



Infrastructure Report

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1. Introduction, Objectives and Disclaimer

1.1 Objectives of this Report

The purpose of this report is to:

1.1.1 Investigate the current storage facilities for manure and slurry and assess these against the estimated level of production of manures.

1.1.2 Highlight where improvements can be made, which in turn should improve resources and business efficiency, and reduce carbon equivalent Green House Gas (GHG) emissions.

1.2 Disclaimer

This report is prepared from physical and financial information supplied by the farming client. The report is prepared in good faith and every effort has been made to ensure accuracy, however AgriPlan Cymru cannot accept liability for errors and omissions. Responsibility for actions taken lies with the client. Professional advice and statutory advice should be taken as appropriate. Due to the social distancing guidance provided by H M Government and the Welsh Assembly Government following the COVID 19 outbreak, it has not been possible to undertake a meeting on farm to assist in the preparation of this report.

1.3 Farming Connect

AgriPlan Cymru has been approved to deliver the Advisory Service on behalf of Farming Connect. This Technical Report should be part-funded through Farming Connect.

2. Farm resources

Family partnership of Glyn and Eifion Owen and their parents. They operate a dairy and sheep farm in the Ceiriog Valley. The farm extends to 178 acres and is owner-occupied acres with a further 60 rented in. Approx 25 acres is woodland.

The farm mainly comprises

- 95 cows with home-reared followers. All year round calving. Milk sold to Arla.
- approx. 15 head per annum reared & sold as heavy stores at 18/24 months.
- A small flock to clean up grass for dairy enterprise

3. Production & Storage of Organic Manures (slurry/manure)

Approximately 95 dairy cows are housed on a slurry system throughout the winter. Slurry generated from the sheds is directed into an existing pre 1991 mass concrete slurry store which has a total estimated capacity of 228.8 cubic m after allowing the 300mm freeboard

The existing slurry store and collecting yard all collect rainwater and enters the slurry system. These areas total 295m sq which collects 199.12 cu m (675mm Data Map Wales Lat: 52.932 - Long: -3.159) of rainwater throughout the winter period. This volume enters the existing slurry stores and becomes contaminated.

In addition, 456 cu m of parlour washings enters the slurry system and becomes contaminated.

At present slurry storage capacity totals 228.8 cu m. This is against a storage requirement of 1,460.73 cu m (84.3% shortfall of capacity). Please see appendix 1 SPG calculations Current Slurry.

Due to the shortfall in storage capacity slurry must be applied throughout the winter period. This system is inefficient as it reduces production efficiency, nutrient efficiency and consequently the farm's profitability.

Eliminating this current part of the farming system will improve water quality of the catchment and reduce GHG emissions of the holding

4. Opportunities and Proposals

It is proposed to invest in new infrastructure to make the farm more sustainable under the Sustainable Production Grant (SPG). The investment will include provision of good slurry storage facilities to include a new mass concrete slurry store and a new roof to cover the proposed mass concrete slurry store. The investment will allow the farm to reach compliance with The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 by 1 August 2024.

The SPG investment will allow all the dairy cows to be housed within the roofed mass concrete slurry store on a slatted system and make the open collecting yard redundant. The new dedicated slatted shed will allow all slurry and parlour washings to be stored throughout the winter period (160day) and applied at optimal times of year when biological activity is at its greatest.

The proposed SPG slurry store will have an internal measurement of 31.41mtr x 15.86mtr x 3.04mtr deep and have an estimated capacity of 1340m³. The total slurry storage capacity will therefore increase to a total of 1,543.70cu m. This is against a storage requirement of is 1,345.98 cu m (14.7% excess of capacity). Please see appendix 2 SPG calculations Future Slurry.

Slats, columns, and concrete panels will be installed by Mr Owen as I have confirmed that these items are non-grant aided under SPG. Mr Owen investments will allow urine and slurry to be directed quickly to the store which reduces the amount of time urine and slurry rest of surface areas and will therefore reduce ammonia emissions of the holding.

The new roof will measure approximately 32.01m x 16.46m. Under SPG grant clean rainwater from the proposed SPG roof will be collected by the gutter's, downpipes and through a first flush diverter and into a dedicated rainwater harvesting tank. The roof area is approximately 526m sq.

The investment will divert all clean rainwater from being contaminated and running to waste over open livestock feeding yard. The roof could potentially collect a total 490.75cu m of rainwater into the tank annually (Annual rainfall totals 933 mm slurry wizard for STD 01691).

The SPG investment will

- increasing water efficiency of the business through reducing the pressure on groundwater supply.
- move the business to a more sustainable water management system.
- reduce the risk of point source pollution of watercourses and protect water quality of the catchment
- allow a significant volume of water to be kept out of the storm-water management system, thereby helping to reduce flooding risks lower in the catchment and soil erosion.

The diverted clean rainwater will be directed into the livestock watering system and be used for wash down of machinery.

The SPG investment will have a no impact on the reducing business costs as the business utilises water from a borehole. However, if the business used mains water the cost benefit of the business will amount to an annual saving of £641.81 (1m³ of water at £1.3078).

The SPG investments will allow efficient and compliant facilities to be built to capture and store all slurry and dirty water on the holding and will mitigate against nutrient losses and reduce GHG emissions.

Provision of sufficient storage facilities and reduced dirty water production will enable all slurry to be applied at optimal times of year when biological activity is at its greatest. The increase in N-utilisation will significantly reduce GHG and ammonia emissions

The above investments will also make a reduction to dirty water production by reduce the amount of rainwater flowing into the proposed slurry store as well as safeguarding water quality of the catchment. The investment will also reduce risk of diffuse pollution caused by nutrients leaching from soils during winter because of limited crop uptake while also improving N-utilisation and therefore the reduction of N₂O and NH₃ emissions from storage, application, denitrification and leaching.

5. Justification

The SPG scheme objectives are:

- To enhance on-farm nutrient management
- To protect and enhance water, soil and air quality
- To increase on-farm water efficiency
- Increase on-farm resource efficiencies.

In turn:

The investment will

- enhance on farm nutrient management as all slurry would be stored for 160 days. Effective slurry storage would improve N utilisation and therefore reduce N₂O and NH₃ emissions from storage, application, denitrification, and leaching.
- reduce the need to apply slurry at sub optimal times and therefore compaction and subsequent reduce subsequent emissions of N₂O and N₂. As soil compaction result in poor drainage and high moisture in soils which renders a conducive environment for denitrification.
- increase on farm resources efficiencies and reduced Ammonia and GHG emissions (CH₄, NO₂ and CO₂) through enhancing nutrient management and targeting slurry application to crop requirements and at optimum crop growth.
- provide better-quality feed and with a programme of feed balancing will lower enteric and manure emissions therefore giving clear benefits for the farm and wider environment
- will significantly reduce dirty water production thus saving spreading costs and reducing associated CO₂ emissions from application during the winter months.

SPG investment of the below items will provide clear benefits for the

a) Cost savings include:

- The investment will improve on farm nutrient efficiency and production by capturing and storing 801.99m³ of slurry and 538.01m³ of dirty water throughout the winter period. Therefore, minimising the loss of nutrients to the air and water. Thus, reducing the amount of additional manufacture inorganic fertiliser required and therefore reducing their associated GHG emissions (NO₂ and CO₂) from their overapplication, production and transportation.

Fertilisers		N	P	K	Financial Value of Manure	
Straight fertiliser cost	£/tonne	£284	£401	£257		
Value of nutrient	p/kg	82	87	43		
Manures					£/M ³	£/t
Slurry spread spring	Surface applied	0.91	0.60	2.9	£2.51	
Slurry spread winter	Surface applied	0.65	0.60	2.9	£2.30	
Dirty Water Spring	Surface appn	0.25	0.05	1.0	£0.68	
Dirty Water Winter	Surface appn	0.175	0.05	1.0	£0.62	

- A new roofed mass concrete slurry store measuring approximately 31.41m x 15.86m x 3.04m deep with an estimated capacity of 1340m³ after allowing for the 300mm freeboard will allow all slurry, dirty water, and parlour washings to be stored throughout the winter. 59.85% of the total volume stored is slurry with the remaining 40.15% being dirty water/parlour washings. Therefore, at a total storage capacity of 1340 m³ the lined earth bank would hold 801.99m³ of slurry with the remaining 538.01 m³ being dirty water/parlour washings.
- The improved utilisation of these volumes of slurry and dirty water/parlour washings can be spread at optimal time in the spring rather than during the winter when biological activity is lower is estimated **at £200.69/annum**. This is based upon the utilisation of Nitrogen rising from 0.65kgN/ m³ to 0.91kgN/ m³ (i.e 25% to 35% availability) for slurry and upon the utilisation of dirty water rising from 0.175kgN/ m³ to 0.25kgN/ m³ (AHDB Nutrient Management Guide (RB209)) (i.e 35% to 50% availability) at an equivalent fertiliser cost of Nitrogen £284/t or 82p/kg N.

6. Action Plan and Recommendation

- The wider environment and the business would benefit from installation of a new mass concrete slurry store and a new roof to cover the proposed mass concrete slurry store

- This investment is potentially eligible for a capital grant under the Sustainable Production Grant. Therefore, it is recommended that a SPG application should be made.
- To this end, obtain three appropriate quotations for a new mass concrete slurry store and a new roof to cover the proposed mass concrete slurry store and associated works.
- **The building work for the supporting quote will need to confirm that the structure will be designed and built to BS5502 Class 2 for buildings and structures.**
- Specifications and construction standards must be in accordance with the Water resources (Control of Agricultural Pollution (Wales) Regulations 2021
- Apply for planning approval for the proposed work.
- This investment will also enhance Cross Compliance opportunities.
link eg https://businesswales.gov.wales/farmingconnect/sites/farming/files/cff_ssafo.pdf
- Apply for planning approval for the proposed work.
- This investment will also enhance Cross Compliance opportunities.

7. Additional information

As a condition of the Farming Connect Grant aid scheme you must demonstrate that you are keeping your land in Good Agricultural and Environmental Condition (GAEC) and that you are complying with a number of specified legal requirements, known as Statutory Management Requirements (SMRs). SMRs relate to the environment, public, animal and plant health and animal welfare.

The table below shows in more detail the Cross Compliance requirements under SMR and GAEC, and which are particularly relevant to this report.

	SMR TITLE	
SMR 1	Conservation of Wild Birds	
SMR 2	Protection of groundwater against pollution	X
SMR 3	Protection of the environment, and in particular soils, when sewage sludge is used in agriculture	
SMR 4	Protection of water in Nitrate Vulnerable Zones (NVZ)	X
SMR 5	Conservation of Fauna & Flora	
SMR 6	Pig identification and registration	
SMR 7	Cattle identification and registration	
SMR 8	Sheep and goat identification and registration	
SMR 9	Restrictions on the use of plant protection products	

SMR 10	Restrictions on the use of substances having a hormonal or thyrostatic action and beta-agonists in farm animals	
SMR 11	Food and Feed law	
SMR12	Prevention, control and eradication of Transmissible Spongiform Encephalopathies (TSE)	
SMR 13 14 & 15	Control and eradication of Foot and Mouth, Swine Fever and Bluetongue	
SMR16	Welfare standards for the protection of calves	
SMR 17	Welfare standards for the protection of pigs	
SMR 18	Welfare standards for the protection of animals kept for farming purposes	

	GAEC TITLE	
GAEC A	Soils	X
GAEC B	Overgrazing	
GAEC C	Under grazing/Under Management	
GAEC D	Supplementary Feeding	
GAEC E	Boundaries	
GAEC F	Scheduled Ancient Monuments	
GAEC G	Permanent Pasture	
GAEC H	Heather and Grass Burning Code	
GAEC I	Environmental Impact Assessment (EIA). Regulations for the use of Uncultivated land and Semi-natural Areas	
GAEC J	Tree Preservation and Felling	
GAEC K	Sites of Special Scientific Interest (SSSI)	
GAEC L	<i>No longer applicable (set aside)</i>	
GAEC M	Water abstraction	
GAEC N	Retention of Landscape Features	
GAEC O	Buffer strips along water courses	

In addition to the need to comply with Cross Compliance requirements, there may be additional requirements if you are currently within a live Glastir Entry or Advanced Contract Glastir that must be followed for the full contract period (including contract extensions) that under the Whole Farm Code (WFC). These include:

- a. **Comply with Cross Compliance** (as above)
- b. **Comply with all legal requirements and obtain necessary consent where appropriate** (see Annexe 2 of Booklet 2: Technical Guidance)
- c. **Retention and Management of Existing Habitat Land.** This includes causing damage by over or under grazing, or poaching caused by stock feeding and rutting by vehicles. You must not improve habitat land or plough or cultivate it. You must not roll or chain harrow between 15th March and 15th July, install new drainage or modify existing drainage, nor clear ditches between 1st March and 31st August. You must not apply slurry, manure or sludge etc, nor any lime, slag, inorganic or organic fertilisers etc. You must not spray herbicides (except spot treatment of some weeds). You must not store manure, silage or other farm wastes on habitat land, landscapes, or

archaeological features or within 10metres of any watercourse. (see relevant pages of the Glastir All-Wales Element Booklet 2: Technical Guidance)

- d. **Rules applicable to all land in Glastir Entry and Advanced** These rules include a general ban on extracting rock, scree, sand, shingle, gravel, clay or peat, and also on burning vegetation on rocky areas or archaeological sites. In addition there is a requirement to keep field records of all applications of Farmyard manures, slurry, fertilisers, limes etc, pesticides and herbicides. You must not cultivate any land within 2 metres of a watercourse or a wetland habitat, nor apply livestock manures or dirty water when the ground is waterlogged or frozen hard. Manure, silage or other farm wastes must not be stored on an EA flood risk area (1 in 100 years risk) or on a high risk slope of over 7°. There are special requirements for practices to follow if growing maize. You must not introduce any non-native animal or plant species to land within your contract. You must retain and protect all in-field and veteran trees, and retain all traditional buildings and remnant structures. You must not damage any Scheduled or Unscheduled Ancient Monuments identified on your AWE map, must comply with your legal duties relating to existing Public Rights of Way (PRoW) and public access to open access.. And the land under your contract must be kept free of rubbish. (see relevant pages of the Glastir Entry /Advanced Booklet 2: Technical Guidance)

8. Regulatory requirements

The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 have been introduced to reduce losses of pollutants from agriculture to the environment by setting rules for certain farming practices.

The Regulations also set standards for silage making, storage of silage effluent and for slurry storage systems. They replace the Water Resources (Control of Pollution)(Silage and Slurry)(Wales) Regulations 2010 and establish good practice requirements for nutrient management into one set of regulations to reduce complexity.

[The Water Resources \(Control of Agricultural Pollution\) \(Wales\) Regulations 2021 Guidance for Farmers and Land Managers \(gov.wales\)](#)

Natural Resources Wales (formerly Environment Agency)

- Natural Resources Wales (NRW) must be notified before the construction or modification of any new silo or slurry storage system. A minimum of 14 days' notice must be issued to Natural Resources Wales (NRW) in writing before construction of a new, substantially enlarged or reconstructed store containing slurry or silage begins. (see Annex 8 for NRW contact details). This applies to any silo or slurry storage system whose construction is to begin on or after 28 April 2021("a new or improved store").
- It is strongly recommended that you minimise the risk of constructing an installation which is not compliant and of receiving a notice, by involving NRW early in the planning stage. Note if you require planning permission NRW is a statutory consultee in the planning process.
- Contact: [**0300 065 3000**](tel:03000653000) (Mon-Fri, 9am-5pm)
[**enquiries@naturalresourceswales.gov.uk**](mailto:enquiries@naturalresourceswales.gov.uk)

Water Resources Act 1991

- It is an offence under Section 85 of the Water Act to cause or knowingly permit any poisonous, noxious or polluting matter or any solid waste matter to enter any controlled waters (this means ground-water, and all coastal or inland waters, including lakes, ponds, streams, canals and ditches) without written consent from the National Resources Wales.

The Groundwater Regulations 1998

- A person shall be treated as contravening these Regulations if he causes or knowingly permits the disposal or tipping for the purposes of disposal of waste pesticides, including sheep dip, and pesticide tank washings to land, disposal of unused diluted pesticide and tank washings and washing water from equipment cleaning, or any other substance in list I or II of the Schedule in circumstances which might lead to an indirect discharge of that substance into groundwater, unless it is carried on under and in accordance with authorisation granted by the National Resources Wales.

Health and Safety

- Any risk to health and safety associated with the workplace must be assessed in accordance with the **Health and Safety at Work etc. Act 1974 and the Management of Health and Safety at Work Regulations 1992**
- Substances that are known to be hazardous need to be assessed to the **Control of Substances Hazardous to Health (COSHH) 1994 Regulations**.
- **Construction (Design and Management) Regulations 1994** will apply to:
 - Any construction design work, irrespective of how long the construction phase lasts or how many workers are involved on site.
 - All demolition work proposed and any construction work that lasts for more than 30 days, or involves more than 500 person days of work must be notified to the local Health and Safety Executive, before commencement, using form F10.
 - Non-notifiable construction work which involves five people or more carrying out construction work on any one time

Planning

- Any new building, structure, tank or excavation for the storage of manure, slurry and dirty water which is to be built within 400 metres of the curtilage of a 'protected' building requires planning permission.
- A 'protected' building is one that is occupied by people on a regular basis and is such as a private dwelling or school. The definition excludes a dwelling or other buildings that are used for or in connection with agriculture.
- The 400-metre rule is in addition to other restrictions on permitted development for agriculture such as that of 'within 25 metres of the metalled portion of a road'.
- From 2 January 1992, even if full planning permission is not required, the local planning authority will require to be informed of the siting, construction and size of any planned agricultural buildings and any engineering operations on any size of agriculture unit.
- Smaller agricultural units of 0.5-5.0 hectares have more restricted development rights.

- Further information is contained in the booklet 'A Farmer's Guide to the Planning System' that is available free from Welsh Assembly Government offices.

Extract from the Code of Good Agricultural Practice (COGAP) re Manure stores:

Solid manure stores

- Permanent stores for solid manures should have impermeable bases. The base should slope so that liquids run-off into collection channels, normally outside the store, which drain to an appropriate sized or designed tank.
- Using narrow densely packed A shaped heaps for manure will shed rainwater more easily and prevent manure from becoming very wet, and also reduce odour and ammonia emissions.
- Providing a roof or cover to keep rainfall off the manure will reduce dirty water run-off. You can reduce odour and ammonia emissions from poultry manure by keeping it as dry as possible. For pig buildings with scraped dunging passages, where it is intended to produce stackable solid manure there should be sufficient concrete yard area to retain the solid fraction for at least 1 month to allow drainage of liquids into a suitable slurry store.

Field heaps

- Only put solid manures into temporary field heaps if there is a minimal risk of run-off polluting groundwater or surface water. Sites should not be in a field liable to flooding or becoming waterlogged.
- You should not put heaps within 10 metres of a surface water or within 50 metres of a spring, well or borehole or in positions that would cause odour problems for nearby residents.
- Temporary field heaps should not be located in any single position for more than 12 successive months.
- There should be a 2-year gap before returning to the same field site.
- Field heaps should not be placed within 10 metres of field drains. If it is unavoidable that manure is stored over field drains, ensure it is for a maximum of a few days only and that it does not cause pollution.
- Field heaps should be located well away from any ruts or tracks that could provide a pathway for effluent to reach surface water or habitats.

Composting

- Composting solid manures reduces the quantity to be spread to land, and the odour that is released during and after spreading. Composting itself can give rise to site odours, and increase the loss of ammonia. The best results are obtained by using ingredients that are chopped and well mixed – usually manure and straw in the right proportions and by controlling temperature and moisture content, and by regular turning.

Appendix 1 Current slurry production in Storage Period with existing infrastructure

Slurry Production in Storage Period (160 days max)

		A	B	C	D
		Number of stock	No of days collected	Daily volume	Volume in storage period
Cattle					
Calf	0-3months		160	7.0	0.0
Dairy replacement	>3 & <13 m		160	20.0	0.0
	>13m		160	40.0	0.0
Dairy Cow after 1st calf	> 9000 Litres		160	64.0	0.0
	6000- 9000 L	95	160	53.0	805600.0
	< 6000 Litres		160	42.0	0.0
Beef Heifers or steers to 25 months	>3 & <13 m		160	20.0	0.0
	>13m & <2 5m		160	26.0	0.0
Beef Cows or steers over 25 months	For slaughter		160	32.0	0.0
	Cows < 500kg		160	32.0	0.0
	Cows > 500kg		160	45.0	0.0
Bulls over 3 months	For slaughter		160	26.0	0.0
	Breeding 3-25m		160	26.0	0.0
	Breeding >25m		160	26.0	0.0
Sheep					
From 6m up to 9m				1.8	0.0
>9m to lambing, tupping or slaughter				1.8	0.0
After lambing or tupping	< 60 kg			3.3	0.0
	> 60 kg			5.0	0.0
Goats, deer, horses					
Goats				3.5	0.0
Deer	Breeding			5.0	0.0
	Other			3.5	0.0
Horses				24.0	0.0
Pigs					
7 kg and less than 13kg				1.3	0.0
13 kg and less than 31kg				2.0	0.0
31kg and less than 66kg	Dry Fed			3.7	0.0
	Liquid Fed			7.1	0.0
66kg	Intended for Slaughter - dry fed			5.1	0.0
	Intended for Slaughter - liquid fed			10.0	0.0
	Sows intended for breeding that have not yet had their first litter			5.6	0.0
	Sows (including			10.9	0.0

	litters up to 7kg)				
	Breeding Boars from 66kg up to 150kg			5.1	0.0
	Breeding Boars from 150kg			8.7	0.0
Total Volume slurry in storage period		Box E	Litres		805600.0
		Box F	Cubic metres		805.6

Average volume of rainfall entering slurry store in Storage Period

	Description	Length	Width	Area m ²
Yard 1	collecting yard	170	1	170.0
Yard 2				0.0
Yard 3				0.0
Yard 4				0.0
Silo 1				0.0
Silo 2				0.0
Silo 3				0.0
Earth banked slurry store				0.0
Slurry store 1	Existing Pre 1991 slurry store	25	5	125.0
Slurry store 2				0.0
Round slurry store		Radius:-		0.0
Less: clean roof 1				0.0
Less: clean roof 2				0.0
Less: clean roof 3				0.0
Less: clean roof 4				0.0
Total area of water entering slurry store				295.0
Average rainfall in storage period (Oct to Feb inclusive) (mm)				675
Rainfall data source:	Data Map Wales Lat: 52.932 - Long: -3.159			
Total Volume of Rainfall entering slurry store (m³)			Box G	199.1

Dairy Wash water entering slurry store during storage period

	No Cows	Litres	No Days	Total litres	Volume m ³
High volume hose	95	30	160	456000	
Low volume hose		20	160	0	
Or daily measured volume			160	0	
Total volume of wash water entering slurry store (M³)				Box K	456.0

Other foul run-off entering slurry store during storage period

Details:	
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Estimate volume 1		
Details:		
Estimate volume 2		
Total estimated volume (m³)	Box L	0.0

Total Volume of Cattle & Sheep Slurry, Rainfall & Foul run-off produced in Storage Period (m³)

Box M

1460.7

Total volume bought forward from previous page (Box M)

1460.7

Volume of Pig slurry produced 1st October to 1st April

Box N

Export of slurry during storage period

Mechanical separator for cattle slurry (less 15-20%)

Spread of slurry to land with low run-off risk after closed period

If so, add one weeks slurry production

Total volume requiring storage (m³)	1460.73
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Volume of available slurry storage

	Freeboard	Length (m)	Width (m)	Depth (m)	Capacity (M ³)
Earth Banked store	750 mm	0	0	0	0.0
Concrete store 1	300mm	0	0	0	0.0
Concrete store 2	300mm	25	5	2.13	228.8
		Π (Pi)	Radius (m)	Depth (m)	
Steel tank (round)	300mm	3.142	0		0.0
Total available slurry storage (m³)				Box O	228.8

Does the farm have sufficient slurry storage to satisfy the NVZ & SPG rules?

No

Shortfall or Excess capacity (m3)	-1232.0
	-84.3%

Appendix 2 Future slurry production in Storage Period under SPG with proposed SPG infrastructure

Slurry Production in Storage Period (1st Oct to 1st March - 152 days max)

		A	B	C	D
		Number of stock	No of days collected	Daily volume	Volume in storage period
Cattle					
Calf	0-3months		160	7.0	0.0
Dairy replacement	>3 & <13 m		160	20.0	0.0
	>13m		160	40.0	0.0
Dairy Cow after 1st calf	> 9000 Litres		160	64.0	0.0
	6000- 9000 L	95	160	53.0	805600.0
	< 6000 Litres		160	42.0	0.0
Beef Heifers or steers to 25 months	>3 & <13 m		160	20.0	0.0
	>13m & <2 5m		160	26.0	0.0
Beef Cows or steers over 25 months	For slaughter		160	32.0	0.0
	Cows < 500kg		160	32.0	0.0
	Cows > 500kg		160	45.0	0.0
Bulls over 3 months	For slaughter		160	26.0	0.0
	Breeding 3-25m		160	26.0	0.0
	Breeding >25m		160	26.0	0.0
Sheep					
From 6m up to 9m				1.8	0.0
>9m to lambing, tupping or slaughter				1.8	0.0
After lambing or tupping	< 60 kg			3.3	0.0
	> 60 kg			5.0	0.0
Goats, deer, horses					
Goats				3.5	0.0
Deer	Breeding			5.0	0.0
	Other			3.5	0.0
Horses				24.0	0.0
Total Volume slurry in storage period		Box E	Litres		805600.0
		Box F	Cubic metres		805.6

Average volume of rainfall entering slurry store in Storage Period

	Description	Length	Width	Area m ²
Yard 1	Decommissioned			0.0
Yard 2				0.0
Yard 3				0.0
Yard 4				0.0
Silo 1				0.0
Silo 2				0.0
Silo 3				0.0
Earth banked slurry store				0.0
Slurry store 1	Existing Pre 1991 slurry store	25	5	125.0

Slurry store 2				0.0
Round slurry store		Radius:-		0.0
Less: clean roof 1				0.0
Less: clean roof 2				0.0
Less: clean roof 3				0.0
Less: clean roof 4				0.0
Total area of water entering slurry store				125.0
Average rainfall in storage period (Oct to Feb inclusive) (mm)				675
Rainfall data source:	Data Map Wales Lat: 52.932 - Long: -3.159			
Total Volume of Rainfall entering slurry store (m³)			Box G	84.4

Dairy Wash water entering slurry store during storage period

	No Cows	Litres	No Days	Total litres	Volume m³
High volume hose	95	30	160	456000	
Low volume hose		20	160	0	
Or daily measured volume			160	0	
Total volume of wash water entering slurry store (M³)				Box K	456.0

Other foul run-off entering slurry store during storage period

Details:			
Estimate volume 1			
Details:			
Estimate volume 2			
Total estimated volume (m³)		Box L	0.0

Total Volume of Cattle & Sheep Slurry, Rainfall & Foul run-off produced in Storage Period (m³)

Box M

1346.0

Total volume bought forward from previous page (Box M)

1346.0

Volume of Pig slurry produced 1st October to 1st April

Box N

Export of slurry during storage period

Mechanical separator for cattle slurry (less 15-20%)

Spread of slurry to land with low run-off risk after closed period

If so, add one weeks slurry production

Total volume requiring storage (m ³)	1345.98
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Volume of available slurry storage

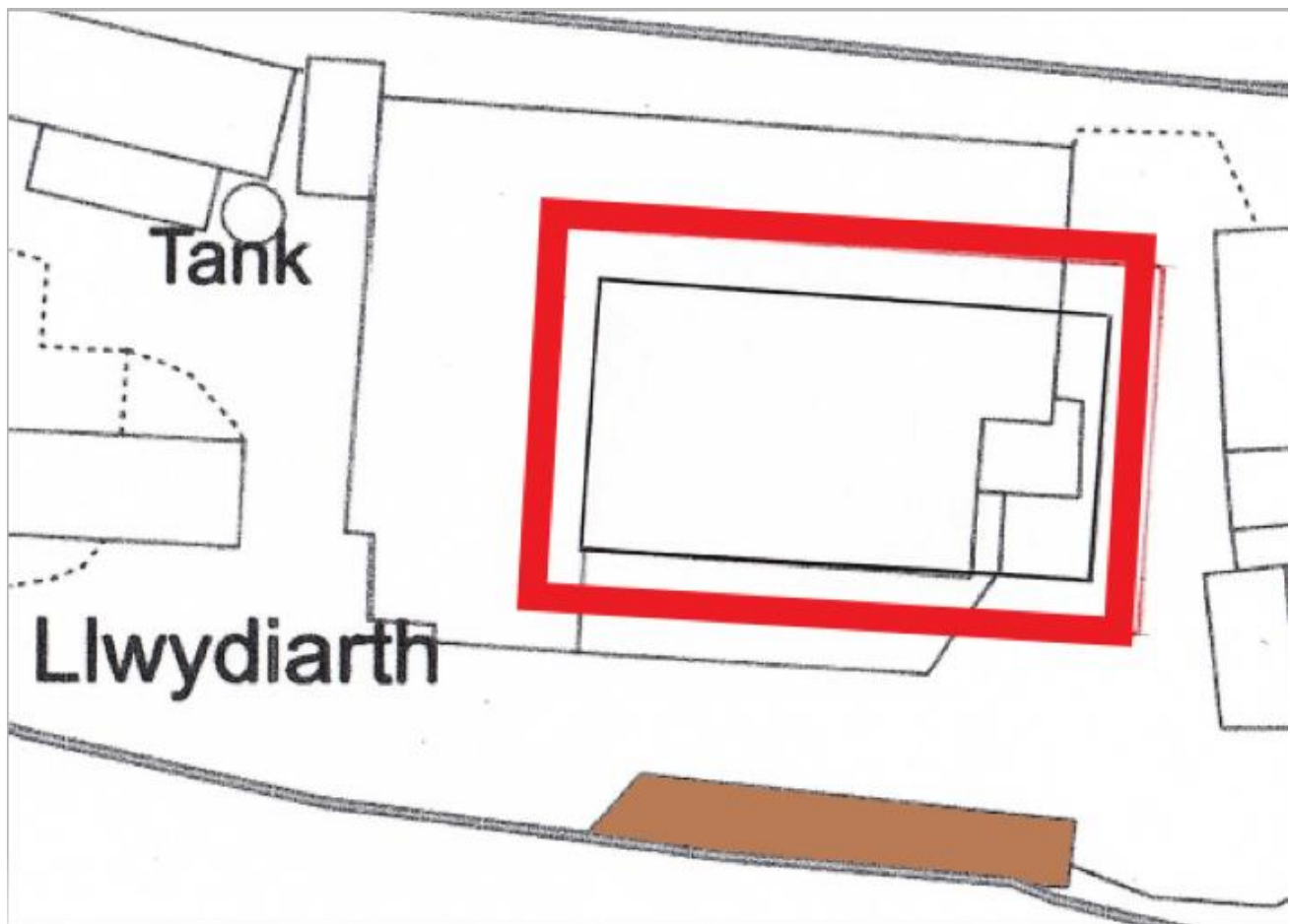
	Freeboard	Length (m)	Width (m)	Depth (m)	Capacity (M ³)
Earth Banked store	750 mm	0	0	0	0.0
Concrete store 1	300mm	31.41	15.86	3.04	1340.0
Concrete store 2	300mm	25	5	2.13	203.8
		Π (Pi)	Radius (m)	Depth (m)	
Steel tank (round)	300mm	3.142	0		0.0
Total available slurry storage (m³)				Box O	1543.7

Does the farm have sufficient slurry storage to satisfy the NVZ & SPG rules?

Yes

Shortfall or Excess capacity (m3)	197.7
	14.7%

Appendix 3 Location Plan



Red denotes the proposed new SPG roofed slurry store

Brown denotes the existing pre 1991 mass concrete slurry store