Construction Quality Assurance Report (CQA) – Digestate Storage Tank

The following is the CQA report for the digestate store at Much Fawley Farm.

The report refers to the Digestate Storage lagoon at Much Fawley which is used to store digestate from the anaerobic digester and is the subject of a permit variation request.

Site Plan Drawing

For location in context or rest of site please see drawing EMS Section7. For construction and layout detail please refer to Drawing EMS Section 21.

Design Drawing Confirming the materials used

Waste store construction. Glass Fused to Steel modular panel construction. Coated with inert silica glass. Meets or exceeds quality requirements of EN ISO 28765:2016. New bolts and jointing compound as part of external specialist installation.

Prefabricated products Manufacturers specifications and guarantee

Used tank so no guarantees exist. Tank was used elsewhere as temporary storage for digestate prior to application to land. Constructed by external specialists. Guarantee document awaited.

Capacity Calculations

The above ground circular digestate store was constructed to comply with appropriate winter storage capacities and with a requirement for a 25% additional winter storage requirement as required by the Environment Agency. 2020 NVZ Storage Requirements sheet attached as justification of how it fits into the storage requirements on the site.

Calculating 2020 Anaerobic Digestate Production and Storage Requirement

Calculate the Anaerobic Digester Diet/ Daily Inputs

Open yard area (m²)	0
Average Monthly Rainfall (mm)	0

* Liquid Waste Plant Washings dewatering sludge

Input material	Daily input amount (tns/m³)	Days fed per annum
Rainfall from yard area	0.00	365
Broiler litter	3.84	365
Distillery Mash*	4.00	365
Ryegrass Silage	3.28	365
Fruit	4.00	365
Winter Rye	2.19	365
Forage Maize	3.28	365
Total	20.69	

Calculate the Anaerobic Digester Daily Output

AD Efficiency (%)	90
Separated solid Ratio (%)	15
Separated Liquid Ratio (%)	85

Total Removed Daily	Daily Production	Annual Production
18.621 m³	Separated solid 2.7931S tns	1803 Separated solid (tns) approx*
	Separated Liquid 15.83 m³	10220 Separated Liquid (m³) approx*

All liquid production includes the average rainfall that would enter open storage areas, along with an extra 25% rainfall to consider extreme weather conditions.

Calculate the Anaerobic Digester Storage Requirement

Months of storage Required	6
Amount of storage Required (m³)	2889

Ref	Earth banked store (Yes/No)	Circular store (Yes/No)	Length (m)		Width / Diameter (m)		Working height or depth (m)		Side Run (m) (Length)	End Run (m) (Width)	Freeboard required (m)	Capacity (m³)
New Pit	No	No	0.0		0.0		0.0		0.0	0.0	0	1571
Dirty Water Tank	No	No	0.0	x	0.0	x	0.0	x	0.0	0.0	0	60
Collection Pit	No	No	0.0		0.0		0.0		0.0	0.0	0	60
Digester Tank 1	No	Yes	0.0	x	0.0	x	0.0	-	0.0	0.0	0.3	1567
Digester Tank 2	No	Yes	0.0		0.0		0.0		0.0	0.0	0.3	1567
New Above Ground Store	No	No	0.0		0.0		0.0		0.0	0.0	0	1000
									Total Existing Capacity =			5825

Total capacity includes an extra 25% rainfall collection, all deductions from the run and rise and also freeboard.

This holding has Sufficient Capacity

Monitoring

As per Management System document 'Tanks and Clamps' Maintenance Schedule. EMS Section 27.

In summary

Daily checks and records kept (Maintenance Checklist) - structure and pipework. Pre store slurry level.

Weekly Checks and records kept (Maintenance Checklist) – Leak Detection (Ammonia Test), Storage reception pit.

5 yearly Check and records kept (As part of Tank written Scheme of Examination) – Wash down and formal inspection.

Installation and Testing

Bradshaws Installation covers assessemnt of the panels and any remediation works. Tank base design and installation as prescribed by Bradshaws Installations Ltd.

Construction Documentation

Concrete Specification

Base – C45 as Bradshaws Specification. 45 N/28 day strength.
Backfill – C45 as Bradshaws Specification.

Joints

Polysulphide Sealant as per installation instructions.

Life expectancy

20 years as accepted by Bradshaws specifications being followed.

Backwall Drainage

Ridge and Furrow in field and earth bunding to prevent surface water entering the bund during extreme weather events.

Leak Detection Systems

Leak detection has been installed as mitigation for the structure holding waste as per the attached plan. Installation as per Bradshaws design as stipulated. Leak detection is employed by groundwater testing from hydrostatic pressure outlet. Sample point located on southwest side of tank as indicated on EMS Section 22 drawing and will be capped to prevent contamination of the containment system, current picture shows in construction. Planning permission is awaited before completing this structure further. Design as per CIRIA 736. Location of leak detection sampling as in picture below – Marked as A. Tank currently in construction awaiting planning consent.

Sampling as per maintenance section of Management System and as monitoring section above.

In summary

Visual Check – Daily and checklist entry.

Sampling – Weekly Ammonia Test and records.

Washdown and integrity check including leak testing – 5 yearly or sooner if damage observed.

Operation of tank

Routine movement of digestate will be to the existing digestate storage lagoon. Manual selection of the above ground circular tank will then be made if the existing storage lagoon becomes full. Currently not covered this tank will be covered when permit and planning allow its use within the permitted area.