Agricultural Benefit Statement

Report Index

1. Permit Details and Appropriate Technical Expertise

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

Relevant Qualifications & Experience include:

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

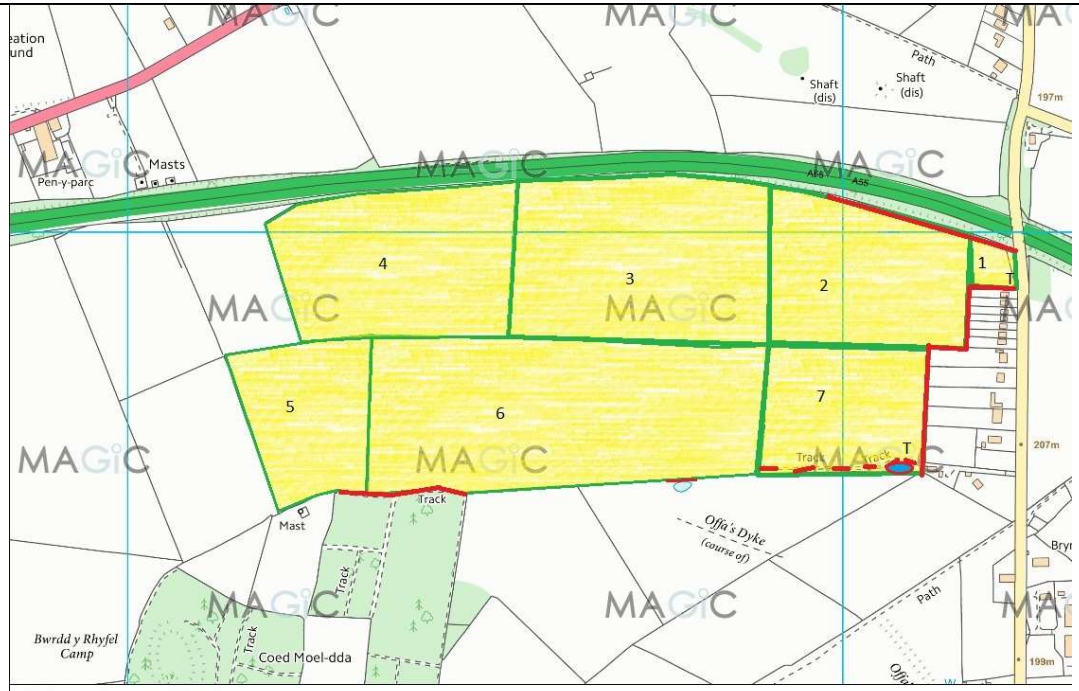
2. Land Details

The following benefit statement proposes to spread up to 10 wastes to land. The land details are listed in Table 1, and the site map can be found in Figure 1. This benefit statement is one of two benefit statements for the land.

Table 1: Farm and Land Details

Farm Name	Trem Y Foel
Farm Address and Postcode	Trem Y Foel, HolyWell CH8 8NF,
Farm NGR	SJ 16253 71286
Total Area to be Spread (hectares)	39.34

Up to 30m^3 of waste will be stored in each mobile storage tank at the land to be spread, with no more than 120m^3 in total being stored on site. This is suitable storage and the storage tank locations with be situated in appropriate locations. The storage locations are marked on the site map in Figure 1, which are at the following grid reference locations: SJ 15087 75703 and SJ 15232 75929



Site Address: Trem Y Foel, Hollywell CH8 8NF
Landowner: Mr Watkins

Environmental Risks:
There is a footpath running through field 7 – 10m No spread zone
There are housing on the border of field 1,2,7- 10m no spread zone
There is woodland surrounding the border of field 5,6,1,2- 10m no spread zone

Key
Boundary –
No Spread Zone –
Watercourse/ditch –
Transfer Tank / Storage Lagoon - T
Pond –
Footpath –
SSSI/SPA/SAC-

Figure 1: Site map including the fields to spread, receptors, storage (T), and spreading control measures

3. Waste Details

The wastes generally arise from food and beverage manufacturers and are primarily sludge from on-site effluent treatment plants, and materials unsuitable for consumption and processing. The waste details are displayed in Table 2.

Table 2: Waste Details

Waste Producer	EWC Code	Waste Description
Secanim	02 02 04	Sludges from on-site ETP from abattoirs, poultry preparation plants, rendering plants or fish preparation plants only
English Provender	02 03 01	Sludge from washing, cleaning, peeling, centrifuging and separation
Croda Goole (Forward Environmental)	07 07 12	Sludges from on-site biological effluent treatment plant at chemical manufacturing sites other than those mentioned in 07 01 11 only
Meadow Foods	02 05 02	Sludge from on-site ETP
Maelor Foods	02 02 01	Sludges from washing and cleaning
Nimbus Foods	02 05 01	biodegradable materials unsuitable for consumption or processing
Beachdean Ice cream	02 05 01	Biodegradable materials unsuitable for consumption or processing
Croda Widnes	02 03 05	Sludges from on-site ETP
Rowan Foods	02 03 05	Sludges from on-site ETP
Kelloggs	02 03 05	Sludges from on-site ETP

The wastes have been analysed by NRM laboratories for nitrogen, phosphorous, potash and PTE's, and individual waste analyses are attached in Appendix D. Additionally, due to the coding of the Secanim (02 02 04), a visual inspection was made to determine if analysis for FOGs was required. It was deemed not necessary. The wastes will be closely monitored during the spreading of this site, and so the requirement for FOGs analysis will be reviewed periodically. The waste is not expected to contain Selenium, Arsenic, Molybdenum and Fluoride, and so has not been tested for such elements.

To avoid the need for multiple deployments when a range of wastes are available, it is necessary to include them all to accommodate such variables as the amount of material produced by the waste producer and the timing of application (before seedbed preparation).

4. Operational Details

The wastes will be delivered to the site by road tanker and off-loaded into the mobile storage tanks. It is intended to spread the wastes by sub-soil injection to reduce the risk of environmental incidents, such as run-off and odour issues; to minimise disbenefit to the growing crop, such as through smothering or leaf scorch; and to provide nutrients to the root zone. Typically, wastes will be applied by deep-leg injector. However, a shallow injector may be used dependant on soil/weather conditions at the time of application. In drought

conditions, wastes with low odour potential and low risk of smothering crop leaf may be surface applied, and will provide additional benefit through irrigation.

It is intended to spread the wastes to arable fields before seedbed preparation. For this application, the wastes are expected to be applied to all fields in February/March 2020. However, this may change due to farmer requirements and weather conditions.

5. Fields and Crop Requirement

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

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

Field	Size	Grid Reference	Current Crop	Next Crop	Expected Yield	Nitrogen	Phosphate	Potash
	ha				t/ha	kg/ha	kg/ha	kg/ha
1	0.36	SJ 15207 75956	Maize	Maize	40	100	**0** *__56__	175
2	5.4	SJ 15021 75942	Maize	Maize	40	100	**0** *__56__	145
3	8.1	SJ 14724 75973	Grass	3rd cut Grass	47	250	**20** **64**	250
4	6.5	SJ 14357 75964	Grass	3rd cut Grass	47	250	**20** **64**	290
5	3.7	SJ 14257 75741	Grass	3rd cut Grass	47	250	**80**	290
6	11.2	SJ 14634 75745	Grass	3rd cut Grass	47	250	**80**	290
7	4.08	SJ 15002 75761	Grass	3rd cut Grass	47	250	**80**	340
Total	**39.34**							

The soil nitrogen supply (SNS) for fields 1 – 7 is 1.

6. NVZ Compliance

The site falls inside an NVZ designated area, which is illustrated in Figure 2. The wastes do not apply for the closed periods as they contain low percentages of available nitrogen. The application rates of the wastes will comply with crop requirement as no more than crop offtake of all nutrients will be applied to fields. In order to aid the landowner or farmer with their recording requirements, a post-notification of nutrients applied will be provided after spreading.

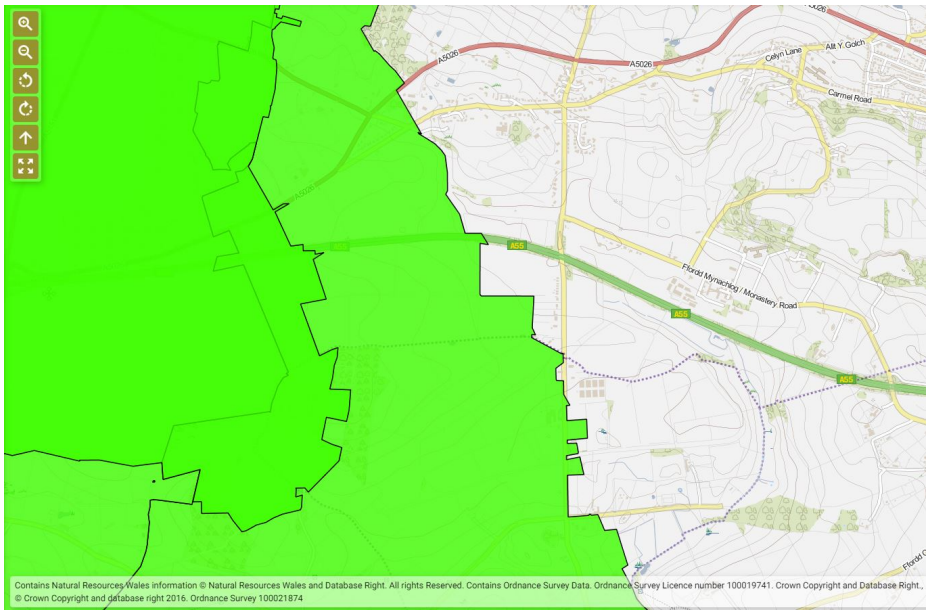


Figure 2: NVZ map for the land to be spread produced from the mapping service on the NRW website (https://lle.gov.wales/catalogue/item/NitrateVulnerableZonesNVZ/?lang=en**).**

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

Table 4: Previous Nutrients Applied

Field	Waste Applied	Month Applied	Application Rate	Nitrogen	Phosphate	Potash
			t/ha	kg/ha	kg/ha	kg/ha
1	FYM	Feb 19	4	18	9.6	28.2
2	FYM	Feb 19	4	18	9.6	28.2
3	FYM	Feb 19	4	18	9.6	28.2
4	FYM	Feb 19	4	18	9.6	28.2
5	FYM	Feb 19	4	18	9.6	28.2
6	FYM	Feb 19	4	18	9.6	28.2
7	FYM	Feb 19	4	18	9.6	28.2

7. Benefits of The Operation

The wastes will be used to provide plant nutrients that will replace a percentage of the fertiliser that the farmer would normally apply to their crop. The wastes will also provide benefit through the addition of organic matter and trace elements. The applied nutrients provided by the wastes may be subject to change: determined by analysis of individual samples during the agreed 12 month deployment period. The sludge is regularly analysed and application rates will be adjusted according to changes in analysis and volumes arising.

A summary of the wastes and the proposed application rates are listed in Table 5.

Table 5: Summary of Waste Nutrients and Application Rate

Waste	Application Rate	Nitrogen		Phosphate		Potash	
	t/ha	(total)	(available) 30%	(total)	(available) 50%	(total)	(available) 90%
Secanim Fields 3-7 Fields 1-2 30%	140 42	126 37.8	37.8 11.34	55 16.5	27.5 8.25	34 10.2	30.6 9.18
English Provender Fields 3-7 Fields 1-2 30%	122 36.6	122 36.6	36.6 10.98	55 16.5	27.5 8.25	12 3.6	10.8 3.24
Croda Goole (Forward Environmental) Fields 3-7 Fields 1-2 30%	41 12.3	82 24.6	24.6 7.38	55 16.5	27.5 8.25	9 2.7	8.1 2.43
Meadow Foods Fields 3-7 Fields 1-2 30%	95 28.5	133 39.9	39.9 11.97	55 16.5	27.5 8.25	37 11.1	33.3 9.99
Maelor Foods Fields 3-7 Fields 1-2 30%	31 9.3	105 31.5	31.5 9.45	55 16.5	27.5 8.25	7 2.1	6.3 1.89
Nimbus Foods Fields 3-7 Fields 1-2 30%	250 75	125 37.5	37.5 11.25	53 15.9	26.5 7.95	20 6	18 5.4
Beachdean Ice cream Fields 3-7 Fields 1-2 30%	169 50.7	118 35.4	35.4 10.62	55 16.5	27.5 8.25	18 5.4	16.2 4.86
Croda Widnes Fields 3-7 Fields 1-2 30%	250 75	100 30	30 9	32 9.6	16 4.8	15 4.5	17.1 5.13
Rowan Foods Fields 3-7 Fields 1-2 30%	68 20.4	68 20.4	20.4 6.12	55 16.5	27.5 8.25	5 1.5	4.5 1.35
Kelloggs Fields 3-7 Fields 1-2 30%	32 9.6	249 74.7	74.7 22.41	54 16.2	27 8.1	30 9	27 8.1

Wastes will be applied on an individual basis and applications, which are established for each waste when applied in isolation, will be carefully managed and monitored to ensure

that nutrients are applied at or below crop requirement/offtake values. It may however be necessary to apply the wastes as a mix such as during storage during adverse weather. In this case, the waste with the highest nutrient, PTE or other limiting factor is used as the maximum application rate, and thus wastes will be applied at the lowest individual application rate. Application rates will be adjusted by variation in tractor speed and or pump speed. It should be noted that if application rates are adjusted, they will not be increased above the application rates stated in this benefit statement (see Table 5).

Nitrogen

The waste analysis shows that the ammonia and nitrate nitrogen in the majority of wastes is relatively low; indicating that only a small proportion of nitrogen will be available immediately. The remaining total nitrogen applied will become available to the crop through mineralisation throughout following seasons. The rate of nitrogen release will be affected by several factors including climate, timing and method of application, and soil type.

Phosphorus

Applications of wastes are limited to ensure that phosphate is applied at or below crop off take values, as calculated from the RB209, ensuring that the spreading activities do not increase soil P reserves. Although Fields 1 and 2 are above target index, the amount of waste that will be spread upon fields 1 and 2 has been reduced to 30%. This means that a maximum of 16.6kg/ha will be spread on these fields. Of this only 8.25kg/ha will be available and this is immediately available to the crop. The planned spreading of the waste is March 2020 before seed bed preparation and drilling, which encourages rapid early growth from the available P applied. There will be a reduction of P as offtake is 56kg/ha leading to a reduction of 40kg/ha. For all fields the risk of leaching is low as according to the RB209 it only becomes a risk at index level 5 and above. Furthermore the risk of P leaching will be mitigated through appropriate application from timing and placement. Field 1 and 2 are relatively flat reducing the risk of runoff, there are also no water courses nearby which means the risk of contamination of watercourses is very low.

Potash

The wastes applied will supply up to 37kg/ha of potash, which will not meet crop offtake for all fields, but it will allow the landowner/farmer to considerably reduce the amount of chemical fertiliser required to meet the crop need. Applications of wastes are limited to ensure that potash is applied at or below crop off take values, as calculated from the RB209, ensuring that the spreading activities do not increase soil reserves.

Organic Matter

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

pH

Nimbus (4.61), Kelloggs (4.47), English Provender (4.51), Beach Deans Icecream (3.75) and Rowson (4.02) which is slightly acidic, the receiving soil have pH ranging from 5.6 to 6.3 and will buffer the waste pH with not detrimental effect anticipated. The soils at Trem y Foel Farm are classified on soil scapes as medium Loamy and clayey soils. These soil types are at a much lower of risk to the effect of pH than other soils such as Non-calcareous sandy soils. Soil scapes states that the soils are naturally free draining slightly acidic soils but base rich soils so the soil pH is naturally acidic. Beachdean will not be spread upon field 6 and 7. All other waste streams the soil pH will buffer the waste. All these wastes have been spread across Wales(Pan-007288, Pan-007287, Pan-006671, Pan-006314, Pan-007722, Pan-007721) and England on similar soils types, pH and application rates and have not seen any detrimental effects.

Soils

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

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

Field	Soil pH	Phosphate		Potash		Magnesium	
		mg/l	Index	mg/l	Index	mg/l	Index
1	6.1	53.8	4	149	2-	43.3	1
2	6.3	69	4	191	2+	54.6	2
3	5.9	32.4	3	140	2-	48.5	1
4	6	32	3	105	1	46.3	1
5	6.1	17	2	67.7	1	41.6	1
6	5.7	16.4	2	6.5	1	42.3	1
7	5.6	24.2	2	52	0	43.5	1

The soils were sampled in November 2019 in accordance with the sampling procedures described in the RB209 (9th Edition). Analysis was carried out by NRM laboratories for pH, major plant nutrients, and potentially toxic elements (PTEs) described in the Sludge (Use in Agriculture) Regulations.

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

Soil pH ranges from 5.6 and 6.3, and are above the target value, although it shouldn't affect crop performance. Soil P index's range from 2 to 4, with several of the soils above the guideline target index of 2. Soil K levels ranged from index 0 to 2+ and are generally around the target index level of 2-. The magnesium index for all fields was satisfactory. PTE concentrations for the majority of fields is low and within the typical range of uncontaminated soil.

8. Potential Negative Impacts

There are no known or expected elevated levels of PTEs within the wastes. However, some wastes do contain low pH, although it shouldn't affect crop performance.

Site Hazards

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

Odour and Noise Control

The wastes have the potential to cause odour, however storage will be sited away from dwellings, and it is unlikely to cause nuisance odour issues. Additionally, application of sludge via an umbilical cord sub soil injection system will minimise the risk of odour. The operation will be carried out in accordance within normal agricultural hours to minimise the risk of odour and noise complaints.

Storage Tanks

Storage tanks are inspected daily by the operator and wherever possible left empty at the end of the working day. Storage tanks will not be sited within 10m of watercourses or at the top of a steep embankment. Signage on the tanks identifies the company and activity, and has emergency contact details. Anticipated location of storage tanks are shown in Figure 1, but locations may vary slightly due to unforeseen operational requirements.

9. Sensitive Receptors

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

There are footpaths or tracks crossing the fields to be spread, and no boreholes, wells or springs have been identified within the spreading area. For the footpaths in the fields a 10m no spread zone has been implemented and they have been marked on the site maps.

The site is not within a flood prone area and the land is outside a ground water protection zone. The wastes will be spread in appropriate conditions with weather and field conditions continuously examined.

10. Contingency Planning

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

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

Spreading operations will not be carried out when there are adverse weather conditions that are likely to interfere with the operation. These conditions include; heavy rain, or during

periods of heavy snow or frozen ground as defined in the Code of Good Agricultural Practice (COGAP).