>2,325</b>
5154	12.1	10.7	Grass	Grass	Mod	190	4.9	1	103	49	0.6	2-	140	158	0.1	2	0	0.2	5.3	250	<b>2,675</b>
4964	9.8	5.5	Grass	Grass	Mod	190	4.9	2	53	49	**3.2	2-	140	158	0.1	3	0	0.2	<b>6.3</b>	250	<b>1,375</b>
4944	13.4	11.0	Grass	Grass	Mod	190	4.9	3	20	49	**3.2	2+	120	158	0.1	3	0	0.2	5.8	250	<b>2,750</b>
4939	9.6	7.2	Grass	Grass	Mod	190	4.9	3	20	49	**3.2	2+	120	158	0.1	3	0	0.2	<b>6.1</b>	250	<b>1,800</b>
<b>Ha</b>	<b>54.9</b>	<b>43.7</b>																			<b>10,925</b>

Grass = 1 cut silage + aftermath grazing

N, P, and K requirements based on values for 1 cut of grass for silage (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 P<sub>2</sub>O<sub>5</sub> and 6.0kg/t K<sub>2</sub>O 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

## 5 Compliance with NVZ regulations

Table 16. Compliance with NVZ regulations

<p><i>Does the site fall within a designated NVZ?</i></p>	<p>Y <input type="checkbox"/>    N <input checked="" type="checkbox"/> (Please skip to section 6)</p>																														
<p><i>Do closed periods apply for the wastes to be applied?</i></p>	<p>Y <input type="checkbox"/>    N <input type="checkbox"/></p> <p>Applicable to:</p> <p>If yes, please indicate the appropriate period:</p> <table border="1" data-bbox="686 678 1369 918"> <thead> <tr> <th>Start Date</th> <th>End Date</th> <th>Land Use</th> <th>Soil Type</th> <th></th> </tr> </thead> <tbody> <tr> <td>1st Aug</td> <td>31st Dec</td> <td>Tillage Land</td> <td>Shallow/Sandy</td> <td><input type="checkbox"/></td> </tr> <tr> <td>1st Sept</td> <td>31st Dec</td> <td>Grassland</td> <td>Shallow/Sandy</td> <td><input type="checkbox"/></td> </tr> <tr> <td>16th Sept</td> <td>31st Dec</td> <td>Tillage Land*</td> <td>Shallow/Sandy</td> <td><input type="checkbox"/></td> </tr> <tr> <td>1st Oct</td> <td>31st Jan</td> <td>Tillage Land</td> <td>All Other Soils</td> <td><input type="checkbox"/></td> </tr> <tr> <td>15th Oct</td> <td>31st Jan</td> <td>Grassland</td> <td>All Other Soils</td> <td><input type="checkbox"/></td> </tr> </tbody> </table> <p>*For Tillage Land with crops sown on or before 15th September</p> <p>If no, applications will be carried out as per CoGAP <i>i.e.</i> when ground conditions are suitable and when no heavy rain is forecast.</p>	Start Date	End Date	Land Use	Soil Type		1st Aug	31st Dec	Tillage Land	Shallow/Sandy	<input type="checkbox"/>	1st Sept	31st Dec	Grassland	Shallow/Sandy	<input type="checkbox"/>	16th Sept	31st Dec	Tillage Land*	Shallow/Sandy	<input type="checkbox"/>	1st Oct	31st Jan	Tillage Land	All Other Soils	<input type="checkbox"/>	15th Oct	31st Jan	Grassland	All Other Soils	<input type="checkbox"/>
Start Date	End Date	Land Use	Soil Type																												
1st Aug	31st Dec	Tillage Land	Shallow/Sandy	<input type="checkbox"/>																											
1st Sept	31st Dec	Grassland	Shallow/Sandy	<input type="checkbox"/>																											
16th Sept	31st Dec	Tillage Land*	Shallow/Sandy	<input type="checkbox"/>																											
1st Oct	31st Jan	Tillage Land	All Other Soils	<input type="checkbox"/>																											
15th Oct	31st Jan	Grassland	All Other Soils	<input type="checkbox"/>																											
<p><i>Will application rates comply with crop requirement and field/whole farm limit?</i></p>																															
<p><i>Previous applications:</i></p>																															

## 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.	<input type="checkbox"/>
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.	<input type="checkbox"/>
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.	<input checked="" type="checkbox"/>
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.	<input type="checkbox"/>
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.	<input type="checkbox"/>
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.	<input type="checkbox"/>
Peat soils	Soils that contain more than 20% organic matter derived from sedge or similar peat material.	<input type="checkbox"/>

The soil analyses (**Soil Analysis**) shows the soils to have sufficient background concentrations of Mg (*i.e.* ADAS Index 2-3). 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
- Liquid sludges (except Cefni): max rate of 250t/ha
- Cefni: max rate of 250t/ha or phosphate on fields with P index  $\geq 2$
- Glascoed: total N or phosphate on fields with P index  $\geq 2$

### 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, for example, the dry solids in Alwen cake consist of 48.1% 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 6.8.

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  $\geq 5.3$  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

Please refer to site specific risk assessment (**CyB SSRA**). Locations of sensitive receptors are shown in **CyB 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 in **CyB SSRA**. Generic measures (in addition to permit requirements and following the EMS) to reduce potential negative impacts of the proposed spreading operation will be as follows;

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

## 10 Contingency planning

Replacement spreading machinery will be available to prevent waste being retained in faulty machinery.

Hire vehicles will be used if required. All machinery will be fully serviced.

There will be a sufficient number of trained staff available to ensure that the operation continues throughout operational hours (*i.e.* there will be sufficient cover for illness, holiday *etc.*).

In adverse weather, storage is available until ground/weather conditions become favourable for land application.

In circumstances where the wastes cannot be stored or spread beyond normal capacities, wastes will be diverted to a local alternative deployment or DCWW sewage treatment works.



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 798055      **Location -** ALWEN CENTRIFUGE CAKE  
**Date Sampled -** 02-May-18      **Time Taken -** 13:00  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168867  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

## Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT 87	
238	Magnesium	MG/KG	155	
288	ALUMINIUM (DRY WT)	MG/KG	2660	
357	ARSENIC (DRY WT)	MG/KG	8.2	
4620	pH	PH UNITS	4.7	
7774	WTW MERCURY TOTAL	MG/KG	LT 0.38	
8241	LOSS ON IGNITION	%	48.1	
8939	TOT NIT AS N (SLDG)	MG/KG	9610	
8941	TOT PHOS AS P (SLDG)	MG/KG	346	
9233	Ammoniacal nitrogen	MG/KG	LT 145	
9234	Sulphur	MG/KG	6520	
9271	Cadmium	MG/KG	LT 0.11	
9272	CHROMIUM TOTAL	MG/KG	13.2	
9273	Copper	MG/KG	LT 7.8	
9275	Nickel	MG/KG	6	
9276	LEAD TOTAL	MG/KG	8.4	
9277	ZINC TOTAL	MG/KG	68.3	
9278	IRON TOTAL	MG/KG	366000	
9281	% Dry solids	%	13.4	
9282	% Minerals	%	51.9	

# DŴR CYMRU - WELSH WATER

## Alwen

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)            194                            Lab ref no. S 4168867  
Application rate (t/acre)        78  
pH                                        4.7  
Dry solids (%)                        13.4  
Organic matter content (%)      48.1

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	0.961	%	1.29	249.8	0.019	3.8
Ammonium-N	145	mg/kg	0.02	3.8		
Phosphorus (P)	346	mg/kg	0.05			
Phosphate (P2O5)			0.11	20.6	0.021	4.1
Potassium (K)	87	mg/kg	0.01			
Potash (K2O)			0.01	2.7	0.003	0.5
Magnesium (Mg)	155	mg/kg	0.02			
Magnesium (MgO)			0.03	6.7	0.007	1.3
Sulphur (S)	6520	mg/kg	0.87			
Sulphur (SO <sub>3</sub> )			2.18	423.7	0.218	42.4

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	68.30	mg/kg	0.01	1.78	15.00
Copper	7.80	mg/kg	0.00	0.20	7.50
Nickel	6.00	mg/kg	0.00	0.16	3.00
Lead	8.40	mg/kg	0.00	0.22	15.00
Cadmium	0.11	mg/kg	0.00	0.00	0.15
Chromium	13.20	mg/kg	0.00	0.34	15.00
Arsenic	8.20	mg/kg	0.00	0.21	0.70
Mercury	0.38	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	366000	mg/kg	49.04	9515	
Aluminium	2660	mg/kg	0.36	69	

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



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V724

Please quote above code for all enquiries

BRYN COLWYD WTW  
 TREFRIW  
 CONWY  
 LL32 8JG  
 SLUDGE

## SLUDGE

Sample Reference :

BRYN COWLYD WTW

Sample Matrix : SLUDGE

Laboratory References	
Report Number	17260
Sample Number	69975

Date Received	22-JUN-2018
Date Reported	27-JUN-2018

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

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

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Oven Dry Solids	3.19	%
Conductivity 1:6	77.3	uS/cm
Total Nitrogen	<0.04	% w/w
Ammonium Nitrogen	<50	mg/kg
Total Phosphorus (P)	56.8	mg/kg
Total Potassium (K)	21.4	mg/kg
Total Magnesium (Mg)	42.8	mg/kg
Total Copper (Cu)	0.77	mg/kg
Total Zinc (Zn)	5.57	mg/kg
Total Sulphur (S)	74.7	mg/kg

Released by *Darren Whitbread*

Date *27/06/18*

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



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Sample Matrix : SLUDGE

Laboratory References	
Report Number	17260
Sample Number	69975

Date Received	22-JUN-2018
Date Reported	27-JUN-2018

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

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

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Calcium (Ca)	241	mg/kg
Total Iron (Fe)	9442	mg/kg
Total Lead (Pb)	0.96	mg/kg
Total Cadmium (Cd)	0.02	mg/kg
Total Mercury (Hg)	<0.05	mg/kg
Total Nickel (Ni)	0.63	mg/kg
Total Chromium (Cr)	0.72	mg/kg
Total Sodium (Na)	<10	mg/kg
pH 1:6 [Fresh]	6.00	
Total Aluminium	167	mg/kg

Released by *Darren Whitbread*

Date *27/06/18*

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



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Please quote above code for all enquiries

BRYN COLWYD WTW  
TREFRIW  
CONWY  
LL32 8JG  
  
SLUDGE

## SLUDGE

Sample Reference :

BRYN COWLYD WTW

Sample Matrix : SLUDGE

### Laboratory References

Report Number	17260
Sample Number	69975

Date Received	22-JUN-2018
Date Reported	27-JUN-2018

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

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

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Arsenic (As)	0.55	mg/kg

Released by *Darren Whitbread*

Date *27/06/18*

**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:** www.nrm.uk.com

# DŴR CYMRU - WELSH WATER

## Bryn Cowlyd

### Analysis of Water Treatment Works Sludge

Date: 27/06/18

Application rate (t/ha)	250	Lab report no. 17260
Application rate (t/acre)	100	Lab sample no. 69975
pH	6.0	
Dry solids (%)	3.19	
Organic matter content (%)	-	

### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	0.04	%	0.40	100.0	0.05	12.5
Ammonium-N	50	mg/kg	0.05	12.5		
Phosphorus (P)	56.8	mg/kg	0.06			
Phosphate (P2O5)			0.13	32.4	0.03	6.5
Potassium (K)	21.4	mg/kg	0.02			
Potash (K2O)			0.03	6.4	0.01	1.3
Magnesium (Mg)	42.8	mg/kg	0.04			
Magnesium (MgO)			0.07	17.1	0.01	3.4
Sulphur (S)	74.7	mg/kg	0.07			
Sulphur (SO <sub>3</sub> )			0.19	46.7	0.02	4.7

### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(g/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	5.57	mg/kg	5.6	1.39	15.00
Copper	0.77	mg/kg	0.8	0.19	7.50
Nickel	0.63	mg/kg	0.6	0.16	3.00
Lead	0.96	mg/kg	1.0	0.24	15.00
Cadmium	0.02	mg/kg	0.0	0.01	0.15
Chromium	0.72	mg/kg	0.7	0.18	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Arsenic	0.55	mg/kg	0.6	0.14	0.70
Other Elements					
Aluminium	167	mg/kg	167	42	
Iron	9442	mg/kg	9442	2361	

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

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



Dŵr Cymru  
Welsh Water

## Sample Analysis Report

**Sampling Point No -** 622914      **Location -** CEFNI WTW SLUDGE  
**Date Sampled -** 11-May-18      **Time Taken -** 10:30  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168871  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

### Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	391	
238	Magnesium	MG/KG	813	
288	ALUMINIUM (DRY WT)	MG/KG	110900	
357	ARSENIC (DRY WT)	MG/KG	9.1	
4620	pH	PH UNITS	6.8	
7774	WTW MERCURY TOTAL	MG/KG	LT 0.44	
8241	LOSS ON IGNITION	%	47.9	
8939	TOT NIT AS N (SLDG)	MG/KG	16300	
8941	TOT PHOS AS P (SLDG)	MG/KG	1990	
9233	Ammoniacal nitrogen	MG/KG	522	
9234	Sulphur	MG/KG	11300	
9271	Cadmium	MG/KG	LT 0.11	
9272	CHROMIUM TOTAL	MG/KG	6.1	
9273	Copper	MG/KG	30.9	
9275	Nickel	MG/KG	21.6	
9276	LEAD TOTAL	MG/KG	LT 6.2	
9277	ZINC TOTAL	MG/KG	39.8	
9278	IRON TOTAL	MG/KG	8340	
9281	% Dry solids	%	4.62	
9282	% Minerals	%	52.1	

# DŴR CYMRU - WELSH WATER

## Cefni

### Analysis of Water Treatment Works Sludge

Date: 11/05/18

Application rate (t/ha)           232  
Application rate (t/acre)       93  
pH                                   6.8  
Dry solids (%)                   4.6  
Organic matter content (%)   47.9

Lab ref no. S 4168871

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	1.63	%	0.75	174.7	0.024	5.6
Ammonium-N	522	mg/kg	0.02	5.6		
Phosphorus (P)	1990	mg/kg	0.09			
Phosphate (P2O5)			0.21	48.8	0.042	9.8
Potassium (K)	391	mg/kg	0.02			
Potash (K2O)			0.02	5.1	0.004	1.0
Magnesium (Mg)	813	mg/kg	0.04			
Magnesium (MgO)			0.06	14.5	0.012	2.9
Sulphur (S)	11300	mg/kg	0.52			
Sulphur (SO <sub>3</sub> )			1.31	302.8	0.131	30.3

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	39.80	mg/kg	0.00	0.43	15.00
Copper	30.90	mg/kg	0.00	0.33	7.50
Nickel	21.60	mg/kg	0.00	0.23	3.00
Lead	6.20	mg/kg	0.00	0.07	15.00
Cadmium	0.11	mg/kg	0.00	0.00	0.15
Chromium	6.10	mg/kg	0.00	0.07	15.00
Arsenic	9.10	mg/kg	0.00	0.10	0.70
Mercury	0.44	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	8340	mg/kg	0.39	89	
Aluminium	110900	mg/kg	5.12	1189	

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

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

# DŴR CYMRU - WELSH WATER

## Cefni

### Analysis of Water Treatment Works Sludge

Date: 11/05/18

Application rate (t/ha)	250	Lab ref no. S 4168871
Application rate (t/acre)	100	
pH	6.8	
Dry solids (%)	4.6	
Organic matter content (%)	47.9	

### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	1.63	%	0.75	188.3	0.024	6.0
Ammonium-N	522	mg/kg	0.02	6.0		
Phosphorus (P)	1990	mg/kg	0.09			
Phosphate (P2O5)			0.21	52.6	0.042	10.5
Potassium (K)	391	mg/kg	0.02			
Potash (K2O)			0.02	5.5	0.004	1.1
Magnesium (Mg)	813	mg/kg	0.04			
Magnesium (MgO)			0.06	15.6	0.012	3.1
Sulphur (S)	11300	mg/kg	0.52			
Sulphur (SO <sub>3</sub> )			1.31	326.3	0.131	32.6

### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	39.80	mg/kg	0.00	0.46	15.00
Copper	30.90	mg/kg	0.00	0.36	7.50
Nickel	21.60	mg/kg	0.00	0.25	3.00
Lead	6.20	mg/kg	0.00	0.07	15.00
Cadmium	0.11	mg/kg	0.00	0.00	0.15
Chromium	6.10	mg/kg	0.00	0.07	15.00
Arsenic	9.10	mg/kg	0.00	0.11	0.70
Mercury	0.44	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	8340	mg/kg	0.39	96	
Aluminium	110900	mg/kg	5.12	1281	

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

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



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 698007      **Location -** CWELLYN WTW SLUDGE  
**Date Sampled -** 02-May-18      **Time Taken -** 07:30  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168861  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

## Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	128	
238	Magnesium	MG/KG	515	
288	ALUMINIUM (DRY WT)	MG/KG	308200	
357	ARSENIC (DRY WT)	MG/KG	27.8	
4620	pH	PH UNITS	6.8	
7774	WTW MERCURY TOTAL	MG/KG	LT 0.54	
8241	LOSS ON IGNITION	%	45.4	
8939	TOT NIT AS N (SLDG)	MG/KG	11700	
8941	TOT PHOS AS P (SLDG)	MG/KG	736	
9233	Ammoniacal nitrogen	MG/KG	LT 526	
9234	Sulphur	MG/KG	8720	
9271	Cadmium	MG/KG	0.38	
9272	CHROMIUM TOTAL	MG/KG	LT 4.3	
9273	Copper	MG/KG	65.5	
9275	Nickel	MG/KG	19.6	
9276	LEAD TOTAL	MG/KG	LT 6.2	
9277	ZINC TOTAL	MG/KG	192	
9278	IRON TOTAL	MG/KG	7870	
9281	% Dry solids	%	3.73	
9282	% Minerals	%	54.6	

# DŴR CYMRU - WELSH WATER

## Cwellyn

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)            250                            Lab ref no. S 4168861  
Application rate (t/acre)        100  
pH                                        6.8  
Dry solids (%)                        3.7  
Organic matter content (%)      45.4

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	1.17	%	0.44	109.1	0.020	4.9
Ammonium-N	526	mg/kg	0.02	4.9		
Phosphorus (P)	736	mg/kg	0.03			
Phosphate (P2O5)			0.06	15.7	0.013	3.1
Potassium (K)	128	mg/kg	0.00			
Potash (K2O)			0.01	1.4	0.001	0.3
Magnesium (Mg)	515	mg/kg	0.02			
Magnesium (MgO)			0.03	8.0	0.006	1.6
Sulphur (S)	8720	mg/kg	0.33			
Sulphur (SO <sub>3</sub> )			0.81	203.3	0.081	20.3

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	192.00	mg/kg	0.01	1.79	15.00
Copper	65.50	mg/kg	0.00	0.61	7.50
Nickel	19.60	mg/kg	0.00	0.18	3.00
Lead	6.20	mg/kg	0.00	0.06	15.00
Cadmium	0.38	mg/kg	0.00	0.00	0.15
Chromium	4.30	mg/kg	0.00	0.04	15.00
Arsenic	27.80	mg/kg	0.00	0.26	0.70
Mercury	0.54	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	7870	mg/kg	0.29	73	
Aluminium	308200	mg/kg	11.50	2874	

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



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 359181      **Location -** DOLBENMAEN WTW SLUDGE  
**Date Sampled -** 02-May-18      **Time Taken -** 08:00  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168857  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

## Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT 87	
238	Magnesium	MG/KG	113	
288	ALUMINIUM (DRY WT)	MG/KG	309600	
357	ARSENIC (DRY WT)	MG/KG	LT 16.7	
4620	pH	PH UNITS	6.8	
7774	WTW MERCURY TOTAL	MG/KG	LT 1.12	
8241	LOSS ON IGNITION	%	35.2	
8939	TOT NIT AS N (SLDG)	MG/KG	5870	
8941	TOT PHOS AS P (SLDG)	MG/KG	1260	
9233	Ammoniacal nitrogen	MG/KG	LT 1090	
9234	Sulphur	MG/KG	18600	
9271	Cadmium	MG/KG	0.84	
9272	CHROMIUM TOTAL	MG/KG	LT 4.3	
9273	Copper	MG/KG	16.6	
9275	Nickel	MG/KG	LT 5.1	
9276	LEAD TOTAL	MG/KG	LT 6.2	
9277	ZINC TOTAL	MG/KG	260	
9278	IRON TOTAL	MG/KG	5240	
9281	% Dry solids	%	1.8	
9282	% Minerals	%	64.8	

# DŴR CYMRU - WELSH WATER

## Dolbenmaen

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)            250                            Lab ref no. S 4168857  
Application rate (t/acre)        100  
pH                                        6.8  
Dry solids (%)                        1.8  
Organic matter content (%)      35.2

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	0.59	%	0.11	26.6	0.020	4.9
Ammonium-N	1090	mg/kg	0.02	4.9		
Phosphorus (P)	1260	mg/kg	0.02			
Phosphate (P2O5)			0.05	13.0	0.010	2.6
Potassium (K)	87	mg/kg	0.00			
Potash (K2O)			0.00	0.5	0.000	0.1
Magnesium (Mg)	113	mg/kg	0.00			
Magnesium (MgO)			0.00	0.8	0.001	0.2
Sulphur (S)	18600	mg/kg	0.33			
Sulphur (SO <sub>3</sub> )			0.84	209.3	0.084	20.9

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	260.00	mg/kg	0.00	1.17	15.00
Copper	16.60	mg/kg	0.00	0.07	7.50
Nickel	5.10	mg/kg	0.00	0.02	3.00
Lead	6.20	mg/kg	0.00	0.03	15.00
Cadmium	0.84	mg/kg	0.00	0.00	0.15
Chromium	4.30	mg/kg	0.00	0.02	15.00
Arsenic	16.70	mg/kg	0.00	0.08	0.70
Mercury	1.12	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	5240	mg/kg	0.09	24	
Aluminium	309600	mg/kg	5.57	1393	

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



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 698171      **Location -** GARREGLWYD WTW SLUDGE  
**Date Sampled -** 02-May-18      **Time Taken -** 11:00  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168872  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

## Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT 87	
238	Magnesium	MG/KG	812	
288	ALUMINIUM (DRY WT)	MG/KG	8550	
357	ARSENIC (DRY WT)	MG/KG	LT 17	
4620	pH	PH UNITS	5.7	
7774	WTW MERCURY TOTAL	MG/KG	LT 1.14	
8241	LOSS ON IGNITION	%	42.4	
8939	TOT NIT AS N (SLDG)	MG/KG	9470	
8941	TOT PHOS AS P (SLDG)	MG/KG	LT 210	
9233	Ammoniacal nitrogen	MG/KG	LT 1120	
9234	Sulphur	MG/KG	4860	
9271	Cadmium	MG/KG	1.91	
9272	CHROMIUM TOTAL	MG/KG	LT 4.3	
9273	Copper	MG/KG	65.2	
9275	Nickel	MG/KG	23.1	
9276	LEAD TOTAL	MG/KG	46.5	
9277	ZINC TOTAL	MG/KG	564	
9278	IRON TOTAL	MG/KG	612000	
9281	% Dry solids	%	1.76	
9282	% Minerals	%	57.6	

# DŴR CYMRU - WELSH WATER

## Garreglwyd

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)            250                            Lab ref no. S 4168872  
Application rate (t/acre)        100  
pH                                        5.7  
Dry solids (%)                        1.8  
Organic matter content (%)      42.4

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	0.95	%	0.17	41.8	0.020	4.9
Ammonium-N	1120	mg/kg	0.02	4.9		
Phosphorus (P)	210	mg/kg	0.00			
Phosphate (P2O5)			0.01	2.1	0.002	0.4
Potassium (K)	87	mg/kg	0.00			
Potash (K2O)			0.00	0.5	0.000	0.1
Magnesium (Mg)	812	mg/kg	0.01			
Magnesium (MgO)			0.02	5.9	0.005	1.2
Sulphur (S)	4860	mg/kg	0.09			
Sulphur (SO <sub>3</sub> )			0.21	53.5	0.021	5.3

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	564.00	mg/kg	0.01	2.48	15.00
Copper	65.20	mg/kg	0.00	0.29	7.50
Nickel	23.10	mg/kg	0.00	0.10	3.00
Lead	46.50	mg/kg	0.00	0.20	15.00
Cadmium	1.91	mg/kg	0.00	0.01	0.15
Chromium	4.30	mg/kg	0.00	0.02	15.00
Arsenic	17.00	mg/kg	0.00	0.07	0.70
Mercury	1.14	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	612000	mg/kg	10.77	2693	
Aluminium	8550	mg/kg	0.15	38	

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



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 798039      **Location -** GLASCOED CENTRIFUGE SLUDGE  
**Date Sampled -** 02-May-18      **Time Taken -** 00:00  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168866  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

## Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	129	
238	Magnesium	MG/KG	593	
288	ALUMINIUM (DRY WT)	MG/KG	1940	
357	ARSENIC (DRY WT)	MG/KG	2.2	
4620	pH	PH UNITS	6.2	
7774	WTW MERCURY TOTAL	MG/KG	LT 0.15	
8241	LOSS ON IGNITION	%	32.2	
8939	TOT NIT AS N (SLDG)	MG/KG	10400	
8941	TOT PHOS AS P (SLDG)	MG/KG	1030	
9233	Ammoniacal nitrogen	MG/KG	270	
9234	Sulphur	MG/KG	2790	
9271	Cadmium	MG/KG	0.14	
9272	CHROMIUM TOTAL	MG/KG	14.6	
9273	Copper	MG/KG	21.6	
9275	Nickel	MG/KG	20.6	
9276	LEAD TOTAL	MG/KG	14.4	
9277	ZINC TOTAL	MG/KG	116	
9278	IRON TOTAL	MG/KG	413000	
9281	% Dry solids	%	14.3	
9282	% Minerals	%	67.8	

# DŴR CYMRU - WELSH WATER

## Glascoed

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)	145	Lab ref no. S 4168866
Application rate (t/acre)	58	
pH	6.2	
Dry solids (%)	14.3	
Organic matter content (%)	32.2	

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	1.04	%	1.49	215.6	0.039	5.6
Ammonium-N	270	mg/kg	0.04	5.6		
Phosphorus (P)	1030	mg/kg	0.15			
Phosphate (P2O5)			0.34	48.9	0.067	9.8
Potassium (K)	129	mg/kg	0.02			
Potash (K2O)			0.02	3.2	0.004	0.6
Magnesium (Mg)	593	mg/kg	0.08			
Magnesium (MgO)			0.14	20.4	0.028	4.1
Sulphur (S)	2790	mg/kg	0.40			
Sulphur (SO <sub>3</sub> )			1.00	144.6	0.100	14.5

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	116.00	mg/kg	0.02	2.41	15.00
Copper	21.60	mg/kg	0.00	0.45	7.50
Nickel	20.60	mg/kg	0.00	0.43	3.00
Lead	14.40	mg/kg	0.00	0.30	15.00
Cadmium	0.14	mg/kg	0.00	0.00	0.15
Chromium	14.60	mg/kg	0.00	0.30	15.00
Arsenic	2.20	mg/kg	0.00	0.05	0.70
Mercury	0.15	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	413000	mg/kg	59.06	8564	
Aluminium	1940	mg/kg	0.28	40	

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

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

# DŴR CYMRU - WELSH WATER

## Glascoed

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)	156	Lab ref no. S 4168866
Application rate (t/acre)	62	
pH	6.2	
Dry solids (%)	14.3	
Organic matter content (%)	32.2	

### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	1.04	%	1.49	232.0	0.039	6.0
Ammonium-N	270	mg/kg	0.04	6.0		
Phosphorus (P)	1030	mg/kg	0.15			
Phosphate (P2O5)			0.34	52.6	0.067	10.5
Potassium (K)	129	mg/kg	0.02			
Potash (K2O)			0.02	3.5	0.004	0.7
Magnesium (Mg)	593	mg/kg	0.08			
Magnesium (MgO)			0.14	22.0	0.028	4.4
Sulphur (S)	2790	mg/kg	0.40			
Sulphur (SO <sub>3</sub> )			1.00	155.6	0.100	15.6

### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	116.00	mg/kg	0.02	2.59	15.00
Copper	21.60	mg/kg	0.00	0.48	7.50
Nickel	20.60	mg/kg	0.00	0.46	3.00
Lead	14.40	mg/kg	0.00	0.32	15.00
Cadmium	0.14	mg/kg	0.00	0.00	0.15
Chromium	14.60	mg/kg	0.00	0.33	15.00
Arsenic	2.20	mg/kg	0.00	0.05	0.70
Mercury	0.15	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	413000	mg/kg	59.06	9213	
Aluminium	1940	mg/kg	0.28	43	

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

# DŴR CYMRU - WELSH WATER

## Glascoed

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)	168	Lab ref no. S 4168866
Application rate (t/acre)	67	
pH	6.2	
Dry solids (%)	14.3	
Organic matter content (%)	32.2	

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	1.04	%	1.49	249.8	0.039	6.5
Ammonium-N	270	mg/kg	0.04	6.5		
Phosphorus (P)	1030	mg/kg	0.15			
Phosphate (P2O5)			0.34	56.7	0.067	11.3
Potassium (K)	129	mg/kg	0.02			
Potash (K2O)			0.02	3.7	0.004	0.7
Magnesium (Mg)	593	mg/kg	0.08			
Magnesium (MgO)			0.14	23.6	0.028	4.7
Sulphur (S)	2790	mg/kg	0.40			
Sulphur (SO <sub>3</sub> )			1.00	167.6	0.100	16.8

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	116.00	mg/kg	0.02	2.79	15.00
Copper	21.60	mg/kg	0.00	0.52	7.50
Nickel	20.60	mg/kg	0.00	0.49	3.00
Lead	14.40	mg/kg	0.00	0.35	15.00
Cadmium	0.14	mg/kg	0.00	0.00	0.15
Chromium	14.60	mg/kg	0.00	0.35	15.00
Arsenic	2.20	mg/kg	0.00	0.05	0.70
Mercury	0.15	mg/kg	0.00	0.00	0.10
Other Elements					
Iron	413000	mg/kg	59.06	9922	
Aluminium	1940	mg/kg	0.28	47	

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



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 698086      **Location -** LLYN CONWY SLUDGE  
**Date Sampled -** 30-Jul-18      **Time Taken -** 14:05  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 6075436  
**Sampler -** EXTA      **No Results -** 20  
**Type -**

## Sample Results

Code	Determinand Name	Units	Result	Limit
238	Magnesium	MG/KG	294	
288	ALUMINIUM (DRY WT)	MG/KG	2900	
357	ARSENIC (DRY WT)	MG/KG	16.4	
4620	pH	PH UNITS	6.2	
7774	WTW MERCURY TOTAL	MG/KG	LT 0.59	
8241	LOSS ON IGNITION	%	34.4	
9233	Ammoniacal nitrogen	MG/KG	211	
9234	Sulphur	MG/KG	5960	
9271	Cadmium	MG/KG	1.16	
9272	CHROMIUM TOTAL	MG/KG	15.9	
9273	Copper	MG/KG	LT 7.8	
9275	Nickel	MG/KG	41.3	
9276	LEAD TOTAL	MG/KG	29.4	
9277	ZINC TOTAL	MG/KG	414	
9278	IRON TOTAL	MG/KG	376000	
9281	% Dry solids	%	3.43	
9282	% Minerals	%	65.6	
9283	% K (dry weight)	%	0.023	
9284	% P (dry weight)	%	0.14	
9285	% N (dry weight)	%	0.68	

# DŴR CYMRU - WELSH WATER

## Llyn Conwy

### Analysis of Water Treatment Works Sludge

Date: 30/07/18

Application rate (t/ha)            250                            Lab ref no. S 6075436  
Application rate (t/acre)        100  
pH                                        6.2  
Dry solids (%)                        3.4  
Organic matter content (%)      34.4

#### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	0.68	%	0.23	58.3	0.007	1.8
Ammonium-N	211	mg/kg	0.01	1.8		
Phosphorus (P)	1400	mg/kg	0.05			
Phosphate (P <sub>2</sub> O <sub>5</sub> )			0.11	27.5	0.022	5.5
Potassium (K)	230	mg/kg	0.01			
Potash (K <sub>2</sub> O)			0.01	2.4	0.002	0.5
Magnesium (Mg)	294	mg/kg	0.01			
Magnesium (MgO)			0.02	4.2	0.003	0.8
Sulphur (S)	5960	mg/kg	0.20			
Sulphur (SO <sub>3</sub> )			0.51	127.8	0.051	12.8

#### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	414.00	mg/kg	0.01	3.55	15.00
Copper	7.80	mg/kg	0.00	0.07	7.50
Nickel	41.30	mg/kg	0.00	0.35	3.00
Lead	29.40	mg/kg	0.00	0.25	15.00
Cadmium	1.16	mg/kg	0.00	0.01	0.15
Chromium	15.90	mg/kg	0.00	0.14	15.00
Arsenic	16.40	mg/kg	0.00	0.14	0.70
Mercury	0.59	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	376000	mg/kg	12.90	3224	
Aluminium	2900	mg/kg	0.10	25	

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



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 698028      **Location -** MYNYDD LLANDEGAI SLUDGE  
**Date Sampled -** 02-May-18      **Time Taken -** 07:00  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168859  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

## Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT 87	
238	Magnesium	MG/KG	450	
288	ALUMINIUM (DRY WT)	MG/KG	324500	
357	ARSENIC (DRY WT)	MG/KG	LT 25.2	
4620	pH	PH UNITS	6.7	
7774	WTW MERCURY TOTAL	MG/KG	LT 1.68	
8241	LOSS ON IGNITION	%	40	
8939	TOT NIT AS N (SLDG)	MG/KG	8980	
8941	TOT PHOS AS P (SLDG)	MG/KG	1470	
9233	Ammoniacal nitrogen	MG/KG	LT 1620	
9234	Sulphur	MG/KG	21200	
9271	Cadmium	MG/KG	LT 0.11	
9272	CHROMIUM TOTAL	MG/KG	LT 4.3	
9273	Copper	MG/KG	79	
9275	Nickel	MG/KG	LT 5.1	
9276	LEAD TOTAL	MG/KG	LT 6.2	
9277	ZINC TOTAL	MG/KG	67.4	
9278	IRON TOTAL	MG/KG	3630	
9281	% Dry solids	%	1.2	
9282	% Minerals	%	60	

# DŴR CYMRU - WELSH WATER

## Mynydd Llandegai

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)	250	Lab ref no. S 4168859
Application rate (t/acre)	100	
pH	6.7	
Dry solids (%)	1.2	
Organic matter content (%)	40.0	

### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	0.9	%	0.11	27.0	0.019	4.9
Ammonium-N	1620	mg/kg	0.02	4.9		
Phosphorus (P)	1470	mg/kg	0.02			
Phosphate (P <sub>2</sub> O <sub>5</sub> )			0.04	10.1	0.008	2.0
Potassium (K)	87	mg/kg	0.00			
Potash (K <sub>2</sub> O)			0.00	0.3	0.000	0.1
Magnesium (Mg)	450	mg/kg	0.01			
Magnesium (MgO)			0.01	2.2	0.002	0.4
Sulphur (S)	21200	mg/kg	0.25			
Sulphur (SO <sub>3</sub> )			0.64	159.0	0.064	15.9

### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	67.40	mg/kg	0.00	0.20	15.00
Copper	79.00	mg/kg	0.00	0.24	7.50
Nickel	5.10	mg/kg	0.00	0.02	3.00
Lead	6.20	mg/kg	0.00	0.02	15.00
Cadmium	0.11	mg/kg	0.00	0.00	0.15
Chromium	4.30	mg/kg	0.00	0.01	15.00
Arsenic	25.20	mg/kg	0.00	0.08	0.70
Mercury	1.68	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	3630	mg/kg	0.04	11	
Aluminium	324500	mg/kg	3.89	974	

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



Dŵr Cymru  
Welsh Water

# Sample Analysis Report

**Sampling Point No -** 618214      **Location -** RHIW GOCH WTW SLUDGE  
**Date Sampled -** 02-May-18      **Time Taken -** 09:00  
**Originator -** SEWAGE      **Purpose -** EQO/DIRECTIVE COMPLIANCE  
**Laboratory -** GLASLYN      **Lab Ref No -** S 4168862  
**Sampler -**      **No Results -** 20  
**Type -** 7HR COMPOSITE

## Sample Results

Code	Determinand Name	Units	Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT 87	
238	Magnesium	MG/KG	113	
288	ALUMINIUM (DRY WT)	MG/KG	7220	
357	ARSENIC (DRY WT)	MG/KG	LT 14.1	
4620	pH	PH UNITS	4.3	
7774	WTW MERCURY TOTAL	MG/KG	LT 0.94	
8241	LOSS ON IGNITION	%	28.1	
8939	TOT NIT AS N (SLDG)	MG/KG	4150	
8941	TOT PHOS AS P (SLDG)	MG/KG	264	
9233	Ammoniacal nitrogen	MG/KG	LT 911	
9234	Sulphur	MG/KG	26600	
9271	Cadmium	MG/KG	LT 0.11	
9272	CHROMIUM TOTAL	MG/KG	6.4	
9273	Copper	MG/KG	LT 7.8	
9275	Nickel	MG/KG	LT 5.1	
9276	LEAD TOTAL	MG/KG	10.2	
9277	ZINC TOTAL	MG/KG	145	
9278	IRON TOTAL	MG/KG	811000	
9281	% Dry solids	%	2.14	
9282	% Minerals	%	71.9	

# DŴR CYMRU - WELSH WATER

## Rhiw Goch

### Analysis of Water Treatment Works Sludge

Date: 02/05/18

Application rate (t/ha)	250	Lab ref no. S 4168862
Application rate (t/acre)	100	
pH	4.3	
Dry solids (%)	2.1	
Organic matter content (%)	28.1	

### NUTRIENT CONTENT

TOTALS	result	units	Total		Available	
			(kg/tonne)	( kg/ha)	(kg/tonne)	( kg/ha)
Nitrogen (N)	0.42	%	0.09	22.5	0.019	4.9
Ammonium-N	911	mg/kg	0.02	4.9		
Phosphorus (P)	264	mg/kg	0.01			
Phosphate (P <sub>2</sub> O <sub>5</sub> )			0.01	3.2	0.003	0.6
Potassium (K)	87	mg/kg	0.00			
Potash (K <sub>2</sub> O)			0.00	0.6	0.000	0.1
Magnesium (Mg)	113	mg/kg	0.00			
Magnesium (MgO)			0.00	1.0	0.001	0.2
Sulphur (S)	26600	mg/kg	0.57			
Sulphur (SO <sub>3</sub> )			1.42	355.8	0.142	35.6

### POTENTIALLY TOXIC ELEMENTS

TOTALS	result	units	Rate		Limit
			(kg/tonne)	( kg/ha)	(kg/ha/yr)
Zinc	145.00	mg/kg	0.00	0.78	15.00
Copper	7.80	mg/kg	0.00	0.04	7.50
Nickel	5.10	mg/kg	0.00	0.03	3.00
Lead	10.20	mg/kg	0.00	0.05	15.00
Cadmium	0.11	mg/kg	0.00	0.00	0.15
Chromium	6.40	mg/kg	0.00	0.03	15.00
Arsenic	14.10	mg/kg	0.00	0.08	0.70
Mercury	0.94	mg/kg	0.00	0.01	0.10
Other Elements					
Iron	811000	mg/kg	17.36	4339	
Aluminium	7220	mg/kg	0.15	39	

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



**ANALYTICAL REPORT**

<b>Report Number</b>	<b>35523-18</b>	<b>V537</b>	<b>JOLYON PRIDDING</b>	<b>Client CLUST Y BLAIDD</b>
<b>Date Received</b>	<b>28-NOV-2018</b>		<b>4RECYCLING LTD</b>	
<b>Date Reported</b>	<b>03-DEC-2018</b>		<b>CONTROL HOUSE</b>	
<b>Project</b>	<b>SOIL</b>		<b>A1 BUSINESS PARK</b>	
<b>Reference</b>	<b>CLUST Y BLAIDD</b>		<b>KNOTTINGLEY ROAD</b>	
<b>Order Number</b>			<b>KNOTTINGLEY WF11 0BU</b>	

Laboratory Reference		SOIL413954	SOIL413955	SOIL413956					
Sample Reference		4964	5154	5194					
Determinand	Unit	SOIL	SOIL	SOIL					
pH water [1:2.5]		6.3	5.3	5.6					
Available Phosphorus (Index)	mg/l	22.2 (2)	14.4 (1)	19.0 (2)					
Available Potassium (Index)	mg/l	149 (2-)	174 (2-)	131 (2-)					
Available Magnesium (Index)	mg/l	111 (3)	80.8 (2)	70.8 (2)					
Total Copper	mg/kg	16.4	22.5	17.8					
Total Zinc	mg/kg	79.0	66.9	75.4					
Total Lead	mg/kg	41.8	46.5	56.3					
Total Cadmium	mg/kg	0.26	0.23	0.70					
Total Nickel	mg/kg	18.7	15.3	14.3					
Total Chromium	mg/kg	35.3	27.2	32.1					
Total Mercury	mg/kg	<0.2	<0.2	<0.2					

**Notes**

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

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

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**ANALYTICAL REPORT**

<b>Report Number</b>	<b>36756-18</b>	<b>V537</b>	<b>JOLYON PRIDDING</b>	<b>Client</b>	<b>CLUST Y BLAIDD</b>
<b>Date Received</b>	<b>10-DEC-2018</b>		<b>4RECYCLING LTD</b>		<b>CERRIGYDRUDION</b>
<b>Date Reported</b>	<b>12-DEC-2018</b>		<b>CONTROL HOUSE</b>		<b>CORWEN</b>
<b>Project</b>	<b>SOIL</b>		<b>A1 BUSINESS PARK</b>		<b>LL21 0RU</b>
<b>Reference</b>	<b>CLUST Y BLAIDD</b>		<b>KNOTTINGLEY ROAD</b>		
<b>Order Number</b>			<b>KNOTTINGLEY WF11 0BU</b>		

Laboratory Reference		SOIL414952	SOIL414953							
Sample Reference		4944	4939							
Determinand	Unit	SOIL	SOIL							
pH water [1:2.5]		5.8	6.1							
Available Phosphorus (Index)	mg/l	36.8 (3)	37.6 (3)							
Available Potassium (Index)	mg/l	201 (2+)	210 (2+)							
Available Magnesium (Index)	mg/l	142 (3)	110 (3)							
Total Copper	mg/kg	22.9	18.6							
Total Zinc	mg/kg	96.5	89.3							
Total Lead	mg/kg	33.3	31.7							
Total Cadmium	mg/kg	0.27	0.24							
Total Nickel	mg/kg	19.5	22.5							
Total Chromium	mg/kg	28.4	45.0							
Total Mercury	mg/kg	<0.2	<0.2							

**Notes**

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

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## Risk Assessment

Risk assessment for land spreading activity at Clust-y-Blaidd, Cerrigydrudion, Corwen, Conwy.

Risk assessment reviewed by Mr A. Stone in Jan 2019.

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

## Risk Assessment (continued)

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

## Risk Assessment (continued)

	spreading equipment								
Corsydd Nug a Merddwr SSSI	Nutrients PTEs Dusts	Ecological	Surface run-off Airborne compounds	Low	High	Low	Proximity of protected site. SSSI borders a small part of field 4964.  Particularly sensitive nature of site (blanket mire/ vegetation)  Waste streams have low potential to produce airborne dust and particulate matter  Delivery to storage area is >950m away from designated area  Risk of contamination through field drains linking directly to SSSI and underlying glacial drift geology	Apply according to PQA  100m non-spread buffer zone applied to SSSI border  Watercourses flowing directly into SSSI will also have 50m non-spread buffer zone	Low
Mynydd Hiraethog SSSI	Nutrients PTEs Dusts	Ecological	Surface run-off Airborne compounds Noise from delivery and spreading	Low	High	Low	Proximity of protected site. SSSI is 430m from field 5194.  Particularly sensitive nature of site (vegetation and upland bird species)  Waste streams have low potential to produce airborne dust and particulate matter  Agricultural machinery in agricultural areas  Delivery to storage area is >950m away from designated area	Apply according to PQA  Avoid sensitive spreading periods e.g. breeding season	Low

