Agricultural Benefit Statement

For the application of beneficial wastes to fields at:

Noyadd Farm, Rhayader, Powys. LD6 5HH

10th April 2025

1 Person with appropriate technical expertise and permit details

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

- B.Agric – Plant production
- PGDip – Agronomy
- MSc - Sustainable Agriculture
- 3 years of agronomic experience
- 4R Group Deployment Training Course

Verified by: Esther Koroma, (Environmental Consultant at 4R Group) FACTS FQA: FE/7273
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:	NA	
Area of the receiving land:	36.54 ha	
Quantity to be stored at any one time:	Stackable: N/A	Non-Stackable: NA
Total maximum quantity to be spread:	9,135 t	
Location map document reference:	**Location map:** NF_01	

3 What is the waste to be spread?

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

Waste	***EWC Code***	***Description***	***Waste Producer***	***Additional Information***
1.	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Elan Valley	Non-stackable ferric liquid sludge
2.	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Talybont	Non-stackable alum liquid sludge
3.	19 09 02	Sludges from water clarification. Potable water treatment effluent.	DCWW Court Farm	Stackable ferric sludge cake

4 Operational details

4.1 Cropping details

Table 3. Cropping details

Current crop including projected yield if known:	Refer to Tables 6-8
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 6-8
When do you intend to apply this waste, e.g., post-harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:	Spreading will only take place subject to ground conditions and following the Code of Good Agricultural Practice (Defra, 2011), NVZ regulations and the permit holder's Environmental Management System (EMS). Spreading activities will also comply with The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021. Targeted periods of spreading on grass fields include early spring (late February), after each cut of silage, dependent on crop growth and weather conditions, and prior to grazing through summer and autumn (September) prior to deployment expiry. No more than 50t/ha will be spread on a field in any 3-week period in accordance with CoGAP, and no more than 250t/ha will be spread within any 12-month period.

4.2 Waste storage

Table 4. Waste storage

How is the waste to be stored? *e.g., mobile tank, field heap, spread on delivery*	Stackable wastes: Spread on delivery Non-stackable wastes: Spread on delivery
Where is the waste to be stored prior to spreading?	NA
Why were these storage locations chosen?	NA

4.3 Waste application

Table 5. Waste application

How is the waste to be spread and why is it to be spread that way?	DCWW liquid sludge will be surface applied using trailing shoe as this is readily available to the farmer. The cake will be spread using conventional rear discharge spreaders as this is the most appropriate for the material and rates it is to be applied at.
How do you plan to incorporate the waste following application?	There is no requirement for further incorporation of the waste on grass fields due to low ammonia content and minimal odour.
With liquid wastes is there any mole draining or sub-soiling planned? *Are there land drains in the field?*	No Yes
Other relevant operational information:	All fields have a soil pH of above 5 and therefore can receive application of the ferric based sludges, DCWW Elan Valley and DCWW Talybont. DCWW Court Farm is limited to fields above pH 6 due to being alum based.

Table 6. DCWW Elan Valley

Nutrient Requirements for Land at Noyadd Farm

						N			P_2O_5				K_2O				Mg				
Field Ref	**Total Area**	**Spread Area**	**Previous Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	***In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	***In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	***In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
29	4.40	4.00	Grass	Grass	6.8	M	220	1.5	1	95	65	3.2	1	180	228	0.7	3	0	1.7	250	1000
31	2.00	1.70	Grass	Grass	6.4	M	220	1.5	1	95	65	3.2	2+	120	228	0.8*	2	0	1.7	250	425
33	4.50	2.00	Grass	Grass	6.4	M	220	1.5	1	95	65	3.2	2+	120	228	0.8*	2	0	1.7	250	500
34	4.70	4.30	Grass	Grass	6.1	M	220	1.5	1	95	65	3.2	2+	120	228	0.8*	2	0	1.7	250	1075
35	4.00	3.60	Grass	Grass	6.1	M	220	1.5	2	65	65	6.4*	2+	120	228	0.8*	2	0	1.7	250	900
36	2.40	2.00	Grass	Grass	6	M	220	1.5	1	95	65	3.2	2-	170	228	0.8*	2	0	1.7	250	500
37	3.70	2.90	Grass	Grass	6	M	220	1.5	1	95	65	3.2	2+	120	228	0.8*	2	0	1.7	250	725
38	4.40	3.70	Grass	Grass	5.9	M	220	1.5	1	95	65	3.2	2+	120	228	0.8*	2	0	1.7	250	925
39	5.04	4.24	Grass	Grass	6.4	M	220	1.5	0	125	65	3.2	1	180	228	0.7	2	0	1.7	250	1060
40	1.46	1.00	Grass	Grass	5.9	M	220	1.5	1	95	65	3.2	2-	170	228	0.8*	2	0	1.7	250	250
41	8.70	7.10	Grass	Grass	6.1	M	220	1.5	1	95	65	3.2	2+	120	228	0.8*	3	0	1.7	250	1775
Ha	**45.30**	**36.54**																			**9135**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2023).

Expected Grazing yield of 9-12t/ha.

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2023).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 250 t/ha is 45.5 kg/ha

Table 7. DCWW Talybont

Nutrient Requirements for Land at Noyadd Farm

						N			P_2O_5				K_2O				Mg				
Field Ref	Total Area	Spread Area	Previous Crop	Next Crop	Soil pH	SNS	Req kg/ha	*In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	*In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	*In Wst kg/ha	Mg Ind	Req kg/ha	*In Wst kg/ha	Rate t/ha	Totals tonnes
29	4.40	4.00	Grass	Grass	6.8	M	220	1.7	1	95	65	31	1	180	228	2.4	3	0	1.7	250	1000
31	2.00	1.70	Grass	Grass	6.4	M	220	1.7	1	95	65	31	2+	120	228	2.7*	2	0	1.7	250	425
33	4.50	2.00	Grass	Grass	6.4	M	220	1.7	1	95	65	31	2+	120	228	2.7*	2	0	1.7	250	500
34	4.70	4.30	Grass	Grass	6.1	M	220	1.7	1	95	65	31	2+	120	228	2.7*	2	0	1.7	250	1075
35	4.00	3.60	Grass	Grass	6.1	M	220	1.7	2	65	65	62*	2+	120	228	2.7*	2	0	1.7	250	900
36	2.40	2.00	Grass	Grass	6	M	220	1.7	1	95	65	31	2-	170	228	2.7*	2	0	1.7	250	500
37	3.70	2.90	Grass	Grass	6	M	220	1.7	1	95	65	31	2+	120	228	2.7*	2	0	1.7	250	725
38	4.40	3.70	Grass	Grass	5.9	M	220	0	1	95	65	0	2+	120	228	0	2	0	0	0	0
39	5.04	4.24	Grass	Grass	6.4	M	220	1.7	0	125	65	31	1	180	228	2.4	2	0	1.7	250	1060
40	1.46	1.00	Grass	Grass	5.9	M	220	0	1	95	65	0	2-	170	228	0	2	0	0	0	0
41	8.70	7.10	Grass	Grass	6.1	M	220	1.7	1	95	65	31	2+	120	228	2.7*	3	0	1.7	250	1775
Ha	**45.30**	**36.54**																			**7960**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2023).

Expected Grazing yield of 9-12t/ha.

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2023).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 250 t/ha is 95.7 kg/ha

Table 8. DCWW Court Farm

Nutrient Requirements for Land at Noyadd Farm

						N			P_2O_5				K_2O				Mg				
Field Ref	Total Area	Spread Area	Previous Crop	Next Crop	Soil pH	SNS	Req kg/ha	*In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	*In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	*In Wst kg/ha	Mg Ind	Req kg/ha	*In Wst kg/ha	Rate t/ha	Totals tonnes
29	4.40	4.00	Grass	Grass	6.8	M	220	1.1	1	95	65	64.5	1	180	228	27.1	3	0	23.4	195	780
31	2.00	1.70	Grass	Grass	6.4	M	220	1.1	1	95	65	64.5	2+	120	228	30.1*	2	0	23.4	195	331.5
33	4.50	2.00	Grass	Grass	6.4	M	220	1.1	1	95	65	64.5	2+	120	228	30.1*	2	0	23.4	195	390
34	4.70	4.30	Grass	Grass	6.1	M	220	1.1	1	95	65	64.5	2+	120	228	30.1*	2	0	23.4	195	838.5
35	4.00	3.60	Grass	Grass	6.1	M	220	0.6	2	65	65	64.8*	2+	120	228	15.1*	2	0	11.7	98	352.8
36	2.40	2.00	Grass	Grass	6	M	220	1.1	1	95	65	64.5	2-	170	228	30.1*	2	0	23.4	195	390
37	3.70	2.90	Grass	Grass	6	M	220	1.1	1	95	65	64.5	2+	120	228	30.1*	2	0	23.4	195	565.5
38	4.40	3.70	Grass	Grass	5.9	M	220	0	1	95	65	64.5	2+	120	228	30.1*	2	0	23.4	195	721.5
39	5.04	4.24	Grass	Grass	6.4	M	220	1.1	0	125	65	64.5	1	180	228	27.1	2	0	23.4	195	826.8
40	1.46	1.00	Grass	Grass	5.9	M	220	0	1	95	65	64.5	2-	170	228	30.1*	2	0	23.4	195	195
41	8.70	7.10	Grass	Grass	6.1	M	220	1.1	1	95	65	64.5	2+	120	228	30.1*	3	0	23.4	195	1384.5
Ha	**45.30**	**36.54**																			**6776**

Grass = 2 cut silage with aftermath grazing

Nutrient requirement based on values for grass with 2 cuts of silage with aftermath grazing (target DM yield 9-12t/ha) described in RB209 (2023).

Expected Grazing yield of 9-12t/ha.

Crop use based on Grass totalling 38t/ha yield where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209, 2023).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Total N supplied at an application rate of 195 t/ha is 232.4 kg/ha

5 Compliance with NVZ regulations

Table 9. 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 ☒

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

*Waste is low in RAN

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>Refer to Tables 6-8</td></tr>
<tr><td>Previous applications:</td><td>Refer to LPD1 Supplement_Previous spreading (2025)</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 6-8 above. General soil type(s) for the fields to be registered are:

Table 10. 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**) show the soils to have ample background concentrations of Mg (i.e., ADAS Index of 2-3).

6.2 Waste characterisation

Full characterisation of the waste with total and available nutrients at the recommended rates for the waste is supplied in **4.2 Waste Interpretations_Noyadd farm 2025**. This information is further summarised against the nutrient requirements for proposed crops in Tables 6-8 above.

The limiting factor for the DCWW Elan and DCWW Talybont wastes is the maximum tonnage permissible to spread for any waste per hectare (250 tons). For DCWW Court Farm, the limiting factor is the P content.

Please note, DCWW report all their analysis on a dry matter basis, including the liquid treatment sludges, unless otherwise stated.

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 6-8 are based on the crop requirement and soil analysis.

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

6.4 Additional requirements

Fields may require additional N, P, and K to achieve optimum yield. Fields may also require liming to raise pH.

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 **4.2 Waste Interpretations_Noyadd farm 2025**.

7.2 Other waste characteristics

The pH of the wastes' ranges from 6.6 to 7.6.

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 ≥ 5.9 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. Liquid wastes will be surface spread, applied using trailing shoe. The cake will be spread using a rear discharge spreader.
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. Where SSSI designated sites borders fields, they will be protected by a 20m non-spreading buffer zone. A 35m non-spreading area will be applied on field 36 adjacent to The River Wye SAC/SSSI.
5. Fields with a historical record of flooding no spreading between October and April. This is applicable to field 29 and 36 in this deployment.
6. Fields 34 and 37 border heritage sites as indicated on the spreading maps. 10m no-spread buffers have been applied to where these areas border spreading areas in order to prevent waste introduction to these protected areas.

8 Sensitive human and environmental receptors

Please refer to site specific risk assessment (**7. SSRA_Noyadd (2025)**). Locations of sensitive receptors are shown in **NF_01 Map**. Prevailing winds are south-westerly.

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

Mitigation measures to safeguard site-specific high and moderate likelihood of emission detection by sensitive receptors are shown in **7. SSRA_Noyadd (2025)**. 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

1. Replacement spreading machinery will be available to prevent waste being retained in faulty machinery.
2. Hire vehicles will be used if required. All machinery will be fully serviced.
3. 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.*).
4. In adverse weather, storage is available until ground/weather conditions become favourable for land application.
5. 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.