

Waste Management Plan – Renewable Energy

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 Avonmouth Renewable Energy Combined Heat and Power (CHP Plant) and Gas to Grid plant (G2G) operating under permit no. EPR/PP3734LK.

For the activities related to the Bristol Food Waste Recycling Facility, see the Waste Management Plan – BFWRF (GENWMP353).

2. Aim

Ensure that personnel involved with all activities related to the CHP and G2G Plants are clear of roles and responsibilities. They are required to:

- (a) Take appropriate measures to ensure that raw materials and water used efficiently in the activities and waste minimisation principles applied.
- (b) Maintain records of raw materials, water usage and waste generated from all activities
- (c) Review and record whether there are suitable alternative materials that could reduce environmental impact or opportunities to improve the efficiency of raw material & water use
- (d) 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 biogas generated from the adjacent Avonmouth Bioresources Centre (BC) and Bristol Food Waste Recycling Facility (BFWRF) can be used as fuel for the CHP plant or cleaned and injected into the G2G plant depending on site requirements.

There are 5no CHP engines which can run on biogas, natural gas or a blend of both. Heat generated from the engines is used to maintain the temperature of the sludge digestion assets from the Avonmouth BC and of the food waste digestion assets from the BFWRF.

Biogas is refined in the G2G Plant through ‘wet scrubbing’ where gas impurities are removed using water. The remaining gas (biomethane) is then injected with propane and combined with odorant to comply with the National Grid requirements before injection.

5. Management of Raw Materials

The raw materials, including any substances which could have an environmental impact, used at the CHP and G2G plants 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 materials list

<u>Name</u>	<u>Quantity (annual throughput per year)</u>	<u>Total held in site</u>	<u>Description of Use</u>
CHP Plant			
Biogas	~6,000,000 m ³	2no 1,800 m ³ gas holders	Fuel for CHPs



Natural gas	~ 4,000,000 m ³	Direct feed	Fuel for CHPs
Maintain Fricofin ESK (Antifreeze)	Top up if required	500L	Heating system antifreeze/inhibitor
Titan Truck Plus 15W-40 (Lubricant)	~1 tank capacity delivery each year	4,000L	Engine lubricating oil for onsite CHP
G2G Plant			
Biogas	~12,000,000 m ³	2no 1,800 m ³ gas holders	Feed gas for biomethane enrichment
FLOGAS Liquid Propane gas	55,000 kg/a	22,700 kg	Calorific Value enrichment
NB Robinson odorant (mercaptans)	33L	50L	Legal requirement to add odour
Carbon filters	~ 72 (4 replacement cycles per year)	18 tonnes (3no 6tonne filters)	Off-gas cleaning
Lubricant Oil	10L	50L	Equipment lubrication
Sodium Hydroxide (20%)	40L	40L	pH adjustment in wet scrubbing column
Sodium Hypochlorite (15%)	125L	2,000L	Prevention of fouling in wet scrubbing column
Momentive SAG 7133 Antifoam	500 mg/d	100L	Prevention of foam in wet scrubbing column

Raw materials are reviewed every 4 years and audited using form [GENWMF14](#). 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

However, due to the nature of the site activities, waste minimisation opportunities are minimal, with all identified changes being adopted in 2018.

6. Water usage

Potable water to the site is supplied via mains water system from the adjacent Avonmouth Water Recycling Centre.

Water used in the G2G Plant wet scrubbing column and odour control unit is supplied from the final effluent ring main installed around Avonmouth WRC. Process water from the wet scrubbing column is also regenerated and recycled through the process.

Daily maximum effluent generated is predominantly process effluent from the odour control unit, regenerated water from the wet scrubbing column and condensate from the CHP Plant dehumidifier chiller. The effluent is discharged back to the Avonmouth WRC Head of Works for treatment.

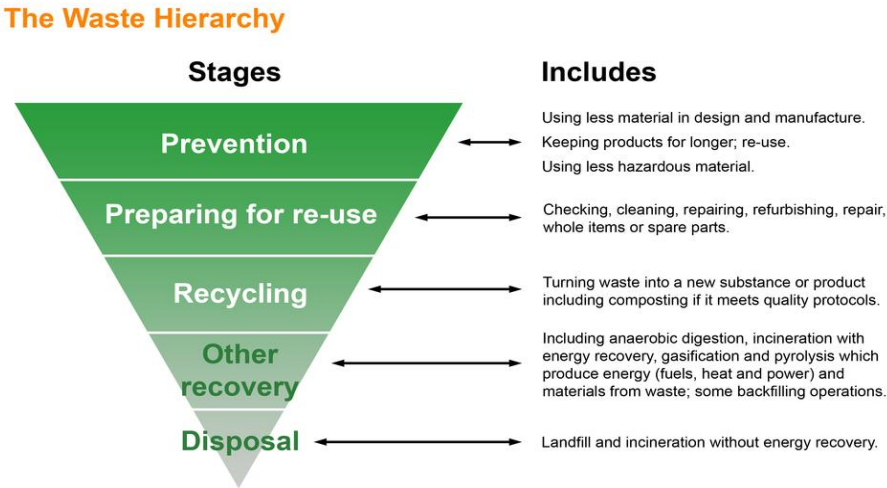
7. Management of Waste Outputs

The EU Waste Framework Directive (WFD) requires that appropriate measures are taken to avoid, recover or dispose waste.

Businesses must have control of waste and measures and if possible, avoid waste being produced. Where waste is produced the WFD requires that the Waste Hierarchy must be applied as follows:

- Prevent or reduce waste production and its harmfulness

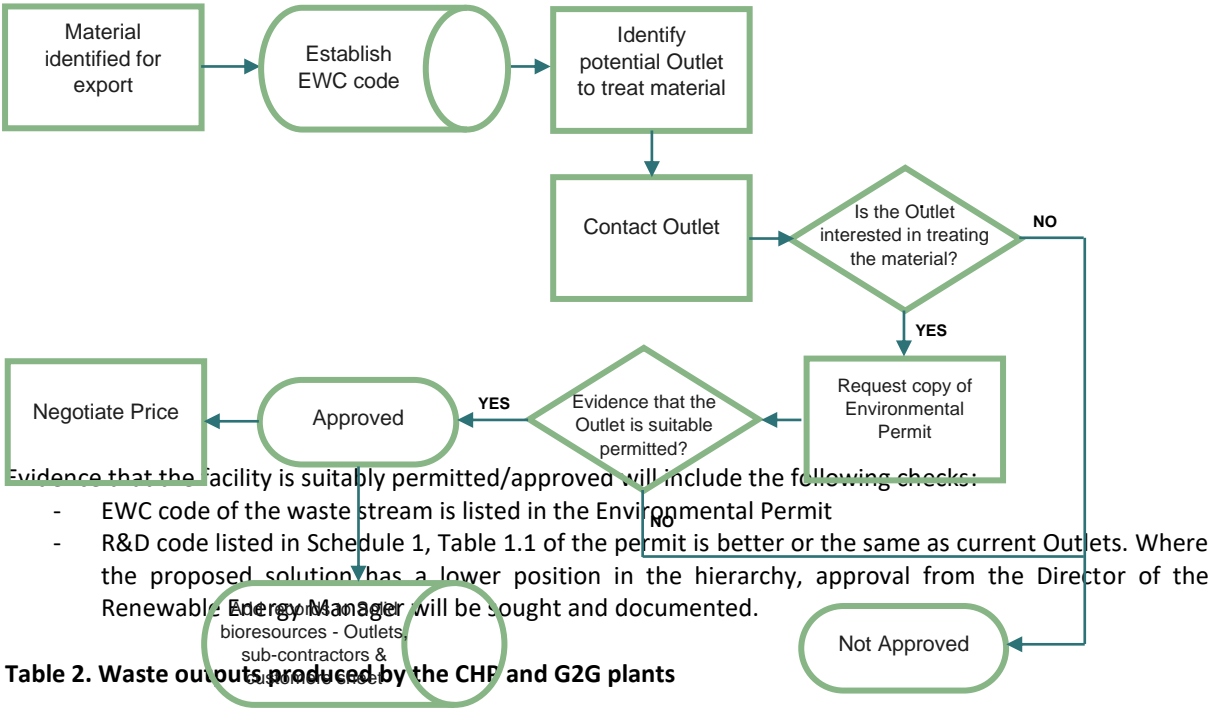
- (b) Recover waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw material
- (c) Use of water as a source of energy.



7.1 Approval of External Outlets

The Renewable energy team will follow the following process diagram to consider and approve external outlets for all waste outputs.

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 in: [Supplier onboarding and selection](#).



Description	EWG code	EWG code description	Approved outlet	Position in hierarchy
CHP Plant				
Oil Filters	16 01 07*	16 01 End-of-life vehicles from different means of transport 16 01 07 Oil filters	Waste Transfer Station followed by Refinery	R13: Storage of waste pending any other operation
Oily rags, wipes & gloves	15 02 02*	15 02 Absorbents, filter materials, wiping cloths and protective clothing 15 02 02 Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by hazardous substances	Waste Transfer Station followed by Refinery	R13: Storage of waste pending any other operation
Used lubricant	13 02 05*	13 02 Waste engine, gear and lubricating oils 13 02 05 Mineral-based non-chlorinated engine, gear and lubricating oils	Waste Transfer Station	R13: Storage of waste pending any other operation
Used antifreeze	16 10 01*	16 10 Aqueous liquid wastes destined for off-site treatment 16 10 01 Aqueous liquid wastes containing hazardous substances		
G2G Plant				
Spent activated carbon	15 02 03	15 02 Absorbents, filter materials, wiping cloths and protective clothing 15 02 03 Absorbents, filter materials, wiping cloths and protective clothing other than those mentioned in 15 02 02	Waste Transfer Station followed by Thermal Reactivation	R07: Recovery of components used for pollution abatement
Plastic filter media	19 02 10	19 02 Wastes from physico/chemical treatments of waste (including dechromation, decyanidation, neutralisation) 19 02 10 Combustible wastes other than those mentioned in 19 02 08 and 19 02 09	TBC	TBC

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 EPR/PP3734LK (Avoidance, recovery and disposal of wastes produced by the activities), any new treatment routes for the waste outputs produced by the CHP and G2G plants will be reviewed against the waste management hierarchy as established in section 7.1.

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 Renewable Energy team. A low-risk outlet would be classed as a site with a proven technology or process that minimises disposal.

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 templates 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 Renewable Energy team.

8. Training

The Renewable Energy manager will ensure that employees have documented training on all of the above policies, plans and procedures.

9. Responsibilities

Meeting the requirements of the 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 the CHP and G2G plants will be reviewed against the waste management hierarchy.

Duty of Care audits will be carried out by a member of the Renewable Energy Team

Revision history

Issue	Date	Prepared by	Description
1	Nov 2025	F Ramirez Diaz	New document Merge between Raw Materials + Waste Minimisation Gas to Grid (GENWMP229) and Management of waste outputs from G2G (GENWMP198A) Expanded to cover business wide policies, GENeco SHEQC policies, and G2G and CHP procedures Removed sections on Best Practice and Audit Review as no longer relevant Removed section on Energy Efficiency Measures as these are covered on a separate document: Energy Efficiency in GENeco (GENWMP230) Updated Table 1 and added raw materials from the CHP plant Updated Waste Outputs table (Table 2) and added waste outputs from the CHP plant