Agricultural Benefit Statement

For the application of beneficial wastes to fields at:

Henllys, Llanfair TH, Abergele, Conwys, LL22 8TF

24th September 2025

1 Person with appropriate technical expertise and permit details

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

- HND Agriculture
- I have 30 years' experience working as a field/operations manager for organic waste recycling companies

Verified by: Jonathan Lloyd (Environmental Consultant at 4R Group) FACTS FQA: FE/4524

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:	Henllys, Llanfair TH Abergele, Conwys LL22 8TF	
Stockpile grid reference:	Refer to Table 4	
Area of the receiving land:	50.00 ha	
Quantity to be stored at any one time:	Stackable (temporary field stockpile): N/A	Non-Stackable: 1,250t
	No more than 1,250 t will be stored at any one time.	
Total maximum quantity to be spread:	12,500 t	
Location map document reference:	2. Spreading Maps_DW1 & DW2	

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	Potable water treatment sludges from water clarification process	DCWW Bala	Non-stackable alum liquid sludge
2	19 09 02	Potable water treatment sludges from water clarification process	*4RecyclingLtd Lagoon permit no DB3597HD PAN 030332 DCWW DCWW Bryn Cowlyd	Non-stackable ferric liquid sludge
3	19 09 02	Potable water treatment sludges from water clarification process	DCWW Cefni	Non-stackable alum liquid sludge
4	19 09 02	Potable water treatment sludges from water clarification process	DCWW Cwellyn	Non-stackable alum liquid sludge
5	19 09 02	Potable water treatment sludges from water clarification process	DCWW Dolbenmaen	Non-stackable alum liquid sludge
6	19 09 02	Potable water treatment sludges from water clarification process	DCWW Gwastadgoed	Non-stackable ferric liquid sludge
7	19 09 02	Potable water treatment sludges from water clarification process	DCWW Llyn Conwy	Non-stackable ferric liquid sludge
8	19 09 02	Potable water treatment sludges from water clarification process	DCWW Mynydd Llannegaai	Non-stackable alum liquid sludge
9	19 09 02	Potable water treatment sludges from water clarification process	DCWW Penybont	Non-stackable alum liquid sludge
10	19 09 02	Potable water treatment sludges from water clarification process	DCWW Rhiw Goch	Non-stackable ferric liquid sludge

*4Recycling Ltd is the producer as the waste is coming from the permitted lagoon, however, the origin for the waste is DCWW Bryn Cowlyd

4 Operational details

4.1 Cropping details

Table 3. Cropping details

Current crop including projected yield if known:	Refer to Tables 6-15
Is straw removed?	Y ☐ N ☐ N/A ☒
Following crop and any sensitive crops within rotation which you are amending the soil for in good time:	Refer to Tables 6-15

When do you intend to apply this waste, e.g., post-harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:	Spreading will only take place subject to ground conditions and following the Code of Good Agricultural Practice (Defra, 2018), NVZ regulations and the permit holder's Environmental Management System (EMS). Spreading activities will also comply with the Spreading activities will also comply with The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021. Targeted periods of spreading on grass fields are from February, through May and after cutting of silage (June-October) as per the RB209 (2023). No more than 50t/ha of waste 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. The number of times a waste will be spread will be dependent on the total tonnage divided by the max application rate (50t/ha in 3 weeks).

4.2 Waste storage

Table 4. Waste storage

How is the waste to be stored? *e.g., mobile tank, field heap, spread on delivery*	Mobile tank / Spread on delivery
Where is the waste to be stored prior to spreading?	Bryn Colwyn waste only will be stored in a lagoon under Permit EPR/DB3597HD (SR2010 No17 at Grid ref SH 90012 67791
Why were these storage locations chosen?	The storage location is accessible by delivering vehicle, near field entrances so the potential damage to fields by delivering vehicles is minimal, and liquid storage facilities are secure on farm. The storage location is not within 10m of any ditch, watercourse, or footpath, nor within a SPZ1, and are at least 50m from any well, spring or borehole. It is also a safe distance from overhead powerlines.

4.3 Waste application

Table 5. Waste application

How is the waste to be spread and why is it to be spread that way?	The wastes will be surface spread by tractor and tanker using dribble bar. This equipment is readily available to the farmer/contractor and the most appropriate for the material and application rates used.
How do you plan to incorporate the waste following application?	There is no requirement for further incorporation of wastes on grass fields due to low ammonia content and minimal odour.
With liquid wastes is there any mole draining or sub-soiling planned? *Are there land drains in the field?*	No to both.
Other relevant operational information:	The wastes may be applied separately or in combination. If the wastes are applied in combination the total combined amount applied will not exceed 250t/ha, the total nitrogen loading will be less than 250kg/ha, and the amount of available nitrogen and total or available phosphate and potash (whichever is appropriate) will not exceed the fertiliser recommendation or the amount removed in crop offtake, whichever is the greater. Only fields which have soil pH 6 or above can receive alum-based sludge. Therefore, there will be no application of alum-based sludge on fields 3,5,11,12,15,17,20 and 21 in this deployment.

Table 6. DCWW Bala

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.5	2	65	75	*6.7	0	260	248	0.6	2	0	4.3	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	3.4	1	210	248	0.6	3	0	4.3	250	300
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	3.4	1	210	248	0.6	2	0	4.3	250	613
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.5	2	65	75	*6.7	2-	170	248	*0.6	2	0	4.3	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.5	2	65	75	*6.7	1	210	248	0.6	2	0	4.3	250	875
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.5	2	65	75	*6.7	2-	170	248	*0.6	2	0	4.3	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	3.4	1	210	248	0.6	2	0	3.1	250	563
Total (Ha)	27.29	21.78																			5445

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	69.9

Table 7. DCWW Bryn Cowlyd

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.5	2	65	75	*4	0	260	248	1.3	2	0	0.9	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	2	1	210	248	1.3	3	0	0.9	250	300
3 SH 89760 67671	1.93	1.50	GRASS	GRASS	5.60	L	220	1.5	2	65	75	*4	2-	170	248	*1.4	2	0	0.9	250	375
5 SH 90003 67569	4.12	3.50	GRASS	GRASS	5.50	L	220	1.5	1	95	75	2	1	210	248	1.3	2	0	0.9	250	875
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	2	1	210	248	1.3	2	0	0.9	250	613
11 SH 8980 167059	2.88	2.46	GRASS	GRASS	5.50	L	220	1.5	2	65	75	*4	1	210	248	1.3	2	0	0.9	250	615
12 SH 89684 67282	2.17	1.82	GRASS	GRASS	5.60	L	220	1.5	2	65	75	*4	2-	170	248	*1.4	2	0	0.9	250	455
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.5	2	65	75	*4	2-	170	248	*1.4	2	0	0.9	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.5	2	65	75	*4	1	210	248	1.3	2	0	0.9	250	875
15 SH 90419 67561	5.10	4.30	GRASS	GRASS	5.70	L	220	1.5	1	95	75	2	1	210	248	1.3	2	0	0.9	250	1075
17 SH 90094 67992	4.30	3.75	GRASS	GRASS	5.90	L	220	1.5	2	65	75	*4	2-	170	248	*1.4	2	0	0.9	250	938
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.5	2	65	75	*4	2-	170	248	*1.4	2	0	0.9	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	2	1	210	248	1.3	2	0	0.9	250	563
20 SH 90466 68572	4.36	3.44	GRASS	GRASS	5.80	L	220	1.5	1	95	75	2	1	210	248	1.3	2	0	0.9	250	860
21 SH 90533 68931	8.70	7.45	GRASS	GRASS	5.90	L	220	1.5	1	95	75	2	1	210	248	1.3	2	0	0.9	250	1863
Total (Ha)	**60.85**	**50.00**																			12500

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	38.7

Table 8. DCWW Cefni

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.5	2	65	75	*67.8	0	260	248	0.9	2	0	3.1	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	33.9	1	210	248	0.9	3	0	3.1	250	300
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	33.9	1	210	248	0.9	2	0	3.1	250	613
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.5	2	65	75	*67.8	2-	170	248	*1	2	0	3.1	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.5	2	65	75	*67.8	1	210	248	0.9	2	0	3.1	250	875
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.5	2	65	75	*67.8	2-	170	248	*1	2	0	3.1	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	33.9	1	210	248	0.9	2	0	3.1	250	563
Total (Ha)	**27.29**	**21.78**																			5445

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	77.8

Table 9. DCWW Cwellyn

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.5	2	65	75	*54.7	0	260	248	0.7	2	0	2.9	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	27.4	1	210	248	0.7	3	0	2.9	250	300
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	27.4	1	210	248	0.7	2	0	2.9	250	613
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.5	2	65	75	*54.7	2-	170	248	*0.8	2	0	2.9	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.5	2	65	75	*54.7	1	210	248	0.7	2	0	2.9	250	875
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.5	2	65	75	*54.7	2-	170	248	*0.8	2	0	2.9	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	27.4	1	210	248	0.7	2	0	2.9	250	563
Total (Ha)	**27.29**	**21.78**																			5445

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	71.3

Table 10. DCWW Dolbenmaen

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.8	2	65	75	*35.7	0	260	248	0.6	2	0	0.5	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.8	1	95	75	17.9	1	210	248	0.6	3	0	0.5	250	300
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.8	0	125	75	17.9	1	210	248	0.6	2	0	0.5	250	613
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.8	2	65	75	*35.7	2-	170	248	*0.7	2	0	0.5	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.8	2	65	75	*35.7	1	210	248	0.6	2	0	0.5	250	875
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.8	2	65	75	*35.7	2-	170	248	*0.7	2	0	0.5	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.8	1	95	75	17.9	1	210	248	0.6	2	0	0.5	250	563
Total (Ha)	**27.29**	**21.78**																			5445

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	46.3

Table 11. DCWW Gwastadgoed

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.5	2	65	75	*57.4	0	260	248	1.6	2	0	1.9	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	28.7	1	210	248	1.6	3	0	1.9	250	300
3 SH 89760 67671	1.93	1.50	GRASS	GRASS	5.60	L	220	1.5	2	65	75	*57.4	2-	170	248	*1.8	2	0	1.9	250	375
5 SH 90003 67569	4.12	3.50	GRASS	GRASS	5.50	L	220	1.5	1	95	75	28.7	1	210	248	1.6	2	0	1.9	250	875
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	28.7	1	210	248	1.6	2	0	1.9	250	613
11 SH 89801 67059	2.88	2.46	GRASS	GRASS	5.50	L	220	1.5	2	65	75	*57.4	1	210	248	1.6	2	0	1.9	250	615
12 SH 89684 67282	2.17	1.82	GRASS	GRASS	5.60	L	220	1.5	2	65	75	*57.4	2-	170	248	*1.8	2	0	1.9	250	455
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.5	2	65	75	*57.4	2-	170	248	*1.8	2	0	1.9	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.5	2	65	75	*57.4	1	210	248	1.6	2	0	1.9	250	875
15 SH 90419 67561	5.10	4.30	GRASS	GRASS	5.70	L	220	1.5	1	95	75	28.7	1	210	248	1.6	2	0	1.9	250	1075
17 SH 90094 67992	4.30	3.75	GRASS	GRASS	5.90	L	220	1.5	2	65	75	*57.4	2-	170	248	*1.8	2	0	1.9	250	938
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.5	2	65	75	*57.4	2-	170	248	*1.8	2	0	1.9	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	28.7	1	210	248	1.6	2	0	1.9	250	563
20 SH 90466 68572	4.36	3.44	GRASS	GRASS	5.80	L	220	1.5	1	95	75	28.7	1	210	248	1.6	2	0	1.9	250	860
21 SH 90533 68931	8.70	7.45	GRASS	GRASS	5.90	L	220	1.5	1	95	75	28.7	1	210	248	1.6	2	0	1.9	250	1863
Total (Ha)	**60.85**	**50.00**																			12500

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	47.5

Table 12. DCWW Llyn Conwy

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	0.1	2	65	75	*22.4	0	260	248	0.8	2	0	1.2	211	211
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	0.1	1	95	75	11.2	1	210	248	0.8	3	0	1.2	211	253
3 SH 89760 67671	1.93	1.50	GRASS	GRASS	5.60	L	220	0.1	2	65	75	*22.4	2-	170	248	*0.9	2	0	1.2	211	317
5 SH 90003 67569	4.12	3.50	GRASS	GRASS	5.50	L	220	0.1	1	95	75	11.2	1	210	248	0.8	2	0	1.2	211	739
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	0.1	0	125	75	11.2	1	210	248	0.8	2	0	1.2	211	517
11 SH 8980167059	2.88	2.46	GRASS	GRASS	5.50	L	220	0.1	2	65	75	*22.4	1	210	248	0.8	2	0	1.2	211	519
12 SH 89684 67282	2.17	1.82	GRASS	GRASS	5.60	L	220	0.1	2	65	75	*22.4	2-	170	248	*0.9	2	0	1.2	211	384
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	0.1	2	65	75	*22.4	2-	170	248	*0.9	2	0	1.2	211	608
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	0.1	2	65	75	*22.4	1	210	248	0.8	2	0	1.2	211	739
15 SH 90419 67561	5.10	4.30	GRASS	GRASS	5.70	L	220	0.1	1	95	75	11.2	1	210	248	0.8	2	0	1.2	211	907
17 SH 90094 67992	4.30	3.75	GRASS	GRASS	5.90	L	220	0.1	2	65	75	*22.4	2-	170	248	*0.9	2	0	1.2	211	791
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	0.1	2	65	75	*22.4	2-	170	248	*0.9	2	0	1.2	211	1794
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	0.1	1	95	75	11.2	1	210	248	0.8	2	0	1.2	211	475
20 SH 90466 68572	4.36	3.44	GRASS	GRASS	5.80	L	220	0.1	1	95	75	11.2	1	210	248	0.8	2	0	1.2	211	726
21 SH 90533 68931	8.70	7.45	GRASS	GRASS	5.90	L	220	0.1	1	95	75	11.2	1	210	248	0.8	2	0	1.2	211	1572
Total (Ha)	**60.85**	**50.00**																			10550

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t $P^{2}O^{5}$** and **6kg/t $K^{2}O$** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	211.0	51.6

Table 13. DCWW Myndd Llandegai

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.5	2	65	75	*66.1	0	260	248	0.8	2	0	3.4	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	33	1	210	248	0.8	3	0	3.4	250	300
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	33	1	210	248	0.8	2	0	3.4	250	613
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.5	2	65	75	*66.1	2-	170	248	*0.9	2	0	3.4	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.5	2	65	75	*66.1	1	210	248	0.8	2	0	3.4	250	875
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.5	2	65	75	*66.1	2-	170	248	*0.9	2	0	3.4	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	33	1	210	248	0.8	2	0	3.4	250	563
Total (Ha)	**27.29**	**21.78**																			5445

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	77.3

Table 14. DCWW Penybont

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.4	2	65	75	*74.7	0	260	248	1.3	2	0	2.6	224	224
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	41.7	1	210	248	1.4	3	0	2.9	250	300
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	41.7	1	210	248	1.4	2	0	2.9	250	613
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.4	2	65	75	*74.7	2-	170	248	*1.4	2	0	2.6	224	645
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.4	2	65	75	*74.7	1	210	248	1.3	2	0	2.6	224	784
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.4	2	65	75	*74.7	2-	170	248	*1.4	2	0	2.6	224	1904
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	41.7	1	210	248	1.4	2	0	2.9	250	563
Total (Ha)	**27.29**	**21.78**																			5032

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	57.5

Table 15. DCWW Rhiw Goch

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	pH	SNS	Recc	*In Waste	P Ind	Recc	Crop Use	*In Waste	K Ind	Recc	Crop Use	*In Waste	Mg Ind	Recc	*In waste	Total	Totals
1 SH 89879 67828	1.42	1.00	GRASS	GRASS	6.20	L	220	1.5	2	65	75	*72	0	260	248	1.2	2	0	1.9	250	250
2 SH 89952 67762	1.84	1.20	GRASS	GRASS	6.40	L	220	1.5	1	95	75	36	1	210	248	1.2	3	0	1.9	250	300
3 SH 89760 67671	1.93	1.50	GRASS	GRASS	5.60	L	220	1.5	2	65	75	*72	2-	170	248	*1.3	2	0	1.9	250	375
5 SH 90003 67569	4.12	3.50	GRASS	GRASS	5.50	L	220	1.5	1	95	75	36	1	210	248	1.2	2	0	1.9	250	875
7 SH 90128 67258	3.12	2.45	GRASS	GRASS	6.30	L	220	1.5	0	125	75	36	1	210	248	1.2	2	0	1.9	250	613
11 SH 89801 67059	2.88	2.46	GRASS	GRASS	5.50	L	220	1.5	2	65	75	*72	1	210	248	1.2	2	0	1.9	250	615
12 SH 89684 67282	2.17	1.82	GRASS	GRASS	5.60	L	220	1.5	2	65	75	*72	2-	170	248	*1.3	2	0	1.9	250	455
13 SH 89623 67140	3.30	2.88	GRASS	GRASS	6.40	L	220	1.5	2	65	75	*72	2-	170	248	*1.3	2	0	1.9	250	720
14 SH 89683 66937	4.25	3.50	GRASS	GRASS	6.30	L	220	1.5	2	65	75	*72	1	210	248	1.2	2	0	1.9	250	875
15 SH 90419 67561	5.10	4.30	GRASS	GRASS	5.70	L	220	1.5	1	95	75	36	1	210	248	1.2	2	0	1.9	250	1075
17 SH 90094 67992	4.30	3.75	GRASS	GRASS	5.90	L	220	1.5	2	65	75	*72	2-	170	248	*1.3	2	0	1.9	250	938
18 SH 90212 68300	10.16	8.50	GRASS	GRASS	6.00	L	220	1.5	2	65	75	*72	2-	170	248	*1.3	2	0	1.9	250	2125
19 SH 90203 68539	3.20	2.25	GRASS	GRASS	6.20	L	220	1.5	1	95	75	36	1	210	248	1.2	2	0	1.9	250	563
20 SH 90466 68572	4.36	3.44	GRASS	GRASS	5.80	L	220	1.5	1	95	75	36	1	210	248	1.2	2	0	1.9	250	860
21 SH 90533 68931	8.70	7.45	GRASS	GRASS	5.90	L	220	1.5	1	95	75	36	1	210	248	1.2	2	0	1.9	250	1863
Total (Ha)	**60.85**	**50.00**																			12500

SNS based on excess winter rainfall of >400mm, soil type and previous cropping.
Soil type :Soilscapes (13) Freely draining acid loamy soils over rock.
Recommendations based on the following (as per RB209, 2023) :
Soil analysis (pH, P,K) based on sample data, where multiple soil samples have been collected per field, highest value (index or pH) has been selected for each field.
Crop use based on **Grass** totalling **38t/ha** yield (25%DM) where **1.7kg/t P^2O^5** and **6kg/t K^2O** removed in offtake
To account for aftermath grazing 1/2 of the P & K requirements for grazing have been added and 10 kg/ha P and 20kg/ha K added for crop use.
N,P_2O_5,K_2O and Mg stated are **Available** concentrations in kg/ha
***Total** P2O5 and K2O stated where soil indices >2
Availability of nutrients in waste - N measured as NH4,P2O5 50%,K2O 90% Mg 10%

Crop	Yield (t/ha)	Straw Removed?	P_2O_5	P_2O_5	K_2O	K_2O
GRASS SILAGE (2 CUTS) + GRAZING	38	YES	1.7	65	6.0	228

	tonnes/ha	kg/ ha
Total N Supplied at max application rate :-	250.0	67.8

5 Compliance with NVZ regulations

Table 16. Compliance with NVZ regulations

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

Applicable to: All wastes < 30% RAN

If yes, please indicate the appropriate period:

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

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

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

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

6.1 Receiving soils

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

Table 17. Soil type

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

The soil analyses (**Soil Analysis**) show the soils to have ample background concentrations of Mg (*i.e.,* ADAS Index of 2-3).
However, for **Livestock management** If grass concentration is low, animals can be at risk of hypomagnesaemia, so applying more Mg to the soil can raise herbage Mg content to safer levels.

The concentrations of PTEs in these materials are very low and indicate that there is not a risk of a build-up of harmful substances in the soil. Therefore, heavy metals analysis on the soils are not required for this deployment as all PTE additions are well below upper limits.

6.2 Waste characterisation

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

The limiting factors for the different wastes are total phosphate where P index is ≥2 or the maximum rate of 250t/ha.

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 6-15 are based on the crop requirement and soil analysis.

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

6.4 *Additional requirements*

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

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

7.1 *Potentially Toxic Elements (PTEs)*

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

The potable water treatment sludges contain varying amounts of Al and Fe due to the flocculation process in the water treatment. At low pH (<6.0), aluminium can potentially transform into the toxic Al^{3+} species, it is therefore necessary to avoid spreading Al flocculated wastes on fields with pH <6.0 as this can cause stunt root growth and induced phosphate deficiency in crops. Additionally, care will be taken to prevent the waste entering a watercourse because aluminium can harm aquatic life. This will be achieved through observing buffer zones as per the location plan. Also, watercourses will be checked before, during and following spreading.

Iron flocculated wastes also have potential disbenefits if applied to inappropriate soils. Spreading high Fe wastes onto soils with pH < 5.0 is not recommended. Spreading onto fields with soil pH between 5.0- 5.5 requires consideration and possible mitigation. Due to potential for Fe-oxide formation which can reduce P_2O_5 mobility, spreading of Fe-flocculated wastes onto fields that are pH 5.0-5.5 has been avoided.

7.2 *Other waste characteristics*

The pH levels in the wastes range from 5.6 to 6.9. It is unlikely that soil pH will decrease following the application detailed here due to the extensive buffering capacity of the receiving soils. The pH levels of the receiving soils are ≥ 5.5 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 a dribble bar.

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. Sampling methods will be consistent with those set out in the RB209, and the analysis for PTEs are consistent with the code of agricultural practice.
4. Wastes will be applied when ground and weather conditions are suitable, following CoGAP to avoid soil damage including wheel ruts, compaction, structural damage, erosion and run-off.
5. Sufficient buffer capacity has been added to the spreading maps to minimise risk and ensure the protection of the monument located near field 8.

8 Sensitive human and environmental receptors

Please refer to site specific risk assessment. Locations of sensitive receptors are shown in **Location Plan**. Prevailing winds are south-westerly.

Non-spreading buffers have been applied to areas protected under the NERC Act to SAP species and habitats. The following were all taken from NT records and included in maps:

- Fields 7,17,18,19,20, 21 and 22's boundaries encroach on high flood risk areas. In order to prevent runoff into the river should flooding occur, no spreading will take place prior to, or immediately following periods of high rainfall.

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 **SSRA**. Generic measures (in addition to permit requirements and following the EMS) to reduce potential negative impacts of the proposed spreading operation will be as follows:

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

10 Contingency planning

Replacement spreading machinery will be available to prevent waste being retained in faulty machinery. Hire vehicles will be used if required. All machinery will be fully serviced.
There will be enough trained staff available to ensure that the operation continues throughout operational hours (*i.e.,* there will be sufficient cover for illness, holiday *etc.*).

In prolonged adverse weather, waste will not be collected from the producer unless suitably permitted storage is available, or ground/weather conditions become favourable for land application.

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