Site Capacity Assessment

High Hedley Biogas

Report produced for **W J Drennan Limited**

Provided by Walker Resource Management Ltd (WRM)

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Author	William Grant 
Reviewer	Martin Ropka 

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0.1	20/09/2021	First Draft
0.2	30/09/2021	Internal Review
0.3	11/08/2022	Amendments with Client Comments

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1.0 INTRODUCTION

W J Drennan Limited (hereon referred to as 'HHB') is seeking permission to vary their existing Standard Rules SR2012 No. 12 environmental permit (EPR/LB3536AZ) to a bespoke installation permit through the incorporation of the following changes:

- To increase the site's maximum throughput to 55,000 tonnes per annum which results in a treatment capacity of more than 100 tonnes per day.

Table 1 - Process Summary

Process Type	Stage	Annual Receipt
Anaerobic Digestion	Anaerobic digestion of non-hazardous organic waste	55,000 tpa

1.1 Demonstrating Operational Capacity

This document sets out the operational capacity and infrastructure in order to demonstrate adequate capacity to process the annual tonnage of non-hazardous material proposed to be processed at the facility.

2.0 AD DESIGN AND ASSESSMENT

The following section outlines the designed capacity of the Anaerobic Digestion system against the proposed annual tonnage allowance for material reception and treatment.

2.1 Waste Reception

All incoming vehicles delivering feedstock will enter via the existing site entrance, and report to the weighbridge on site. Liquid wastes are then directed to the liquid reception area where they are emptied into six waste storage tanks (4x60m^3 and 2x90m^3). Solid waste is sent to the reception hall, where it is fed through a de-packaging unit at a maximum throughput of 10,000kg/hr. Once processed, the waste is fed to one of the six waste storage tanks. From here, the material is fed into a 5m^3 buffer tank then one of two 1.5m^3 Kreis Dissolvers. The site can receive waste Monday to Friday, however given that the digestion process is continual, material can be held in process 365 days per annum.

2.2 AD Design Capacity

The facility consists of two digester tanks which operate in parallel. Both digesters have a fill volume of 2,530m^3, therefore the total holding capacity during the digestion phase is 5,060m^3. Although the full tank capacity is 5,060m^3, it should be noted that the site operates with a 10% buffer capacity in case of emergency. This means the operational capacity of the digestion phase is 4,554m^3.

Due to the composition of the substrate, a ratio of 1m^3 to 1 tonne has been applied and has been taken forward into the treatment capacity calculations.

2.3 AD Capacity Assessment

The minimum residency period for the digesters is 30 days during which time temperatures reach the mesophilic range of ~39°C (+-2°C).

The total maximum amount of material that can processed through the digestion phase at any one time is outlined below:

4,554 tonnes / 30-day retention time = 151.8 tonnes of material treated per day.

2.4 Maximum Annual Treatment Capacity

The maximum annual treatment capacity of the site is outlined below:

151.8 tonnes of material treated per day * 365 days = 55,407 tonnes.

The overall assessment therefore identifies that the AD operation is able to treat a straight-line throughput at a maximum capacity in any given year of 55,407 tonnes, providing the 30-day retention time is maintained. The designed capacity is therefore considered appropriate for the current annual tonnage receipt.

3.0 STORAGE AT ANY ONE TIME

The total theoretical amount of material to be held on site at any one time is outlined below. This includes material at all stages of the process from reception, temporary storage awaiting processing and digestate storage after processing.

- The waste storage tanks can hold 420 tonnes of feedstock material at maximum.
- The Solid Material Reception Area can hold 240 tonnes of feedstock material at maximum (150 tonnes in the packaged food waste reception building, 90 tonnes in the solid unpackaged waste reception).
- The former pasteurisation tanks can hold 3 tonnes of feedstock material at maximum.
- The buffer tank can hold 5 tonnes of feedstock material at maximum.
- The Kreis dissolver can hold 3 tonnes of feedstock material at maximum.
- The digestion tanks can hold 4,554 tonnes of feedstock material at maximum.
- The pasteurisation tank can hold 20 tonnes of feedstock material at maximum.
- The digestate separator (currently not in use) liquor tank can hold 20 tonnes of material at maximum.
- The whole digestate storage lagoon can hold 15,000 tonnes of material at maximum.

Based upon the above, the theoretical maximum amount of material which can be stored on site at any one time is 20,265 tonnes.

3.1 Vehicle Movements

There will not be an increase in vehicle movements on site as a result of the increased annual throughput and will remain at a maximum of six vehicles in and six vehicles out per day as per the planning permission of the site. The site currently has no issue in dealing with the current level of movements on site and foresees no problems in relation to vehicle movements in the future.

18 Manor Square, Otley, LS21 3AY

01943 468138
www.wrm-ltd.co.uk

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