Agricultural Benefit Statement

For the application of beneficial wastes to fields at;

Cefn Naw Clawdd, Dolgellau, Gwynedd, LL40 2SG

24th June 2019

1 Person with appropriate technical expertise and permit details

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

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

Verified by; Mr Adam Stone FE/6321

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:	Cefn Naw Clawdd, Dolgellau, Gwynedd, LL40 2SG	
Stockpile grid reference:	Refer to Table 4	
Area of the receiving land:	30.8ha	
Quantity to be stored at any one time:	Stackable (temporary field stockpile): n/a	Non-Stackable: 1250t
Total maximum quantity to be spread:	7700t	
Location map document reference:	2. Spreading Area	

3 What is the waste to be spread

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

Waste	*EWC Code*	*Description*	*Waste Producer*	*Additional Information*
1	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Bala	
2	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Cilfor	
3	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Dolbenmaen	
4	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Eithin Fynydd	
5	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Garreglwyd	
6	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Gwastagoed	
7	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Llyn Conwy	
8	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Penybont	
9	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Penycefn	
10	19 09 02	Potable Water Treatment Sludge - LQ	DCWW Rhiwgoch	

4 Operational details

4.1 Cropping details

Table 3. Cropping details

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

	No more than 50t/ha will be spread onto 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 NRW will be notified 48 hours prior to spreading.

4.2 Waste storage

Table 4. Waste storage

How is the waste to be stored? *e.g. mobile tank, field heap, spread on delivery*	Above the ground store or spread on delivery.
Where is the waste to be stored prior to spreading?	SH 76260 14921
Why were these storage locations chosen?	The storage locations are accessible by delivery vehicle, near field entrances so the potential damage to fields by delivering vehicles is minimal. The storage locations are not within 10m of any ditch, watercourse, or footpath, not within a SPZ1, and are at least 50m from any well spring or borehole. They are also distant 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 waste will be surface spread by tractor and tanker using a low-trajectory splash plate.
How do you plan to incorporate the waste following application?	There is no requirement for incorporation of wastes 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?*	There is no mole draining,or subsoiling planned. There are some land drains in the fields.
Other relevant operational information:	Spreading the wastes will be carried out in accordance with the Code of Good Agricultural Practice for the Protection of Water, Soil, and Air for Wales (2011), NVZ regulations and the permit holder Environmental Management System (EMS). The wastes will be applied separately or in combination. If they are to be applied in combination, the total tonnage applied will not exceed 250t/ha, total N will be less than 250kg/ha, and the amount of total an available Phosphate

	and Potash (whichever appropriate) will not exceed the fertiliser recommendation or the amount removed in crop offtake, whichever is greater.

Table 6. DCWW Bala

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1416	2.7	2.1	Grass	Grass	6.3	M	205	2	2	65	65	**6	1	210	228	*0	4	0	*4	250	**525**
9846	7.3	4.2	Grass	Grass	6.2	M	205	2	2	65	65	**6	1	210	228	*0	4	0	*4	250	**1050**
0865	5.2	3.6	Grass	Grass	6.6	M	205	2	3	20	65	**6	1	210	228	*0	4	0	*4	250	**900**
9678	2.1	1.5	Grass	Grass	6.6	M	205	2	2	65	65	**6	1	210	228	*0	4	0	*4	250	**375**
1285	3.0	2.2	Grass	Grass	6.5	M	205	2	2	65	65	**6	0	260	228	*0	4	0	*4	250	**550**
2488	2.5	1.8	Grass	Grass	6.1	M	205	2	3	20	65	**6	0	260	228	*0	4	0	*4	250	**450**
9216	2.1	1.0	Grass	Grass	6.5	M	205	2	3	20	65	**6	1	210	228	*0	4	0	*4	250	**250**
1113	2.2	2.1	Grass	Grass	6.3	M	205	2	3	20	65	**6	1	210	228	*0	4	0	*4	250	**525**
2585	6.5	5.8	Grass	Grass	6.9	M	205	2	2	65	65	**6	1	210	228	*0	5	0	*4	250	**1450**
0264	2.9	2.5	Grass	Grass	6.6	M	205	2	2	65	65	**6	1	210	228	*0	5	0	*4	250	**625**
6854	6.2	4.0	Grass	Grass	6.6	M	205	2	2	65	65	**6	1	210	228	*0	4	0	*4	250	**1000**
Ha	**42.70**	**30.80**																			**7700**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 250t/ha is 64kg/ha

Table 7. DCWW Cilfor

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1416	2.7	2.1	Grass	Grass	6.3	M	205	2	2	65	65	**28	1	210	228	*0	4	0	*3	250	**525**
9846	7.3	4.2	Grass	Grass	6.2	M	205	2	2	65	65	**28	1	210	228	*0	4	0	*3	250	**1050**
0865	5.2	3.6	Grass	Grass	6.6	M	205	2	3	20	65	**28	1	210	228	*0	4	0	*3	250	**900**
9678	2.1	1.5	Grass	Grass	6.6	M	205	2	2	65	65	**28	1	210	228	*0	4	0	*3	250	**375**
1285	3.0	2.2	Grass	Grass	6.5	M	205	2	2	65	65	**28	0	260	228	*0	4	0	*3	250	**550**
2488	2.5	1.8	Grass	Grass	6.1	M	205	2	3	20	65	**28	0	260	228	*0	4	0	*3	250	**450**
9216	2.1	1.0	Grass	Grass	6.5	M	205	2	3	20	65	**28	1	210	228	*0	4	0	*3	250	**250**
1113	2.2	2.1	Grass	Grass	6.3	M	205	2	3	20	65	**28	1	210	228	*0	4	0	*3	250	**525**
2585	6.5	5.8	Grass	Grass	6.9	M	205	2	2	65	65	**28	1	210	228	*0	5	0	*3	250	**1450**
0264	2.9	2.5	Grass	Grass	6.6	M	205	2	2	65	65	**28	1	210	228	*0	5	0	*3	250	**625**
6854	6.2	4.0	Grass	Grass	6.6	M	205	2	2	65	65	**28	1	210	228	*0	4	0	*3	250	**1000**
Ha	**42.70**	**30.80**																			**7700**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 250t/ha is 115kg/ha

Table 8. DCWW Dolbenmaen

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	SNS	Req kg/ha	In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	Mg Ind	Req kg/ha	In Wst kg/ha	Rate t/ha	Totals tonnes
1416	2.7	2.1	Grass	Grass	6.3	M	205	2	2	65	65	**40	1	210	228	*0	4	0	*1	250	**525**
9846	7.3	4.2	Grass	Grass	6.2	M	205	2	2	65	65	**40	1	210	228	*0	4	0	*1	250	**1050**
0865	5.2	3.6	Grass	Grass	6.6	M	205	2	3	20	65	**40	1	210	228	*0	4	0	*1	250	**900**
9678	2.1	1.5	Grass	Grass	6.6	M	205	2	2	65	65	**40	1	210	228	*0	4	0	*1	250	**375**
1285	3.0	2.2	Grass	Grass	6.5	M	205	2	2	65	65	**40	0	260	228	*0	4	0	*1	250	**550**
2488	2.5	1.8	Grass	Grass	6.1	M	205	2	3	20	65	**40	0	260	228	*0	4	0	*1	250	**450**
9216	2.1	1.0	Grass	Grass	6.5	M	205	2	3	20	65	**40	1	210	228	*0	4	0	*1	250	**250**
1113	2.2	2.1	Grass	Grass	6.3	M	205	2	3	20	65	**40	1	210	228	*0	4	0	*1	250	**525**
2585	6.5	5.8	Grass	Grass	6.9	M	205	2	2	65	65	**40	1	210	228	*0	5	0	*1	250	**1450**
0264	2.9	2.5	Grass	Grass	6.6	M	205	2	2	65	65	**40	1	210	228	*0	5	0	*1	250	**625**
6854	6.2	4.0	Grass	Grass	6.6	M	205	2	2	65	65	**40	1	210	228	*0	4	0	*1	250	**1000**
Ha	**42.70**	**30.80**																			**7700**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 250t/ha is 93kg/ha

Table 9. DCWW Eithin Fynydd

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	SNS	Req kg/ha	In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	Mg Ind	Req kg/ha	In Wst kg/ha	Rate t/ha	Totals tonnes
1416	2.7	2.1	Grass	Grass	6.3	M	205	2	2	65	65	**20	1	210	228	*0	4	0	*1	250	**525**
9846	7.3	4.2	Grass	Grass	6.2	M	205	2	2	65	65	**20	1	210	228	*0	4	0	*1	250	**1050**
0865	5.2	3.6	Grass	Grass	6.6	M	205	2	3	20	65	**20	1	210	228	*0	4	0	*1	250	**900**
9678	2.1	1.5	Grass	Grass	6.6	M	205	2	2	65	65	**20	1	210	228	*0	4	0	*1	250	**375**
1285	3.0	2.2	Grass	Grass	6.5	M	205	2	2	65	65	**20	0	260	228	*0	4	0	*1	250	**550**
2488	2.5	1.8	Grass	Grass	6.1	M	205	2	3	20	65	**20	0	260	228	*0	4	0	*1	250	**450**
9216	2.1	1.0	Grass	Grass	6.5	M	205	2	3	20	65	**20	1	210	228	*0	4	0	*1	250	**250**
1113	2.2	2.1	Grass	Grass	6.3	M	205	2	3	20	65	**20	1	210	228	*0	4	0	*1	250	**525**
2585	6.5	5.8	Grass	Grass	6.9	M	205	2	2	65	65	**20	1	210	228	*0	5	0	*1	250	**1450**
0264	2.9	2.5	Grass	Grass	6.6	M	205	2	2	65	65	**20	1	210	228	*0	5	0	*1	250	**625**
6854	6.2	4.0	Grass	Grass	6.6	M	205	2	2	65	65	**20	1	210	228	*0	4	0	*1	250	**1000**
Ha	**42.70**	**30.80**																			**7700**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 250t/ha is 81kg/ha

Table 10. DCWW Garreglywyd

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	SNS	Req kg/ha	In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	Mg Ind	Req kg/ha	In Wst kg/ha	Rate t/ha	Totals tonnes
1416	2.7	2.1	Grass	Grass	6.3	M	205	2	2	65	65	**5	1	210	228	*0	4	0	*1	250	**525**
9846	7.3	4.2	Grass	Grass	6.2	M	205	2	2	65	65	**5	1	210	228	*0	4	0	*1	250	**1050**
0865	5.2	3.6	Grass	Grass	6.6	M	205	2	3	20	65	**5	1	210	228	*0	4	0	*1	250	**900**
9678	2.1	1.5	Grass	Grass	6.6	M	205	2	2	65	65	**5	1	210	228	*0	4	0	*1	250	**375**
1285	3.0	2.2	Grass	Grass	6.5	M	205	2	2	65	65	**5	0	260	228	*0	4	0	*1	250	**550**
2488	2.5	1.8	Grass	Grass	6.1	M	205	2	3	20	65	**5	0	260	228	*0	4	0	*1	250	**450**
9216	2.1	1.0	Grass	Grass	6.5	M	205	2	3	20	65	**5	1	210	228	*0	4	0	*1	250	**250**
1113	2.2	2.1	Grass	Grass	6.3	M	205	2	3	20	65	**5	1	210	228	*0	4	0	*1	250	**525**
2585	6.5	5.8	Grass	Grass	6.9	M	205	2	2	65	65	**5	1	210	228	*0	5	0	*1	250	**1450**
0264	2.9	2.5	Grass	Grass	6.6	M	205	2	2	65	65	**5	1	210	228	*0	5	0	*1	250	**625**
6854	6.2	4.0	Grass	Grass	6.6	M	205	2	2	65	65	**5	1	210	228	*0	4	0	*1	250	**1000**
Ha	**42.70**	**30.80**																			**7700**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 250t/ha is 85kg/ha

Table 11. DCWW Gwastagoed

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	SNS	Req kg/ha	In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	Mg Ind	Req kg/ha	In Wst kg/ha	Rate t/ha	Totals tonnes
1416	2.7	2.1	Grass	Grass	6.3	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	78	**164**
9846	7.3	4.2	Grass	Grass	6.2	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	78	**328**
0865	5.2	3.6	Grass	Grass	6.6	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	78	**281**
9678	2.1	1.5	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	78	**117**
1285	3.0	2.2	Grass	Grass	6.5	M	205	1	2	65	65	**65	0	260	228	*0	4	0	*1	78	**172**
2488	2.5	1.8	Grass	Grass	6.1	M	205	1	3	20	65	**65	0	260	228	*0	4	0	*1	78	**140**
9216	2.1	1.0	Grass	Grass	6.5	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	78	**78**
1113	2.2	2.1	Grass	Grass	6.3	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	78	**164**
2585	6.5	5.8	Grass	Grass	6.9	M	205	1	2	65	65	**65	1	210	228	*0	5	0	*1	78	**452**
0264	2.9	2.5	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	5	0	*1	78	**195**
6854	6.2	4.0	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	78	**312**
Ha	**42.70**	**30.80**																			**2402**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 78t/ha is 26kg/ha

Table 12. DCWW Llyn Conwy

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	SNS	Req kg/ha	In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	Mg Ind	Req kg/ha	In Wst kg/ha	Rate t/ha	Totals tonnes
1416	2.7	2.1	Grass	Grass	6.3	M	205	2	2	65	65	**26	1	210	228	*0	4	0	*1	250	**525**
9846	7.3	4.2	Grass	Grass	6.2	M	205	2	2	65	65	**26	1	210	228	*0	4	0	*1	250	**1050**
0865	5.2	3.6	Grass	Grass	6.6	M	205	2	3	20	65	**26	1	210	228	*0	4	0	*1	250	**900**
9678	2.1	1.5	Grass	Grass	6.6	M	205	2	2	65	65	**26	1	210	228	*0	4	0	*1	250	**375**
1285	3.0	2.2	Grass	Grass	6.5	M	205	2	2	65	65	**26	0	260	228	*0	4	0	*1	250	**550**
2488	2.5	1.8	Grass	Grass	6.1	M	205	2	3	20	65	**26	0	260	228	*0	4	0	*1	250	**450**
9216	2.1	1.0	Grass	Grass	6.5	M	205	2	3	20	65	**26	1	210	228	*0	4	0	*1	250	**250**
1113	2.2	2.1	Grass	Grass	6.3	M	205	2	3	20	65	**26	1	210	228	*0	4	0	*1	250	**525**
2585	6.5	5.8	Grass	Grass	6.9	M	205	2	2	65	65	**26	1	210	228	*0	5	0	*1	250	**1450**
0264	2.9	2.5	Grass	Grass	6.6	M	205	2	2	65	65	**26	1	210	228	*0	5	0	*1	250	**625**
6854	6.2	4.0	Grass	Grass	6.6	M	205	2	2	65	65	**26	1	210	228	*0	4	0	*1	250	**1000**
Ha	**42.70**	**30.80**																			**7700**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 250t/ha is 84kg/ha

Table 13. DCWW Pen Y Bont

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Current Crop**	**Next Crop**	**Soil pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
1416	2.7	2.1	Grass	Grass	6.3	M	205	2	2	65	65	**62	1	210	228	*1	4	0	*4	250	**525**
9846	7.3	4.2	Grass	Grass	6.2	M	205	2	2	65	65	**62	1	210	228	*1	4	0	*4	250	**1050**
0865	5.2	3.6	Grass	Grass	6.6	M	205	2	3	20	65	**62	1	210	228	*1	4	0	*4	250	**900**
9678	2.1	1.5	Grass	Grass	6.6	M	205	2	2	65	65	**62	1	210	228	*1	4	0	*4	250	**375**
1285	3.0	2.2	Grass	Grass	6.5	M	205	2	2	65	65	**62	0	260	228	*1	4	0	*4	250	**550**
2488	2.5	1.8	Grass	Grass	6.1	M	205	2	3	20	65	**62	0	260	228	*1	4	0	*4	250	**450**
9216	2.1	1.0	Grass	Grass	6.5	M	205	2	3	20	65	**62	1	210	228	*1	4	0	*4	250	**250**
1113	2.2	2.1	Grass	Grass	6.3	M	205	2	3	20	65	**62	1	210	228	*1	4	0	*4	250	**525**
2585	6.5	5.8	Grass	Grass	6.9	M	205	2	2	65	65	**62	1	210	228	*1	5	0	*4	250	**1450**
0264	2.9	2.5	Grass	Grass	6.6	M	205	2	2	65	65	**62	1	210	228	*1	5	0	*4	250	**625**
6854	6.2	4.0	Grass	Grass	6.6	M	205	2	2	65	65	**62	1	210	228	*1	4	0	*4	250	**1000**
Ha	**42.70**	**30.80**																			**7700**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 250t/ha is 54kg/ha

Table 14. DCWW Pen Y Cefn

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	SNS	Req kg/ha	In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	Mg Ind	Req kg/ha	In Wst kg/ha	Rate t/ha	Totals tonnes
1416	2.7	2.1	Grass	Grass	6.3	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	93	**195**
9846	7.3	4.2	Grass	Grass	6.2	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	93	**391**
0865	5.2	3.6	Grass	Grass	6.6	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	93	**335**
9678	2.1	1.5	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	93	**140**
1285	3.0	2.2	Grass	Grass	6.5	M	205	1	2	65	65	**65	0	260	228	*0	4	0	*1	93	**205**
2488	2.5	1.8	Grass	Grass	6.1	M	205	1	3	20	65	**65	0	260	228	*0	4	0	*1	93	**167**
9216	2.1	1.0	Grass	Grass	6.5	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	93	**93**
1113	2.2	2.1	Grass	Grass	6.3	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	93	**195**
2585	6.5	5.8	Grass	Grass	6.9	M	205	1	2	65	65	**65	1	210	228	*0	5	0	*1	93	**539**
0264	2.9	2.5	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	5	0	*1	93	**233**
6854	6.2	4.0	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	93	**372**
Ha	**42.70**	**30.80**																			**2864**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 93t/ha is 30kg/ha

Table 15. DCWW Rhiwgoch

						N			P_2O_5				K_2O				Mg				
Field Reference	Total Area	Sprd Area	Current Crop	Next Crop	Soil pH	SNS	Req kg/ha	In Wst kg/ha	P Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	K Ind	Req kg/ha	Crop Use kg/ha	In Wst kg/ha	Mg Ind	Req kg/ha	In Wst kg/ha	Rate t/ha	Totals tonnes
1416	2.7	2.1	Grass	Grass	6.3	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	144	**302**
9846	7.3	4.2	Grass	Grass	6.2	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	144	**605**
0865	5.2	3.6	Grass	Grass	6.6	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	144	**518**
9678	2.1	1.5	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	144	**216**
1285	3.0	2.2	Grass	Grass	6.5	M	205	1	2	65	65	**65	0	260	228	*0	4	0	*1	144	**317**
2488	2.5	1.8	Grass	Grass	6.1	M	205	1	3	20	65	**65	0	260	228	*0	4	0	*1	144	**259**
9216	2.1	1.0	Grass	Grass	6.5	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	144	**144**
1113	2.2	2.1	Grass	Grass	6.3	M	205	1	3	20	65	**65	1	210	228	*0	4	0	*1	144	**302**
2585	6.5	5.8	Grass	Grass	6.9	M	205	1	2	65	65	**65	1	210	228	*0	5	0	*1	144	**835**
0264	2.9	2.5	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	5	0	*1	144	**360**
6854	6.2	4.0	Grass	Grass	6.6	M	205	1	2	65	65	**65	1	210	228	*0	4	0	*1	144	**576**
Ha	**42.70**	**30.80**																			**4435**

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

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

Expected Grazing yield of 4-5t/ha

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

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

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

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

Total N supplied at an application rate of 144t/ha is 54kg/ha

5 Compliance with NVZ regulations

Table 7. 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: N/A

If yes, please indicate the appropriate period:

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

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

If no, applications will be carried out as per CoGAP i.e. when ground conditions are suitable and when no heavy rain is forecast.</td></tr>
<tr><td>Will application rates comply with crop requirement and field/whole farm limit?</td><td>Please refer to tables 6-15</td></tr>
<tr><td>Previous applications:</td><td>Please refer to 1i. LPD1 Supplementation</td></tr>
</table>

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

6.1 Receiving soils

The nutrient status of individual fields to be registered are provided in tables 6-15 above. General soil type(s) for the fields to be registered are;
The soil type is slowly permeable wet very acid upland soils with a peaty surface.

Table 8. Soil type

Light sand soils	Soils which are sand, loamy sand or sandy loam to 40cm depth and are sand or loamy sand between 40 and 80 cm, or over sandstone rock.	☐

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

The soil analyses (**Soil Analysis**) shows the soils to have sufficient background concentrations of Mg (*i.e.* ADAS Index 4-5). It is therefore unlikely that the crop will require any additional input of Mg over the course of the cropping cycle. The wastes contains some Mg but it is highly unlikely that applications of these materials will increase background levels in the receiving soil over time and are only likely to have a soil conditioning effect by increasing the base element content.

6.2 Waste characterisation

Full characterisations of individual wastes with total and available nutrients at the recommended rates for each waste stream are supplied in **5. Waste Analyses.** This information is further summarised against the nutrient requirements for proposed crops in tables 6-15 above.

The limiting factors on the wastes are –

- Nitrogen
- Phosphate (for Gwastagoed, Pen Y Cefn and Rhiwgoch).

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

Silage crop may require additional N and K to achieve optimum yield/off-take.

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 **5. Waste Analyses**.

7.2 Other waste characteristics

The pH levels in the wastes range from 5.8-7.

It is unlikely that soil pH will decrease following the application detailed here due to the extensive buffering capacity of the receiving soils. The pH levels of the receiving soils are between 6.1 and 6.9, 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. Wastes will be applied at low trajectory and will have little visual impact as they are not brightly coloured.
2. Potential compaction of receiving soil will be mitigated by suitable adjustment of tyres/tyre pressure to match soil conditions, direction of spreading and load to be spread.
3. Wastes will be applied when ground and weather conditions are suitable, following CoGAP to avoid soil damage including wheel ruts, compaction, structural damage, erosion and run-off.
4. Sampling methods will be consistent with those set out in the RB209, and the analysis for PTEs are consistent with the code of agricultural practice.
5. With regards to odour management for any potentially odorous material – the materials will only be disturbed when the material is being spread, and application to land will be done under permit conditions, following procedures in our permit EMS to minimise risk of odour emissions.

8 Sensitive human and environmental receptors

Please refer to site specific risk assessment (**CNC SSRA**). Locations of sensitive receptors are shown in **CNC Maps**. Prevailing winds are south-westerly.

As well as the designated sites included in the site-specific risk assessment, other sensitive areas have been accounted for. Flood risk areas at Glyn Farm have been designated as non-spreading, and fields at Tan-y-Coed Uchaf are over 500m downstream of a source protection zone (SPZ). For the Cadair Idris SSSI, where it borders some of the fields there will be a 20m non spreading buffer zone put in place.

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 purple in Table 10. Generic measures (in addition to permit requirements and following the EMS) to reduce potential negative impacts of the proposed spreading operation will be as follows;

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

10 Contingency planning

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