Cyfoeth Naturiol Cymru
Natural Resources Wales

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

Natural Resources Wales
Fully Received
25 JAN 2019
Cardiff

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: FB3606GC

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): Agrispread Ltd

Title: Mr

First name: R & R

Last name: Piggott

Address: 22 Coniston Drive

	Frodsham
	Frodsham
	Cheshire
Postcode	WA6 7LR
Telephone - mobile	
Telephone - office	01978 661866
Email address	agrispreadltd@gmail.com

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

Document reference	

3 Contact details

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

Title	Mr	
First name	Richard	
Last name	Street	
Telephone - mobile		
Telephone - office	01978 661866	
Email address	agrispreadltd@gmail.com	

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	Richard	
Last name	Street	
Telephone - mobile		

Telephone - office	01978 661866
Email address	agrispreadltd@gmail.com

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	03 03 11	Liquid from on-site effluent plant	Liquid	**Ahlstrom Chirnside**	1300
2					
3					
4					
5					
6					
7					
8					
9					
10					
				Total tonnage	1300

4g About the land you want to treat

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

Address	Honkley Farm
	Burton
	Rossett
	Wrexham
Postcode	LL12 0AP
National grid reference (12 digit)	SJ 34266 59130

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

Agricultural land ☒ Please give your County/ Parish/ Holding number 56/010/00022

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	**Table 3 – Fields details (17 Fields)**			
2				
3				
4				
5				
6				
7				
8				
9				
10				
			Total hectares	50

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	Richard	

Last name	Knowles
Address	Honkley Farm
	Burton
	Rossett
	Wrexham
Postcode	LL12 0AP
Telephone - mobile	0770 331 3964
Telephone - office	
Email address	

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

Document reference

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

Yes ☒ *Go to section 4k*

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

Explanation

4k Previous land treatment

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

No ☐ *Go to section 4l*

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

Table 4 – previous land treatment

	Field name/ number/ reference	**Describe the waste spread** (in last 12 months)	**Person/ company who spread the waste**	**Quantity spread per hectare** (in tonnes)	**Deployment/ other reference** (if known)
e.g.	East field	Digested sewage sludge cake	Eastern Waters	20	PAN 000000
1	Table 4 Previous Nutrients (17 Fields)	FYM			

2					
3					
4					
5					
6					
7					
8					
9					
10					

4l Waste storage

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

No X *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				
2				
3				
4				
5				
6				
7				
8				
9				
10				

5 Payment

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

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

5b Paying by electronic transfer

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

Company name:	Natural Resources Wales
Company address:	Income Dept., PO BOX 663, Cardiff, CF24 0TP
Bank:	RBS
Address:	National Westminster Bank Plc, 2 ½ Devonshire Square, London, EC2M 4BA
Sort code:	60-70-80
Account number:	10014438

Reference number

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

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

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

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

BACS reference

Amount paid

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 779

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)	☒	Appendix A – Site Map
Benefit statement (required for all deployments)	☒	Appendix E – Benefit Statement
Waste analysis (required for all deployments)	☒	Appendix C – Waste Analysis
Receiving soil analysis (required for all deployments)	☒	Appendix B – Soil Analysis
Site-specific risk assessment (in accordance with 4e)	☐	
Any other additional information	N/A	
	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	Richard	
Last name	Street	
On behalf of (if relevant)		

Today's date (DD/MM/YYYY)	15/01/2019

Agrispread Ltd
22 Coniston Drive
Frodsham
Cheshire
WA6 7LR

Natural Resources Wales
29 Newport Road
Ty Cambria
Cardiff
CF24 0TP

5th August 2017

To whom it may concern

Re: Deployment Applications declarations

I write to confirm that Richard Street of Trade Effluent Services Ltd is authorised to complete deployment applications and sign declarations on behalf of Agrispread Ltd.

Yours sincerely,

Robert Netzband-Piggott
Company Secretary

Certificate No. OCC67391

Operator Competence Certificate

Title:

Mobile Plant for land spreading (land treatment resulting in benefit) (4MTMPL6)

This Certificate is awarded to

Richard George Street

Awarded: 21/12/2016

Authorised

WAMITAB Chief Executive Officer

CIWM Chief Executive Officer

The Chartered Institution of Wastes Management

This certificate is jointly awarded by WAMITAB and the Chartered Institution of Wastes Management (CIWM) and provides evidence to meet the Operator Competence requirements of the Environmental Permitting (EP) Regulations, which came into force on 6 April 2008.

00123142

Agricultural Benefit Statement

Report Index

1. Permit Details and Appropriate Technical Expertise

The following benefit statement has been written by Richard Street on behalf of Agrispread Ltd. (permit no. FB3606GC/A001).

Relevant Qualifications & Experience include:

- FACTs Qualified – Basis registration no. R/FE/5689
- 8 Years' experience of waste to land recycling operations
- Land spreading of non-farm wastes course (3 day course – May 2010)
- BSc. (Hons) Environmental Management (University of Central Lancashire)

2. Land Details

The following benefit statement proposes to spread Ahlstrom Black Liquor to land. The land details are listed in Table 1, and the site map can be found in Figure 1.

Table 1: Farm and Land Details

Farm Name	Honkley Farm
Farm Address and Postcode	Burton, Rossett, Wrexham, LL12 0AP
Total Area to be Spread (hectares)	50

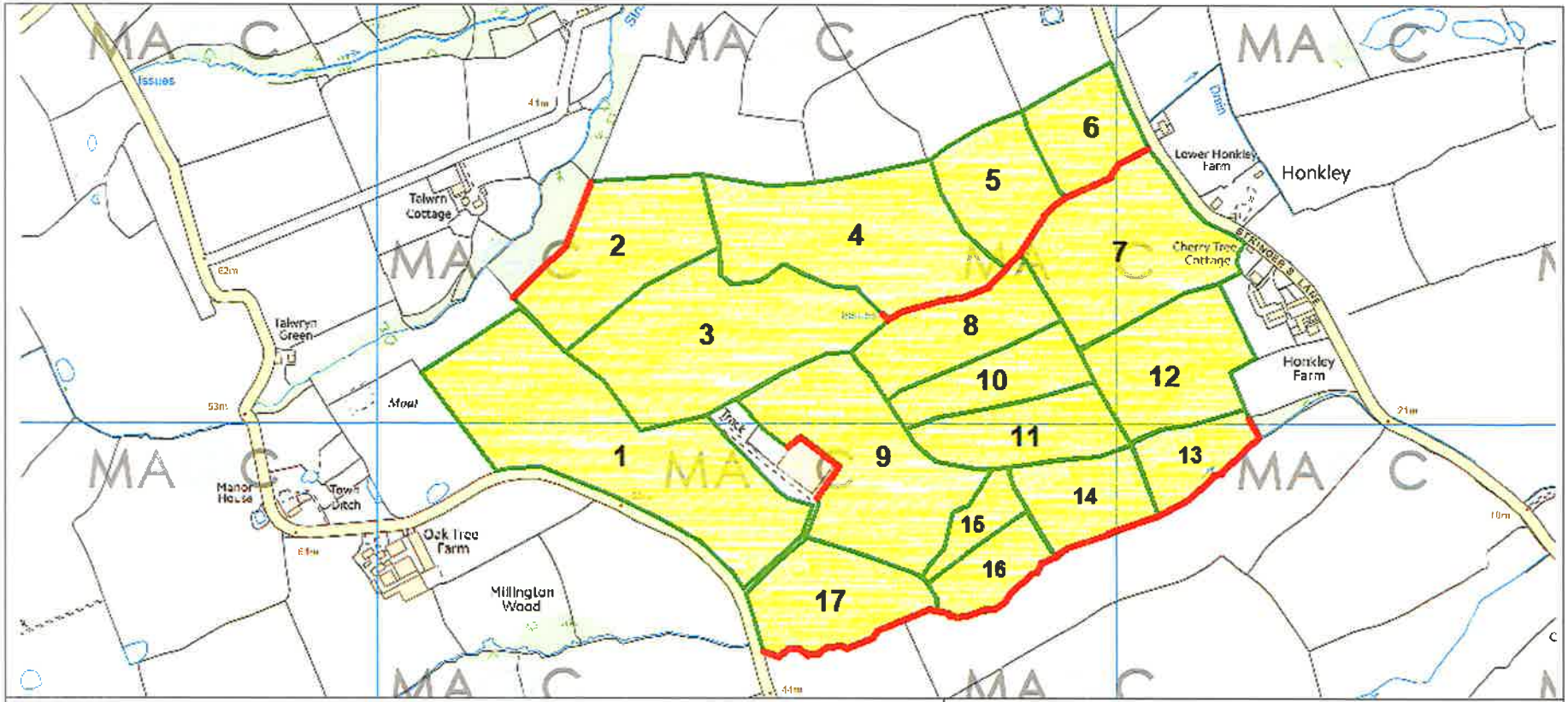

Figure 1a: Site map including the fields to spread, receptors, and spreading control measures

3. Waste Details

The waste details of Ahlstrom Black Liquor are displayed in Table 2.

Table 2: Waste Details

Waste Producer	Ahlstrom Chirnside Limited
Address of Waste Producer	Mt Sion Works, Mount Sion Rd, Radcliffe, Manchester, M26 3SB
EWC Code	03 03 11
Waste Description	Produced as a by-product of cellulose fibre extraction (sludge from on-site ETP other than 03 03 10)

Ahlstrom Black Liquor contains moderate levels of sulphur and potash, and trace levels of magnesium, phosphate and nitrogen. The waste has been analysed by NRM laboratories in September 2018 for nitrogen, phosphorous, potash, PTE's and other analysis such as FOGs and water soluble sulphur, and the waste analysis, and a waste evaluation, is attached in Appendix D.

4. Operational Details

The Ahlstrom will be delivered to the site by road tanker and off-loaded. The black liquor will be surface applied by umbilical supplied tractor mounted spreader bar or splash plate to reduce the risk of compaction across fields caused by the travelling weight, and due to the low application rate. In order to reduce the risk of crop scorch, applications of the liquor may be split, especially if spreading occurs during the summer months.

It is intended to spread Ahlstrom to arable fields before seedbed preparation. For this application, the waste is expected to be applied to all fields in March 2019 and while the grass leaf is short or after cuts of silage in early summer 2019. However, this may change due to farmer requirements and weather conditions.

5. Fields and Crop Requirement

Ahlstrom will be applied to all fields and so the crop requirements for all fields, as well as the field sizes and grid references, are displayed in Table 3. Fertiliser requirements are based on figures from the RB209 (9th edition). The magnesium recommendation for all fields is 0 kg/ha.

Table 3: Field Details and Crop Requirements (* denotes crop offtake)

Field	Size	Grid Reference	Current Crop	Next Crop	SNS	Expected Yield	Nitrogen	Phosphate	Potash
	ha					t/ha	kg/ha	kg/ha	kg/ha
1	7.4	SJ 3330 5896	Grass	2 Cut silage & grazing	Moderate	38	260	20	170
2	3.4	SJ 3332 5923	Grass	2 Cut silage & grazing	Moderate	38	260	0 ***Off take 64**	170
3	4.2	SJ 3344 5911	Grass	2 Cut silage & grazing	Moderate	38	260	20	120
4	5.3	SJ 3363 5925	Maize	Maize	1	40	100	0 ***Off take 56**	175
5	2.2	SJ 3383 5933	Grass	2 Cut silage & grazing	Moderate	38	260	0 ***Off take 64**	170
6	1.8	SJ 3396 5938	Grass	2 Cut silage & grazing	Moderate	38	260	20	210
7	4.3	SJ 3401 5923	Grass	2 Cut silage & grazing	Moderate	38	260	0 ***Off take 64**	210
8	2.3	SJ 3378 5911	Grass	2 Cut silage & grazing	Moderate	38	260	20	120
9	4.8	SJ 3366 5893	Grass	2 Cut silage & grazing	Moderate	38	260	20	210
10	1.7	SJ 3383 5905	Grass	2 Cut silage & grazing	Moderate	38	260	20	170
11	2.2	SJ 3388 5899	Grass	2 Cut silage & grazing	Moderate	38	260	20	0 ***228**
12	3.1	SJ 3407 5907	Grass	2 Cut silage & grazing	Moderate	38	260	0 ***Off take 64**	0 *228
13	1.3	SJ 3410 5895	Grass	2 Cut silage & grazing	Moderate	38	260	65	120
14	1.7	SJ 3395 5890	Grass	2 Cut silage & grazing	Moderate	38	260	65	120
15	0.8	SJ 3381 5886	Maize	Maize	1	40	100	20	110
16	1.1	SJ 3383 5880	Maize	Maize	1	40	100	00 ***Off take 56**	145
17	2.4	SJ 3361 5877	Maize	Maize	1	40	100	20	110
Total	**50**		***Off take Values**						

6. NVZ Compliance

The site falls within an NVZ designated area, which is illustrated in Figure 2. All fields to be spread are within an NVZ designated area, the remaining are outside an NVZ designated area. The waste does not apply for the closed periods as Ahlstrom contains trace levels of nitrogen. The application rate of Ahlstrom will comply with crop requirement as no more than crop offtake of all nutrients will be applied to fields. In order to aid the landowner or farmer with their recording requirements, a post-notification of nutrients applied will be provided after spreading.

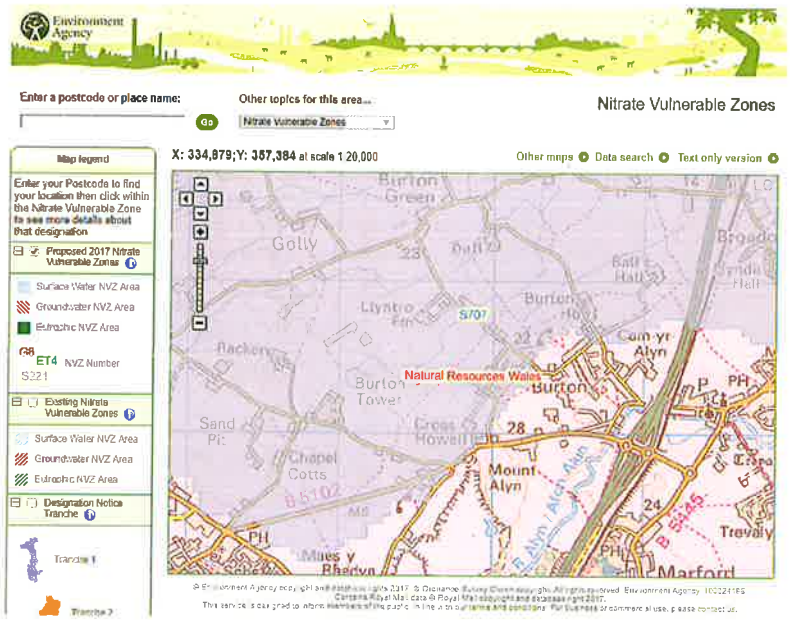

Figure 2: NVZ map for the land to be spread produced from the 'What's in my backyard' mapping service on the EA website (www.environment-agency.gov.uk).

Application rates are limited to a maximum of 250 kg total N/ha, and any other organic waste or manure applications have been accounted for. Previous nutrients applied to the fields within the last 12 months are listed in Table 4. The nutrients in Table 4 are total applied, and the availability of each can be taken from the standard figures in the RB209 (9th edition, section 2).

Table 4: Previous Nutrients Applied

Field	Waste Applied	Month Applied	Application Rate	Nitrogen	Phosphate	Potash
			t/ha	kg/ha	kg/ha	kg/ha
1	FYM	April 2018	3	18.0	9.6	28.2
2	FYM	April 2018	3	18.0	9.6	28.2
3	FYM	April 2018	3	18.0	9.6	28.2
4	FYM	March 2018	10	30	16	47
5	FYM	April 2018	3	18.0	9.6	28.2
6	FYM	April 2018	3	18.0	9.6	28.2
7	FYM	April 2018	3	18.0	9.6	28.2
8	FYM	April 2018	3	18.0	9.6	28.2
9	FYM	April 2018	3	18.0	9.6	28.2
10	FYM	April 2018	3	18.0	9.6	28.2
11	FYM	April 2018	3	18.0	9.6	28.2
12	FYM	April 2018	3	18.0	9.6	28.2
13	FYM	April 2018	3	18.0	9.6	28.2
14	FYM	April 2018	3	18.0	9.6	28.2
15	FYM	March 2018	10	30	16	47
16	FYM	March 2018	10	30	16	47
17	FYM	March 2018	10	30	16	47

7. Benefits of The Operation

The Ahlstrom will be used to provide plant nutrients that will replace a percentage of the fertiliser that the farmer would normally apply to their crop. The waste will primarily be used as an alternative to potash fertiliser. The liquor will also provide benefit through the addition of organic matter and trace elements. A full waste assessment is attached in Appendix D, and a summary of Ahlstrom can be found in Table 5.

Table 5: Summary of Ahlstrom Nutrients and Application Rate

Waste	Application Rate	Nitrogen		Phosphate		Potash	
	t/ha	(total)	(available) 35%	(total)	(available) 50%	(total)	(available) 90%
Ahlstrom	26	10	3.5	0.1	0.05	100	90

Nitrogen

The waste analysis shows that the ammoniacal and nitrate nitrogen in the waste is relatively low; indicating that only a small proportion of nitrogen will be available immediately. The remaining total nitrogen applied will become available to the crop through mineralisation

throughout following seasons. The rate of nitrogen release will be affected by several factors including climate, timing and method of application, and soil type.

Phosphorus

Ahlstrom contains trace levels of phosphorus, and at the proposed application rate of 26t/ha will apply trace amounts of phosphate (<1kg/ha). The landowner/farmer should look to reduce the P index, for fields with P indexes of 3 & 4, over the coming seasons.

Potash

The waste applied will not meet the crop requirements for potash for any fields but it will allow the landowner/farmer to considerably reduce the amount of chemical fertiliser required to meet the crop need. The application of Ahlstrom at 26 t/ha will provide nutrients at or below crop requirement or offtake, and will not result in an increase in soil nutrient reserves.

Organic Matter

The Ahlstrom waste will also provide a small increase in soil organic matter. This can help to improve soil structure and water, and nutrient holding capacity.

Soils

Additionally, full soil analysis of the proposed fields to be spread has been attached in Appendix C, and a summary table has been included in Table 6.

Table 6: Summary of soil pH and major nutrients for the fields to be spread

Field	Soil pH	Phosphate		Potash		Magnesium	
		mg/l	Index	mg/l	Index	mg/l	Index
1	7.7	32.8	3	139	2-	135	3
2	7.7	52.8	4	123	2-	59.7	2
3	6.9	35.8	3	203	2+	144	3
4	7.4	47.8	4	178	2-	172	3
5	8.0	47.4	4	131	2-	59.3	2
6	6.5	41.8	3	68.5	1	52.3	2
7	6.3	51.2	4	105	1	55.2	2
8	6.9	43.8	3	215	2+	54.2	2
9	8.1	39	3	106	1	67.8	2
10	7.3	32.6	3	133	2-	190	4
11	5.5	28.4	3	544	4	87.9	2
12	8.0	52.2	4	570	4	130	3
13	7.3	24.4	2	225	2+	105	3
14	6.0	25.2	2	221	2+	104	3
15	7.4	27.8	3	261	3	71.1	2
16	7.0	81	5	199	2+	159	3
17	6.6	40	3	320	3	149	3

The soils were sampled in May 2018 in accordance with the sampling procedures described in the RB209 (9th Edition). Analysis was carried out by NRM laboratories for pH, major plant nutrients, and potentially toxic elements (PTEs) described in the Sludge (Use in Agriculture) Regulations.

Soils were found to be Medium loam soil type categorised in accordance with RB209 (9th edition) as mineral soils for crop recommendations.

Soil pH ranges from 6.0 and 8.1, and are generally at or around the target value, although it shouldn't affect crop performance. Soil P index's range from 2 to 5, and the soils are generally above the guideline target index of 2. Soil K levels ranged from index 1 to 4 and are generally above the target index level of 2-. The magnesium index for all fields was satisfactory. PTE concentrations for all fields is low and within the typical range of uncontaminated soil.

8. Potential Negative Impacts

There are no known, or expected, elevated levels of PTEs within the Ahlstrom waste. However, the waste does contains high levels of sodium and sulphur, and justification in this regard is explained in this section. Additionally, a report by '*4Recycling*' prepared for '*Northern Disposal Services*' on the '*Assessment of suitable application rates for the recycling of Ahlstrom Black Liquor to agricultural soils*' has been appended in Appendix E, which further details the sulphur and sodium content.

Sulphur

The sulphur will be less likely to leach as it will be bound to the organic matter in the soil as the soil type is medium loam. This is because the majority of the sulphur present is in the form of lignosulphates, which are organically bound to the soil. These are stable compounds that promote soil aggregation and thus have been used as soil conditioners.

The levels of sulphur will be monitored over the coming seasons to ensure that a continued build-up of sulphur will not have a detrimental impact on the environment. The fields are relatively flat with drainage and at 26t/ha, a total of 814kg of sulphur will have been applied per field.

Sodium

The Ahlstrom analysis has an elevated conductivity caused by the presence of soluble salts, in particular sodium. If applied in very dry soil conditions, particularly on light textured soils, this might lead to a risk of temporary scorch, in particular grass, and might affect germination of small seeded crops. Therefore, care will be taken to ensure that Ahlstrom is applied to short, cut or grazed grass and to soils that aren't too dry or light textured.

This will be mitigated by the soil types at this farm which are of medium loams and the high rainfall in this area (<700mm/yr). Previous detailed plant growth trials using this waste have shown that electrical conductivity of the soil will return to normal after a period of 10-12 weeks of application and that conductivity or soil structural instability is unlikely to be an issue when applying this waste at 26t/ha.

Site Hazards

Hazards have been identified on the site plan in Figure 1 and relevant control measures and buffer zones have been identified. Operations are to be carried out in accordance with the company generic risk assessment for landspreading, which will reduce the impacts of the operation on the receiving soil.

Odour and Noise Control

The waste has the potential to cause odour however storage will be sited away from dwellings and it is unlikely to cause nuisance odour issues. The operation will be carried out in accordance within normal agricultural hours to minimise the risk of odour and noise complaints.

9. Sensitive Receptors

There are a number of properties within 500m of the fields proposed to be spread. Odour and noise will be controlled, as detailed in section 8, in order to minimise the disruption caused to residents.

There are no footpaths or tracks crossing the fields to be spread, and no boreholes, wells or springs have been identified within the spreading area.

The site is not within 500m of a statutory designated environmentally sensitive area as defined by Magic Maps (magic.gov.uk).

The site is within a flood prone area and the land is within a ground water protection zone 3 (Figure 3). The waste will be spread in appropriate conditions with weather and field conditions continuously examined.

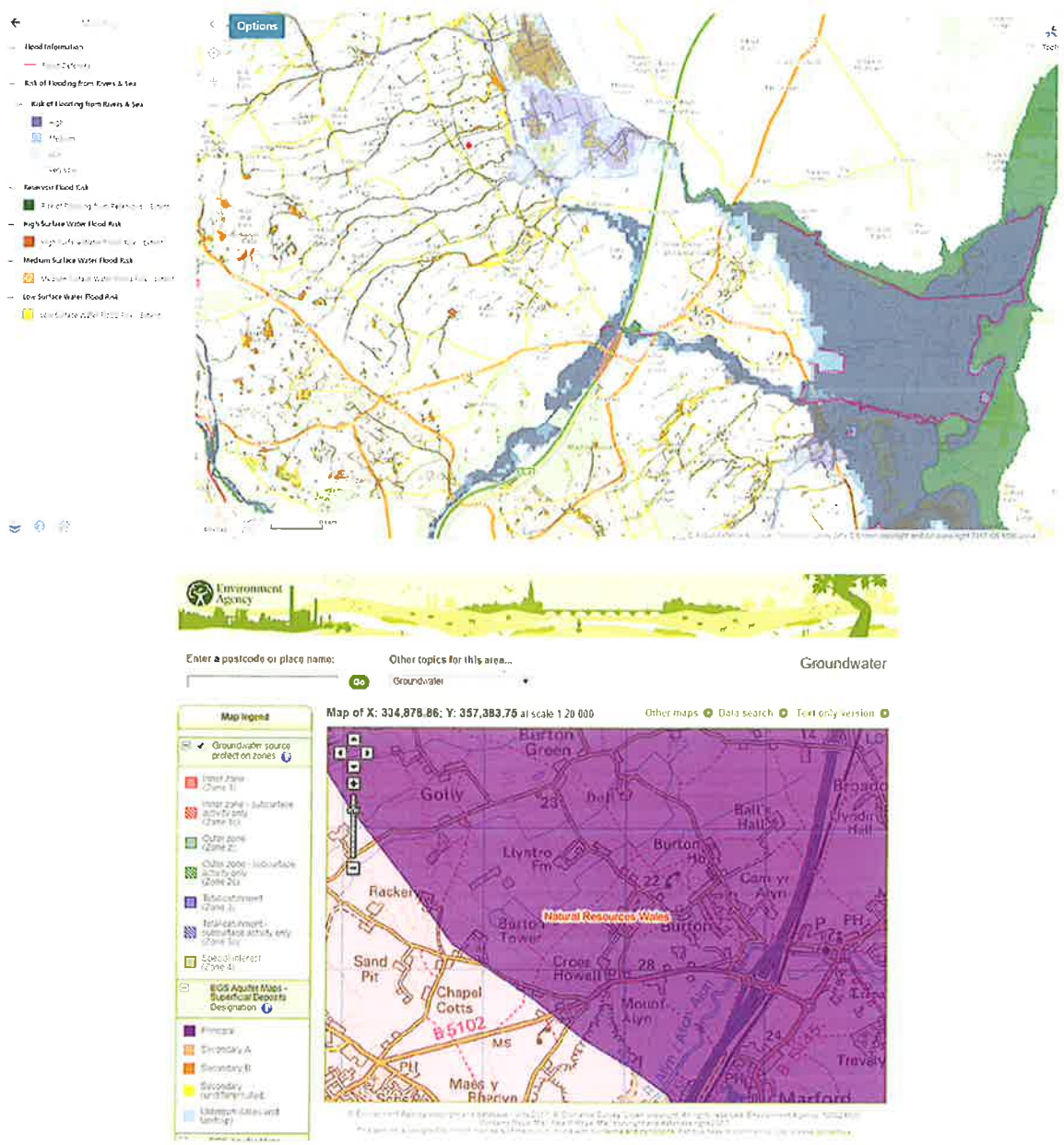

Figure 3: Maps of flood prone areas and ground water protection zones of the land to be spread. These were obtained from the NRW website (naturalresources.wales/evidence-and-data/maps/long-term-flood-risk) and 'What's in my backyard' (www.environment-agency.gov.uk) respectively.

10. Contingency Planning

To cover machinery breakdown, replacement machinery is available or can be hired from suppliers and mobile mechanics are available to attend sites. All machinery is regularly serviced.

There is sufficient trained staff to maintain sickness and holiday cover.

Spreading operations will not be carried out when there are adverse weather conditions that are likely to interfere with the operation. These conditions include; heavy rain, or during periods of heavy snow or frozen ground as defined in the Code of Good Agricultural Practice (COGAP).

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Please quote above code for all enquiries

AHLSTROM

LIQUID WASTE

LIQUID WASTE

Sample Reference :

AHLSTROM

Sample Matrix : LIQUID WASTE

Laboratory References	
Report Number	27935
Sample Number	73778

Date Received	19-SEP-2018
Date Reported	26-SEP-2018

The sample submitted was of adequate size to complete all analysis requested.
The sample will be kept under refrigeration for at least 3 weeks.

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Oven Dry Solids	13.0	%
Conductivity 1:6	11110	uS/cm
Total Nitrogen	<0.04	% w/w
Nitrate Nitrogen	<10	mg/kg
Ammonium Nitrogen	<50	mg/kg
Total Phosphorus (P)	<5	mg/kg
Total Potassium (K)	3200	mg/kg
Total Magnesium (Mg)	<10	mg/kg
Total Copper (Cu)	<0.2	mg/kg
Total Zinc (Zn)	0.69	mg/kg

Released by *Darren Whitbread* Date *26/09/18*

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AHLSTROM

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Laboratory References	
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Date Received	19-SEP-2018
Date Reported	26-SEP-2018

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Total Sulphur (S)	12553	mg/kg
Total Calcium (Ca)	15.9	mg/kg
Total Lead (Pb)	<0.5	mg/kg
Total Cadmium (Cd)	<0.01	mg/kg
Total Mercury (Hg)	<0.05	mg/kg
Total Nickel (Ni)	<0.2	mg/kg
Total Chromium (Cr)	<0.2	mg/kg
Total Sodium (Na)	23904	mg/kg
pH 1:6 [Fresh]	9.31	
Organic Matter LOI	4.44	% w/w

Released by *Darren Whitbread* Date *26/09/18*

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AHLSTROM

LIQUID WASTE

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Sample Reference :

AHLSTROM

Sample Matrix : LIQUID WASTE

Laboratory References	
Report Number	27935
Sample Number	73778

Date Received	19-SEP-2018
Date Reported	26-SEP-2018

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

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

ANALYTICAL RESULTS *on 'as received' basis.*

Determinand	Value	Units
Water Soluble Magnesium	1.74	mg/kg
Water Soluble Phosphorus	1.70	mg/kg
Water Soluble Potassium	2913	mg/kg

Released by *Darren Whitbread* Date *26/09/18*

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Waste Producer	Ahlstrom Black Liquor		
EWC code	03 03 11		
Waste description	Black liquor from long fibre pulp		
Laboratory	NRM Laboratories Ltd	**Sample Ref:**	73778

Ahlstrom Black Liquor was sampled in accordance with the standard sampling procedures in October 2017 and was analysis by NRM laboratories Ltd.

	Units	Result	Nutrients applied at 26t/ha
pH	-	9.31	-
Electrical conductivity	µS/cm	11400	-

The waste has low dry matter content and will apply 13% solids to the receiving soil. This will help improve soil structure and aid nutrient and water holding capacity.

The black liquor has a pH of 9.31 and no detrimental effects are anticipated from its application to most soils at the proposed spreading rate of 26t/ha.

A detailed report carried out in 2008 regarding the suitability of land application of the black liquor found no disbenefit from the application of black liquor and this is attached in Appendix E.

1. Major Plant Nutrients

	Unit	Result	Nutrients applied at 26t/ha
Nitrogen	kg/t	0	10
Phosphate	kg/t	0	0
Potash	kg/t	4	100
Magnesium	kg/t	0	0
Sulphur	kg/t	31.38	815.95

The liquor from the effluent treatment plant at Ahlstrom contains high levels of potash and sulphur with small quantities of phosphate, nitrogen and magnesium. Potash availability should be high and will be available for the next crop. Phosphate levels are low and less than 1kg/ha will be applied to the soil and following crop.

2. Potentially Toxic Elements (PTEs)

The waste was analysed for a range of PTEs as described in the Sludge (Use in Agriculture) Regulations. The analysis shows that the waste contains only trace elements of the majority of PTEs additions, and they fall well within the maximum permitted annual application limit. The table below shows the waste contribution of PTEs in kg/ha at the proposed application rate.

Application rate (t/ha)	Copper	Zinc	Lead	Cadmium	Mercury	Nickel	Chromium
26	0.01	0.02	0.01	0.0	0.0	0.01	0.01

3. Sodium

The total addition of sodium in any one application of the Ahlstrom Black liquor waste is 621.50kg/ha, which is higher than that recommended in agency guidance. However, the sodium will not all be immediately available as the extraction process makes use of the less available forms of sodium, which is likely to be bound within the lignin in the waste.

The loamy topsoil at the farm is at a lower risk of structural instability following addition of sodium than if they were a lighter texture. Structural instability is usually a feature associated with the addition of many tonnes of

sodium deposited within topsoil from seawater inundation, saline intrusion or from capillary rise and evaporation of saline water leading to salt in the upper layers. In extreme cases this can lead to de-flocculation of clay particles and structural instability, changes in soil-plant osmotic processes, induced drought stress and in extreme cases sodium toxicity. The sodium content has remained fairly stable since 2005 and with more than 9 years experience of spreading the black liquor; we are yet to see evidence of damage to the soil structure following an application of black liquor.

Bioassays carried out in 2000 applied black liquor at an application rate of 50t/ha and over 800kg/ha of total sodium was added to the soil. No detrimental effect to the soil structure was noted and after 12 weeks the elevated conductivity of the soil was 2165uS/cm, within the normal range for agricultural soils in the UK and within the limit for topsoil detailed in the BS3882. I would therefore conclude from this that the waste will not lead to unacceptable high longer term EC and sodium issues after application.

In addition, sodium is an essential element for grass herbage growth. Sodium fertilizers will not normally give extra grass yield but they will increase the Na content of grass which will improve the palatability of herbage and can reduce the chance of grass staggers. Sodium is also associated with a greater % of live herbage, higher D values and sugar content of grass. Research from Bangor University indicates that these effects increase milk output and % butterfat and may also have a small benefit on somatic cell count. Grass palatability and milk output increase at herbage sodium levels up to 0.5% in the dry matter.

4. Conductivity

While an application of Ahlstrom will temporarily elevate conductivity within the soils this does not automatically mean that it will cause crop scorch or lead structural damage after a receipt of the waste. It is largely dependent on soils type, weather and soil conditions. Many Chemical (Liquid & solid) fertiliser has an elevated conductivity far in excess of that measured in the Ahlstrom waste which will could lead to similar issues.

The conductivity within the waste is measured as the total of all of the salts it contains including chlorides, sulphates and other soluble oxides/compounds. The effects of conductivity are more pounced on soils that are lighter textured and also when soils are dry as the salts applied can increase the strength of the soil water solution and lead to induced drought stress. The fields are loamy textured and are in a heavy rainfall area so are low risk of induced drought stress.

5. Potential disbenefits

- The black liquor pH is 9.31 and no adverse effects are anticipated from its application to agricultural land.
- The level of PTEs applied are well within regulatory recommendations and will have no impact on the receiving soils or crops.
- Compaction of soils will be minimised by the use of an umbilical cord system and tractor mounted spreader.
- The black liquor does not have an offensive odour and is unlikely to cause a nuisance during normal spreading operations.
- Additions of sodium and conductivity which are discussed above.

6. Conclusion

The black liquor from the treatment plant at Ahlstrom provides agricultural benefit through the addition of major plant nutrients and will be used to reduce the requirement for chemical fertiliser. The liquor will supply additional benefit through the addition of organic matter to the receiving soil. Application rates will be reviewed to ensure soil and crop requirements are not exceeded following regular analysis of the waste.

The additions of sodium at the above applications rates fall within those that are recommended within previous assessments.

There should be no significant impacts on soil structural stability.

I would expect the electrical conductivity of the topsoil to initially rise after application but that it will return to normal within a matter of a few weeks, a feature no different to the effects of any fertiliser application.

The material has been recycled to land for a number of years and experience has shown that it can be applied without cause harm to the environment. There should be no disbenefit from the application when applied in accordance with the management plan and relevant current regulations.

SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 1

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

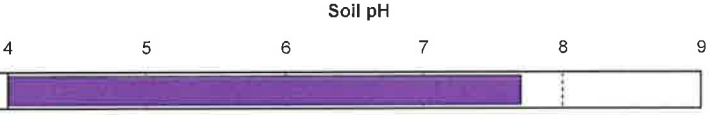
Laboratory References

Report Number	11327
Sample Number	384684

ANALYTICAL RESULTS *on 'dry matter' basis.*

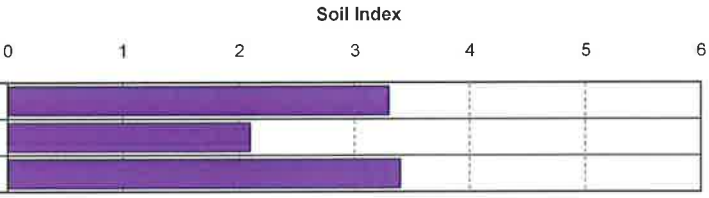
pH (1)

Determinand	Result
Soil pH	7.7



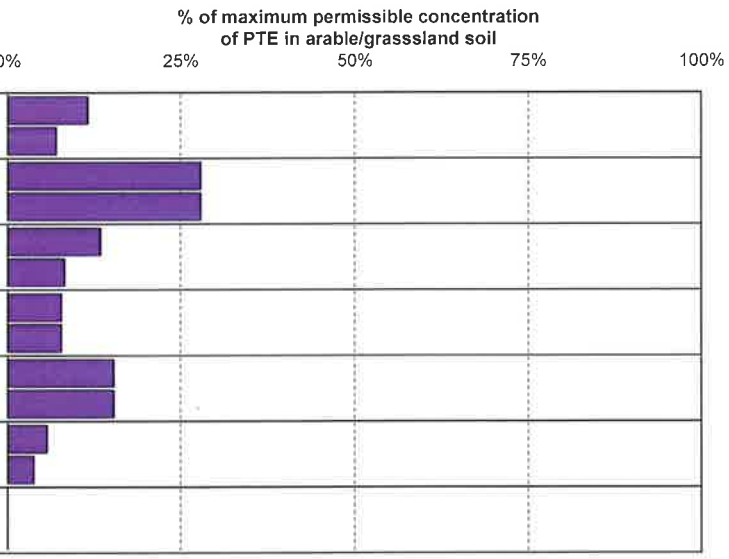
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	32.8	3
Soil Potassium as K	139	2-
Soil Magnesium as Mg	135	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	22.9	Arable	200
		Grassland	330
Total Zinc as Zn	83.6	Arable	300
		Grassland	300
Total Nickel as Ni	14.6	Arable	110
		Grassland	180
Total Cadmium as Cd	0.23	Arable	3
		Grassland	3
Total Lead as Pb	45.6	Arable	300
		Grassland	300
Total Chromium as Cr	22.4	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 2

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

Laboratory References

Report Number	11327
Sample Number	384685

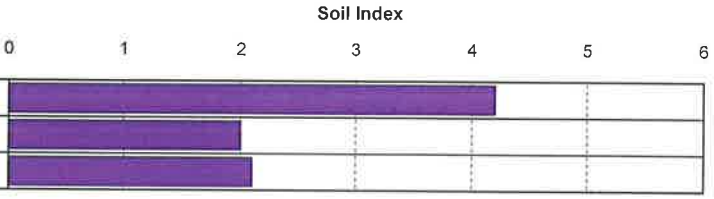
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)

Determinand	Result
Soil pH	7.7

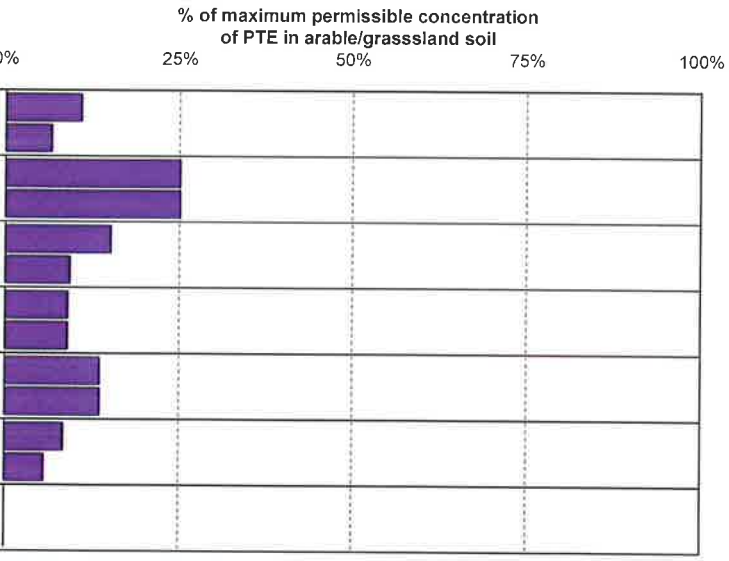
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	52.8	4
Soil Potassium as K	123	2-
Soil Magnesium as Mg	59.7	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	21.8	Arable	200
		Grassland	330
Total Zinc as Zn	75.4	Arable	300
		Grassland	300
Total Nickel as Ni	16.7	Arable	110
		Grassland	180
Total Cadmium as Cd	0.27	Arable	3
		Grassland	3
Total Lead as Pb	41.0	Arable	300
		Grassland	300
Total Chromium as Cr	33.6	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 3

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

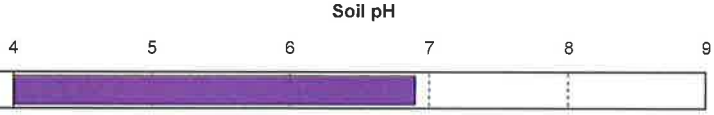
Laboratory References

Report Number	11327
Sample Number	384686

ANALYTICAL RESULTS *on 'dry matter' basis.*

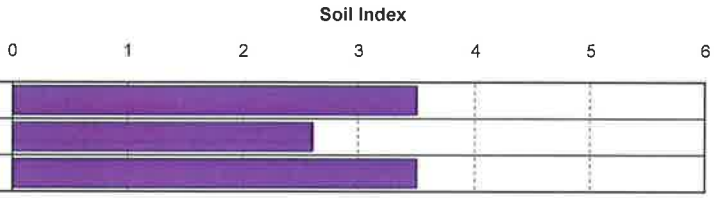
pH (1)

Determinand	Result
Soil pH	6.9



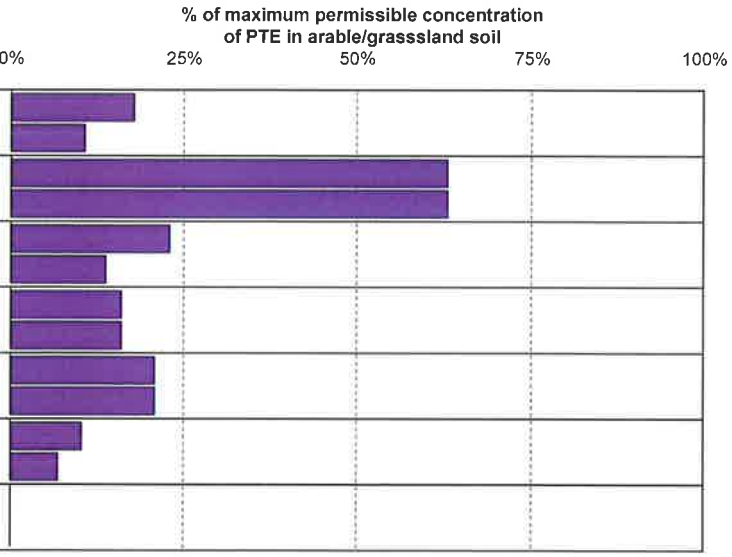
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	35.8	3
Soil Potassium as K	203	2+
Soil Magnesium as Mg	144	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	24.0	Arable	135
		Grassland	225
Total Zinc as Zn	126	Arable	200
		Grassland	200
Total Nickel as Ni	17.2	Arable	75
		Grassland	125
Total Cadmium as Cd	0.48	Arable	3
		Grassland	3
Total Lead as Pb	62.4	Arable	300
		Grassland	300
Total Chromium as Cr	41.1	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 4

MR ROB PIGGOTT
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HUGMOOR HOUSE
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LLANYPWLL
WREXHAM LL13 9YE

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

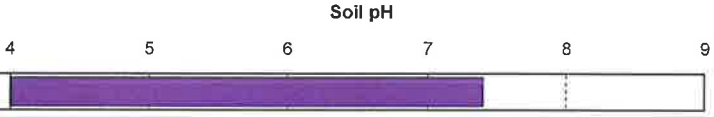
Laboratory References

Report Number	11327
Sample Number	384687

ANALYTICAL RESULTS *on 'dry matter' basis.*

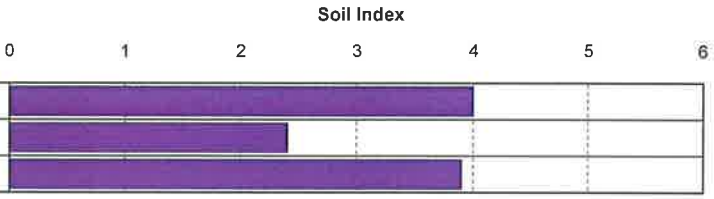
pH (1)

Determinand	Result
Soil pH	7.4



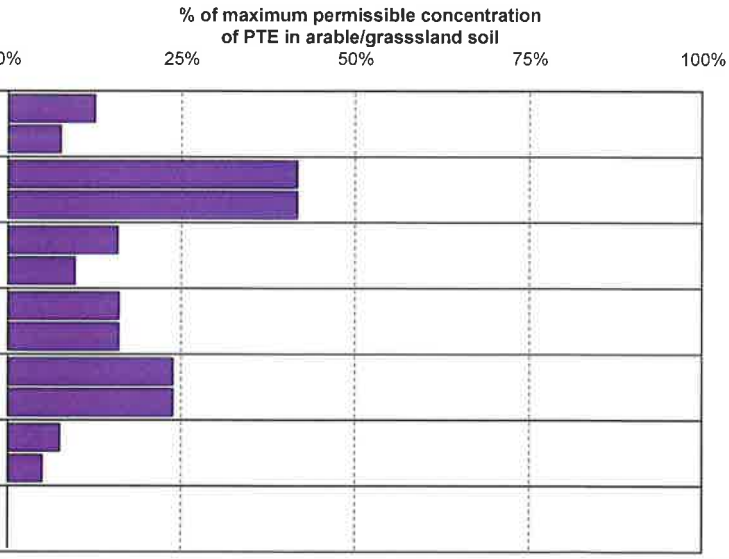
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	47.8	4
Soil Potassium as K	178	2-
Soil Magnesium as Mg	172	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	25.0	Arable	200
		Grassland	330
Total Zinc as Zn	125	Arable	300
		Grassland	300
Total Nickel as Ni	17.4	Arable	110
		Grassland	180
Total Cadmium as Cd	0.48	Arable	3
		Grassland	3
Total Lead as Pb	71.3	Arable	300
		Grassland	300
Total Chromium as Cr	30.0	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by ..... *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 5

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

Laboratory References

Report Number	11327
Sample Number	384688

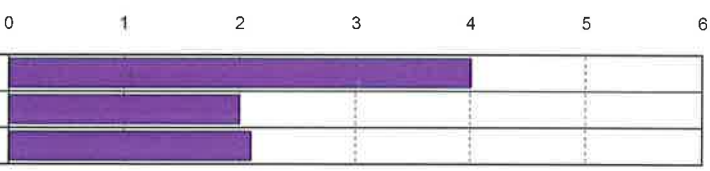
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)

Determinand	Result
Soil pH	8.0

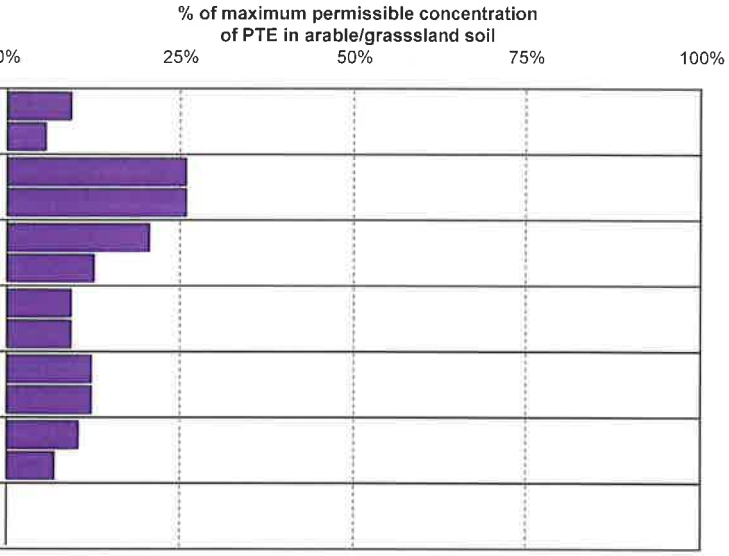
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	47.4	4
Soil Potassium as K	131	2-
Soil Magnesium as Mg	59.3	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	18.6	Arable	200
		Grassland	330
Total Zinc as Zn	77.6	Arable	300
		Grassland	300
Total Nickel as Ni	22.6	Arable	110
		Grassland	180
Total Cadmium as Cd	0.28	Arable	3
		Grassland	3
Total Lead as Pb	36.8	Arable	300
		Grassland	300
Total Chromium as Cr	41.6	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by ..... *Darren Whitbread* ..... Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 6

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

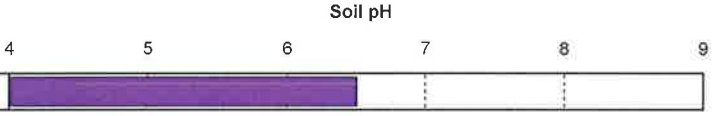
Laboratory References

Report Number	11327
Sample Number	384689

ANALYTICAL RESULTS *on 'dry matter' basis.*

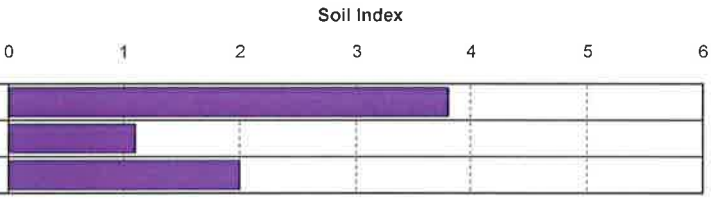
pH (1)

Determinand	Result
Soil pH	6.5



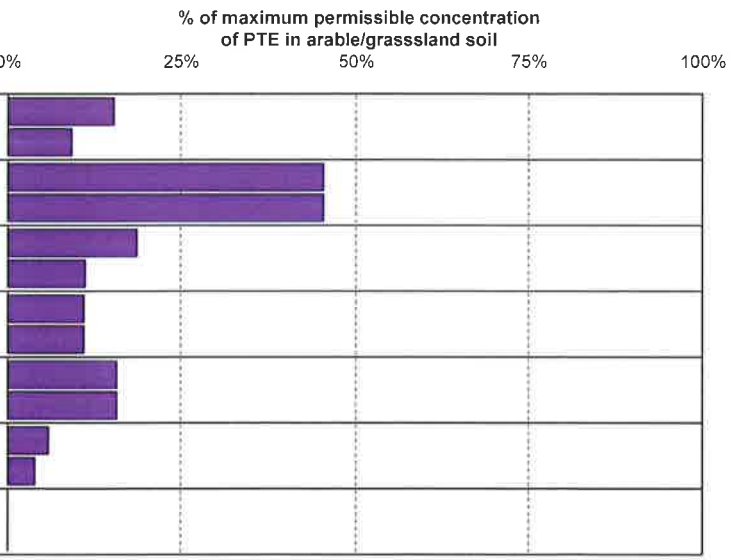
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	41.8	3
Soil Potassium as K	68.5	1
Soil Magnesium as Mg	52.3	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	20.7	Arable	135
		Grassland	225
Total Zinc as Zn	90.7	Arable	200
		Grassland	200
Total Nickel as Ni	14.0	Arable	75
		Grassland	125
Total Cadmium as Cd	0.33	Arable	3
		Grassland	3
Total Lead as Pb	47.4	Arable	300
		Grassland	300
Total Chromium as Cr	23.5	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 7

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WREXHAM LL13 9YE

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

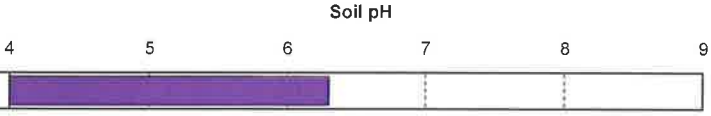
Laboratory References

Report Number	11328
Sample Number	384690

ANALYTICAL RESULTS *on 'dry matter' basis.*

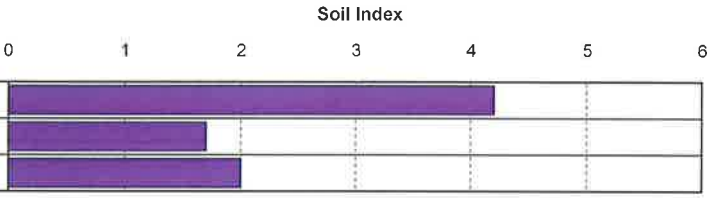
pH (1)

Determinand	Result
Soil pH	6.3



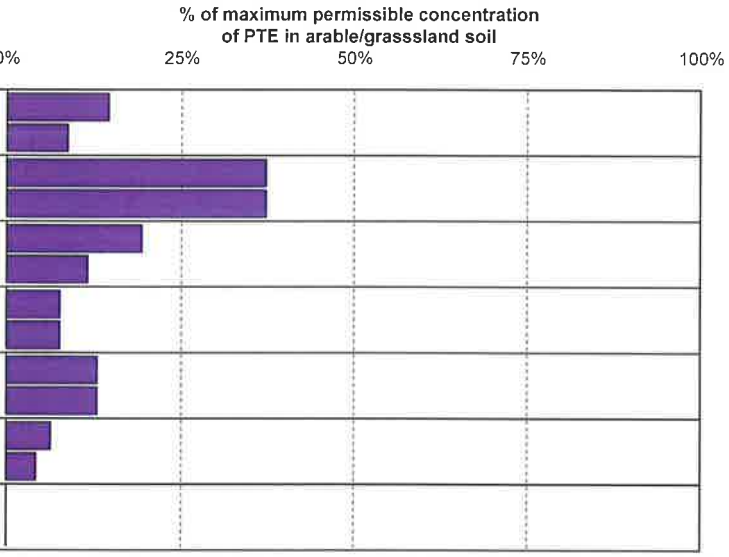
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	51.2	4
Soil Potassium as K	105	1
Soil Magnesium as Mg	55.2	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	19.7	Arable	135
		Grassland	225
Total Zinc as Zn	74.4	Arable	200
		Grassland	200
Total Nickel as Ni	14.5	Arable	75
		Grassland	125
Total Cadmium as Cd	0.23	Arable	3
		Grassland	3
Total Lead as Pb	39.0	Arable	300
		Grassland	300
Total Chromium as Cr	25.5	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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Released by *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 8

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WREXHAM LL13 9YE

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

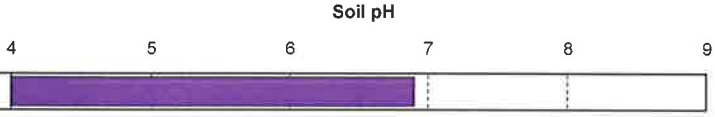
Laboratory References

Report Number	11328
Sample Number	384691

ANALYTICAL RESULTS *on 'dry matter' basis.*

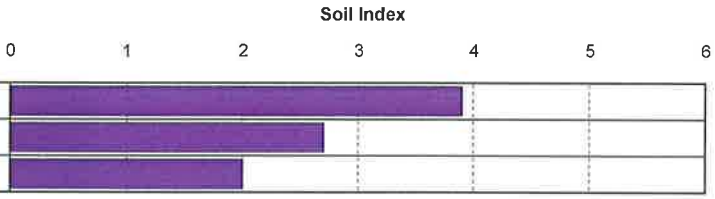
pH (1)

Determinand	Result
Soil pH	6.9



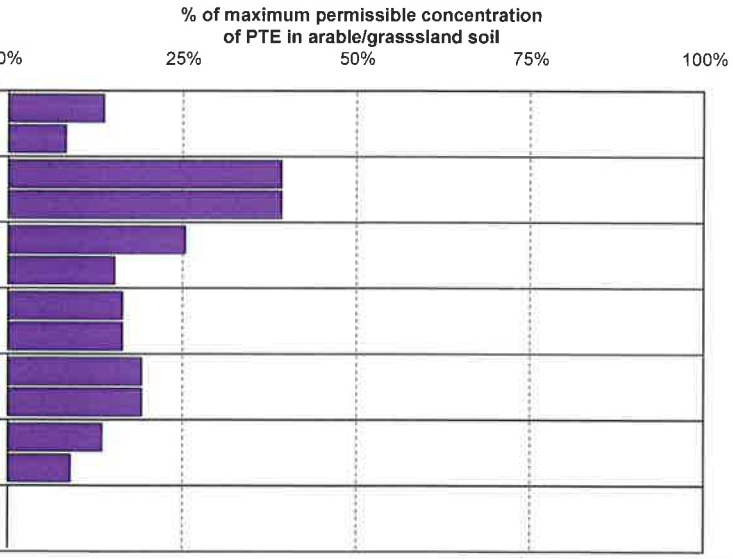
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	43.8	3
Soil Potassium as K	215	2+
Soil Magnesium as Mg	54.2	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	18.4	Arable	135
		Grassland	225
Total Zinc as Zn	78.3	Arable	200
		Grassland	200
Total Nickel as Ni	19.0	Arable	75
		Grassland	125
Total Cadmium as Cd	0.49	Arable	3
		Grassland	3
Total Lead as Pb	57.3	Arable	300
		Grassland	300
Total Chromium as Cr	53.7	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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Released by *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 9

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

Laboratory References

Report Number	11328
Sample Number	384692

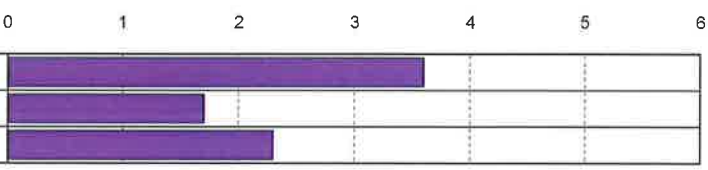
ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)

Determinand	Result
Soil pH	8.1

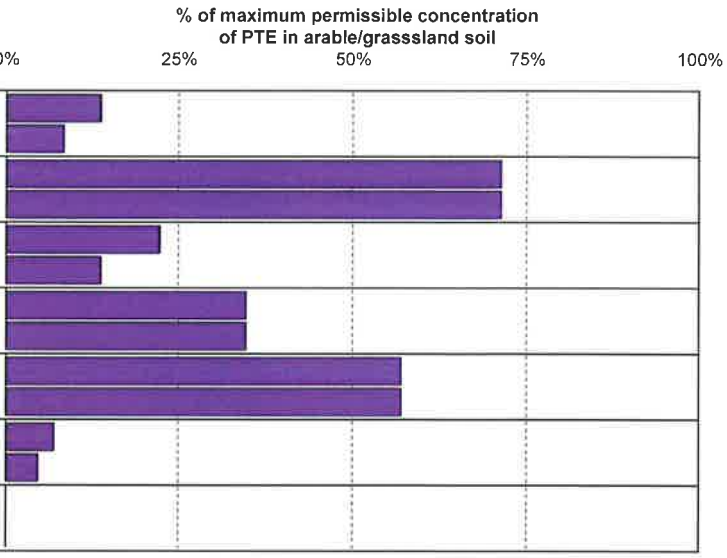
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	39.0	3
Soil Potassium as K	106	1
Soil Magnesium as Mg	67.8	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	27.1	Arable	200
		Grassland	330
Total Zinc as Zn	214	Arable	300
		Grassland	300
Total Nickel as Ni	24.4	Arable	110
		Grassland	180
Total Cadmium as Cd	1.04	Arable	3
		Grassland	3
Total Lead as Pb	171	Arable	300
		Grassland	300
Total Chromium as Cr	27.5	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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Released by ..... *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 10

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WREXHAM LL13 9YE

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

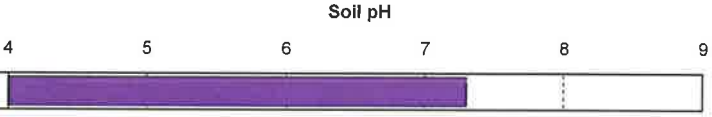
Laboratory References

Report Number	11328
Sample Number	384693

ANALYTICAL RESULTS *on 'dry matter' basis.*

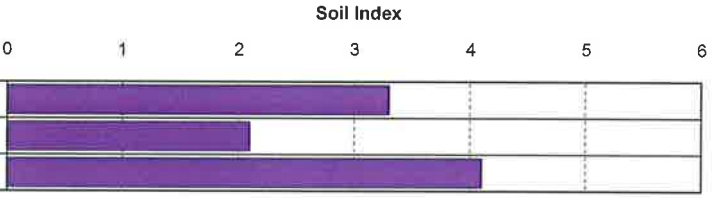
pH (1)

Determinand	Result
Soil pH	7.3



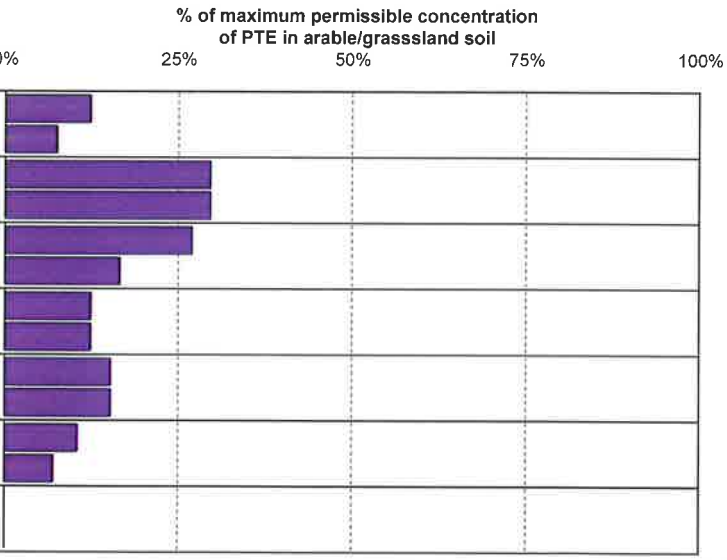
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	32.6	3
Soil Potassium as K	133	2-
Soil Magnesium as Mg	190	4



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	24.5	Arable	200
		Grassland	330
Total Zinc as Zn	88.9	Arable	300
		Grassland	300
Total Nickel as Ni	29.7	Arable	110
		Grassland	180
Total Cadmium as Cd	0.37	Arable	3
		Grassland	3
Total Lead as Pb	45.7	Arable	300
		Grassland	300
Total Chromium as Cr	41.7	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 11

MR ROB PIGGOTT
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HUGMOOR HOUSE
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LLANYPWLL
WREXHAM LL13 9YE

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

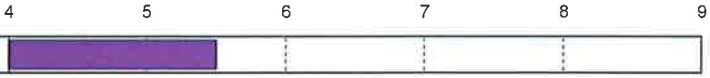
Laboratory References

Report Number	11328
Sample Number	384694

ANALYTICAL RESULTS *on 'dry matter' basis.*

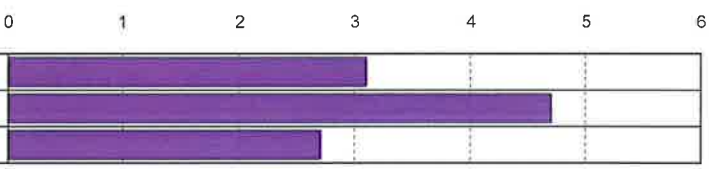
pH (1)

Determinand	Result
Soil pH	5.5



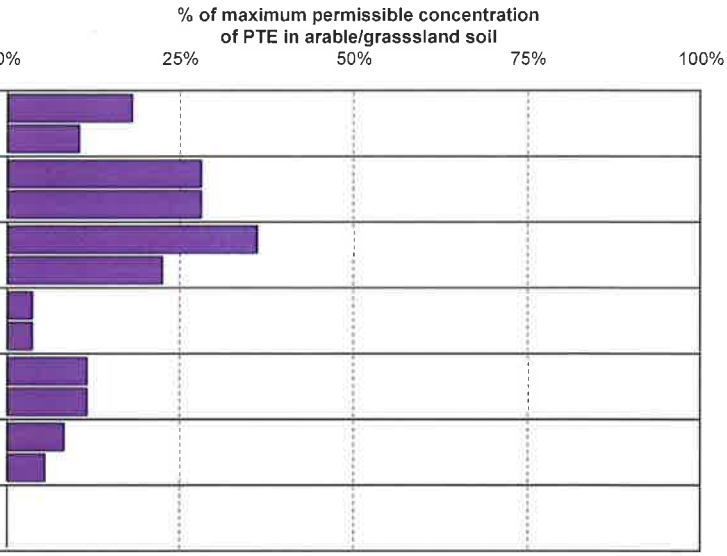
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	28.4	3
Soil Potassium as K	544	4
Soil Magnesium as Mg	87.9	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	14.5	Arable	80
		Grassland	138
Total Zinc as Zn	56.1	Arable	200
		Grassland	200
Total Nickel as Ni	18.0	Arable	50
		Grassland	80
Total Cadmium as Cd	0.11	Arable	3
		Grassland	3
Total Lead as Pb	35.0	Arable	300
		Grassland	300
Total Chromium as Cr	33.3	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 12

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

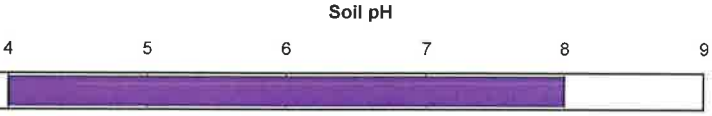
Laboratory References

Report Number	11328
Sample Number	384695

ANALYTICAL RESULTS *on 'dry matter' basis.*

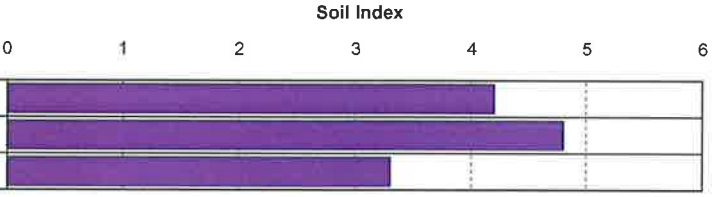
pH (1)

Determinand	Result
Soil pH	8.0



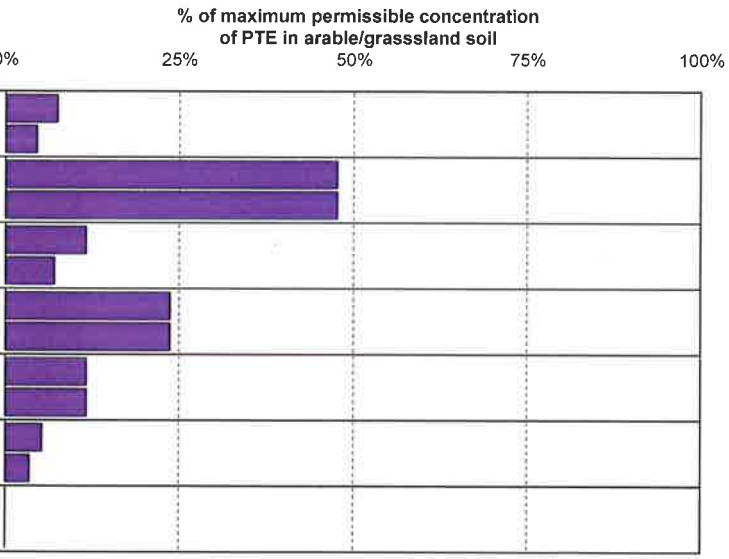
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	52.2	4
Soil Potassium as K	570	4
Soil Magnesium as Mg	130	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	15.0	Arable	200
		Grassland	330
Total Zinc as Zn	143	Arable	300
		Grassland	300
Total Nickel as Ni	12.8	Arable	110
		Grassland	180
Total Cadmium as Cd	0.71	Arable	3
		Grassland	3
Total Lead as Pb	35.2	Arable	300
		Grassland	300
Total Chromium as Cr	21.3	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 13

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

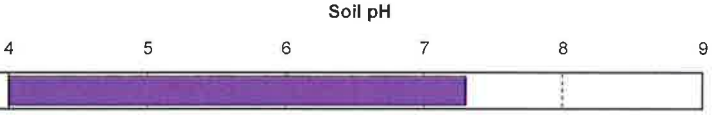
Laboratory References

Report Number	11329
Sample Number	384696

ANALYTICAL RESULTS *on 'dry matter' basis.*

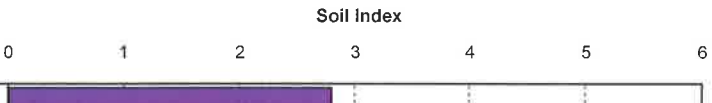
pH (1)

Determinand	Result
Soil pH	7.3



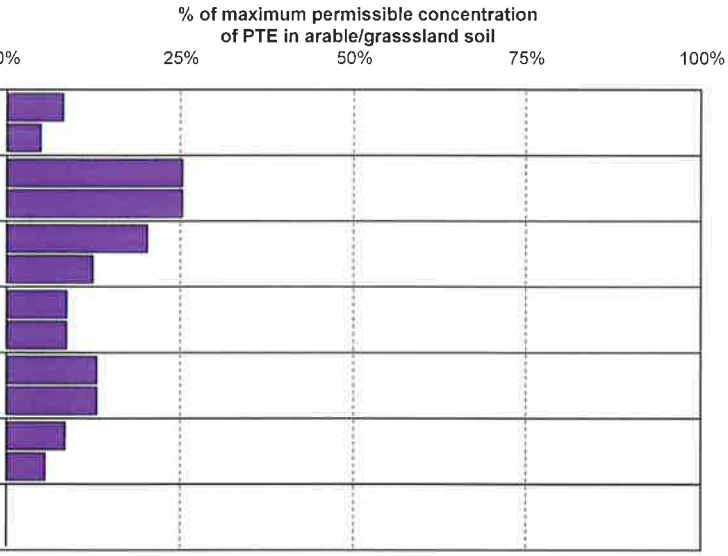
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	24.4	2
Soil Potassium as K	225	2+
Soil Magnesium as Mg	105	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	16.2	Arable	200
		Grassland	330
Total Zinc as Zn	76.0	Arable	300
		Grassland	300
Total Nickel as Ni	22.3	Arable	110
		Grassland	180
Total Cadmium as Cd	0.26	Arable	3
		Grassland	3
Total Lead as Pb	39.0	Arable	300
		Grassland	300
Total Chromium as Cr	33.8	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 14

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

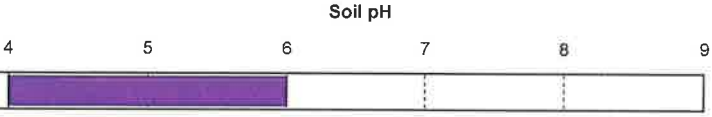
Laboratory References

Report Number	11329
Sample Number	384697

ANALYTICAL RESULTS *on 'dry matter' basis.*

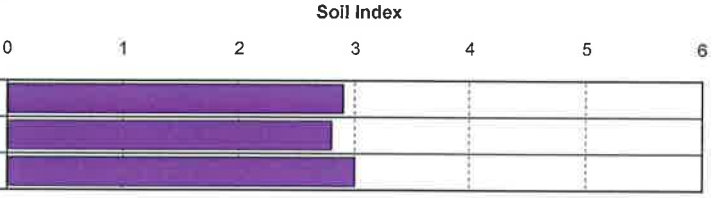
pH (1)

Determinand	Result
Soil pH	6.0



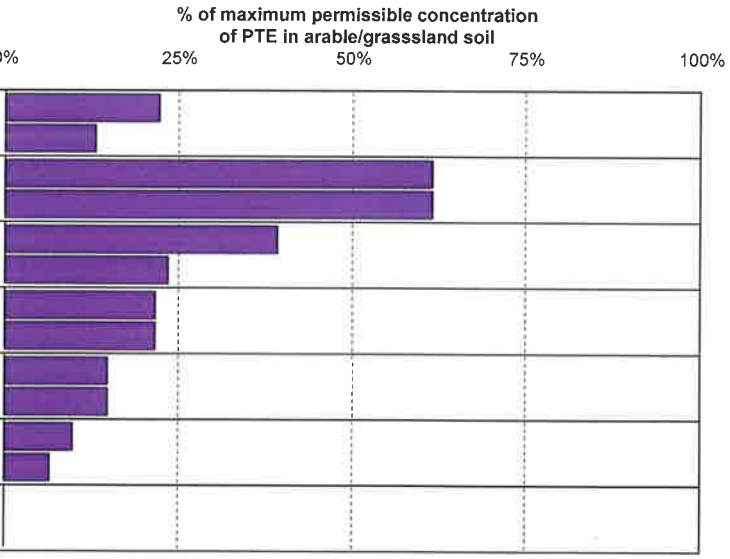
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	25.2	2
Soil Potassium as K	221	2+
Soil Magnesium as Mg	104	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	22.2	Arable	100
		Grassland	170
Total Zinc as Zn	123	Arable	200
		Grassland	200
Total Nickel as Ni	23.5	Arable	60
		Grassland	100
Total Cadmium as Cd	0.65	Arable	3
		Grassland	3
Total Lead as Pb	44.5	Arable	300
		Grassland	300
Total Chromium as Cr	39.4	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 15

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

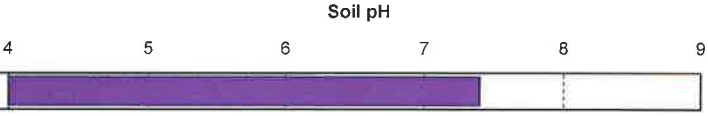
Laboratory References

Report Number	11329
Sample Number	384698

ANALYTICAL RESULTS *on 'dry matter' basis.*

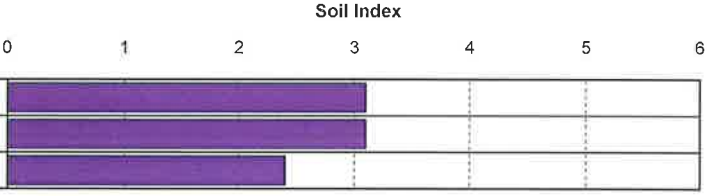
pH (1)

Determinand	Result
Soil pH	7.4



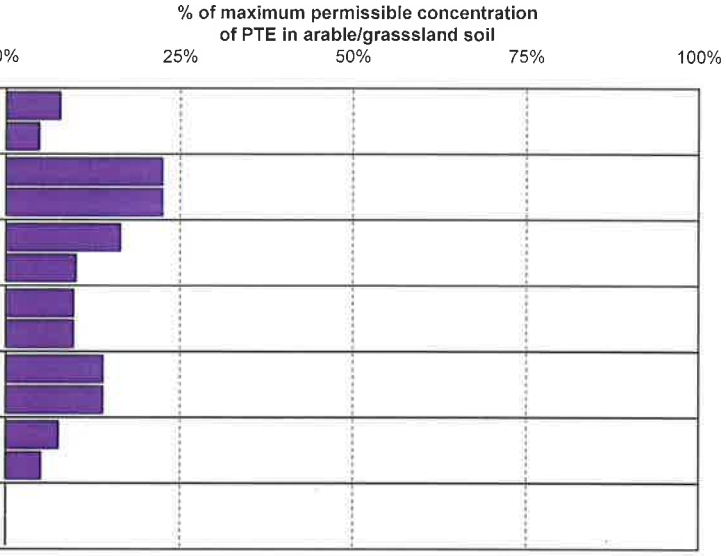
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	27.8	3
Soil Potassium as K	261	3
Soil Magnesium as Mg	71.1	2



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	15.4	Arable	200
		Grassland	330
Total Zinc as Zn	67.3	Arable	300
		Grassland	300
Total Nickel as Ni	18.0	Arable	110
		Grassland	180
Total Cadmium as Cd	0.29	Arable	3
		Grassland	3
Total Lead as Pb	41.7	Arable	300
		Grassland	300
Total Chromium as Cr	30.1	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 16

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

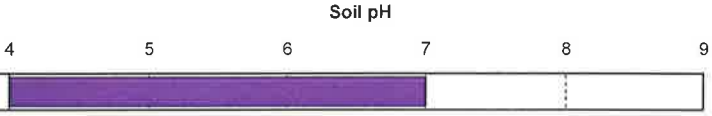
Laboratory References

Report Number	11329
Sample Number	384699

ANALYTICAL RESULTS *on 'dry matter' basis.*

pH (1)

Determinand	Result
Soil pH	7.0

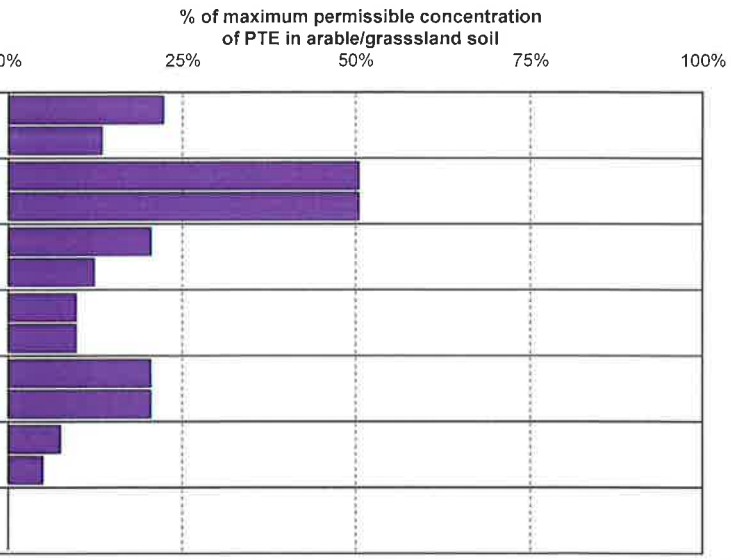


Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	81.0	5
Soil Potassium as K	199	2+
Soil Magnesium as Mg	159	3

Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	30.0	Arable	135
		Grassland	225
Total Zinc as Zn	101	Arable	200
		Grassland	200
Total Nickel as Ni	15.3	Arable	75
		Grassland	125
Total Cadmium as Cd	0.29	Arable	3
		Grassland	3
Total Lead as Pb	61.2	Arable	300
		Grassland	300
Total Chromium as Cr	29.7	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



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Released by *Darren Whitbread* Date *08/05/18*

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SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 17

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RICHARD KNOWLES
HONKLEY FARM

SOIL

Date Received	02-MAY-2018
Date Reported	08-MAY-2018

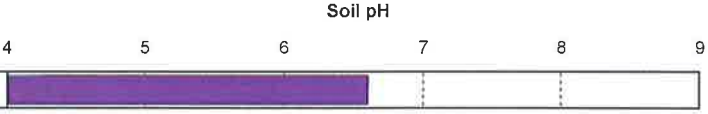
Laboratory References

Report Number	11329
Sample Number	384700

ANALYTICAL RESULTS *on 'dry matter' basis.*

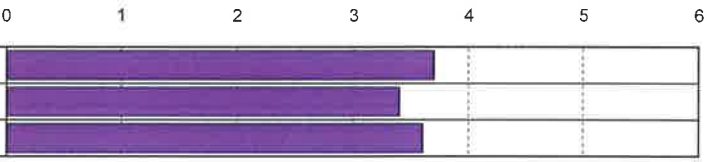
pH (1)

Determinand	Result
Soil pH	6.6



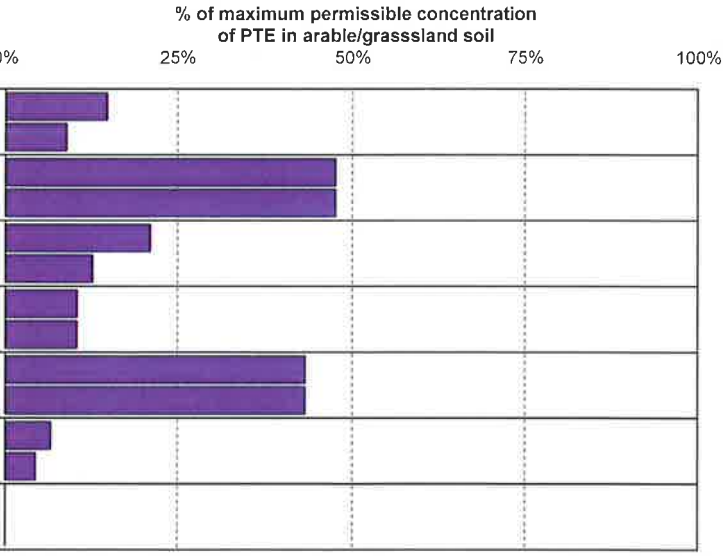
Soil Nutrients (1)

Determinand	Result mg/litre	Soil Index
Soil Phosphorus as P	40.0	3
Soil Potassium as K	320	3
Soil Magnesium as Mg	149	3



Potentially Toxic Elements (2)

Determinand	Result mg/kg		Maximum mg/kg
Total Copper as Cu	19.8	Arable	135
		Grassland	225
Total Zinc as Zn	95.3	Arable	200
		Grassland	200
Total Nickel as Ni	15.7	Arable	75
		Grassland	125
Total Cadmium as Cd	0.31	Arable	3
		Grassland	3
Total Lead as Pb	130	Arable	300
		Grassland	300
Total Chromium as Cr	26.4	Arable	400
		Grassland	600
Total Mercury as Hg	<0.2	Arable	1
		Grassland	1.5



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by ..... *Darren Whitbread* ..... Date ..... *08/05/18* .....

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