

Agricultural Benefit Statement – Woodlands Farm

Permit Details

Company Name: D Wise

Permit Reference: BB3505LT

Qualifications and Technical Expertise

This agricultural benefit statement has been prepared by Ryan Griffiths-Patel of Trade Effluent Services Ltd for D Wise Ltd

Professional Qualifications:

- Land spreading of non-farm wastes course (2 day course – Feb 2021)
- FACTS Trained
- BSC. (Hons) Geography
- MSc Environmental Informatics
- 2 Years experience of waste to land recycling operations

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Land to be treated

Landowner/Occupier: Ian Becket

Main Farm Address: Woodlands Farm- Willington Worthenbury, Tallarn Green, Wrexham, Wales, SY14 7ND, United Kingdom

Grid Reference of main farm: SJ 45652 43766

CPH Number: 56/256/0080

Land Usage: Agricultural

Field	Field Size (ha)	Spreadable Area (ha)	Grid Reference	Waste types to be spread
1	2.6	2.1	SJ 45556 43962	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
2	2.1	2.1	SJ 45471 43947	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
3	1.9	1.3	SJ 45486 44108	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
4	4.4	3.5	SJ 45753 43682	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
5	3.4	2.9	SJ 45483 43574	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
6	1.5	1.4	SJ 45328 43619	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
7	3.4	2.8	SJ 45435 43435	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
8	2.3	2.1	SJ 45323 43350	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
9	1.8	1.5	SJ 45423 43267	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
10	1.1	1	SJ 44921 43452	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
11	3.9	3.2	SJ 45029 43300	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
12	1.8	1.5	SJ 45202 43285	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)

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13	3.5	3.1	SJ 45095 43133	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
14	4.3	3.9	SJ 45550 43719	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
15	3.9	3.5	SJ 45303 43069	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
16	2.5	1.8	SJ 45483 43091	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
17	1.5	1.1	SJ 45672 43224	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
18	8.4	7.1	SJ 45506 42828	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
19	3.8	3.1	SJ 45164 42902	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)
20	1.3	1	SJ 45551 43115	D Wise Sludge (02 02 02) D Wise Egg Shells (02 02 02)

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Field Nutrient Status and Crop Requirement

Field	Field Size (ha)	Spreadable Area (ha)	Grid Reference	Soil Type	Current Crop	Next Crop	Expected Yield (t/ha)	Nitrogen kg/ha	Phosphate kg/ha	Potash kg/ha
1	2.6	2.1	SJ 45556 43962	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	125	310
2	2.1	2.1	SJ 45471 43947	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	95	170
3	1.9	1.3	SJ 45486 44108	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	20 Offtake(64.6)	120
4	4.4	3.5	SJ 45753 43682	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	64.6	310
5	3.4	2.9	SJ 45483 43574	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	125	310
6	1.5	1.4	SJ 45328 43619	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	125	310
7	3.4	2.8	SJ 45435 43435	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	125	310
8	2.3	2.1	SJ 45323 43350	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	65	120
9	1.8	1.5	SJ 45423 43267	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	65	170
10	1.1	1	SJ 44921 43452	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	65	310
11	3.9	3.2	SJ 45029 43300	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	65	310
12	1.8	1.5	SJ 45202 43285	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	125	310
13	3.5	3.1	SJ 45095 43133	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	65	Offtake 228
14	4.3	3.9	SJ 45550 43719	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	95	Offtake 228
15	3.9	3.5	SJ 45303 43069	Clay Loam	Maize	Maize	40	100	Offtake (56)	145

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16	2.5	1.8	SJ 45483 43091	Clay Loam	Maize	Maize	40	100	55	175
17	1.5	1.1	SJ 45672 43224	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	65	170
18	8.4	7.1	SJ 45506 42828	Clay Loam	Maize	Maize	40	100	85	205
19	3.8	3.1	SJ 45164 42902	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	95	260
20	1.3	1	SJ 45551 43115	Clay Loam	2nd cut silage and grazing	2nd cut silage and grazing	38	210	125	310

Soil sampling was carried out in accordance with the ADHB Nutrient Management Guide (RB209) updated May 2023 and submitted to NRM Laboratories for analysis. A copy of the analysis is attached as part of this application (Appendix A).

Soil type is a medium/clay loam

Recommendations are based on the ADHB Nutrient Management Guide

Field	Soil pH	Phosphate		Potash		Magnesium		SNS
	pH	mg/l	Index	mg/l	Index	mg/l	Index	Index
1	6.3	6.8	0	103	1	150	3	Moderate
2	5.9	13.6	1	126	2-	154	3	Moderate

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3	7	38.5	3	192	2+	125	3	Moderate
4	6.6	60.4	4	72	1	155	3	Moderate
5	6	8.8	0	86	1	328	5	Moderate
6	5.5	5.2	0	68	1	143	3	Moderate
7	5.8	5.8	0	63	1	138	3	Moderate
8	5.7	21.4	2	194	2+	144	3	Moderate
9	5.9	23.6	2	141	2-	204	4	Moderate
10	5.8	16.6	2	69	1	158	3	Moderate
11	5.5	16.2	2	110	1	175	3	Moderate
12	5.6	5	0	63	1	134	3	Moderate
13	5.9	19	2	268	3	81	2	Moderate
14	6.1	13.8	1	229	3	98	2	Moderate
15	5.5	66	4	128	2+	91	2	1
16	5.6	22.4	2	158	2-	124	3	1
17	5.9	20.8	2	78	2-	89	2	Moderate
18	5.7	10.4	1	78	1	107	3	1
19	5.5	10.2	1	52	0	92	2	Moderate
20	5.5	7.2	0	86	1	132	3	Moderate

Previous Land treatment

The fields proposed to be spread in this deployment have been spread with FYM in the past 12 months

Application rates and nutrient additions are shown in the table below

Field	Waste Applied	Application Rate(m3/ha)	Nitrogen		Phosphate		Potash	
			Total	Available	Total	Available	Total	Available
1	FYM	3	6	2	9.6	5.7	28.2	25.5
2	FYM	3	6	2	9.6	5.7	28.2	25.5
3	FYM	3	6	2	9.6	5.7	28.2	25.5
4	FYM	3	6	2	9.6	5.7	28.2	25.5
5	FYM	3	6	2	9.6	5.7	28.2	25.5
6	FYM	3	6	2	9.6	5.7	28.2	25.5
7	FYM	3	6	2	9.6	5.7	28.2	25.5
8	FYM	3	6	2	9.6	5.7	28.2	25.5
9	FYM	3	6	2	9.6	5.7	28.2	25.5
10	FYM	3	6	2	9.6	5.7	28.2	25.5
11	FYM	3	6	2	9.6	5.7	28.2	25.5
12	FYM	3	6	2	9.6	5.7	28.2	25.5
13	FYM	3	6	2	9.6	5.7	28.2	25.5
14	FYM	3	6	2	9.6	5.7	28.2	25.5
15	FYM	3	6	2	9.6	5.7	28.2	25.5
16	FYM	3	6	2	9.6	5.7	28.2	25.5
17	FYM	3	6	2	9.6	5.7	28.2	25.5
18	FYM	3	6	2	9.6	5.7	28.2	25.5
19	FYM	3	6	2	9.6	5.7	28.2	25.5
20	FYM	3	6	2	9.6	5.7	28.2	25.5

Waste Details

The table below shows the wastes that are proposed to be spread under this application. Each waste can convey a benefit and application rates are established when applied in isolation.

Waste Producer	EWC Code	EWC Code Description	Total Amount being spread (Tonnes)
D.Wise (sludge)	02 02 02	Eggshell sludge from hatcheries, processing and similar premises.	12500
D Wise Egg Shells	02 02 02	Egg shells from hatcheries, processing and similar premises.	808.4(grass fields) 124(Maize Fields)

Waste analysis has been carried out by NRM laboratories and is attached to the application as Appendix B

Specific field application rates are tailored to the requirements of each individual field and are detailed in Appendix D.

Operational Details

The liquid wastes (sludges) are delivered by HGV road tankers to the lagoon or spread directly. The material will be applied via sub soil injector, or trailing shoe applicator depending on soil conditions, weather conditions and timing of application. Both methods of application have been selected as they allow for precise application of sludges and minimise odour and ammonia emissions from spreading sludges and slurries to land and allow for sludges to be applied directly to the soil/root zone minimising contamination of plant leaf. The egg shell waste will be stockpiled before being spread. The eggshells will be delivered to site by tractor trailer and stored in temporary field heaps until they are spread via manure spreader.

Storage

Sludge/liquid will be delivered into the lagoon located at the farm or stockpiled (eggshells). Stockpile locations are at either end of the fields to be spread and adjacent to field gateways to reduce vehicle travel and unnecessary compaction of the soil when delivering. Material is intended to be stored until there is sufficient quantities to spread whole fields which to reduce the number of spreading events and reduce the likelihood of generating odour issues associated with spreading waste to land. Topography, distance from watercourses and other sensitive receptors were also a factor in stockpile location. Storage is expected to be short term for operational purposes with storage times limited to minimise the risk of odour issues from the operation. Only the waste specified in this deployment will be stored before spreading.

Proposed storage locations are shown below and have been shown on the site plan.

Description	Grid Reference	Maximum storage (at any one time)
Lagoon	SJ 45748 43849	1200
Stockpile	SJ 45270 42880	933
Stockpile	SJ 45543 43216	933
Stockpile	SJ 45728 43805	933

Timings of Application

Application timings are dependent on suitable ground conditions, weather conditions, soil temperature and crop growth stage. All fields are cropped for silage and grazing so Applications of waste will be made before the growing season or after a cut has been taken- we anticipate this to be between July and September of 2023 and between February and end of September 2024 for the grass crop. For the maize crop applications will occur after harvest in 2023 usually from September to October and before seed bed preparation and worked in prior to drilling in the Spring of 2024- usually February to April.

Application Rate- The rates have been reduced for the maize fields

Commercial Waste	Application Rate t/ha	pH	Nitrogen kg/ha		Phosphorous kg/ha		Potassium kg/ha		Magnesium kg/ha
			Total	Available	Total	Available (50%)	Total	Available (90%)	Total
D.Wise (sludge)	250	7	100	3	10	5	25	22	4
D Wise Egg Shells	21.5	8.35	207	25	51	26	20	18	93

All grass fields

Commercial Waste	Application Rate t/ha	pH	Nitrogen kg/ha		Phosphorous kg/ha		Potassium kg/ha		Magnesium kg/ha
			Total	Available	Total	Available (50%)	Total	Available (90%)	Total
D.Wise (sludge)	250	7	100	3	10	5	25	22	4
D Wise Egg Shells	10	8.35	96	12	24	12	10	9	43

Maize fields

Application rates and nutrients for each waste to be applied are given in Appendix D

Benefits of the operation

The wastes will provide agricultural benefit through the addition of plant nutrients specifically nitrogen, phosphate and potash and sulphur. Application of these wastes can be beneficially used to replace a proportion of mineral fertiliser. The waste analysis and calculations in Appendix D show application rates and nutrients applied for each waste.

Phosphate applied from the application will be up to crop offtake levels where fields are at target index

Silage removes large amounts of potash from the soil. While the application of wastes will provide benefit from the supply of upto 25kg/ha of potash, this will not account for the crop offtake values and additional potash should be applied to maximise yield.

Potential Negative Impacts from the operation

Neutralising Value

The analysis shows that the waste has a neutralising value of 39.5% CaO however this analysis was carried out on a dry ground sample of the waste (requirement for analysis). The waste material has a large particle size compared to the fine-grained form that the waste is tested under and as with agricultural lime products the particle size significantly impacts its efficiency. Given the large particle size of material, the neutralising potential is unlikely to be realised and at the application rates the material is applied at, the waste will have minimal neutralising value.

- Deliveries will be made during the working day.
- Storage kept to a minimum with storage tanks planned to be left empty at the end of each day.
- Storage tanks have lid to be kept closed during use
- Applications to be made using sub soil injector or trailing shoe, these are both low emission spreading activities and which place waste material directly on or below the soil surface reducing ammonia and odour emissions by over 60% when compared with higher trajectory spreading techniques.
- Application via umbilical cord to minimise vehicle movements and loading/unloading via vacuum tanker which can increase risk of odour issues due to air movements.
- Stockpiled waste will be situated away from residential areas and covered if adverse weather conditions are predicted or if odour occurs however the waste is not offensive in its smell. The stockpile located at SJ 45728 43805 is located at the farm. The stockpile located at SJ 45543 43216 is within 150m of a farm (Brookhouse Farm) this farm is also owned Ian Beckett and so should not be expected cause odour issues. The stockpile located at SJ 45270 42880 is over 250m away from a residential area. With this distance and unoffensive smell we do not expect any issues to occur. There are multiple stockpiles so if any problems occur due to weather or odour the waste can be moved to another stockpile. We understand that only 933 tonnes of eggshell waste can be stored across the deployment.

pH of wastes

- The pH of the eggshell waste is considered to be high at 8.35. Due to the low application rate it is unlikely that it will have an effect upon the soils. The soil pH will also act as a buffer to the waste further reducing the risk.

Potentially Toxic Elements

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The wastes and receiving soil have been tested for potentially toxic elements. All results are low and the application of sludges will add significantly less than the limits in the Sludge (Use in Agriculture) Regulations.

Potential Sensitive Receptors

Application via sub-soil injection and trailing shoe will reduce the potential for odour arising from the spreading operation.

The umbilical pipe will be checked daily by the operator

Waste deliveries to the field tank will be made during normal agricultural working hours and the intention is to leave the tanks empty at the end of each day.

There is a spring located outside the spreading area. A 50m no spread zone has been put into place.

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).

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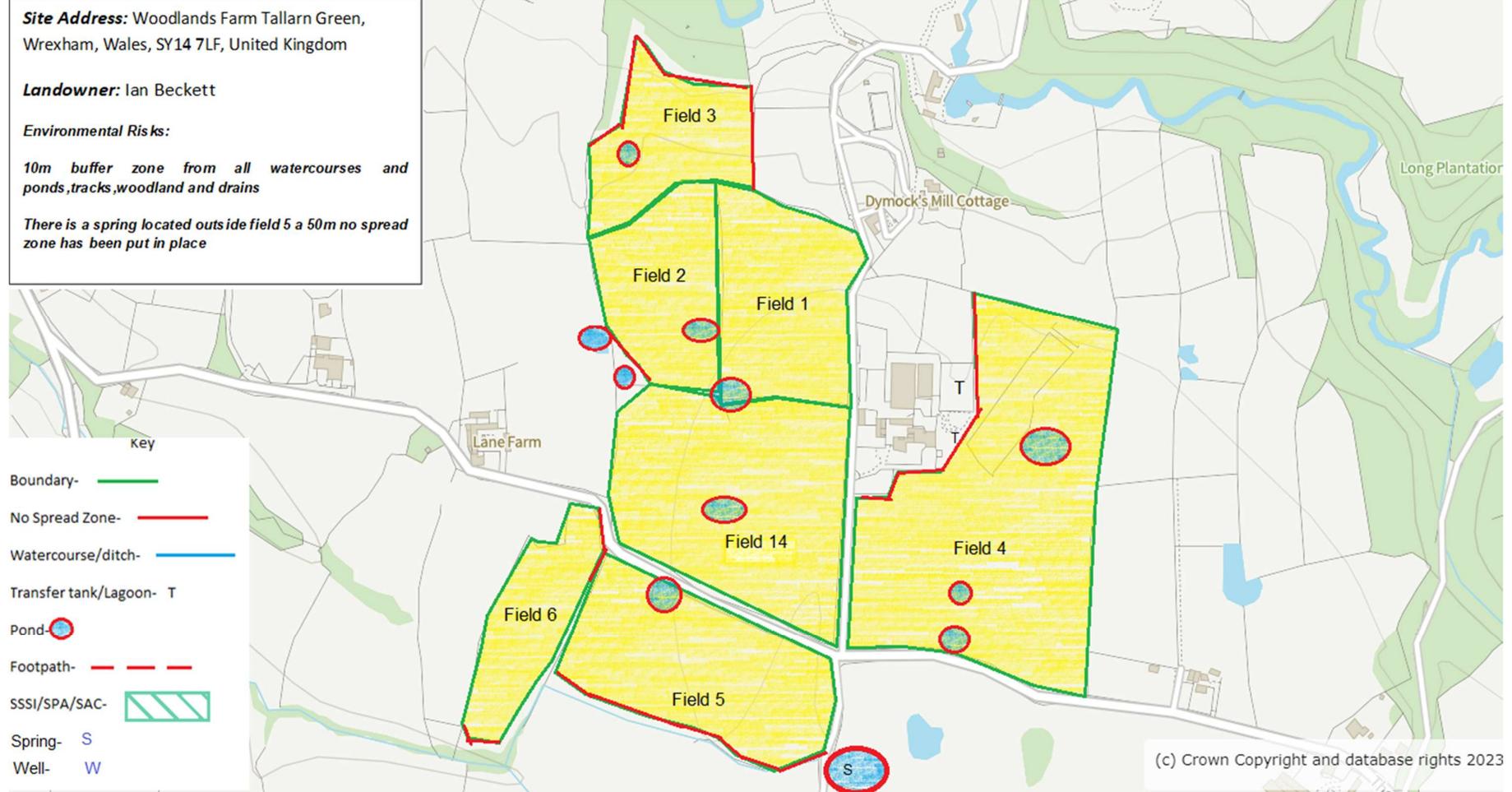
Site Address: Woodlands Farm Tallarn Green, Wrexham, Wales, SY14 7LF, United Kingdom

Landowner: Ian Beckett

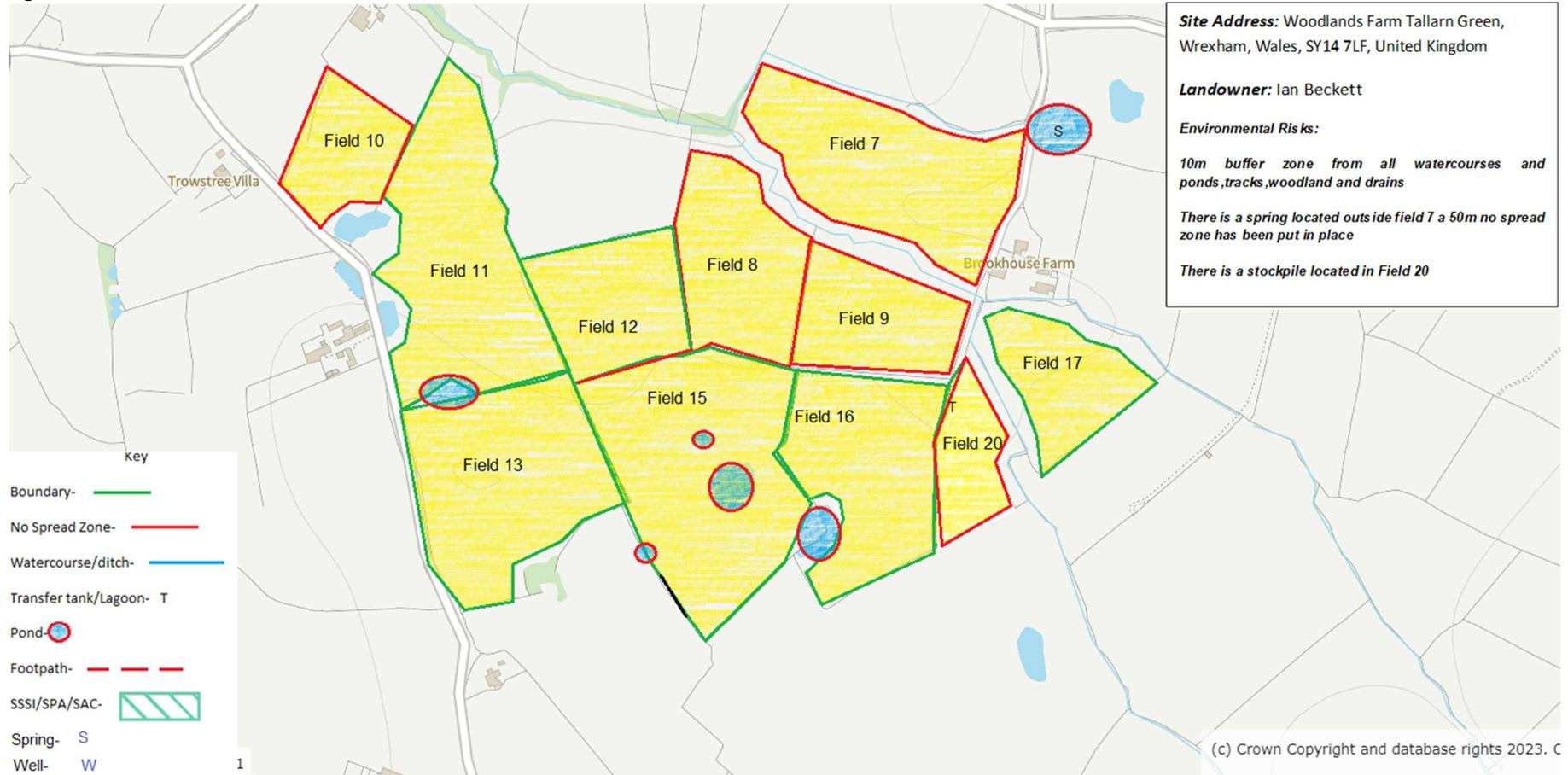
Environmental Risks:

10m buffer zone from all watercourses and ponds, tracks, woodland and drains

There is a spring located outside field 5 a 50m no spread zone has been put in place



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Site Address: Woodlands Farm Tallarn Green,
Wrexham, Wales, SY14 7LF, United Kingdom

Landowner: Ian Beckett

Environmental Risks:

10m buffer zone from all watercourses and ponds, tracks, woodland and drains

There is a stockpile located in Field 18

