

Waste Management Plan – BFWRF

1. Scope

This Waste Management Plan has been developed to manage the raw materials and waste minimisation, recovery, and disposal for all activities related to the Bristol Food Waste Recycling Facility (BFWRF) operating under permit no. EPR/PP3734LK.

Associated documents to this Plan are:

Acceptance Procedure – Food Waste Reception Hall ([GENWMP152](#))

BFWRF Rejection Procedure ([GENWMP50](#))

2. Aim

Ensure that personnel involved with all activities related to the BFWRF are clear of roles and responsibilities. They are required to:

- 1) Take appropriate measures to ensure that raw materials and water are used efficiently in all activities.
- 2) Review and record whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material and water use
- 3) Take appropriate measures to ensure that the waste hierarchy is applied to the generation of waste by the activities.
- 4) Any waste generated by the activities is treated in accordance with the waste hierarchy
- 5) Where disposal is necessary, this is undertaken in a manner which minimises its impact on the environment.

3. Policies

On a corporate level, the Wessex Water Environmental Policy ([ENVPOL001](#)) outlines Wessex Water approach to management of raw materials and the Wessex Water Waste Management Policy ([ENVPOL05](#)) outlines the approach to managing residues across the business.

On a departmental level, the GENeco SHEQC Policy ([IMS025](#)) includes the commitment to 'Leading the transition to a circular economy where resources are used optimally, and waste is eliminated'.

4. Description of Operations

The BFWRF accepts source-segregated food waste delivered in solid form by skips tipped into the Food Waste Reception Hall. The food is then de-packaged, pulped and screened to produce a food slurry which then undergoes the natural first step of anaerobic digestion (hydrolysis). The hydrolysed slurry (HBT soup) is then pasteurised at 70°C for one hour (pasteurised soup) to satisfy the PAS110 standard for the Anaerobic Digestion Quality Protocol (ADQP).

The pasteurised soup is then treated via mesophilic anaerobic digestion. The resulting digestate is dewatered to produce a solid material (cake) which is then collected in skips. The cake can then be recycled to farmland to grow crops.

5. Management of Raw Materials

The raw materials, including any substances which could have an environmental impact, used at BFWRF are listed in Table 1. Further information of the raw materials properties can be found in its COSHH assessment and associated Safety Data Sheets (SDS).

Table 1. Raw material list

<u>Name</u>	<u>Quantity (annual throughput per year)</u>	<u>Total held in site</u>	<u>Description of Use</u>
Zetag 8180 poly electrolyte	~33,000 kg/a	2,100kg (3 x 700kg bags)	Used in poly make up for dewatering centrifuges 1 & 2
Antiprex - Antifoam	Ad Hoc. ~20L when needed	2,000L (2 x 1000L IBCs)	Used infrequently to prevent digester foaming.

Raw materials are reviewed and audited using form [GENWMF14](#) (see section 10). The review will include the following considerations:

- Annual volume
- Current disposal route
- Annual cost
- Measures in place for waste minimisation
- Suggestions to reduce environmental impact
- Actions, timescales, and outcomes
- Best environmental option following the review

On completion of the audit, proposals with a timetabled plan for completion of actions will be made available to the Environmental Agency.

6. Water Use

All water usage is metered and recorded weekly to monitor use.

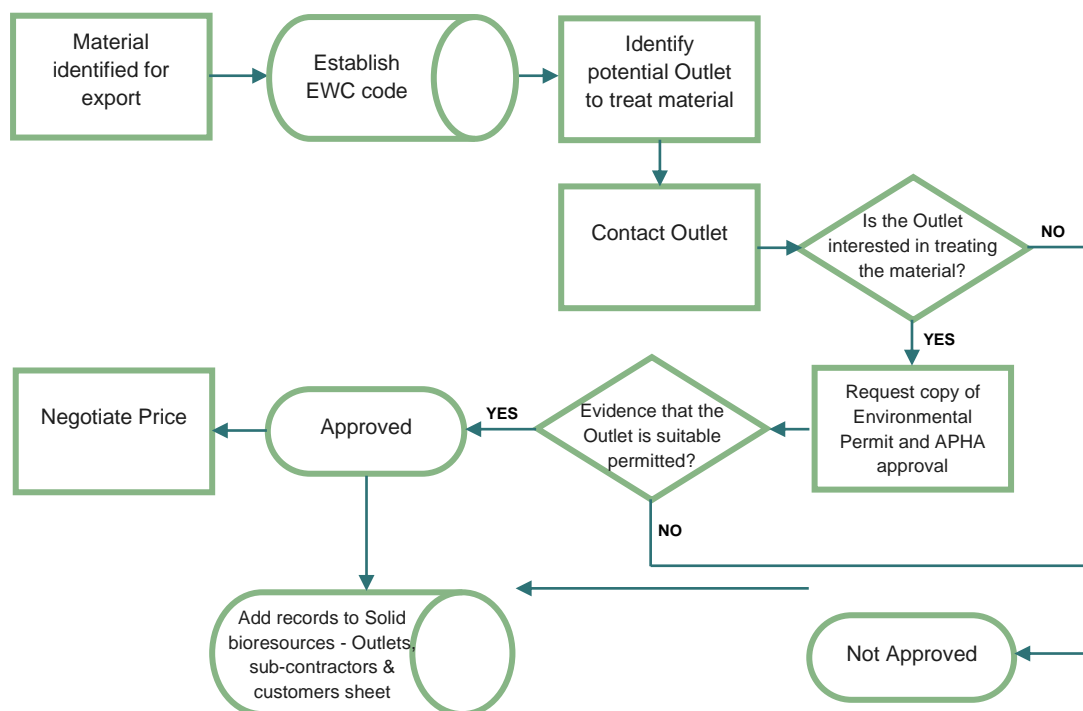
- Centrate is recirculated as dilution water in the de-packaging stage
- Hammer mill water use is minimised where possible
- Poly electrolyte is used before digestate dewatering to reduce wastewater emissions
- Final Effluent from the adjacent Avonmouth Water Recycling Centre (WRC) cannot be used due to PAS 110 requirements. It is only used as wash-down water only



7. Management of Waste Outputs

7.1 Approval of External Outlets for BFWRF Material

The GENeco teams will follow the following process diagram to consider and approve external outlets for BFWRF waste streams. Wessex Water Procurement require a supplier application form to be filled out and/or request their registration on Bravo. The procurement team will then evaluate the desired Outlet, and, if deemed suitable, will set the Outlet up on the procurement system. This information will be stored by the Wessex Water Procurement team and can be accessed via contacting the team purchase.requisitions@wessexwater.co.uk. The company procurement rules can be found here: [Supplier onboarding and Selection](#)



Evidence that the facility is suitably permitted/approved will include the following checks:

- EWC code of the waste stream is listed in the Environmental Permit
- R&D code listed in Schedule1. Table 1.1 of the permit is better or the same as current outlets. Where the proposed solution has a lower position in the hierarchy, approval of the Director of Wessex Water Enterprises will be sought (and documented).
- Relevant APHA approval where required.

Table 2. Waste outputs produced by the BFWRF

Description	EWC code	EWC code description	Approved outlet	Position in hierarchy
Food waste	20 01 08	20. Municipal waste (household waste and similar commercial, industrial, and institutional waste) including separately collected fractions 20 01 separately collected fractions (except 15 01) 20 01 08 biodegradable kitchen and canteen waste	Biogas AD plants	Recovery R03, R04, R05
Food waste packaging	19 12 04	19 Material from waste and waste treatment	Transfer station >energy from waste	Transfer station mechanical sorting &/or repackaging is D13, D14, D15 or D8



(hammer mill screenings)		19 12 Mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified. 19 02 10 Combustible Wastes 19 12 04 Plastic and rubber		EfW is Recovery R01
Grit, glass and eggshell	19 12 12	19 Material from waste and waste treatment 19 12 Mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified. Material extracted from sump or tank cleans	Gravity settlement, hydrocyclone, or vibratory sieve separation followed by water washing to remove ABP material. Sterilisation cookers followed by IVC composting plant.	R3: Recycling/reclamation of organic substances which are not used as solvents. R13: Storage of waste pending the R3 operation.
Food waste digestate (cake): PAS 110 Non-Compliant	19 06 06	19 06 Material from waste and waste treatment 19 06 06 Whole digestate and digestate fibre	Recycled to agriculture. Contingency in case of PAS110 failure	R 13 storage, pending R10 land treatment resulting in agricultural or ecological benefit
Food waste digestate (cake): PAS 110 Compliant	n/a	PAS110 digestate "separated fibre" recycled as product to agriculture.	Recycled to agriculture	Prepared for recycle or R10 use of waste for construction in the recultivation of landfills
Food waste dewatering liquor (centrate)	n/a	Material is transferred via pipeline to the adjacent STW (it is not transferred by tanker).	Disposal to STW	n/a
Biogas	n/a	Material is transferred via pipeline to the biogas storage area where it is used for power generation		n/a
Food waste digestate oversize screenings	19 06 06	19 06 Material from waste and waste treatment 19 06 06 Whole digestate and digestate fibre	Energy from waste	EfW Recover R01
De-packaged food waste slurry (soup)	19 12 12	19 Material from waste and waste treatment 19 12 Mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified. Exported as a contingency.	Biogas AD plants	R3: Recycling/reclamation of organic substances which are not used as solvents.

7.2 Operational planning and contingency

Where possible more than one Outlet should be utilised to ensure operational requirements can be met and to ensure tried and tested contingency.



New outlets and/or technologies should be continually sought to provide the business with the most robust and environmentally responsible routes for waste outputs.

7.3 Compliance

To apply condition 1.4 of the environmental permit (Avoidance, recovery and disposal of wastes produced by the activities), any new treatment routes for the waste outputs produced by BFWRF will be reviewed against the waste management hierarchy.

7.4 Duty of Care

Where possible, Duty of Care Audits will be undertaken within 3 months of a new outlet being used. The need and frequency of any audit will be risk assessed and agreed upon by the GENeco and BFWRF teams.

A low-risk outlet would be classed as a site with a proven technology or process such as anaerobic digestion, energy from waste, IVC composting and land spreading.

A [DOC programme](#) has been developed to track the need for audits. It is stored in the Duty of Care section within the Risk Assurance library on SharePoint. All documents associated with DOC audits should be stored there.

Once an audit has been undertaken, a low-risk site is to be re audited every 2 years as a minimum unless the process has significantly changed.

Records of audits of outlets will be stored in the Risk Assurance library on SharePoint .

The template GENeco – Duty of Care Audit Protocol for Commercial Waste-disposal/Recovery Facilities ([GENWMP177](#)) is used for audits and can be undertaken by a member of the GENeco and/or BFWRF teams.

As per section 5, a formal review of the waste avoidance recovery and disposal is completed by the BFWRF team annually following the template GENWMP14 (see section 10).

7.5 Waste Minimisation

Table 3. Waste Minimisation Review

Audit Date	02 April 2025	Consultees	FRD, PN, SH	Date next review due		31 March 2026		
Waste Produced	Source	Annual volume	Current disposal route	Annual cost	Measures in place for waste minimisation	Suggestions to reduce environmental impact further	Actions, timescales & outcomes	Best environmental option following review (waste management hierarchy)
Source-segregated Food Waste	Contingency export from reception of food waste during winter or during plant closure	ca. 2,000 tonnes	Biogas AD Plants	ca. £15,000	Target weekly reception limit of 750 tonnes to minimise any unprocessed waste contingency exports. Any planned maintenance is carried out on weekends to minimise plant closures.	Consider operating on weekends during winter months to account for increased weekly food waste reception	None	AD remains best option
Grit, Glass and Eggshell	Pre-pasteuriser grit sump. Screenings prior to digester feed.	ca. 65 tonnes	IVC Composting Plants	ca. £10,000	Currently none Hydro-cyclone installed in 2017 is no longer in use due to high digester feed dilution	Consider redesigning de-packaging process to further reduce particle size and separate organics from inorganics more efficiently. Find a more suitable grit removal system	Scope whether hydro-cyclone can be re-installed in another part of the process to prevent dilution	Composting remains the best option
Plastics / Packaging	Shredder output and Hammer Mill screenings	ca. 1,300 tonnes	Energy from Waste Plants	ca. £182,000	Currently none	Plastic volumes have been constant in the last 5 years. The only way to reduce volume is to reduce packaged food waste acceptance. Best way to minimise environmental impact is to find an alternative Energy from Waste site due to current outlet closure	Scope alternative EFW facilities with R McCluskey	Energy from Waste (incineration) remains the best option
Non-Compliant PAS110 Digestate separated fibre (cake)	Contingency export for centrifuge solid output failing PAS110 standard	ca.800 tonnes	Recycled to agriculture	None	Currently none	Current PAS110 standard will be too difficult to meet (last 12 cake samples pre-spill showed failure to meet Cadmium limits)	Trial biochar route when project is complete	Land reclamation remains best option

						Alternative routes for digestate treatment would be biochar. Project is currently scoped by WWEL		
PAS110 Digestate separated fibre (cake)	Centrifuge solid output	ca. 3,500 tonnes	Recycled to agriculture	None	Currently none PAS110 cake is classified as a product	See above	See above	Land reclamation as fertiliser remains the best option
Digestate separated liquor (centrate)	Centrifuge liquid output	Unknown (see Actions)	70% returned to Avonmouth WRC Head of Works (HoW) 30% recycled in process	Unknown (see Actions) Budget of £92,000	Currently none	It is recommended to run two centrifuges at the same time to improve quality of centrate returned to HoW. Alternatively, centrate can be exported as PAS110 separated liquor fertilizer	Discuss benefits of exporting centrate as PAS110 liquor with R McCluskey and F Marsh	Consider increasing centrate recycling in the process. Otherwise, treatment through the WRC remains the best option
Grit, Glass	Tank cleanout	Dependant on cleaning schedule	IVC Composting Plants	Dependant on cleaning schedule	Currently none	See above suggestion for grit, glass & eggshell	See above action for grit, glass & eggshell	Composting remains the best option
Oversized Digestate Fibre & Contaminant Screenings	Stran press solid output	ca. 70 tonnes	Energy from Waste Plants	ca. £10,000	Currently none	Due to amount of fine plastics, waste cannot be composted	None	Energy from Waste remains the best option
Hydrolysed FW soup	Contingency export from HBT during plant closure	TBC (see Actions)	Biogas AD Plants	None	TBC	N/A	None	AD will be the best option. However, consider using soup as feedstock for fly nutrient farm
Pasteurised FW soup	Contingency export from Pasteurisers during plant closure.	TBC (see Actions)	Biogas AD Plants	None	TBC	N/A	None	AD will be the best option. However, consider using soup as feedstock for fly nutrient farm



8. **Training**

Managers/supervisors responsible for the employees involved with the waste management from BFWRF will ensure that employees have documented training on the above policies, plans and procedures.

9. **Responsibilities**

- Meeting the requirements of Waste Management Policy, plans and Procedures outlined in this document is the responsibility of the Managing Director of Wessex Water Enterprises.
- Any new treatment routes for the waste outputs produced by BFWRF will be reviewed against the waste management hierarchy.
- Duty of care audits will be carried out by a member of the waste resources and/or BFWRF team.

Revision History

Issue	Date	Prepared by	Description
1	Nov 25	F Ramirez Diaz	New document Merge of Management of Waste Outputs from BFWRF (GENWMP198) and Raw Materials Consumption & Waste Minimisation Review – BFWRF (GENWMF14) Updated document locations on SharePoint Updated all links and figures