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

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

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

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

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

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

Contents

1 About the permit

1a Discussions before your application

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

Case or document reference

1b Permit number

Permit number this application relates to GP3792SK

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

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

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

SR2010No6 Mobile plant for landspreading of sewage sludge ☐

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

2 About you

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

Organisation name (if relevant) ByProduct Recovery Ltd

Title

First name

Last name

Address Control House

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

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

Document reference	

3 Contact details

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

Title	Miss	
First name	Vanessa	
Last name	McDonnell	
Telephone - mobile	07940 720800	
Telephone - office	0113 232 2418	
Email address	Vanessa.McDonnell@4r-group.co.uk	

4 About the deployment

4a Multiple deployments for one area of land

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

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

No ☒ *Go to section 4b*

Yes ☐ How many deployments are in the batch?

4b Nominated competent person

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

Title	Mr	
First name	Ian	
Last name	Holden	
Telephone - mobile	07912 362364	

Telephone - office	0113 232 2418
Email address	Kevin.brook@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 _____ *Go to section 4c*

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

CIWM / WAMITAB ☒

ESA / EU ☐

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

4c Which risk band does the activity fall within?

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

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

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

Table 1 – risk band

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

Bespoke mobile plant permit	Low risk deployment ☐	Medium risk deployment ☐	High risk deployment ☐

4d Additional information on sensitive receptors

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

No ☐

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

4e Site specific risk assessment

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

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

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

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

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

4f About the waste

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

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

Table 2 – waste types

	List of Waste code (6 digit)	**Waste description**	**Physical form**	**Waste producer**	**Total amount being spread/used** (tonnes)
e.g.	03 03 05	De-inked paper	Sludge	Smith's Newsprint	500
1	19 09 02	Water Treatment Sludge	LQ	DCWW Strata Florida	3650
2	19 09 02	Water Treatment Sludge	SL	DCWW Crai	5810
3	19 09 02	Water Treatment Sludge	LQ	DCWW Bontgoch	10525
4	19 09 02	Water Treatment Sludge	LQ	DCWW Cefn Dryscoed	10525
5	19 09 02	Water Treatment Sludge	LQ	DCWW Crai	10525
6	19 09 02	Water Treatment Sludge	LQ	DCWW Elan	10525
7	19 09 02	Water Treatment Sludge	LQ	DCWW Hirwaun	10525
8	19 09 02	Water Treatment Sludge	LQ	DCWW Talybont	3650
9	19 09 02	Water Treatment Sludge	LQ	DCWW Portis	10525
10	19 09 02	Water Treatment Sludge	LQ	DCWW Llyswen	3650
				Total tonnage	10525

4g About the land you want to treat

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

Address	Noyadd Farm

	Rhayader
	Powys
Postcode	LD6 5HH
National grid reference (12 digit)	**295746 266921**

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

Agricultural land ☒ Please give your County/ Parish/ Holding number 52-258-0016

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	**29**	**295649 266485**	19 09 02	4
2	**26**	**295800 266023**	**19 09 02**	2
3	**27**	**295775 265867**	**19 09 02**	4.4
4	**28**	295917 265923	**19 09 02**	4.3
5	**33**	**296022 267404**	**19 09 02**	4.1
6	**32**	**295836 267301**	**19 09 02**	4
7	**31**	**295772 267149**	**19 09 02**	1.8
8	**34**	**296248 267319**	**19 09 02**	4.3
9	**35**	**295955 267127**	**19 09 02**	4
10	**37**	**295965 267024**	**19 09 02**	3.3
			Total hectares	Continued…

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

Yes ☐ *Go to section 4k*

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

Organisation name (if relevant)		
Title	Mr	
First name	T	
Last name	Morgan	
Address	Noyadd Farm	

	Rhayader
	Powys
	Wales
Postcode	LD6 5HH
Telephone - mobile	
Telephone - office	01597 210151
Email address	

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

Document reference	

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

Yes ☒ *Go to section 4k*

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

Explanation

4k Previous land treatment

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

No ☐ *Go to section 4l*

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

Table 4 – previous land treatment

	Field name/ number/ reference	**Describe the waste spread** (in last 12 months)	**Person/ company who spread the waste**	**Quantity spread per hectare** (in tonnes)	**Deployment/ other reference** (if known)
e.g.	East field	Digested sewage sludge cake	Eastern Waters	20	PAN 000000
1	26	19 09 02	4R Group	40	PAN-002583
2	27	19 09 02	4R Group	63	PAN-002583
3	28	19 09 02	4R Group	37	PAN-002583
4	30	19 09 02	4R Group	28	PAN-002583
5	31	19 09 02	4R Group	111	PAN-002583

6	33	19 09 02	4R Group	43	PAN-002583
7	34	19 09 02	4R Group	26	PAN-002583
8	37	19 09 02	4R Group	50	PAN-002583
9					
10					

4l Waste storage

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

No ☐ *Go to section 5*

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

Table 5 – waste storage details

	Grid reference (12 digit)	**Waste type being stored** (6 digit List of Waste code)	**Storage method**	**Quantity stored at any one time** (in tonnes)
1	**295978 265924**	19 09 02	Stockpile	3000
2	295993 267202	19 09 02	Stockpile	3000
3	296083 267355	19 09 02	Above ground storage	1250
4	295736 266866	19 09 02	Above ground storage	1250
5	295533 266582	19 09 02	Above ground storage	1250
6				
7		No more than 3000t SL, and 1250t LQ will be stored at any one time.		
8				
9				
10				

5 Payment

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

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

Cheque ☐ *Go to section 5c*

Postal order ☐ *Go to section 5d*

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

5b Paying by electronic transfer

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

Company name: Natural Resources Wales

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

Bank: RBS

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

Sort code: 60-70-80

Account number: 10014438

Reference number

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

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

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

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

BACS reference	**PSCAPPBYPRO0512**
Amount paid	£994

Making payments from outside the UK

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

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

5c Paying by cheque or postal order

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

Cheque/ postal order number	
Amount paid	

5d Paying by credit or debit card

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

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

6 Supporting documents

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

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

6a What supporting evidence do you need to send?

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

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

6b Checklist for deployments under SR2010 No4 only

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

Table 6

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

6c Checklist for all types of deployment application.

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

Table 7

Item	Complete	Your document reference/ description
Location map (required for all deployments)	☒	Spreading Area
Benefit statement (required for all deployments)	☒	ABS
Waste analysis (required for all deployments)	☒	Waste Analyses
Receiving soil analysis (required for all deployments)	☒	Soil Analyses

Site-specific risk assessment (in accordance with 4e)	☒	Risk Assessment
Any other additional information	N/A	Waste to land register
	N/A	
	N/A	
	N/A	

7 The data Protection Act 1998

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

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

We may also process or release the information to:

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

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

8 Confidentiality and national security

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

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

Please treat the information in my application as confidential. ☐

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

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

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

9 Declaration

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

A relevant person should make the declaration. You must be a relevant person or have the authority of a

relevant person to sign this application on their behalf.

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

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

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

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

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

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

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

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

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

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

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

9c Sign to confirm you understand the declaration.

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

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

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

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

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

Title	Mr	
First name	Mike	
Last name	Holt	
On behalf of (if relevant)		
Today's date (DD/MM/YYYY)	14/12/2017	

4h The parcels of land you want to treat

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

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

Field name/number/reference	Grid reference – centre of field (12digit)	Waste types to be spread/used (list of waste codes)	Size (Hectares)
36	295633 266921	**19 09 02**	2.1
38	295936 266885	**19 09 02**	3.7
39	296068 266737	**19 09 02**	4
30	295576 266698	**19 09 02**	3.4
			TOTAL – 49.4ha

Location Plan
Noyadd Farm

Site:
Noyadd Farm
Rhayader
Powys
LD6 5HH

Client:
DCWW

Key:

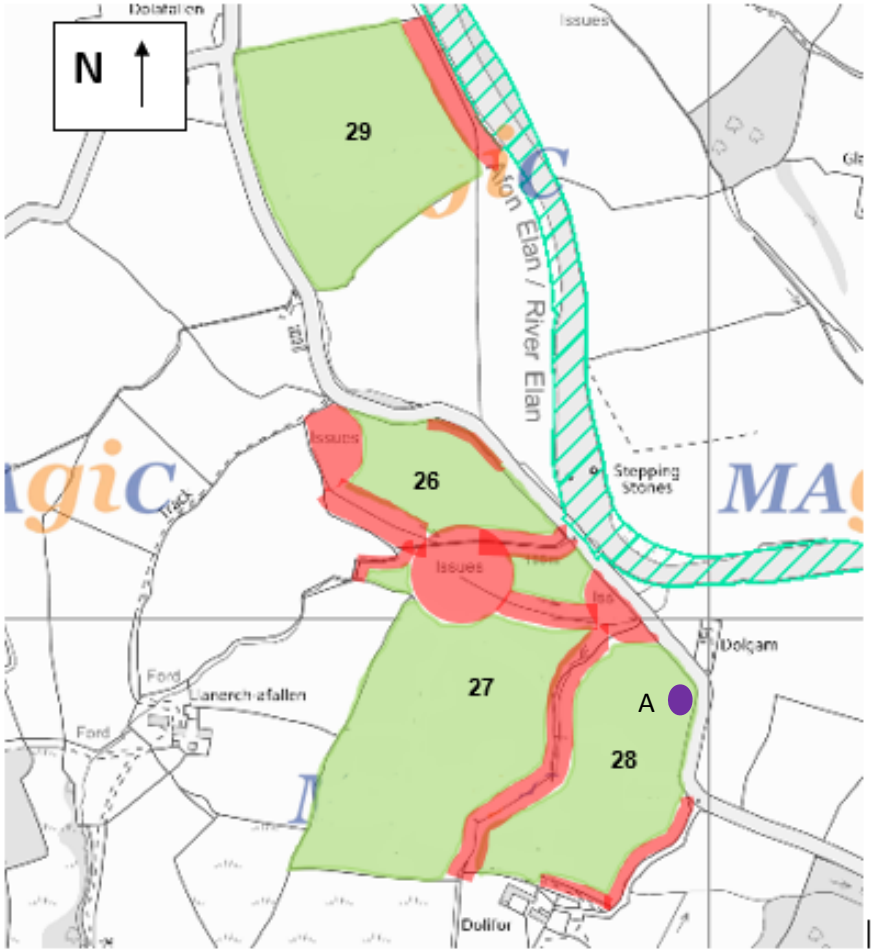
Spreading area

10m non-spreading area

Location tags

Location tags:

- Stockpile A – 295978 265924



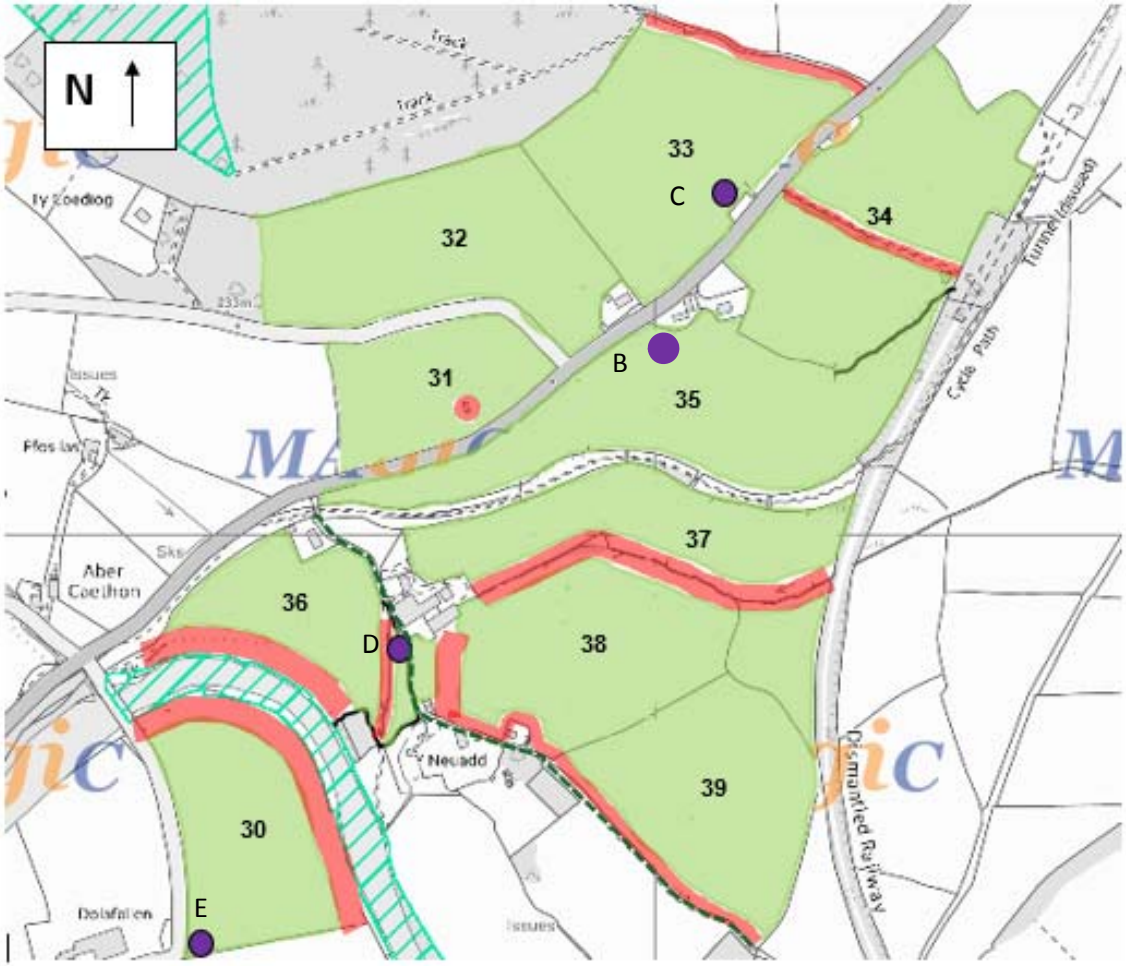
Location Plan
Noyadd Farm

Key:

- Spreading area
- 10m non-spreading area
- Location tags

Location tags:

- Stockpile B - 295993 267202
- Above ground storage tank C – 296083 267355
- Above ground storage tank D – 295736 266866
- Above ground storage tank E – 295533 266582



Agricultural Benefit Statement

For the application of beneficial wastes to fields at;

Noyadd Farm Rhayader Powys LD6 5HH

26th March 2019

1 Person with appropriate technical expertise and permit details

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

- Foundation Degree in Agriculture with Land Management
- Level 3 Diploma in Agriculture

Verified by;

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

2 Where the waste is to be spread

Table 1. Where the waste is to be spread

Farm address:	Noyadd Farm Rhayader Powys LD6 5HH	
Stockpile grid reference:	Refer to Table 4	
Area of the receiving land:	49.4ha	
Quantity to be stored at any one time:	Stackable (temporary field stockpile): 3,000t	Non-Stackable (spread on delivery): 1,250t
Total maximum quantity to be spread:	10525t	
Location map document reference:	2. Spreading Area	

3 What is the waste to be spread

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

Waste		***Description***	***Waste Producer***	

	EWC Code			Additional Information
1	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Strata Florida	
2	19 09 02	Potable Water Treatment Sludge - SL	DCWW Crai	
3	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Bontgoch	
4	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Cefn Dryscoed	
5	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Crai	
6	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Elan	
7	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Hirwaun	
8	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Talybont	
9	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Portis	
10	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Llyswen	

4 Operational details

4.1 Cropping details

Table 3. Cropping details

Current crop including projected yield if known:	Refer to Tables 6-15
Is straw removed?	Y ☒ N ☐ N/A ☐
Following crop and any sensitive crops within rotation which you are amending the soil for in good time:	Refer to tables 6-15.
When do you intend to apply this waste; e.g. post harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:	When both the ground and weather conditions are suitable. The wastes will be spread during periods of peak nutrient requirement, for example - March-April prior to first cut silage, May-June after first cut, July-August after second cut. The grass will be left for a minimum of three weeks before it is used for grazing or cutting.

4.2 Waste storage

Table 4. Waste storage

How is the waste to be stored?	Stackable wastes: field stockpiles

e.g. mobile tank, field heap, spread on delivery	Non-stackable wastes: spread on delivery/above ground storage tanks.
Where is the waste to be stored prior to spreading?	Stockpile A – 295978 265924 Stockpile B – 295993 267202 Above the ground storage tank C – 296083 267355 Above the ground storage tank D – 295736 266866 Above the ground storage tank E – 295533 266582
Why were these storage locations chosen?	The storage locations are accessible by delivery vehicle, near field entrances so the potential damage to fields by delivering vehicles is minimal. The storage locations are not within 10m of any ditch, watercourse, or footpath, not within a SPZ1, and are at least 50m from any well spring or borehole. They are also a safe distance from overhead powerlines.

4.3 Waste application

Table 5. Waste application

How is the waste to be spread and why is it to be spread that way?	The cake will be spread using conventional rear discharge spreaders as this equipment is readily available to the farmer/contractor and the most appropriate for the material and application rates used. Liquid sludges will be surface spread by tractor and tanker using a low-trajectory splash plate.
How do you plan to incorporate the waste following application?	There is no residue on the surface and therefore no requirement for incorporation of wastes on grass fields especially considering the very low levels of ammonia and minimal odour.
With liquid wastes is there any mole draining or sub-soiling planned? *Are there land drains in the field?*	There is no mole draining, or subsoiling planned. There are some land drains in the fields.
Other relevant operational information:	Spreading the wastes will be carried out in accordance with the Code of Good Agricultural Practice for the Protection of Water, Soil, and Air for Wales (2011), NVZ regulations and the permit holder Environmental Management System (EMS).

Table 6. DCWW Strata Florida LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
26	2.40	2.00	Grass	Grass	5.7																**0**
27	5.80	4.40	Grass	Grass	6.2	M	205	13	0	125	65	*11	1	210	228	*1	2	0	*1	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	13	0	125	65	*11	0	260	228	*1	1	0	*1	250	**1075**
29	4.40	4.00	Grass	Grass	5.8																**0**
30	4.20	3.40	Grass	Grass	5.8																**0**
31	2.00	1.80	Grass	Grass	6.7	M	205	13	1	95	65	*11	0	260	228	*1	2	0	*1	250	**450**
32	4.00	4.00	Grass	Grass	5.9																**0**
33	4.50	4.10	Grass	Grass	6.0	M	205	13	1	95	65	*11	1	210	228	*1	2	0	*1	250	**1025**
34	4.70	4.30	Grass	Grass	5.9																**0**
35	4.00	4.00	Grass	Grass	5.9																**0**
36	2.50	2.10	Grass	Grass	5.7																**0**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6																**0**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**3650**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 35t/ha is 245kg/ha

Table 7. DCWW Crai SL

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req**	**In Wst**	**P Ind**	**Req**	**Crop Use**	**In Wst**	**K Ind**	**Req**	**Crop Use**	**In Wst**	**Mg Ind**	**Req**	**In Wst**	**Rate**	**Totals**
							kg/ha	**kg/ha**		**kg/ha**	**kg/ha**	**kg/ha**		**kg/ha**	**kg/ha**	**kg/ha**		**kg/ha**	**kg/ha**	**t/ha**	**tonnes**
26	2.40	2.00	Grass	Grass	5.7	M	205	1	1	95	65	*13	1	210	228	*1	2	0	*2	138	**276**
27	5.80	4.40	Grass	Grass	6.2	M	205	1	0	125	65	*13	1	210	228	*1	2	0	*2	138	**607**
28	4.80	4.30	Grass	Grass	6.3	M	205	1	0	125	65	*13	0	260	228	*1	1	0	*2	138	**593**
29	4.40	4.00	Grass	Grass	5.8	M	205	1	0	125	65	*13	0	260	228	*1	2	0	*2	138	**552**
30	4.20	3.40	Grass	Grass	5.8	M	205	1	0	125	65	*13	0	260	228	*1	2	0	*2	138	**469**
31	2.00	1.80	Grass	Grass	6.7	M	205	1	1	95	65	*13	0	260	228	*1	2	0	*2	138	**248**
32	4.00	4.00	Grass	Grass	5.9	M	205	1	1	95	65	*13	1	210	228	*1	2	0	*2	138	**552**
33	4.50	4.10	Grass	Grass	6.0	M	205	1	1	95	65	*13	1	210	228	*1	2	0	*2	138	**566**
34	4.70	4.30	Grass	Grass	5.9	M	205	1	1	95	65	*13	0	260	228	*1	2	0	*2	138	**593**
35	4.00	4.00	Grass	Grass	5.9	M	205	1	1	95	65	*13	0	260	228	*1	2	0	*2	138	**552**
36	2.50	2.10	Grass	Grass	5.7	M	205	1	0	125	65	*13	1	210	228	*1	2	0	*2	138	**290**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6	M	205	1	1	95	65	*13	1	210	228	*1	2	0	*2	138	**511**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**5810**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 138t/ha is 245kg/ha

Table 8. DCWW Bontgoch LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req**	**In Wst**	**P Ind**	**Req**	**Crop Use**	**In Wst**	**K Ind**	**Req**	**Crop Use**	**In Wst**	**Mg Ind**	**Req**	**In Wst**	**Rate**	**Totals**
							kg/ha	kg/ha		kg/ha	kg/ha	kg/ha		kg/ha	kg/ha	kg/ha		kg/ha	kg/ha	t/ha	tonnes
26	2.40	2.00	Grass	Grass	5.7	M	205	13	1	95	65	*20	1	210	228	*1	2	0	*2	250	**500**
27	5.80	4.40	Grass	Grass	6.2	M	205	13	0	125	65	*20	1	210	228	*1	2	0	*2	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	13	0	125	65	*20	0	260	228	*1	1	0	*2	250	**1075**
29	4.40	4.00	Grass	Grass	5.8	M	205	13	0	125	65	*20	0	260	228	*1	2	0	*2	250	**1000**
30	4.20	3.40	Grass	Grass	5.8	M	205	13	0	125	65	*20	0	260	228	*1	2	0	*2	250	**850**
31	2.00	1.80	Grass	Grass	6.7	M	205	13	1	95	65	*20	0	260	228	*1	2	0	*2	250	**450**
32	4.00	4.00	Grass	Grass	5.9	M	205	13	1	95	65	*20	1	210	228	*1	2	0	*2	250	**1000**
33	4.50	4.10	Grass	Grass	6.0	M	205	13	1	95	65	*20	1	210	228	*1	2	0	*2	250	**1025**
34	4.70	4.30	Grass	Grass	5.9	M	205	13	1	95	65	*20	0	260	228	*1	2	0	*2	250	**1075**
35	4.00	4.00	Grass	Grass	5.9	M	205	13	1	95	65	*20	0	260	228	*1	2	0	*2	250	**1000**
36	2.50	2.10	Grass	Grass	5.7	M	205	13	0	125	65	*20	1	210	228	*1	2	0	*2	250	**525**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6	M	205	13	1	95	65	*20	1	210	228	*1	2	0	*2	250	**925**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**10525**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazing.

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 100kg/ha

Table 9. DCWW Cefn Dryscoed LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
26	2.40	2.00	Grass	Grass	5.7	M	205	2	1	95	65	*0	1	210	228	*16	2	0	*1	250	**500**
27	5.80	4.40	Grass	Grass	6.2	M	205	2	0	125	65	*0	1	210	228	*16	2	0	*1	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	2	0	125	65	*0	0	260	228	*16	1	0	*1	250	**1075**
29	4.40	4.00	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*16	2	0	*1	250	**1000**
30	4.20	3.40	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*16	2	0	*1	250	**850**
31	2.00	1.80	Grass	Grass	6.7	M	205	2	1	95	65	*0	0	260	228	*16	2	0	*1	250	**450**
32	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	1	210	228	*16	2	0	*1	250	**1000**
33	4.50	4.10	Grass	Grass	6.0	M	205	2	1	95	65	*0	1	210	228	*16	2	0	*1	250	**1025**
34	4.70	4.30	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*16	2	0	*1	250	**1075**
35	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*16	2	0	*1	250	**1000**
36	2.50	2.10	Grass	Grass	5.7	M	205	2	0	125	65	*0	1	210	228	*16	2	0	*1	250	**525**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6	M	205	2	1	95	65	*0	1	210	228	*16	2	0	*1	250	**925**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**10525**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 48kg/ha

Table 10. DCWW Crai LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
26	2.40	2.00	Grass	Grass	5.7	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**500**
27	5.80	4.40	Grass	Grass	6.2	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	2	0	125	65	*0	0	260	228	*0	1	0	*1	250	**1075**
29	4.40	4.00	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**1000**
30	4.20	3.40	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**850**
31	2.00	1.80	Grass	Grass	6.7	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**450**
32	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1000**
33	4.50	4.10	Grass	Grass	6.0	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1025**
34	4.70	4.30	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1075**
35	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1000**
36	2.50	2.10	Grass	Grass	5.7	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**525**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**925**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**10525**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 36kg/ha

Table 11. DCWW Elan Valley LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req**	**In Wst**	**P Ind**	**Req**	**Crop Use**	**In Wst**	**K Ind**	**Req**	**Crop Use**	**In Wst**	**Mg Ind**	**Req**	**In Wst**	**Rate**	**Totals**
							kg/ha	**kg/ha**		**kg/ha**	**kg/ha**	**kg/ha**		**kg/ha**	**kg/ha**	**kg/ha**		**kg/ha**	**kg/ha**	**t/ha**	**tonnes**
26	2.40	2.00	Grass	Grass	5.7	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**500**
27	5.80	4.40	Grass	Grass	6.2	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	2	0	125	65	*0	0	260	228	*0	1	0	*1	250	**1075**
29	4.40	4.00	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**1000**
30	4.20	3.40	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**850**
31	2.00	1.80	Grass	Grass	6.7	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**450**
32	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1000**
33	4.50	4.10	Grass	Grass	6.0	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1025**
34	4.70	4.30	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1075**
35	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1000**
36	2.50	2.10	Grass	Grass	5.7	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**525**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**925**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**10525**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 38kg/ha

Table 12. DCWW Hirwaun LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
26	2.40	2.00	Grass	Grass	5.7	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**500**
27	5.80	4.40	Grass	Grass	6.2	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	2	0	125	65	*0	0	260	228	*0	1	0	*1	250	**1075**
29	4.40	4.00	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**1000**
30	4.20	3.40	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**850**
31	2.00	1.80	Grass	Grass	6.7	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**450**
32	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1000**
33	4.50	4.10	Grass	Grass	6.0	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1025**
34	4.70	4.30	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1075**
35	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1000**
36	2.50	2.10	Grass	Grass	5.7	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**525**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**925**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**10525**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 43kg/ha

Table 13. DCWW Talybont LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
26	2.40	2.00	Grass	Grass	5.7																**0**
27	5.80	4.40	Grass	Grass	6.2	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	2	0	125	65	*0	0	260	228	*0	1	0	*1	250	**1075**
29	4.40	4.00	Grass	Grass	5.8																**0**
30	4.20	3.40	Grass	Grass	5.8																**0**
31	2.00	1.80	Grass	Grass	6.7	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**450**
32	4.00	4.00	Grass	Grass	5.9																**0**
33	4.50	4.10	Grass	Grass	6.0	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1025**
34	4.70	4.30	Grass	Grass	5.9																**0**
35	4.00	4.00	Grass	Grass	5.9																**0**
36	2.50	2.10	Grass	Grass	5.7																**0**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6																**0**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**3650**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 48kg/ha

Table 14. DCWW Portis LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
26	2.40	2.00	Grass	Grass	5.7	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**500**
27	5.80	4.40	Grass	Grass	6.2	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	2	0	125	65	*0	0	260	228	*0	1	0	*1	250	**1075**
29	4.40	4.00	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**1000**
30	4.20	3.40	Grass	Grass	5.8	M	205	2	0	125	65	*0	0	260	228	*0	2	0	*1	250	**850**
31	2.00	1.80	Grass	Grass	6.7	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**450**
32	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1000**
33	4.50	4.10	Grass	Grass	6.0	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**1025**
34	4.70	4.30	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1075**
35	4.00	4.00	Grass	Grass	5.9	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*1	250	**1000**
36	2.50	2.10	Grass	Grass	5.7	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*1	250	**525**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*1	250	**925**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**10525**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 27kg/ha

Table 15. DCWW Llyswen LQ

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
26	2.40	2.00	Grass	Grass	5.7																**0**
27	5.80	4.40	Grass	Grass	6.2	M	205	2	0	125	65	*0	1	210	228	*0	2	0	*0	250	**1100**
28	4.80	4.30	Grass	Grass	6.3	M	205	2	0	125	65	*0	0	260	228	*0	1	0	*0	250	**1075**
29	4.40	4.00	Grass	Grass	5.8																**0**
30	4.20	3.40	Grass	Grass	5.8																**0**
31	2.00	1.80	Grass	Grass	6.7	M	205	2	1	95	65	*0	0	260	228	*0	2	0	*0	250	**450**
32	4.00	4.00	Grass	Grass	5.9																**0**
33	4.50	4.10	Grass	Grass	6.0	M	205	2	1	95	65	*0	1	210	228	*0	2	0	*0	250	**1025**
34	4.70	4.30	Grass	Grass	5.9																**0**
35	4.00	4.00	Grass	Grass	5.9																**0**
36	2.50	2.10	Grass	Grass	5.7																**0**
37	3.70	3.30	Grass	Grass	5.2																**0**
38	4.40	3.70	Grass	Grass	5.6																**0**
39	4.30	4.00	Grass	Grass	5.4																**0**
Ha	**55.70**	**49.40**																			**3650**

Nutrient requirement based on values described in the nutrient management guide (RB209) updated May 2017.

Phosphate and Potash requirements based on **Grass Silage, 2 Cuts (38t/ha)** (target DM yield 9-12t/ha) (Nutrient management guide (RB209) updated May 2017) with aftermath grazin

Expected Grazing yield of 4-5t/ha

Crop use based on **Grass** totalling **38t/ha** yield where **1.7kg/t P_2O_5** and **6kg/t K_2O** removed in offtake (Nutrient management guide) (RB209) updated May 2017)

*P2O5 and K2O stated are **Available** concentrations in kg/ha index 1 or below

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

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 20%, K_2O 20%, Mg 20%

Total N supplied at an application rate of 250t/ha is 49kg/ha

5 Compliance with NVZ regulations

Table 16. Compliance with NVZ regulations

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

Applicable to:

If yes, please indicate the appropriate period:

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

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

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

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

6.1 Receiving soils

The nutrient status of individual fields to be registered are provided in tables 6-15 above. General soil type(s) for the fields to be registered are;
The soil type is freely draining slightly acid and loamy soils.

Table 17. Soil type

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

The soil analyses (**Soil Analysis**) shows the soils to have sufficient background concentrations of Mg (*i.e.* ADAS Index 1-2). It is therefore unlikely that the crop will require any additional input of Mg over the course of the cropping cycle. The wastes contains some Mg but it is highly unlikely that applications of these materials will increase background levels in the receiving soil over time and are only likely to have a soil conditioning effect by increasing the base element content.

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.

6.3 Summary of benefits

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

Clean water treatment sludges contain significant amounts of organic matter. Additions of organic matter to soil will improve soil structural stability, biological activity, water and nutrient holding capacity, i.e. resistance to drought, and reduction of localised flooding, reduced leaching of nutrients, and improved

workability in soil. Organic matter is a particularly good source of N and S, and organic acids that aid nutrient solubility and uptake, as well as enhancing microbial activity for enhanced nutrient cycling in soils.

6.4 Additional requirements

The 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 4.8 - 6.9.

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 between 5.2 and 6.7, 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. Wastes will be applied at low trajectory and will have little visual impact as they are not brightly coloured.
2. Potential compaction of receiving soil will be mitigated by suitable adjustment of tyres/tyre pressure to match soil conditions, direction of spreading and load to be spread.
3. Wastes will be applied when ground and weather conditions are suitable, following CoGAP to avoid soil damage including wheel ruts, compaction, structural damage, erosion and run-off.
4. Sampling methods will be consistent with those set out in the RB209, and the analysis for PTEs are consistent with the code of agricultural practice.
5. With regards to odour management for any potentially odorous material – the materials will only be disturbed when the material is being spread, and application to land will be done under permit conditions, following procedures in our permit EMS to minimise risk of odour emissions.

8 Sensitive human and environmental receptors

Please refer to site specific risk assessment **NF Risk Assessment**. Locations of sensitive receptors are shown in **NF Maps**. Prevailing winds are south-westerly.

- There are 3 SSSI's that are within 500m of the fields to be registered. These sites are discussed in the attachment **NF Risk Assessment.**
- There are several isolated properties near the spreading areas. The properties are not considered to be affected by the spreading activity because the material is non-odorous and compliant with the codes of practice.
- Some fields are bordered by minor roads. Risks to the roads and any people using them are considered negligible. All waste will be transported according to the waste Duty of Care Code of Practice and will be handled and spread according to the Code of Good Agricultural Practice (Defra, 2011).

Locations of sensitive receptors are shown in 2. Spreading Maps.

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

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

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

10 Contingency planning

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

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STRATA FLORIDA WTW
STRATA FLORIDA
TREGARON

SLUDGE

SLUDGE

Laboratory References	
Report Number	45285
Sample Number	79539

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

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

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

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

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

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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STRATA FLORIDA
TREGARON

SLUDGE

SLUDGE

Laboratory References	
Report Number	45285
Sample Number	79539

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

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

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

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

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

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TREGARON

SLUDGE

SLUDGE

Laboratory References	
Report Number	45285
Sample Number	79539

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

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

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

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

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

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DŴR CYMRU - WELSH WATER

Strata Florida LQ

Analysis of Water Treatment Works Liquid

26/02/2019

Application rate (t/ha)	**250**	Lab report no. 45285
Application rate (t/acre)	**100.0**	
pH	**5.4**	
Dry solids (%)	**2.90**	
Organic Matter	**1.9**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(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)	95.4	mg/kg	0.10			
Phosphate (P_2O_5)			0.22	54.4	0.04	10.9
Potassium (K)	16.2	mg/kg	0.02			
Potash (K_2O)			0.02	4.9	0.00	1.0
Magnesium (Mg)	10	mg/kg	0.01			
Magnesium (MgO)			0.02	4.0	0.00	0.8
Sulphur (S)	166	mg/kg	0.17			
Sulphur (SO_3)			0.42	103.8	0.04	10.4

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	3.82	mg/kg	3.8	0.96	15.00
Copper	0.71	mg/kg	0.7	0.18	7.50
Nickel	0.32	mg/kg	0.3	0.08	3.00
Lead	1.59	mg/kg	1.6	0.40	15.00
Cadmium	0.01	mg/kg	0.0	0.00	0.15
Chromium	0.3	mg/kg	0.3	0.08	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Arsenic	1.35	mg/kg	1.4	0.34	0.70
Other Elements					
Aluminium	3398	mg/kg	3398.0	849.50	
Iron	784	mg/kg	784.0	196.00	

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

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CRAY WTW
CRAY
SWANSEA VALLEY

SLUDGE CAKE

SLUDGE CAKE

Sample Reference :

CRAY WTW SLUDGE CAKE

Sample Matrix : SLUDGE CAKE

Laboratory References	
Report Number	39262
Sample Number	98402

Date Received	14-JAN-2019
Date Reported	24-JAN-2019

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

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

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Oven Dry Matter	15.7	%
Conductivity 1:6 [Fresh]	116	uS/cm
Total Nitrogen	1.13	% w/w
Ammonium Nitrogen	<10	mg/kg
Total Phosphorus (P)	1310	mg/kg
Total Potassium (K)	219	mg/kg
Total Magnesium (Mg)	305	mg/kg
Total Copper (Cu)	39.3	mg/kg
Total Zinc (Zn)	81.1	mg/kg
Total Sulphur (S)	5583	mg/kg

Released by ..... *Darren Whitbread* ..... Date ..... *24/01/19* .....

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V724

Please quote above code for all enquiries

CRAY WTW
CRAY
SWANSEA VALLEY

SLUDGE CAKE

SLUDGE CAKE

Sample Reference :

CRAY WTW SLUDGE CAKE

Sample Matrix : SLUDGE CAKE

Laboratory References	
Report Number	39262
Sample Number	98402

Date Received	14-JAN-2019
Date Reported	24-JAN-2019

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

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

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Total Calcium (Ca)	1746	mg/kg
Total Iron (Fe)	332441	mg/kg
Total Lead (Pb)	11.3	mg/kg
Total Cadmium (Cd)	0.59	mg/kg
Total Mercury (Hg)	0.12	mg/kg
Total Nickel (Ni)	21.7	mg/kg
Total Chromium (Cr)	33.3	mg/kg
Total Sodium (Na)	<5	mg/kg
pH 1:6 [Fresh]	4.80	
Organic Matter LOI	39.0	% w/w

Released by ..... *Darren Whitbread* ..... Date ..... *24/01/19* .....

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CRAY WTW
CRAY
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SLUDGE CAKE

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Sample Reference :

CRAY WTW SLUDGE CAKE

Sample Matrix : SLUDGE CAKE

Laboratory References	
Report Number	39262
Sample Number	98402

Date Received	14-JAN-2019
Date Reported	24-JAN-2019

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

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

ANALYTICAL RESULTS *on 'dry matter' basis.*

Determinand	Value	Units
Lime Equivalent as CaCO3	3.3	% w/w
Total Aluminium	2634	mg/kg
Total Arsenic (As)	50.8	mg/kg
Neutralising Value as CaO [TNV]	1.8	% w/w

Released by ..... *Darren Whitbread* ..... Date ..... *24/01/19* .....

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DŴR CYMRU - WELSH WATER

Crai SL

Analysis of Water Treatment Works Sludge

14/01/2019 39262

Application rate (t/ha)	**138**
Application rate (t/acre)	**55.2**
pH	**4.8**
Dry solids (%)	**15.7**
Organic matter content (%)	**39.00**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	1.13	%	1.77	244.83	0.002	0.2
Ammonium-N	10	mg/kg	0.00	0.22		
Phosphorus (P)	1310	mg/kg	0.21			
Phosphate (P_2O_5)			0.47	65.0	0.094	13.0
Potassium (K)	219	mg/kg	0.03			
Potash (K_2O)			0.04	5.7	0.008	1.1
Magnesium (Mg)	305	mg/kg	0.05			
Magnesium (MgO)			0.08	11.0	0.016	2.2
Sulphur (S)	5583	mg/kg	0.88			
Sulphur (SO_3)			2.19	302.4	0.219	30.2

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	81.1	mg/kg	0.01	1.76	15.00
Copper	39.3	mg/kg	0.01	0.85	7.50
Nickel	21.70	mg/kg	0.00	0.47	3.00
Lead	11.30	mg/kg	0.00	0.24	15.00
Cadmium	0.59	mg/kg	0.00	0.01	0.15
Chromium	33.3	mg/kg	0.01	0.72	15.00
Arsenic	50.8	mg/kg	0.01	1.101	0.70
Mercury	0.12	mg/kg	0.00	0.00	0.10
Other Elements					
Aluminium	2634	mg/kg	0.41	57	
Iron	332441	mg/kg	52.19	7203	

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

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BONTGOCH WTW
BONTGOCH

SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	45286
Sample Number	79540

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

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

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

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

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BONTGOCH WTW
BONTGOCH

SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	45286
Sample Number	79540

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

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

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

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

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BONTGOCH WTW
BONTGOCH

SLUDGE

SLUDGE ANALYSIS RESULTS

Sample Reference :

LIQUID SLUDGE

Sample Matrix : SLUDGE

Laboratory References	
Report Number	45286
Sample Number	79540

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

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

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

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

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DŴR CYMRU - WELSH WATER

Bontgoch LQ

Analysis of Water Treatment Works Liquid

Application rate (t/ha)	**250**	Lab report no.
Application rate (t/acre)	**100.0**	
pH	**5.8**	
Dry solids (%)	**1.78**	
Organic Matter	**0.7**	

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(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)	176	mg/kg	0.18			
Phosphate (P_2O_5)			0.40	100.3	0.08	20.1
Potassium (K)	10	mg/kg	0.01			
Potash (K_2O)			0.01	3.0	0.00	0.6
Magnesium (Mg)	24.7	mg/kg	0.02			
Magnesium (MgO)			0.04	9.9	0.01	2.0
Sulphur (S)	59.8	mg/kg	0.06			
Sulphur (SO_3)			0.15	37.4	0.01	3.7

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(g/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	9.22	mg/kg	9.2	2.31	15.00
Copper	0.6	mg/kg	0.6	0.15	7.50
Nickel	1.23	mg/kg	1.2	0.31	3.00
Lead	0.82	mg/kg	0.8	0.21	15.00
Cadmium	0.04	mg/kg	0.0	0.01	0.15
Chromium	0.6	mg/kg	0.6	0.15	15.00
Mercury	0.05	mg/kg	0.1	0.01	0.10
Arsenic	0.5	mg/kg	0.5	0.13	0.70
Other Elements					
Aluminium	148	mg/kg	148.0	37.00	
Iron	6035	mg/kg	6035.0	1508.75	

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

Dŵr Cymru
Welsh Water

Sample Analysis Report

Sampling Point No -	79186	**Location -**	CEFN DRYSCOED WTW SLUDGE TANKE
Date Sampled -	14-May-18	**Time Taken -**	15:10
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 4179278
Sampler -	ETI3	**No Results -**	22
Type -	7HR COMPOSITE		

Sample Results

Code	Determinand Name	Units		Result	Limit
212	POTASSIUM (DRY WT)	MG/KG		12800	
238	Magnesium	MG/KG		500	
288	ALUMINIUM (DRY WT)	MG/KG		205	
357	ARSENIC (DRY WT)	MG/KG		45.1	
4620	pH	PH UNITS		6.9	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.96	
8241	LOSS ON IGNITION	%		58.3	
8939	TOT NIT AS N (SLDG)	MG/KG			
8941	TOT PHOS AS P (SLDG)	MG/KG			
9233	Ammoniacal nitrogen	MG/KG	LT	288	
9234	Sulphur	MG/KG		4470	
9271	Cadmium	MG/KG	LT	0.16	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG		10.9	
9275	Nickel	MG/KG	LT	5.1	
9276	LEAD TOTAL	MG/KG	LT	23.8	
9277	ZINC TOTAL	MG/KG		26.9	
9278	IRON TOTAL	MG/KG		4760	
9281	% Dry solids	%		2.11	
9282	% Minerals	%		41.7	
9284	% P (dry weight)	%	LT	0.00584	
9285	% N (dry weight)	%		0.91	

DŴR CYMRU - WELSH WATER

Cefn Dryscoed LQ

Analysis of Water Treatment Works Sludge

14/05/2018 417278

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.9**
Dry solids (%)	**2.1**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.91	%	0.19	48.00	0.006	1.5
Ammonium-N	288	mg/kg	0.01	1.52		
Phosphorus (P)	58.4	mg/kg	0.00			
Phosphate (P_2O_5)			0.00	0.7	0.001	0.1
Potassium (K)	12800	mg/kg	0.27			
Potash (K_2O)			0.33	81.7	0.065	16.3
Magnesium (Mg)	500	mg/kg	0.01			
Magnesium (MgO)			0.02	4.4	0.004	0.9
Sulphur (S)	4470	mg/kg	0.09			
Sulphur (SO_3)			0.24	58.9	0.024	5.9

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	26.9	mg/kg	0.00	0.14	15.00
Copper	10.9	mg/kg	0.00	0.06	7.50
Nickel	5.10	mg/kg	0.00	0.03	3.00
Lead	23.80	mg/kg	0.00	0.13	15.00
Cadmium	0.16	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	0.96	mg/kg	0.00	0.005	0.70
Mercury	45.1	mg/kg	0.00	0.24	0.10
Other Elements					
Aluminium	205	mg/kg	0.00	1	
Iron	4760	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 -	79114	**Location -**	CRAY WTW SLUDGE TANKERING POINT
Date Sampled -	14-May-18	**Time Taken -**	14:00
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 4179277
Sampler -	ETI3	**No Results -**	22
Type -	7HR COMPOSITE		

Sample Results

Code	Determinand Name	Units		Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT	87	
238	Magnesium	MG/KG		282	
288	ALUMINIUM (DRY WT)	MG/KG		2400	
357	ARSENIC (DRY WT)	MG/KG		38.6	
4620	pH	PH UNITS		6.3	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.98	
8241	LOSS ON IGNITION	%		36.5	
8939	TOT NIT AS N (SLDG)	MG/KG			
8941	TOT PHOS AS P (SLDG)	MG/KG			
9233	Ammoniacal nitrogen	MG/KG	LT	297	
9234	Sulphur	MG/KG		2320	
9271	Cadmium	MG/KG	LT	0.21	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG	LT	7.8	
9275	Nickel	MG/KG	LT	5.1	
9276	LEAD TOTAL	MG/KG	LT	24.4	
9277	ZINC TOTAL	MG/KG		82.2	
9278	IRON TOTAL	MG/KG		405000	
9281	% Dry solids	%		2.06	
9282	% Minerals	%		63.5	
9284	% P (dry weight)	%	LT	0.00584	
9285	% N (dry weight)	%		0.69	

DŴR CYMRU - WELSH WATER

Crai LQ

Analysis of Water Treatment Works Sludge

14/05/2018 4179277

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.3**
Dry solids (%)	**2.1**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.69	%	0.14	35.54	0.006	1.5
Ammonium-N	297	mg/kg	0.01	1.53		
Phosphorus (P)	58.4	mg/kg	0.00			
Phosphate (P_2O_5)			0.00	0.7	0.001	0.1
Potassium (K)	87	mg/kg	0.00			
Potash (K_2O)			0.00	0.5	0.000	0.1
Magnesium (Mg)	282	mg/kg	0.01			
Magnesium (MgO)			0.01	2.4	0.002	0.5
Sulphur (S)	2320	mg/kg	0.05			
Sulphur (SO_3)			0.12	29.9	0.012	3.0

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	82.2	mg/kg	0.00	0.42	15.00
Copper	7.8	mg/kg	0.00	0.04	7.50
Nickel	5.10	mg/kg	0.00	0.03	3.00
Lead	24.40	mg/kg	0.00	0.13	15.00
Cadmium	0.21	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	38.6	mg/kg	0.00	0.199	0.70
Mercury	0.98	mg/kg	0.00	0.01	0.10
Other Elements					
Aluminium	2400	mg/kg	0.05	12	
Iron	405000	mg/kg	8.34	2086	

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 -	340282	**Location -**	ELAN WTW SLUDGE TANKERING POINT
Date Sampled -	14-May-18	**Time Taken -**	17:05
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 4179281
Sampler -	ETI3	**No Results -**	22
Type -	7HR COMPOSITE		

Sample Results

Code	Determinand Name	Units		Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT	87	
238	Magnesium	MG/KG		507	
288	ALUMINIUM (DRY WT)	MG/KG		11000	
357	ARSENIC (DRY WT)	MG/KG		39.3	
4620	pH	PH UNITS		6.3	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.91	
8241	LOSS ON IGNITION	%		35.2	
8939	TOT NIT AS N (SLDG)	MG/KG			
8941	TOT PHOS AS P (SLDG)	MG/KG			
9233	Ammoniacal nitrogen	MG/KG	LT	276	
9234	Sulphur	MG/KG		2340	
9271	Cadmium	MG/KG	LT	0.2	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG	LT	7.8	
9275	Nickel	MG/KG	LT	5.1	
9276	LEAD TOTAL	MG/KG	LT	22.7	
9277	ZINC TOTAL	MG/KG		79.6	
9278	IRON TOTAL	MG/KG		371000	
9281	% Dry solids	%		2.21	
9282	% Minerals	%		64.8	
9284	% P (dry weight)	%	LT	0.00584	
9285	% N (dry weight)	%		0.68	

DŴR CYMRU - WELSH WATER

Elan LQ

Analysis of Water Treatment Works Sludge

14/05/2018 340282

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.3**
Dry solids (%)	**2.2**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.68	%	0.15	37.57	0.006	1.5
Ammonium-N	276	mg/kg	0.01	1.52		
Phosphorus (P)	58.4	mg/kg	0.00			
Phosphate (P_2O_5)			0.00	0.7	0.001	0.1
Potassium (K)	87	mg/kg	0.00			
Potash (K_2O)			0.00	0.6	0.000	0.1
Magnesium (Mg)	507	mg/kg	0.01			
Magnesium (MgO)			0.02	4.6	0.004	0.9
Sulphur (S)	2340	mg/kg	0.05			
Sulphur (SO_3)			0.13	32.3	0.013	3.2

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	79.6	mg/kg	0.00	0.44	15.00
Copper	7.8	mg/kg	0.00	0.04	7.50
Nickel	5.10	mg/kg	0.00	0.03	3.00
Lead	22.70	mg/kg	0.00	0.13	15.00
Cadmium	0.20	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	39.3	mg/kg	0.00	0.217	0.70
Mercury	0.91	mg/kg	0.00	0.01	0.10
Other Elements					
Aluminium	11000	mg/kg	0.24	61	
Iron	371000	mg/kg	8.20	2050	

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 -	303551	**Location -**	HIRWAUN WTW SLUDGE TANKERING PO
Date Sampled -	14-May-18	**Time Taken -**	11:15
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 4179276
Sampler -	ETI3	**No Results -**	22
Type -	7HR COMPOSITE		

Sample Results

Code	Determinand Name	Units		Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT	87	
238	Magnesium	MG/KG		476	
288	ALUMINIUM (DRY WT)	MG/KG		2560	
357	ARSENIC (DRY WT)	MG/KG		38.8	
4620	pH	PH UNITS		6.3	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.91	
8241	LOSS ON IGNITION	%		37	
8939	TOT NIT AS N (SLDG)	MG/KG			
8941	TOT PHOS AS P (SLDG)	MG/KG			
9233	Ammoniacal nitrogen	MG/KG	LT	274	
9234	Sulphur	MG/KG		2310	
9271	Cadmium	MG/KG	LT	0.11	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG	LT	7.8	
9275	Nickel	MG/KG	LT	5.1	
9276	LEAD TOTAL	MG/KG	LT	22.6	
9277	ZINC TOTAL	MG/KG		83.3	
9278	IRON TOTAL	MG/KG		425000	
9281	% Dry solids	%		2.22	
9282	% Minerals	%		63	
9284	% P (dry weight)	%	LT	0.00584	
9285	% N (dry weight)	%		0.77	

DŴR CYMRU - WELSH WATER

Hirwaun LQ

Analysis of Water Treatment Works Sludge

14/05/2018 303551

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.3**
Dry solids (%)	**2.2**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.77	%	0.17	42.74	0.006	1.5
Ammonium-N	274	mg/kg	0.01	1.52		
Phosphorus (P)	58.4	mg/kg	0.00			
Phosphate (P_2O_5)			0.00	0.7	0.001	0.1
Potassium (K)	87	mg/kg	0.00			
Potash (K_2O)			0.00	0.6	0.000	0.1
Magnesium (Mg)	476	mg/kg	0.01			
Magnesium (MgO)			0.02	4.4	0.004	0.9
Sulphur (S)	2310	mg/kg	0.05			
Sulphur (SO_3)			0.13	32.1	0.013	3.2

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	83.3	mg/kg	0.00	0.46	15.00
Copper	7.8	mg/kg	0.00	0.04	7.50
Nickel	5.10	mg/kg	0.00	0.03	3.00
Lead	22.60	mg/kg	0.00	0.13	15.00
Cadmium	0.11	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	38.8	mg/kg	0.00	0.215	0.70
Mercury	0.91	mg/kg	0.00	0.01	0.10
Other Elements					
Aluminium	2560	mg/kg	0.06	14	
Iron	425000	mg/kg	9.44	2359	

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 -	363244	**Location -**	TALYBONT WTW SLUDGE TANKERING P
Date Sampled -	14-May-18	**Time Taken -**	10:30
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 4179275
Sampler -	ETI3	**No Results -**	22
Type -	7HR COMPOSITE		

Sample Results

Code	Determinand Name	Units		Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT	87	
238	Magnesium	MG/KG		273	
288	ALUMINIUM (DRY WT)	MG/KG		160100	
357	ARSENIC (DRY WT)	MG/KG		45.8	
4620	pH	PH UNITS		6.8	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.98	
8241	LOSS ON IGNITION	%		58.6	
8939	TOT NIT AS N (SLDG)	MG/KG			
8941	TOT PHOS AS P (SLDG)	MG/KG			
9233	Ammoniacal nitrogen	MG/KG	LT	295	
9234	Sulphur	MG/KG		4690	
9271	Cadmium	MG/KG	LT	0.28	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG		12.6	
9275	Nickel	MG/KG	LT	5.1	
9276	LEAD TOTAL	MG/KG	LT	24.3	
9277	ZINC TOTAL	MG/KG		27.9	
9278	IRON TOTAL	MG/KG		4850	
9281	% Dry solids	%		2.07	
9282	% Minerals	%		41.4	
9284	% P (dry weight)	%	LT	0.00584	
9285	% N (dry weight)	%		0.92	

DŴR CYMRU - WELSH WATER

Talybont LQ

Analysis of Water Treatment Works Sludge

14/05/2018 4179275

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.8**
Dry solids (%)	**2.1**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.92	%	0.19	47.61	0.006	1.5
Ammonium-N	295	mg/kg	0.01	1.53		
Phosphorus (P)	58.4	mg/kg	0.00			
Phosphate (P_2O_5)			0.00	0.7	0.001	0.1
Potassium (K)	87	mg/kg	0.00			
Potash (K_2O)			0.00	0.5	0.000	0.1
Magnesium (Mg)	273	mg/kg	0.01			
Magnesium (MgO)			0.01	2.3	0.002	0.5
Sulphur (S)	4690	mg/kg	0.10			
Sulphur (SO_3)			0.24	60.7	0.024	6.1

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	27.9	mg/kg	0.00	0.14	15.00
Copper	12.6	mg/kg	0.00	0.07	7.50
Nickel	5.10	mg/kg	0.00	0.03	3.00
Lead	24.30	mg/kg	0.00	0.13	15.00
Cadmium	0.28	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	45.8	mg/kg	0.00	0.237	0.70
Mercury	0.98	mg/kg	0.00	0.01	0.10
Other Elements					
Aluminium	160100	mg/kg	3.31	829	
Iron	4850	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 -	48418	**Location -**	PORTIS WTW SLUDGE TANKERING POIN
Date Sampled -	14-May-18	**Time Taken -**	14:40
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 4179279
Sampler -	ETI3	**No Results -**	22
Type -	7HR COMPOSITE		

Sample Results

Code	Determinand Name	Units		Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT	87	
238	Magnesium	MG/KG		801	
288	ALUMINIUM (DRY WT)	MG/KG		2820	
357	ARSENIC (DRY WT)	MG/KG		42.7	
4620	pH	PH UNITS		6.6	
7774	WTW MERCURY TOTAL	MG/KG	LT	1.38	
8241	LOSS ON IGNITION	%		37.6	
8939	TOT NIT AS N (SLDG)	MG/KG			
8941	TOT PHOS AS P (SLDG)	MG/KG			
9233	Ammoniacal nitrogen	MG/KG	LT	416	
9234	Sulphur	MG/KG		2390	
9271	Cadmium	MG/KG	LT	0.12	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG	LT	7.8	
9275	Nickel	MG/KG		7.3	
9276	LEAD TOTAL	MG/KG	LT	34.5	
9277	ZINC TOTAL	MG/KG		92.7	
9278	IRON TOTAL	MG/KG		449000	
9281	% Dry solids	%		1.46	
9282	% Minerals	%		62.4	
9284	% P (dry weight)	%	LT	0.00584	
9285	% N (dry weight)	%		0.75	

DŴR CYMRU - WELSH WATER

Portis LQ

Analysis of Water Treatment Works Sludge

14/05/2018 4179279

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.6**
Dry solids (%)	**1.5**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.75	%	0.11	27.38	0.006	1.5
Ammonium-N	416	mg/kg	0.01	1.52		
Phosphorus (P)	58.4	mg/kg	0.00			
Phosphate (P_2O_5)			0.00	0.5	0.000	0.1
Potassium (K)	87	mg/kg	0.00			
Potash (K_2O)			0.00	0.4	0.000	0.1
Magnesium (Mg)	801	mg/kg	0.01			
Magnesium (MgO)			0.02	4.9	0.004	1.0
Sulphur (S)	2390	mg/kg	0.03			
Sulphur (SO_3)			0.09	21.8	0.009	2.2

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	92.7	mg/kg	0.00	0.34	15.00
Copper	7.8	mg/kg	0.00	0.03	7.50
Nickel	7.30	mg/kg	0.00	0.03	3.00
Lead	34.50	mg/kg	0.00	0.13	15.00
Cadmium	0.12	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	42.7	mg/kg	0.00	0.156	0.70
Mercury	1.38	mg/kg	0.00	0.01	0.10
Other Elements					
Aluminium	2820	mg/kg	0.04	10	
Iron	449000	mg/kg	6.56	1639	

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
LLYSWEN V CL SLUDGE TANK

Sample Analysis Report

Sampling Point No -	360173	**Location -**	LLYSWEN WTW SLUDGE TANKERING POI
Date Sampled -	14-May-18	**Time Taken -**	07:35
Originator -	SEWAGE	**Purpose -**	EQO/DIRECTIVE COMPLIANCE
Laboratory -	GLASLYN	**Lab Ref No -**	S 4179273
Sampler -	ETI3	**No Results -**	22
Type -	7HR COMPOSITE		

Sample Results

Code	Determinand Name	Units		Result	Limit
212	POTASSIUM (DRY WT)	MG/KG	LT	87	
238	Magnesium	MG/KG		77	
288	ALUMINIUM (DRY WT)	MG/KG		161700	
357	ARSENIC (DRY WT)	MG/KG		43.4	
4620	pH	PH UNITS		6.6	
7774	WTW MERCURY TOTAL	MG/KG	LT	0.91	
8241	LOSS ON IGNITION	%		52.2	
8939	TOT NIT AS N (SLDG)	MG/KG			
8941	TOT PHOS AS P (SLDG)	MG/KG			
9233	Ammoniacal nitrogen	MG/KG	LT	277	
9234	Sulphur	MG/KG		4740	
9271	Cadmium	MG/KG	LT	0.25	
9272	CHROMIUM TOTAL	MG/KG	LT	4.3	
9273	Copper	MG/KG		14.3	
9275	Nickel	MG/KG	LT	5.1	
9276	LEAD TOTAL	MG/KG	LT	22.5	
9277	ZINC TOTAL	MG/KG		32.1	
9278	IRON TOTAL	MG/KG		4960	
9281	% Dry solids	%		2.21	
9282	% Minerals	%		47.8	
9284	% P (dry weight)	%	LT	0.00584	
9285	% N (dry weight)	%		0.89	

DŴR CYMRU - WELSH WATER

Portis LQ

Analysis of Water Treatment Works Sludge

14/05/2018 360173

Application rate (t/ha)	**250**
Application rate (t/acre)	**100.0**
pH	**6.6**
Dry solids (%)	**2.2**

NUTRIENT CONTENT

			Total		Available	
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/tonne)**	**(kg/ha)**
Nitrogen (N)	0.89	%	0.20	49.17	0.006	1.5
Ammonium-N	277	mg/kg	0.01	1.53		
Phosphorus (P)	58.4	mg/kg	0.00			
Phosphate (P_2O_5)			0.00	0.7	0.001	0.1
Potassium (K)	87	mg/kg	0.00			
Potash (K_2O)			0.00	0.6	0.000	0.1
Magnesium (Mg)	77	mg/kg	0.00			
Magnesium (MgO)			0.00	0.7	0.001	0.1
Sulphur (S)	4740	mg/kg	0.10			
Sulphur (SO_3)			0.26	65.5	0.026	6.5

POTENTIALLY TOXIC ELEMENTS

			Rate		Limit
TOTALS	**result**	**units**	**(kg/tonne)**	**(kg/ha)**	**(kg/ha/yr)**
Zinc	32.1	mg/kg	0.00	0.18	15.00
Copper	14.3	mg/kg	0.00	0.08	7.50
Nickel	5.10	mg/kg	0.00	0.03	3.00
Lead	22.50	mg/kg	0.00	0.12	15.00
Cadmium	0.25	mg/kg	0.00	0.00	0.15
Chromium	4.3	mg/kg	0.00	0.02	15.00
Arsenic	43.4	mg/kg	0.00	0.240	0.70
Mercury	0.91	mg/kg	0.00	0.01	0.10
Other Elements					
Aluminium	161700	mg/kg	3.57	893	
Iron	4960	mg/kg	0.11	27	

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

Report Number	**16516-16**	**F916**	**JOHN LEWIS**	**Client**	**NOYADD FARM**
Date Received	**04-MAY-2016**		**ECOGANIX LTD**		
Date Reported	**10-MAY-2016**		**25 CEFNESGAIR**		
Project	**CWV0019**		**LLANBADARN FAWR**		
Reference	**NOYADD FARM**		**ABERYSTWYTH**		
Order Number	**CWV0019**		**SY23 3JG**		

Laboratory Reference		**SOIL303889**	**SOIL303890**	**SOIL303891**	**SOIL303892**	**SOIL303893**	**SOIL303894**
Sample Reference		**26**	**27**	**28**	**29**	**30**	**31**
Determinand	**Unit**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**
pH water [1:2.5]		5.7	6.2	6.3	5.8	5.8	6.7
Available Phosphorus (Index)	mg/l	9.6 (1)	7.4 (0)	8.6 (0)	8.2 (0)	8.0 (0)	15.4 (1)
Available Potassium (Index)	mg/l	60.9 (1)	61.3 (1)	42.7 (0)	38.7 (0)	26.6 (0)	24.1 (0)
Available Magnesium (Index)	mg/l	55.9 (2)	56.8 (2)	49.2 (1)	71.3 (2)	59.0 (2)	58.0 (2)
Conductivity Sat CaSO4	uS/cm	1951	1933	1933	1941	1951	1925
Organic Matter LOI	% w/w	8.2	10.0	9.9	6.0	5.1	10.3
Total Copper	mg/kg	20.6	17.3	17.1	20.7	20.6	18.2
Total Zinc	mg/kg	129	129	116	161	144	171
Total Lead	mg/kg	36.3	37.3	33.8	39.5	32.9	45.8
Total Cadmium	mg/kg	0.21	0.38	0.25	0.40	0.28	0.64
Total Nickel	mg/kg	33.9	28.2	26.6	39.3	40.1	31.1
Total Chromium	mg/kg	42.9	36.8	34.5	41.6	43.7	39.4
Total Mercury	mg/kg	0.03	0.05	0.04	<0.02	0.03	0.05
Total Sulphur	mg/kg	434	561	542	255	230	405

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.

ANALYTICAL NOTES

Report Number	**16516-16**	**F916**	**JOHN LEWIS**	**Client NOYADD FARM**
Date Received	**04-MAY-2016**		**ECOGANIX LTD**	
Date Reported	**10-MAY-2016**		**25 CEFNESGAIR**	
Project	**CWV0019**		**LLANBADARN FAWR**	
Reference	**NOYADD FARM**		**ABERYSTWYTH**	
Order Number	**CWV0019**		**SY23 3JG**	

Notes

Reported by

J Doyle

Natural Resource Management, a trading division of Cawood Scientific Ltd.
Coopers Bridge, Braziers Lane, Bracknell, Berkshire, RG42 6NS
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ANALYTICAL REPORT

Report Number	**16517-16**	**F916**	**JOHN LEWIS**	**Client**	**NOYADD FARM**
Date Received	**04-MAY-2016**		**ECOGANIX LTD**		
Date Reported	**10-MAY-2016**		**25 CEFNESGAIR**		
Project	**CWV0019**		**LLANBADARN FAWR**		
Reference	**NOYADD FARM**		**ABERYSTWYTH**		
Order Number	**CWV0019**		**SY23 3JG**		

Laboratory Reference		SOIL303895	SOIL303896	SOIL303897	SOIL303898	SOIL303899	SOIL303900	SOIL303901	SOIL303902		
Sample Reference		32	33	34	35	36	37	38	39		
Determinand	**Unit**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**	**SOIL**		
pH water [1:2.5]		5.9	6.0	5.9	5.9	5.7	5.2	5.6	5.4		
Available Phosphorus (Index)	mg/l	11.4 (1)	11.2 (1)	13.2 (1)	9.6 (1)	7.4 (0)	9.4 (0)	10.8 (1)	10.4 (1)		
Available Potassium (Index)	mg/l	77.0 (1)	74.1 (1)	53.2 (0)	50.3 (0)	119 (1)	62.8 (1)	73.3 (1)	88.6 (1)		
Available Magnesium (Index)	mg/l	82.4 (2)	74.7 (2)	91.3 (2)	66.1 (2)	64.2 (2)	36.8 (1)	56.6 (2)	60.9 (2)		
Conductivity Sat CaSO4	uS/cm	1916	1942	1934	1908	1926	1933	1915	1895		
Organic Matter LOI	% w/w	11.6	10.5	11.5	12.0	11.1	10.3	10.6	10.1		
Total Copper	mg/kg	16.8	16.7	22.4	22.1	20.6	20.9	21.3	20.4		
Total Zinc	mg/kg	113	111	131	120	140	137	132	129		
Total Lead	mg/kg	38.7	42.1	46.8	37.5	45.4	37.1	37.4	34.3		
Total Cadmium	mg/kg	0.30	0.29	0.31	0.22	0.37	0.39	0.32	0.30		
Total Nickel	mg/kg	24.7	23.8	27.7	27.3	30.9	27.3	30.4	31.3		
Total Chromium	mg/kg	39.6	40.1	40.8	36.5	43.5	34.6	39.7	40.5		
Total Mercury	mg/kg	0.05	0.07	0.07	0.06	0.08	0.04	0.06	0.05		
Total Sulphur	mg/kg	483	492	541	590	571	542	568	502		

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.

ANALYTICAL NOTES

Report Number	**16517-16**	**F916**	**JOHN LEWIS**	**Client NOYADD FARM**
Date Received	**04-MAY-2016**		**ECOGANIX LTD**	
Date Reported	**10-MAY-2016**		**25 CEFNESGAIR**	
Project	**CWV0019**		**LLANBADARN FAWR**	
Reference	**NOYADD FARM**		**ABERYSTWYTH**	
Order Number	**CWV0019**		**SY23 3JG**	

Notes

Reported by

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Risk Assessment

Risk assessment for land spreading activity at Noyadd Farm, Rhayader, Powys.

Risk assessment carried out by Mr A Stone. Reviewed January 2019.

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
Surface water – ditches, watercourses and ponds	Nutrients, aluminium, and organic matter	Surface water pollution	Surface run-off	Medium	High	Medium	Proximity of ditches and under drainage. Low pollution potential of material.	Comply with 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, PTE's	Groundwater pollution	In appropriate application.	Medium	Medium	Low	WTW Sludge has very low concentrations of PTE's. and nutrients. Aluminium insoluble. Rate and timing of application as per PQA.	Comply with Water Code NVZ, EPR and Sludge Regs. Follow PQA.	Low
Soils	Physical damage to soil structure	Damage to soil structure and poor subsequent crop yields	Delivery and spreading activity	Low	Medium to high	Low	Delivery and spreading to be undertaken when e ground conditions are suitable.	Comply with Soil Code and Cross Compliance Criteria. Apply only in suitable conditions. Follow PQA.	Low
Soils	Nutrients, Aluminium, and PTE's	Build up of nutrients. and/or PTE's	Spreading activity	High	Medium to high	Low	WTW sludge analysis. Soil analysis. Appropriate rates of application.	Apply per PQA, RB209 and Soil Code.	Low

Risk Assessment continued

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
Local human population and wildlife	Spreading activities – physical	Harm to humans or animals	Trespass, accidental contact	Low	Medium	Low	Agricultural areas with limited public access. Minimum 3 week non-utilisation period.	Application during appropriate conditions and awareness of access issues.	Low
Local human population	Odour during spreading activity	Odour issues/complaints	Airborne compounds	Low	Low	Low	WTW sludge has no odour.	Comply with Air Code.	Low
Local human population	Releases of airborne dusts/ particulate matter	Harm to human health - respiratory irritation and illness.	Air transport then inhalation	Low	Medium	Low	Waste has a low potential to produce airborne dust and particulate matter.	Waste will be applied in accordance with CoGAP and EMS.	Low
Local human population	As above	Nuisance dust on cars, clothing etc.	Deposition from air	Low	Low	Low	As above	As above	Low
Local human population	Emissions; litter	Nuisance loss of amenity and harm to pet health	Transport through air	Low	Low	Low	Waste does not contain litter as it derives from a controlled manufacturing process.	Waste will be applied per Codes of Good Agricultural Practice and SR2010No4 EMS.	Low
Local human population	Noise	Noise complaints	Noise from delivery, and spreading	Low	Low to Medium	Low	Agricultural machinery in agricultural areas.	Avoid sensitive spreading periods e.g. e.g. bank holidays and weekends. Delivery during daylight hours.	Low
Local human population	Pests (e.g. flies)	Harm to human health, nuisance, loss of amenity	Air transport and over land	Low	Low	Low	WTW sludge does not attract scavenging animals and flies.	WTW sludge will be stored, transported and spread in accordance with conditions set in SR2010No4 permit, CoGAP and Duty of Care.	Low

Risk Assessment continued

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
Local human population and local environment	Emissions; litter and mud on local roads	Nuisance, loss of amenity, risk of accident	Vehicles entering and leaving site	Medium	Medium	Medium	Road safety. Tractors/ spreaders trailing mud and debris from fields.	Operation will not cause any additional effects on surrounding roads than normal agricultural practice occurring in the surrounding area. Application of waste will condition the soil and improve workability, which reduces environmental impact associated with spreading.	Low
Hedgerows and trees	Physical damage from spreading equipment	Ecological & landscape	Physical damage from spreading equipment	Low	Low	Low	Professional contractors employed instructed to take care around trees.	Leave a 2.0m, minimum buffer zone adjacent to trees and hedgerows.	Low
SSSI River Wye upper tributaries,	Nutrients PTE's Aluminium	Ecological Protection of habitat, flora and fauna	Spreading activity	Medium	High	Medium	Low pollution potential of material. Proximity of SSSI	Leave 20m non-spreading area in fields 26, 27, 29, 30, and 36 where protected sites are adjacent. to the River Wye tributaries Comply with Water Code, NVZ, Cross Compliance, Sludge Regs and EPR. Follow PQA.	Low

Data				Judgement				Action	
Receptor What is at risk? What do I wish to protect?	*Source* The agent or process with potential to cause harm	*Harm* The harmful consequences if things go wrong	*Pathway* How the receptor might come into contact with the source	*Probability of exposure* How likely is this contact?	*Consequence* Severity of the consequences if this occurs	*Magnitude of risk* The overall magnitude of the risk	*Justification for magnitude* Basis of my judgement	*Risk management* How I can best manage the risk to reduce the magnitude	*Residual risk* Magnitude of the risk after management
SAC River Wye upper tributaries,	Nutrients PTE's Aluminium	Ecological Protection of habitat, flora and fauna	Spreading activity	Medium	High	Medium	Low pollution potential of material. Proximity of SSSI	Leave 20m non-spreading area in fields 26, 27, 29, 30, and 36 where protected sites are adjacent. to the River wye tributaries Comply with Water Code, NVZ, Cross Compliance, Sludge Regs and EPR. Follow PQA.	Low
SSSI Coed y Cefn, (sessile oak woodland)	Nutrients PTE's Aluminium	Ecological Protection of habitat, flora and fauna	Spreading activity	Medium	Medium	Low	Low pollution potential of material. Proximity of SSSI	No mitigation measures for oak woodland as 60 m from nearest field and fields are at a lower height than the SSSI	Low
SSSI New House Meadow, (herb rich grassland)	Nutrients PTE's Aluminium	Ecological Protection of habitat, flora and fauna	Spreading activity	Medium	Medium	Low	Low pollution potential of material. Proximity of SSSI	No mitigation measures as meadow is 450 m from nearest field	Low
SSSI Carn Gafallt (upland - semi natural woodland and moorland)	Nutrients PTE's Aluminium	Ecological Protection of habitat, flora and fauna	Spreading activity	Medium	Medium	Low	Low pollution potential of material. Proximity of SSSI	No mitigation measures as site is 400 m from nearest field	Low

This is to certify that

Ian Holden

Has successfully completed

Recycling Waste to Land Training

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

At: 4R Newent Office

Date: 17/05/16

Trainer's Name: Dr Paul Gibbs

Training Organisation: In-House

Renewal Date: Ongoing

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