Statement of Agricultural Benefit – Trefwtial Farm (1)

Applicant: Mr Daniel James and Mrs Carys James (Stepside Agricultural Contractors)
Permit: SR2010 No4: mobile plant for land-spreading
Permit number: EPR/AB3891CX

Agricultural benefit statement is prepared by:

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This agricultural benefit statement has been prepared based on information provided by Stepside Agricultural Contractors. It is made on the understanding that all information provided is correct and representative of the fields to which the material is to be applied and of the waste material to be applied.

Farm address:

Trefwtial, Blaenannerch, Cardigan, Ceredigion, SA43 2AG

Wastes to be applied:

Waste Code	Waste Description	Physical Form	Waste Producer
02 05 02	Waste from the dairy products industry – sludges from on-site effluent treatment	Liquid sludge	Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) *
19 09 02	Sludge from water clarification	Sludge cake (stackable)	Dwr Cymru Welsh Water Bolton Hill WTW
19 09 02	Sludge from water clarification	Sludge cake (stackable)	Dwr Cymru Welsh Water Llechryd WTW
19 09 02	Sludge from water clarification	Sludge cake (stackable)	Dwr Cymru Welsh Water Preseli WTW
19 09 02	Sludge from water clarification	Sludge cake (stackable)	Dwr Cymru Welsh Water Strata Florida WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Bryngwyn WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Cray WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Llechryd WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Strata Florida WTW

* Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant - Volac International Limited has been acquired by Arla Foods Ingredients. Sensient Flavours Limited is no longer operational at the Felinfach site. A permit variation is pending to reflect these operational and ownership changes as discussed with NRW.

Application:

- Fields Trefwtial 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13 & 15 will be spread in February – April 2027 prior to first cut silage and following silage cuts May – September 2027. For liquid sludge, spreading of these grass fields will be split into up to 5 applications. Each individual application of liquid sludge will not exceed 50t/ha in any one application to a field. For sludge cake, spreading may be split into 2 separate applications.
- Fields Trefwtial 4, 19 & 20 will be spread in February – April 2027 prior to first cut silage and following silage cut May – June 2027, in advance of periods of grazing May - September 2027. For liquid sludge, spreading of these grass fields will be split into up to 5 applications. Each individual application of liquid sludge will not exceed 50t/ha in any one application to a field. For sludge cake, spreading may be split into 2 separate applications.
- Field Trefwtial 14 will be spread in April – June 2027 with sludge cake, or one application of liquid sludge up to 50t/ha prior to cultivations and the forage maize crop being planted with the sludge incorporated into the soil. The field may be spread again with one application of liquid sludge up to 50t/ha into the growing forage maize crop in May to July 2027.
- Spreading of the waste will be carried out in accordance with the Code of Good Agricultural Practice, The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 and in accordance with the requirements of the deployment and Environmental Permitting Regulations.
- The grass fields aren't to be cut or grazed for at least 3 weeks following application.
- NRW will be informed at least 48 hours prior to any spreading commencing and no spreading will occur within 48 hours of forecasted heavy rainfall.
- The liquid sludges are delivered by HGV road tankers which are discharged into a nurse tank or pumped from a nurse tank to the slurry bag with hose prior to spreading. Liquid sludge is spread from a nurse tank or slurry bag onto the deployed fields at the required timings as stated above. This is done by either umbilical method with the liquid delivered to tractor in deployed fields pumped through hose and spread by dribble bar applicator mounted onto the back of the tractor, or a tractor and vacuum tanker with dribble bar applicator. The dribble bar applicator places the liquid in bands onto the surface of the ground. This spread method is effective in limiting odour generation & nutrient losses associated with higher trajectory spread methods such as splash plate. Spreading is undertaken with the use of flow meters to ensure correct rates are applied.
- Should the timing, ground or weather conditions mean it's unsuitable for spreading then temporary storage of liquid sludge in nurse tanks or the slurry bag may be required. These potential locations are detailed on the attached field maps & within the LPD1 form.
- The nurse tanks do not have secondary containment, but are impermeable purpose built AW Trailers alloy nurse tanks featuring internal bracing, an anti-corrosive interior coating, designated fill and empty valves that can be shut by gate valves. These valves can be locked off in the event of temporary overnight temporary storage if the tank contains liquid to ensure secure temporary storage. The tanks are normally in use just prior to or when spreading activity is being undertaken. In most cases the nurse tanks are unlikely to contain liquid overnight. The tank fills from the top via internal pipework with a 'swanneck' reducing chances off any spills when decoupling connecting pipes after filling. The empty valve allows the tank to be completely emptied to the bottom. The tank is sealed with roof to prevent odour, rainwater entering the tank and for safety, and can be vented if required. A hydraulic lifting axle in the middle allows the tank to positioned and lowered, then locked into position so the whole tank is on the ground.
- The Labaronne Citaf self-supporting slurry bag is purpose built, sealed, can be vented and has designated fill and empty valves and is sited on a suitable flat area. The bag has a 10 year manufacturer guarantee: 100% against all material (technical fabric) and manufacturing (welding) defects. The technical fabric is composed of polyester coated with PVC and protected with an anti UV treatment on both sides. The bag has a life expectancy of 20 years +. The liquid is pumped across to the bag from a nurse tank or pumped from a lorry using a pump and lay flat hose across field connected to the bag fill valve. There are 2 gate valves in sequence over a metre apart and a non return valve. The bag features a number of degassers with anti-odour filters. The slurry bag will have a soil bund around the perimeter and will be fenced to prevent access & damage.
- The nurse tanks and slurry bag will be completely empty before use. Only liquid sludge as specified in this deployment will be stored in the nurse tanks and slurry bag.
- For liquid sludge, the maximum application rate in Table 1 for each field will be split into multiple applications where it's over 50t/ha. Each individual application will not exceed 50t/ha in any one application to a field.
- Liquid sludge of the same waste code may be stored together as a mix for operational purposes.
- The stackable water clarification sludge cakes are delivered to the spreading fields and are stockpiled in temporary field heaps prior to spreading. Spreading of the sludge cakes is undertaken with rear discharge muck spreaders.
- Only water clarification sludge cakes as listed under this deployment are to be stored in the temporary field heap stockpile locations and no other wastes.
- The wastes may be applied separately or in combination to a field. When more than one waste is applied to the same field the maximum application rate will be set as in section 'Application of wastes in combination' below.
- The maximum application rates for each field listed in Table 1 apply to an individual waste being applied to a field and have been made on a field by field basis using The Nutrient Management Guide (RB209).

Benefits from waste application:

- The analysis and nutrient content of the wastes are shown in the waste analysis attachments.
- The wastes are a source of nitrogen, phosphate, potassium, sulphur and organic matter. The wastes can be beneficially used to replace a proportion of bagged mineral fertiliser.
- The risk of sulphur deficiency has been estimated as 'High' based on the soil texture and expected winter rainfall (RB209). The crop requirements are 25-120kg SO_3/ha. The amount of available sulphur supplied by the wastes at the proposed maximum application rates is 1-12kg SO_3/ha.
- The addition of organic matter to the soil will help 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.

Materials applied in previous 12 months:

The fields within this deployment application have received the rates (t/ha) of materials as in 'Table 4 - Previous Land Treatment' within the previous 12 months.

It's considered that the nutrients applied from these applications were for the requirements of the previous crops before the material within this deployment is applied for the next crops.

Nutrients supplied by this application:

The recommended maximum application rates for each individual waste when applied on it's own to a field are shown in Table 1 and below. The rates have been made on a field by field basis using The Nutrient Management Guide (RB209).

Rates of application (t/ha)	**Nitrogen kg/ha**		**Phosphate (P_2O_5) kg/ha**		**Potash (K_2O) kg/ha**		**Magnesium (MgO) kg/ha**		**Sulphur (SO_3) kg/ha**	
	Total	Available	Total	Available	Total	Available	Total	Available	Total	Available
Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on-site effluent treatment @ 32 t/ha	10	2	13	8	10	8	2	0	3	1
Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on-site effluent treatment @ 50 t/ha	15	3	20	12	16	13	3	0	5	1
Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on-site effluent treatment @ 65 t/ha	20	4	26	16	21	17	4	0	7	1
Estimated Availability	20%		60%		80%		10%		20%	

Rates of application (t/ha)	Nitrogen kg/ha		Phosphate (P_2O_5) kg/ha		Potash (K_2O) kg/ha		Magnesium (MgO) kg/ha		Sulphur (SO_3) kg/ha	
	Total	Available	Total	Available	Total	Available	Total	Available	Total	Available
DCWW Bolton Hill WTW sludge cake @ 33 t/ha	73	7	40	8	5	1	14	3	88	9
DCWW Llechryd WTW sludge cake @ 16 t/ha	24	2	19	4	2	0	6	1	25	2
DCWW Llechryd WTW sludge cake @ 32 t/ha	48	5	39	8	3	1	12	2	50	5
DCWW Llechryd WTW sludge cake @ 51 t/ha	77	8	62	12	6	1	20	4	79	8
DCWW Llechryd WTW sludge cake @ 65 t/ha	98	10	79	16	7	1	25	5	101	10
DCWW Preseli WTW sludge cake @ 25 t/ha	56	6	39	8	2	0	11	2	119	12
DCWW Strata Florida WTW sludge cake @ 44 t/ha	83	8	40	8	2	0	2	0	91	9
DCWW Bryngwyn WTW liquid sludge @ 75 t/ha	12	1	20	4	2	0	2	0	24	2
DCWW Bryngwyn WTW liquid sludge @ 100 t/ha	16	2	27	5	2	0	2	0	32	3
DCWW Bryngwyn WTW liquid sludge @ 150 t/ha	23	2	40	8	3	1	3	1	48	5
DCWW Bryngwyn WTW liquid sludge @ 250 t/ha	39	4	67	13	5	1	5	1	80	8
DCWW Cray WTW liquid sludge @ 74 t/ha	16	2	20	4	2	0	2	0	20	2
DCWW Cray WTW liquid sludge @ 100 t/ha	21	2	27	5	2	0	3	1	26	3
DCWW Cray WTW liquid sludge @ 148 t/ha	31	3	40	8	3	1	4	1	39	4
DCWW Cray WTW liquid sludge @ 250 t/ha	53	5	67	13	5	1	7	1	66	7
DCWW Llechryd WTW liquid sludge @ 31 t/ha	13	1	19	4	2	0	6	1	11	1
DCWW Llechryd WTW liquid sludge @ 63 t/ha	26	3	39	8	3	1	13	3	23	2
DCWW Llechryd WTW liquid sludge @ 100 t/ha	42	4	63	13	5	1	21	4	36	4
DCWW Llechryd WTW liquid sludge @ 127 t/ha	53	5	79	16	7	1	26	5	46	5
DCWW Strata Florida WTW liquid sludge @ 149 t/ha	37	4	40	8	3	1	2	0	46	5
Estimated Availability	10%		20%		20%		20%		10%	

Application of wastes in combination:

When different wastes are applied to the same field the maximum application rates will be set so that the total combined amount applied will not exceed 250 t/ha, the total nitrogen loading will be less than 250 kg/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 (as listed in Table 1), whichever is the greater.

The following example shows the maximum rate of application and nutrient content applied based on 50t/ha DCWW Bryngwyn liquid water clarification sludge and 50t/ha DCWW Cray WTW liquid water clarification sludge being applied in total of all applications to the same field (no more than 50t/ha of liquid sludge spread in a single application).

	Rate of application (t/ha)	**Nitrogen kg/ha**		**Phosphate (P_2O_5) kg/ha**		**Potash (K2O) kg/ha**		**Magnesium (MgO) kg/ha**		**Sulphur (SO3) kg/ha**	
		Total	Available	Total	Available	Total	Available	Total	Available	Total	Available
DCWW Bryngwyn WTW liquid sludge	50	8	1	13	3	1	0	1	0	16	2
DCWW Cray WTW liquid sludge	50	11	1	13	3	1	0	1	0	13	1
TOTAL	**100**	**19**	**2**	**26**	**6**	**2**	**0**	**2**	**0**	**29**	**3**

Table 1: Field, Soil & Cropping Details, Fertiliser Recommendations and Application Rates

					Nitrogen		Phosphate			Potash			Magnesium	
Field Ref.	**Soil Type**	**Spreadable Area (ha)**	**Previous Crop**	**Next Crop**	**SNS**	**N Required (kg/ha)**	**P Index**	**P_2O_5 Required (kg/ha)**	**Crop Use (Offtake) (kg/ha)**	**K Index**	**K_2O Required (kg/ha)**	**Crop Use (Offtake) (kg/ha)**	**Mg Index**	**MgO Required (kg/ha)**
Trefwtial 1	Medium soils	3.70	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	1	320	282	2	0
Trefwtial 2	Medium soils	2.30	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	1	320	282	2	0
Trefwtial 3	Medium soils	3.30	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	1	320	282	2	0
Trefwtial 4	Medium soils	1.50	Grass 1 cut silage & grazing	Grass 1 cut silage & grazing	Moderate	190	3	20	39	3	30	138	3	0
Trefwtial 5	Medium soils	2.20	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	1	320	282	2	0
Trefwtial 6	Medium soils	4.40	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	1	320	282	2	0
Trefwtial 7	Medium soils	1.80	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	2	80	80	1	320	282	2	0
Trefwtial 8	Medium soils	2.30	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	1	320	282	2	0
Trefwtial 9	Medium soils	2.20	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	0	370	282	2	0
Trefwtial 10	Medium soils	4.60	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	2	80	80	0	370	282	2	0
Trefwtial 11	Medium soils	3.10	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	2	80	80	0	370	282	2	0
Trefwtial 12	Medium soils	2.70	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	2	80	80	0	370	282	2	0
Trefwtial 13	Medium soils	0.70	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	2	80	80	0	370	282	2	0
Trefwtial 14	Medium soils	4.50	Forage maize	Forage maize	1	100	2	62	63	0	257	198	2	0
Trefwtial 15	Medium soils	3.50	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	2	80	80	0	370	282	2	0
Trefwtial 19	Medium soils	2.60	Grass 1 cut silage & grazing	Grass 1 cut silage & grazing	Moderate	190	2	40	39	0	200	138	2	0
Trefwtial 20	Medium soils	2.80	Grass 1 cut silage & grazing	Grass 1 cut silage & grazing	Moderate	190	2	40	39	0	200	138	2	0
TOTAL		**48.20**												

Nutrient requirements based on:
Forage maize 45t FW/ha silage (30% DM)
Grass 3 cuts silage (23t FW/ha at 1st cut, 15t FW/ha at 2nd cut, 9t FW/ha at 3rd cut), silage 25% DM, totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake
Grass 1 cut silage (23t FW/ha at 1st cut), silage 25% DM, totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake + grazing
Expected DM yields of grass 9-12t/ha, good growth class

	Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on site effluent treatment						Dwr Cymru Welsh Water Bolton Hill WTW - water clarification sludge cake					
Field Ref.	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**
Trefwtial 1	**4	*26	**17	*4	65	241					0	0
Trefwtial 2	**4	*26	**17	*4	65	149					0	0
Trefwtial 3	**4	*26	**17	*4	65	215					0	0
Trefwtial 4	**2	*13	*10	*2	32	48					0	0
Trefwtial 5	**4	*26	**17	*4	65	143					0	0
Trefwtial 6	**4	*26	**17	*4	65	286					0	0
Trefwtial 7	**4	*26	**17	*4	65	117					0	0
Trefwtial 8	**4	*26	**17	*4	65	149					0	0
Trefwtial 9	**4	*26	**17	*4	65	143					0	0
Trefwtial 10	**4	*26	**17	*4	65	299					0	0
Trefwtial 11	**4	*26	**17	*4	65	202					0	0
Trefwtial 12	**4	*26	**17	*4	65	175					0	0
Trefwtial 13	**4	*26	**17	*4	65	45					0	0
Trefwtial 14	**3	*20	**13	*3	50	225					0	0
Trefwtial 15	**4	*26	**17	*4	65	228					0	0
Trefwtial 19	**2	*13	**8	*2	32	83	**7	*40	**1	*14	33	86
Trefwtial 20	**2	*13	**8	*2	32	90	**7	*40	**1	*14	33	92
TOTAL						**2838**						**178**

	Dwr Cymru Welsh Water Llechryd WTW - water clarification sludge cake						Dwr Cymru Welsh Water Preseli WTW - water clarification sludge cake						Dwr Cymru Welsh Water Strata Florida WTW - water clarification sludge cake					
Field Ref.	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**
Trefwtial 1	**5	*39	**1	*12	32	118					0	0					0	0
Trefwtial 2	**5	*39	**1	*12	32	74					0	0					0	0
Trefwtial 3	**5	*39	**1	*12	32	106					0	0					0	0
Trefwtial 4	**2	*19	*2	*6	16	24					0	0					0	0
Trefwtial 5	**5	*39	**1	*12	32	70					0	0					0	0
Trefwtial 6	**5	*39	**1	*12	32	141					0	0					0	0
Trefwtial 7	**10	*79	**1	*25	65	117					0	0					0	0
Trefwtial 8	**5	*39	**1	*12	32	74					0	0					0	0
Trefwtial 9	**5	*39	**1	*12	32	70					0	0					0	0
Trefwtial 10	**10	*79	**1	*25	65	299					0	0					0	0
Trefwtial 11	**10	*79	**1	*25	65	202					0	0					0	0
Trefwtial 12	**10	*79	**1	*25	65	175					0	0					0	0
Trefwtial 13	**10	*79	**1	*25	65	45					0	0					0	0
Trefwtial 14	**8	*62	**1	*20	51	229					0	0					0	0
Trefwtial 15	**10	*79	**1	*25	65	228					0	0					0	0
Trefwtial 19	**5	*39	**1	*12	32	83	**6	*39	**0	*11	25	65	**8	*40	**0	*2	44	114
Trefwtial 20	**5	*39	**1	*12	32	90	**6	*39	**0	*11	25	70	**8	*40	**0	*2	44	123
TOTAL						**2145**						**135**						**237**

	Dwr Cymru Welsh Water Bryngwyn WTW - liquid water clarification sludge						Dwr Cymru Welsh Water Cray WTW - liquid water clarification sludge						Dwr Cymru Welsh Water Llechryd WTW - liquid water clarification sludge					
Field Ref.	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**
Trefwtial 1	**2	*40	**1	*3	150	555	**3	*40	**1	*4	148	548	**3	*39	**1	*13	63	233
Trefwtial 2	**2	*40	**1	*3	150	345	**3	*40	**1	*4	148	340	**3	*39	**1	*13	63	145
Trefwtial 3	**2	*40	**1	*3	150	495	**3	*40	**1	*4	148	488	**3	*39	**1	*13	63	208
Trefwtial 4	**1	*20	*2	*2	75	113	**2	*20	*2	*2	74	111	**1	*19	*2	*6	31	46
Trefwtial 5	**2	*40	**1	*3	150	330	**3	*40	**1	*4	148	326	**3	*39	**1	*13	63	139
Trefwtial 6	**2	*40	**1	*3	150	660	**3	*40	**1	*4	148	651	**3	*39	**1	*13	63	277
Trefwtial 7	**4	*67	**1	*5	250	450	**5	*67	**1	*7	250	450	**5	*79	**1	*26	127	229
Trefwtial 8	**2	*40	**1	*3	150	345	**3	*40	**1	*4	148	340	**3	*39	**1	*13	63	145
Trefwtial 9	**2	*40	**1	*3	150	330	**3	*40	**1	*4	148	326	**3	*39	**1	*13	63	139
Trefwtial 10	**4	*67	**1	*5	250	1150	**5	*67	**1	*7	250	1150	**5	*79	**1	*26	127	584
Trefwtial 11	**4	*67	**1	*5	250	775	**5	*67	**1	*7	250	775	**5	*79	**1	*26	127	394
Trefwtial 12	**4	*67	**1	*5	250	675	**5	*67	**1	*7	250	675	**5	*79	**1	*26	127	343
Trefwtial 13	**4	*67	**1	*5	250	175	**5	*67	**1	*7	250	175	**5	*79	**1	*26	127	89
Trefwtial 14	**2	*27	**0	*2	100	450	**2	*27	**0	*3	100	450	**4	*63	**1	*21	100	450
Trefwtial 15	**4	*67	**1	*5	250	875	**5	*67	**1	*7	250	875	**5	*79	**1	*26	127	444
Trefwtial 19	**2	*40	**1	*3	150	390	**3	*40	**1	*4	148	385	**3	*39	**1	*13	63	164
Trefwtial 20	**2	*40	**1	*3	150	420	**3	*40	**1	*4	148	414	**3	*39	**1	*13	63	176
TOTAL						**8533**						**8479**						**4205**

	Dwr Cymru Welsh Water Strata Florida WTW - liquid water clarification sludge					
Field Ref.	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**
Trefwtial 1					0	0
Trefwtial 2					0	0
Trefwtial 3					0	0
Trefwtial 4					0	0
Trefwtial 5					0	0
Trefwtial 6					0	0
Trefwtial 7					0	0
Trefwtial 8					0	0
Trefwtial 9					0	0
Trefwtial 10					0	0
Trefwtial 11					0	0
Trefwtial 12					0	0
Trefwtial 13					0	0
Trefwtial 14					0	0
Trefwtial 15					0	0
Trefwtial 19	**4	*40	**1	*2	149	387
Trefwtial 20	**4	*40	**1	*2	149	417
TOTAL						**804**

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

** Available nutrient content of waste used on P, K or Mg index 0 or 1

The assumed availability of total nutrients in the Volac/Sensient (Arla) liquid sludge are N 20%, P_2O_5 60%, K_2O 80%, MgO 10%, SO_3 20%

The assumed availability of total nutrients in the DCWW water clarification sludges are N 10%, P_2O_5 20%, K_2O 20%, MgO 20%, SO_3 10%

Potential negative impacts from this application and mitigation measures planned:

Waste composition & receiving soils

- Potentially Toxic Elements: The supplied concentrations at the proposed application rates are all lower than the maximum permissible levels detailed in the Sludge (Use in Agriculture) Regulations for biosolids applied to agricultural land, which is believed to be a suitable comparison for wastes applied to agricultural land.
- Physical contaminants: The wastes are produced by managed processes. The wastes do not contain physical contaminants.
- The pH of the receiving soils ranges from pH 5.5 to 6.0.
- Dwr Cymru Welsh Water Bryngwyn, Cray & Llechryd water treatment works use iron-based coagulants to condition the water. Liquid sludge from these sites will only be spread on fields with a soil pH of 5.5 or above. All fields have a soil pH of 5.5 or above.
- Dwr Cymru Welsh Water Bolton Hill, Preseli & Strata Florida water treatment works uses aluminium-based coagulants to condition the water. Liquid water clarification sludges & sludge cakes from these sites will only be spread on fields with a soil pH of 6.0 or above. Liquid water clarification sludges & sludge cakes from these sites will only be spread on fields Trefwtial 19 & 20 which have a soil pH of 6.0 and not spread on any other fields.
- BOD: The BOD of the Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on-site effluent treatment is 903 mg/l and is significantly less than the range for cattle slurry (10-20,000 mg/l). Consequently, the environmental risks applying this sludge will be less than that of the material mentioned and more similar to 'dirty water' (1000-2000 mg/l). Consequently, the environmental risks applying the waste will be similar to that of the material mentioned. To mitigate the pollution risk to watercourses the sludge will not be applied at a rate greater than 50 t/ha in a single application. The proposed method of application, no-spread zones and precautions as stated in this document should be sufficient to minimise the pollution risk to manageable levels.
- Soils have been sampled to 7.5cm depth for permanent grass fields and to 15cm depth for temporary grass & arable fields with a 'half cheese' corer soil sampler walking a 'W' pattern across each field collecting approx. 25 sub samples per field.
- Receiving soils have been analysed and are suitable for application at the proposed application rates.
- Field Trefwtial 4 has a soil magnesium index of 3. The total magnesium applied by the wastes for this field is 2-6 kg/ha which is less than is likely to be removed by the next crop so there is unlikely to be an increase to soil magnesium levels. The amount of magnesium being applied is unlikely to have any noticeable difference on soil structure and the field is in grass cropping.
- Grass is not responsive to magnesium however herbage levels should be maintained to prevent 'Grass Staggers' in lactating animals. Potassium applications can reduce magnesium uptake resulting in 'Staggers'. The receiving soils have a magnesium index of 2 or 3 and so the risk is low.
- Some of the fields have a soil phosphate index of 3 based on soil analysis undertaken which is above target P index of 2 for grassland & arable soils. Application rates for these soil P index 3 fields are applying no more than half of the of total phosphate crop offtake for the next crops for these fields so there will be rundown of phosphate in the soil through crop offtake. The liquid sludges & sludge cakes are providing many benefits through application of other nutrients and trace elements. The soil phosphate levels of these fields will be monitored by the farm through regular soil analysis with the aim to run down the phosphate in the soil to target P index 2 over a number of years should future soil analysis indicate the fields are still above target P index 2 and run down is required.

Operations

The fields in this deployment have been designated as 'medium risk' following site checks on the proximity to surrounding protected areas (e.g. SSSIs) and groundwater source protection zones. On the basis of 'medium risk' the proposed operation will be subject to the generic risk assessment for deploying mobile plant under a SR2010 No.4. The potential risks associated with the application of waste on this deployment have been identified as;

- Potential run-off after application: The wastes will be applied following the Code of Good Agricultural Practice. The maximum application rate for each field over 50t/ha where spread with liquid sludges will be split into multiple applications and will not exceed 50t/ha in any one application to a field. The fields will be spread using precision spreading dribble bar equipment for liquid sludges and with rear discharge muck spreaders for sludge cakes, with no spreading areas enforced as per maps.
- All handling of the wastes will be in accordance to current regulations and relevant mitigation strategies will be adopted.
- Odour may potentially be emitted from the spreading of the Volac/Sensient (Arla) liquid sludge – to mitigate odour generation all handling of waste will be done in accordance to current regulations and relevant mitigation strategies will be adopted. Liquid sludge will be spread with low trajectory dribble bar applicator. This is an efficient method to prevent odour transmission & nutrient losses associated with higher trajectory spread methods such as splash plate. If any odour complaints are received, further odour mitigation methods will be implemented.
- The Dwr Cymru Welsh Water liquid water clarification sludges & stackable sludge cakes are considered to have no noticeable odour.
- Spillages: all spillages will be reported immediately to NRW.
- No waste will be spread within 10m of any ditch, pond or surface water, within 50m of any spring, well, borehole, or reservoir that supplies water for human consumption or farm dairies.
- The wastes will be spread on delivery or temporarily securely stored as stated above. Operators will aim to empty spreading equipment before the end of each working day to avoid overnight storage of waste in machinery.
- Regular servicing of all machinery is conducted and spreading equipment is annually calibrated. To prevent waste being held in faulty machinery replacement spreading equipment will be available.
- Spreading machinery will travel over the field in a direction which will most easily allow the machinery to turn within the boundaries of the field. Any spreading equipment will be turned off prior to turning at the end of each run.
- Machinery turns will be routed to avoid rutting and wheel slip. The turns will not be executed on any buffer strips.
- There will be sufficient trained staff available to ensure that the operation continues throughout operational hours (i.e. there will be sufficient cover for illness, holiday etc.).
- Rights of way have been marked on the spread risk maps. There are footpaths across fields Trefwtial 1, 6 & 9.
- Weather conditions will be monitored prior to spreading with wind speed and direction assessed.
- Consideration for the public and local residential receptors will be taken into account.

Signed: Robert Tucker	**Date:** 04/09/2026