Installation Report
WEPA UK Ltd, Bridgend Paper Mill, Llangynwyd, Bridgend, CF34 9RS (Permit Ref. EPR/EP3738NG)

On behalf of:
WEPA UK Ltd

Project Reference:
023-1944

Revision:
REV00

Date:
August 2024

Earth & Marine Environmental Consultants Ltd
7th Floor, West One, Forth Banks
Newcastle upon Tyne
NE1 3PA, UK

Tel: 0800 130 3408
enquiry@eame.co.uk
www.eame.co.uk

United Kingdom | Iraq | Kurdistan Region of Iraq | Guyana

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Abbreviations

AST	Above Ground Storage Tank
BAT	Best Available Technique
BGS	British Geological Survey
BREF	Best Available Techniques Reference Documents
DEFRA	Department for Environment Food and Rural Affairs
EA	Environment Agency
EAME	Earth & Marine Environmental Consultants Ltd
EMS	Environmental Management System
EPR	Environmental Permit
FPMP	Fire Prevention Management Plan
IBC	Intermediate Bulk Container
NGR	National Grid Reference
NRW	Natural Resources Wales
Opra	Operational Risk Appraisal
PPM	Planned Preventative Maintenance
SCR	Site Condition Report
SSSI	Site of Special Scientific Interest
µg/l	micrograms per litre

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1 Introduction

1.1 Background

This document has been prepared by WEPA UK Ltd ("WEPA") and its environmental consultant Earth & Marine Environmental Consultants Ltd ("EAME") in support of a permit application (variation) as required under the *Environmental Permitting (England and Wales) Regulations 2016* concerning current and proposed activities to be undertaken at WEPA UK Ltd, Bridgend Paper Mill, Llangynwyd, Bridgend, CF34 9RS (Permit Ref. EPR/EP3738NG (the "Site").

The Authorised Company contact is Richard Lewis (WEPA UK Ltd, Energy & Environment Manager, Bridgend Paper Mill).

The status log (history) for the permit is outlined in **Table *1-1***.

Table 1-1: *WEPA Bridgend Paper Mill Permit Log*

Description	Date	Comments
Application EPR/BJ5805IX	27/02/2001	-
Permit BJ5805IX determined	27/11/2001	-
Application for Variation BR8042	06/03/2002	Standard variation – to amend completion dates of improvement condition 9.4 a) and b) EPR/BJ5805IX/**V002**.
Variation BR8042 determined	29/04/2002	Introduced sampling on A3 and A4.
Application for variation XP3235SE	22/11/2004	EPR/BJ5805IX/**V003** –addition of PVA coating to Jupiter paper machine.
Variation XP3235SE determined	29/04/2005	Introduced 3 improvement conditions (9.12 – 9.14) to assess effect of process on River Llynfi and reduce impact. New VOC emission point (A5) linked to paper machine modification.

Description	Date	Comments
Variation KP3634LB Environment Agency Initiated	06/06/2006	EPR/BJ5805IX/**V004** – lowers maximum temperature limit on discharged effluent, further reduce ammonia limit, adds limit for VOC emissions from A5 stack, additional improvement condition (9.24) to install active cooling on effluent discharge.
Transfer application EPR/SP3639KA/T001 (full transfer of base permit EPR/BK6122IE and subsequent variations)	29/05/2009	-
Transfer EPR/SP3639KA determined	23/07/2009	-
Environment Agency Paper and Pulp Sector Review 2011 Variation determined EPR/BJ5805IX/**V005**	28/10/2011	Multi-permit consolidation of EPR/BJ5805IX and EPR/SP3639KA. EPR/BJ5805IX is the base permit going forward. Varied and consolidated permit issued in modern condition format.
Application EPR/SP3431CN/T001 (full transfer of consolidated permit EPR/BJ5805IX)	16/07/2012	Application to transfer the permit in full to SCA Hygiene Products Tissue Limited.
Transfer determined EPR/SP3431CN	19/07/2012	Full transfer of permit complete.
Agency variation determined EPR/SP3431CN/**V002**	25/03/2013	Agency variation to implement the changes introduced by IED.
Application EPR/EP3738NG/T001(full transfer of permit EPR/SP3431CN)	16/05/2013	Application to transfer the permit in full to Northwood & Wepa Limited.
Transfer determined EPR/EP3738NG	18/06/2013	Full transfer of permit complete.
Variation application EPR/EP3738NG/**V002**	02/12/2013	Addition of two paperconverting lines and IED conditions.
Variation determined EPR/EP3738NG/**V002**	24/02/2014	Varied permit issued.
Natural Resources Wales Paper, Pulp and Board Sector Review 2015 Permit EPR/EP3728BH Variation issued EPR/EP3738NG/**V003**	31/03/2016	Varied and consolidated permit issued in modern IED condition format.
Variation application EPR/EP3738NG/**V004**	03/07/2018	Admin variation to change company name from Northwood Wepa Limited to WEPA UK Ltd.

Description	Date	Comments
Variation determined EPR/EP3738NG/**V004**	04/09/2018	Variation issued to WEPA UK Ltd.
Variation application EPR/3738NG/**V005** (PAN013155) Further information Air Quality 23/08/21 & 22/09/2021 on fuel oil	24/08/2021	Substantial Variation to include new paper machine converting line.
Variation Determined EPR/3738NG/**V005**	17/01/2022	Variation Issued to WEPA UK Limited.
Note: This table only provides details of the main permit-related events. The status log should be referred to for full details.		

1.2 Current Permitted Activities

WEPA UK Ltd operates a paper mill and converting facility, a Combined Heat and Power Plant (CHP) and an effluent treatment plant (ETP) at Llangynwyd in the Llynfi Valley in South Wales approximately 5km south of Maesteg and 10 km north of Bridgend. Situated in a semi-rural location, papermaking at the installation has been established since 1950. The installation is situated adjacent to the River Llynfi and the Nant Gwyn stream also runs through the site. The nearest area of designated sensitive habitat is the Merthyr Mawr Warren Special Area of Conservation (SAC) which is located approximately 6km south of the installation. The installation is not deemed to have an impact on this site.

The mill uses virgin wood-pulp and broke (paper trimmings and scrap) as raw materials in the production of a range of hygienic paper tissue products. The mill operates two paper machines with standalone stock preparation and converting lines. The capacity of the installation is approximately 125,000 tonnes of paper product per annum.

Virgin fibre and broke are independently processed through low consistency pulpers, which are designed to disperse the fibres in water and produce stock. Each stock line is then passed through basic cleaning systems before being mixed and fed to the paper machine. The ratio of virgin pulp to broke is strictly controlled to achieve specific product quality requirements. The mixed paper stock is fed to the papermaking machine which is designed to continuously produce a cohesive web of fibre, forming a wet sheet of paper tissue. Once the initial wet sheet is formed the paper is passed through the drying section which is made up of a series of steam heated cylinders to dry the paper. At the end of the drying process, the continuous paper sheet is wound onto a reel. When the reel is full the

sheet is spliced onto the next reel so that continuous paper production is achieved without stopping to change from one reel to the next.

The installation includes a CHP Plant with a net thermal input of less than 50MW which supplies the entire steam demand of the papermaking operation and approximately 50% of the electrical power of the mill. When the CHP is aggregated with the paper machine hood burner rating it becomes a Part A(1) combustion activity. The CHP plant is natural gas-fired with the capacity for supplementary gas oil firing. The plant comprises two Gas turbines with a single 37m stack and a shell boiler with a 30m stack.

The plant has been operational since 1995 and is now operated by WEPA UK Ltd. The permit was transferred from SCA Hygiene Products Tissue Limited to WEPA UK Ltd (formerly Northwood and Wepa Limited) on 18th June 2013. Emissions to air are strictly controlled, including particulates and oxides of carbon, sulphur and nitrogen.

1.3 Proposed Variation Application

This permit variation application proposes the following changes to the current permitted installation:

- **Installation** of two new gas-fired boilers within a standalone boiler house with associated fuel supply and stacks (within a shared/combined windshield).
- **Removal** of the existing Combined Heat and Power (CHP) unit and associated stacks (emission points A1 and A2). The units will be decommissioned and removed once the new gas-fired boiler house is commissioned.
- **Addition** of four specific (non-hazardous) List of Waste (LoW) Codes (03 03 08 – wastes from sorting of paper and cardboard destined for recycling, 15 01 01 – paper and cardboard packaging, 19 12 01 – paper and cardboard and 20 01 01 – paper and cardboard) to allow the receipt, storage, and processing of wastepaper within the existing processes.

The remainder of this document outlines the requirements required by Natural Resources Wales (NRW) to progress the permit variation application. The document represents the Main Installation Report submitted as part of the application package (EAME Ref. 023-1944).

1.4 Pre-Application Advice and Consultation

Discussion have been held with relevant NRW personnel; this has included:

- Tony Leakey (NRW Senior Specialist Industry Regulation);
- Dale Padfield (NRW Team leader - Air emissions Monitoring); and
- Kelly Sherratt (NRW Industry Regulation Team leader).

1.5 Permit Boundary

The proposed variation does not alter the existing permit boundary that is outlined within Schedule 7 of the current environmental permit (Ref. EPR/EP3738NG) i.e. no additional land is required to implement the project.

An updated Site Condition Report (in the current required format) has been provided within the application package.

1.6 Technical Standards

The application has been produced following current NRW, Environment Agency (EA) and the Department for Environment, Food & Rural Affairs (Defra) guidance. WEPA has considered the following Appropriate Measures as representing the Best Available Techniques (BAT) for the sector and the proposed activity (***Table 1-2***).

Table 1-2: *Technical Standards and Guidance (Appropriate Measures)*

EPR Guidance	
UK Government (2023). Develop a management system: environmental permits.	https://www.gov.uk/guidance/develop-a-management-system-environmental-permits
Horizontal Guidance	
UK Government (2023). Risk assessments for specific activities: environmental permits (collection).	https://www.gov.uk/government/collections/risk-assessments-for-specific-activities-environmental-permits
UK Government (2022). Guidance Noise and vibration management: environmental permits.	https://www.gov.uk/government/publications/noise-and-vibration-management-environmental-permits

NRW (2014). Environmental permitting: H5 Site condition report.	https://naturalresources.wales/media/1215/environmental-permitting-regulations-guidance-for-applicants-h5-site-condition-report-guidance-and-template.pdf
UK Government (2024). Guidance Air emissions risk assessment for your environmental permit	https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit
BATc and Bref Notes	
European Commission (2015). Best Available Techniques (BAT) Reference Document for the Production of Pulp, Paper and Board, Joint Research Centre Institute for Prospective Technological Studies	https://eippcb.jrc.ec.europa.eu/sites/default/files/2019-11/PP_revised_BREF_2015.pdf
European Commission (2014). 2014/687/EU: Commission Implementing Decision of 26 September 2014 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the production of pulp, paper and board (notified under document C(2014) 6750)	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0687
European Commission. (2021). Reference Document on Best Available Techniques for Energy Efficiency.	https://eippcb.jrc.ec.europa.eu/sites/default/files/2021-09/ENE_Adopted_02-2009corrected20210914.pdf
Monitoring	
Monitoring emissions to air, land and water (MCERTS) (collection)	https://www.gov.uk/government/collections/monitoring-emissions-to-air-land-and-water-mcerts#stack-emissions-monitoring-performance-standards-and-test-procedures
Sector Specific Guides	
NRW (2017). Fire Prevention & Mitigation Plan Guidance – Waste Management.	https://naturalresources.wales/media/684379/guidance-note-16-fire-prevention-mitigation-plan-english.pdf

1.7 Application Package

The application package includes completed application forms that are cross-referenced to various technical documents, which are intended to address all the areas required by the variation application. The various documents included with this application package are outlined in **Table *1-3***.

Table 1-3: *Application Documents*

Type	Reference
Air Emissions Risk Assessment	023-1944 WEPA Air Emissions Risk Assessment v1 WEPA June 2024 Model Files (Zip File)
Application Forms	Form A – About You (NRW V1, Jul 2016) Form C2 – General: varying a bespoke permit (NRW V2, Oct 2018) Form C3 – Variation to a bespoke installation permit (NRW V2, Oct 2018) Form F1 – Opra charges-and-declarations 240118-charge-tool-variation WEPA-EPR-EP3738NG-Opra
BAT Assessments	023-1944 WEPA Permit Variation - BAT Assessment REV00
Drainage Systems	57300_OVE_7615_Drainage-and-Ducts-Layout-Full-Site_FC_22 AS BUILT Drainage Management and Maintenance Strategy
Energy and Efficiency	WEPA GHG Permit WEPA Paper Sector CCA
Fire Protection Systems	119003 WEPA UK BRIDGEND Concept Fire Protection System
Flood Consequence Assessment	Quorum FRA 2019
Installation Report	023-1944 WEPA Permit Variation - Installation Report REV00
Management Plans	023-1944 WEPA UK Ltd FPMP REV00
Monitoring	0934Testing-Multiple

Type	Reference
Noise Impact Assessment	E3726 - WEPA Bridgend_Noise v1-0 E3726 - WEPA Bridgend.cna
Non-technical Summary	023-1944 WEPA Variation - NTS Report REV00
Plans and Figures	023-1944 Figure A1 Site Location REV00 023-1944 Figure A2 Permitted Installation Boundary REV00 023-1944 Figure A3 Environmental Receptors Within 1km REV00 023-1944 Figure A3 Installation Drawings 023-1944 Figure A4 Ecological Receptors Within 2km REV00 023-1944 Figure A5 Ecological Receptors Within 10km REV00
Plant Technical Specifications	1041. Paper Mill Drawings Blowdown Vessels 2024 Hotwell June 2024 Service and After-sales – 2023 Steam Brochure Web 24 YSZ13750 PROVISIONAL GA YSZLN13750 Performance sheet WEPA Louver sizing for gas- BYWORTH
QEHS Management System	ISO14001 EMS Certificate ISO45001 SMS Certificate ISO9001 QMS Certificate
Safety Data Sheets	EWS S10 v1 EWS S22 v1 EWS S88 v1 EWS S456N v1 EWS SH32 v1
Site Condition Report	023-1944 WEPA Permit Variation - SCR REV00

Type	Reference
Surface Water Risk Assessment	**WEPA Monitoring** 023-1944 Point W1 - 106248 Effluent Analysis 2023 023-1944 WEPA Annual Limits 2023 REV00 023-1944 WEPA Daily Continuous Monitoring 2023 REV00 023-1944 WEPA Daily Flows 2023 REV00 023-1944 WEPA Monthly Monitoring 2023 REV00 023-1944 WEPA Weekly Monitoring 2023 REV00 **NRW BC Data** 023-1944 WEPA ProUCL Export REV00 NRW Water Quality - Llynfi Data **H1 Assessment** WEPA Variation H1TOOL_2.78 m-BAT tool 20150206 023-1944 Copper H1 Assessment - M-BAT Derived PNEC REV00
Sustainability Assessments	WEPA-sustainability-report-2022
Water Abstraction	Water Abstraction License 2013

The above items should be regarded as constituting the variation application. In line with the Form F1 guidance the various application sections have been submitted via email to permitreceiptcentre@naturalresourceswales.gov.uk

1.8 Fees and Payments

From 22nd January 2024, NRW issued a variation Charge Banding Tool to calculate the charge for all Tier 3 (bespoke installation) permits. This has replaced Opra as the tool to calculate variation application charges.

- Company name: Natural Resources Wales
- Company address: Income Department, PO Box 663, Cardiff, CF24 0TP
- Bank: RBS

- Address: National Westminster Bank Plc., 2 1/2 Devonshire Square, London, EC2M 4BA
- Sort code: 60-70-80
- Account number: 10014438

Notification of the BACS payment has been sent (including reference number – EPRWEPAUKLTD0001) to banking.team@naturalresourceswales.gov.uk

Part F1 Form Banding Tool (1d.) states that an operator needs to complete an Opra spreadsheet with the new application to allow NRW to calculate your associated annual subsistence charge. For variations, an operator needs a completed Opra spreadsheet that reflects the situation on the site once your permit is determined. The application has updated the current Opra assessment based on NRW V2 01 April 2019 to the current version (NRW V2.1-2023) (Ref. **WEPA-EPR-EP3738NG-Opra**).

2 Permitted Activities

2.1 Proposed Changes – New Boilers

2.1.1 Proposed Change

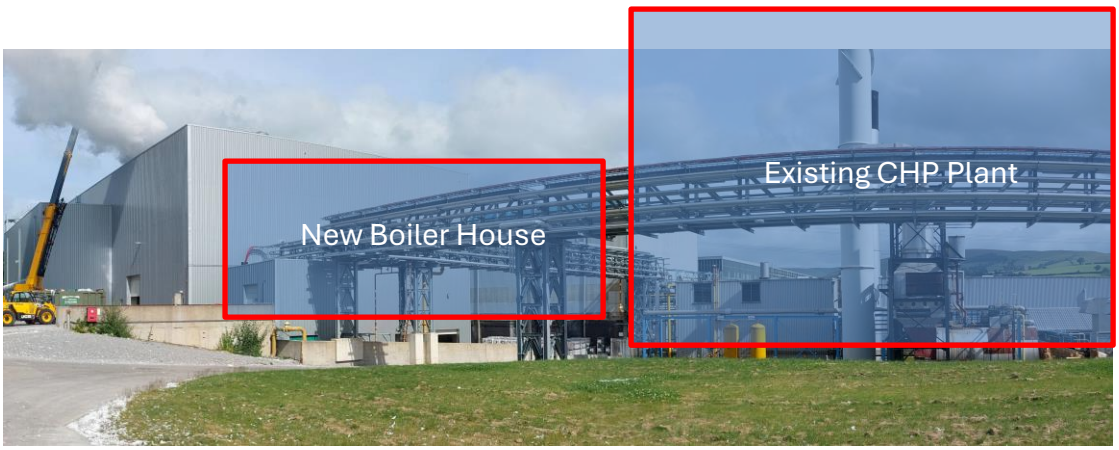
WEPA proposes to replace the existing (ageing) Combined Heat and Power (CHP) plant with a new natural gas-fired (hydrogen-ready) boiler house containing two 9.23 MW boilers (a total of 18.46 MW net thermal input) discharging through two individual stacks contained within a common wind shield (**Photograph *2-1***).

Photograph 2-1: *Proposed location of the new boiler house*

2.1.2 Existing Activity

The current CHP (installed in 1995) is a continuous operation consisting of two natural gas-fired Solar Taurus 60 Gas Turbines (GTs) which each driver a 4.5 MW(e) electrical generator. The turbine exhaust gas contains about 9 MW of thermal energy and is passed through two heat recovery steam generators (HRSGs). A separate shell boiler can generate 75% of the steam requirement of the mill. The steam is used primarily to heat the inside of the Yankee cylinders on which the paper products are dried. Under normal conditions, the turbine/generator set supplies 50% of the electrical energy required by the various motors, actuators, drives, lighting and computers of the mill. The thermal input of the CHP plant is 48.18 MW. As stated, the current CHP Plant has a net thermal

input of less than 50MW but when aggregated with the paper machine hood burner rating it became a Part A(1) combustion activity (i.e. >50 MW). The current CHP plant is natural gas-fired with the capacity for supplementary gas oil firing. The plant comprises two gas turbines with a single 37m stack and a shell boiler with a 30m stack. Upon commissioning of the new gas boilers the CHP and all associated equipment will be decommissioned and removed (**Photograph *2-2***).



Photograph 2-2: *Relationship between new boiler house and existing CHP*

2.1.3 Aggregation Rules

Under Section 25 of *The Environmental Permitting (England and Wales) (Amendment) Regulations 2018,* a combination formed by two or more new medium combustion plants shall be a single medium combustion plant where waste gases pass through a common windshield and/or where they could pass through a common windshield.

As there are no changes to the paper machine hood burners (i.e. Jupiter, Neptune and Hall 2 air handling unit) the aggregated capacity (using the existing aggregation approach) will be less than the previous Part A(1) threshold of 50 MW (i.e. does not meet the definition of a Section 1.1 Part A(1)(a) activity).

It is not possible to combine the emissions from the paper machine hoods and the boiler house. Therefore, the boiler house will be considered a new single Medium Combustion Plant Directive (MCPD) unit attached to an Industrial Emissions Directive (IED) activity under Section 6.1 Part A(1)(b). As the rated thermal input is between 1 MWth and 20 MWth a Part B permit is not required[1].

1 https://www.gov.uk/guidance/part-b-activities-combustion-and-incineration-permits

Figure 2-1: *Proposed boiler house location and layout*

Key characteristics of the new boiler house are:

- Building dimensions circa17 x 22m footprint. Circa 8.5 metres in height.
- Insulated cladding: Kingspan GB QuadCore KS1000RW Wall Panel (or alternative FM-approved cladding)
- Louvres: Natural ventilation louvres; 2 x 8m low level and 3.3 x 3.3m high level at each end of the building (2 louvres, 33.29m^2 total area).

The approach outlined in ***Figure 2-2*** was discussed and agreed with NRW on 17/07/2024.

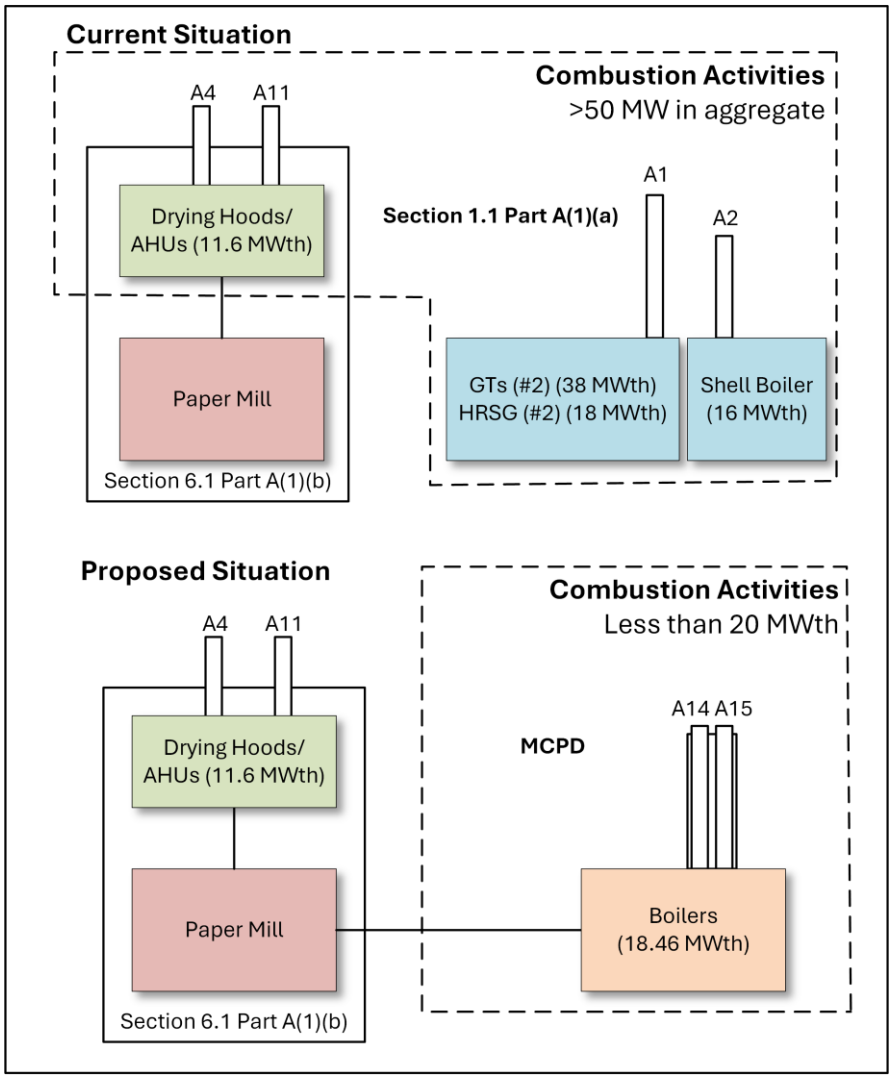


Figure 2-2: *Proposed CHP to Boiler Change*

2.2 Proposed Changes – Removal of CHP

After the installation and permitting of the new boiler house, the existing CHP plant will be decommissioned and removed. WEPA plans to create a series of workshops within the area currently occupied by the CHP plant.

All plant and equipment shall be removed as per the previously supplied decommissioning /site closure procedure.

2.3 Proposed Changes – Addition of Four Waste Types

WEPA has a sustainability target (by 2030) to ensure sales products are made from at least 60% recycled fibres and alternative virgin fibres whilst also reducing the ecological footprint of its fibre portfolio by 25%. As a result, the Bridgend facility would like to import and utilise certain designated (non-hazardous) waste streams within the process. Within the industry this is referred to as 'Broke' i.e. partly or fully manufactured paper or board that is discarded from paper or board making, converting, and finishing processes.

The scope of the variation includes:

- acceptance of specific specified waste materials on to site;
- storage of specified waste materials on the site (within designated areas); and
- use of the specified materials within the existing permitted processes.

The specific waste types that shall be accepted at the Site are outlined in **Table *2-1***.

Table 2-1: *Proposed list of waste codes*

Waste Code	Description
03	**Wood/Paper/Card processing**
03 03	Pulp – paper and cardboard production and processing
03 03 08	wastes from sorting of paper and cardboard destined for recycling
15	**Packaging, Absorbents, Wiping Cloths and Filters**
15 01	Packaging (including separately collected municipal packaging waste)
15 01 01	paper and cardboard packaging

Waste Code	Description
19	**Materials from Waste and Water Treatment**
19 12	Mechanical treatment of waste (for example sorting, crushing, compacting, pelletising) not otherwise specified
19 12 01	paper and cardboard
20	**Municipal Waste and Similar Materials from Commerce and Industry**
20 01	Separately collected fractions (except 15 01)
20 01 01	paper and cardboard
Notes:	

Full details of the process are outlined in the Fire Protection Management Plan (Ref. **023-1944 WEPA UK Ltd FPMP REV00**) that is included in the variation application.

3 General Management Measures

3.1 Management System

WEPA UK Ltd has implemented and maintains an Environmental Management System (EMS) that is certified to ISO14001:2015.

The EMS continues to be maintained and is externally audited (by BSI Assurance UK Limited) whilst delivering all indicative Best Available Technique (BAT) requirements for an effective management system. The current management systems will be updated to include the proposed operations.

WEPA UK Ltd also operates a certified ISO 45001:2018 Occupational health and safety management system and a certified ISO9001:2015 quality management system. These systems continue to be applied to the permitted installation.

The organisational arrangements for the permitted installation are outlined in ***Figure 3-1***.

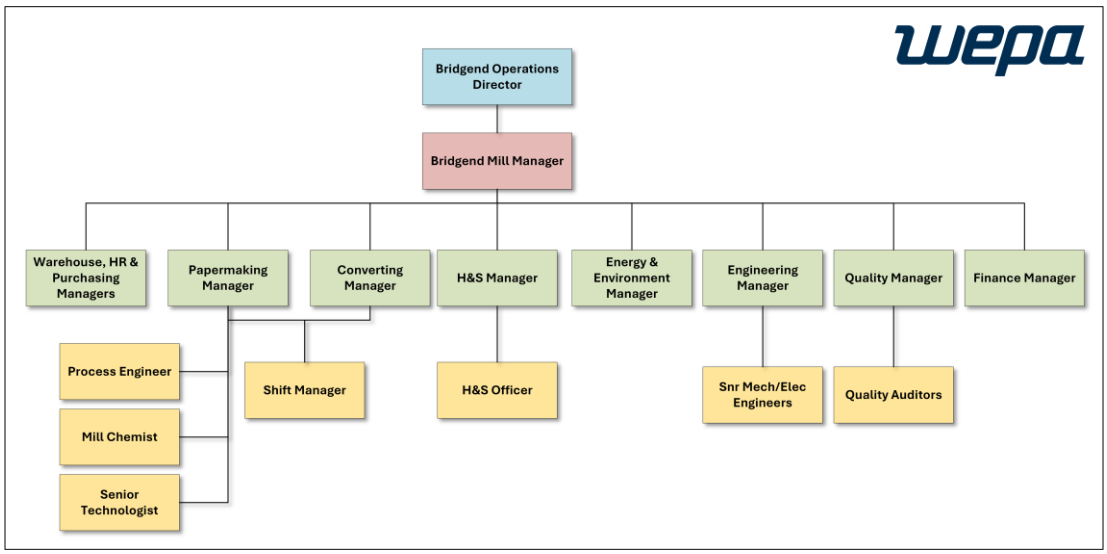


Figure 3-1: *WEPA Bridgend Organogram*

3.2 Management Plans

In line with the statutory guidance and BAT requirements the following environmental management plans have been established and will be maintained as part of the EMS (**Table *3-1***).

Table 3-1: *Environmental Management Plans*

Plan	Comments
Accident management plan Noise and Vibration Management Plan Environmental Management Plan	The installation operates a certified ISO14001 management system that includes documented procedures for establishing, implementing and maintaining processes needed to prepare for and respond to potential emergencies (throughout the permitted installation). The documented processes also covers normal and other than normal operating conditions (OTNOC) associated with the installation such as unplanned noise and vibration. An updated environmental risk and management plan has been provided within this application (Ref. **023-1944 WEPA Risk and Environmental Management Plan REV00**).
Site condition report (SCR)	A revised and updated SCR has been provided with the variation application (**Ref. 023-1944 WEPA Permit Variation - SCR REV00**).
Fire prevention management plan (FPMP)	The facility has established and will maintain a FPMP that is aligned with current NRW Guidance (Ref. **023-1944 WEPA UK Ltd FPMP REV00**).
Notes: Waste Recovery Plan, Dust Management Plan, Pest Management Plan, Emissions Management Plan, Dust and Bio-aerosol Management Plan and Odour Management Plan are not deemed relevant to this variation application.	

The draft plans are provided within the application package. It is important to note that these are subject to amendment as they form a part of the WEPA operational QEHS Management System.

3.3 Operations and Maintenance

The company uses a "risk" based approach for assessing the criticality of site equipment in terms of Health, Safety, and Environment requirements. As well as the criticality of the

plant the equipment is given a priority which determines how quickly an unplanned failure of said equipment is responded to.

Given the importance of the boiler house to the operation of the business WEPA will ensure, to maximise site availability, that spare and wear parts are readily available.

The site will establish and maintain a Planned Preventative Maintenance (PPM) schedule in line with the manufacturer's recommendations. This will identify all critical environmental equipment that is used to mitigate or prevent environmental impacts. All records associated with these activities will be maintained on-site and controlled as part of the ISO14001 management system. Any breakdown or malfunction of plant or equipment that could result in abnormal emissions and/or increased energy or resource consumption will be dealt with promptly and process operations adjusted until normal operations can resume. Any such events shall be recorded.

3.4 Accidents

The site has established and maintains procedures which are subject to regular review and update and are controlled via the EMS. The systems detail site drainage, site services, location of hazardous materials (*e.g.* fuels), emergency response equipment, pollution control points *etc*. Where required the emergency plan will be revised to consider any identified deficiencies.

Appropriate spill kits and absorbents will be available throughout the site. These will be subject to regular inspection to ensure stock levels are maintained. All operatives will be trained in their use.

In response to fire prevention and mitigation requirements, the controls are outlined within **023-1944 WEPA UK Ltd FPMP REV00.**

3.5 Incidents and non-conformances

Accidents, Incidents, complaints, and non-conformances are to be handled through the existing processes (Zenya System) that form part of the ISO 14001 EMS.

3.6 Site Security

There are multiple levels of security to prevent/control unauthorised access to the Site. The entrance point is secured and maintained by security staff and a CCTV system has been installed which includes remote monitoring and provides full-service maintenance. Escalation (*i.e.* post-detection/alarm response) is provided.

3.7 Staff Competence

The total manning of the activity can vary depending upon the level of activity being undertaken. At the current time, there are 372 staff.

WEPA UK Ltd will provide centralised engineering, technical, transport, administration, and environmental support (as required). WEPA UK Ltd provides a comprehensive training programme for the site and the proposed operations in line with the required competency requirements (*e.g.* general environmental awareness, maintenance and operational activities, accident, and emergency response). This training will be provided to all site operatives.

3.8 Records that demonstrate your management system

Records relating to the operation of the site are to be handled through the existing processes that form part of the ISO 14001 EMS. All records relating to the operation of the installation will be maintained as per the stated procedures.

3.9 Access to your permit

Access to the permit will be through existing internal systems (*i.e.* intranet and on-site noticeboard). Where contractors undertake work within the site the requirements of the permit will be actively brought to their attention.

3.10 Permit surrender and closure

Upon cessation of activities, the following site closure plan will be initiated:

- disconnection of electrical supply and make safe;
- drain down and empty any fuel storage tanks;
- remove all plant and equipment down to slab level;
- remove and dispose of all remaining waste materials in line with current regulatory requirements; and
- undertake site surrender SCR monitoring (*i.e.* provide the evidence necessary to demonstrate to NRW that the site does not pose a pollution risk and is in a satisfactory state).

4 Process Efficiency

4.1 Energy Efficiency

As part of WEPA's ISO 14001 EMS, WEPA has identified its potentially significant environmental aspects, whilst considering its legal requirements. Objectives and targets are set on an annual basis to deliver continual improvement in the management of these environmental aspects, this includes energy usage. WEPA is careful to ensure that its processes are efficient to minimise the use of energy and avoid waste.

As the proposed Medium Combustion Plants (MCPs) total thermal rated input is less than 20 MWth an energy efficiency report is not required as stated within Schedule 24 of *The Environmental Permitting (England and Wales) Regulations 2016*.

4.1.1 Energy Use within the Installation

This variation application relates solely to the installation of two new gas-fired boilers within a standalone boiler house with associated fuel supply and stacks (within a shared/combined windshield), the removal of the existing Combined Heat and Power (CHP) unit and associated stacks (emission points A1 and A2) and the addition of four specific (non-hazardous) waste codes to allow the receipt, storage, and processing of wastepaper within the existing processes.

The consideration of energy use within the installation associated with the proposed switch from CHP (steam and electrical supply) to boilers (steam and grid supply) is assessed and discussed within the BAT Assessment (Ref. **023-1944 WEPA Permit Variation - BAT Assessment REV00**). This document also discusses and justifies the deviation from BAT stated in the current sector guidance (European Commission, 2014).

The replacement steam boilers are fitted with economisers. An economiser is a heat exchanger through which the feedwater is pumped. The feedwater thus arrives in the boiler at a higher temperature than would be the case if no economiser was fitted. Less energy is then required to raise the steam. Alternatively, if the same quantity of energy is supplied, then more steam is raised. This results in a higher efficiency. In broad terms, a 10°C increase in feedwater temperature will give an efficiency improvement of around 2%.

4.1.2 Greenhouse Gas Permit

Where an operator undertakes an activity covered by the UK Emissions Trading Scheme (UK ETS) a greenhouse gas (GHG) emissions permit is required. The facility has held a GHG Permit (Ref. UK-W-IN-12920) since 1st February 2016 (Ref. **WEPA GHG Permit**).

As the current permit refers to the existing CHP plant it will need to be varied to account for the new boiler arrangement.

The natural gas use associated with the current CHP arrangement is monitored and reported as part of the permit requirements. The current arrangements and systems will be used once the natural gas boilers are installed:

- Activity data (natural gas) will be calculated using meter readings taken from the main high-pressure fiscal gas supply meter into the site (owned by NGT) and the low-pressure fiscal gas meter into the site (also owned by NGT). The Net Calorific Value and Emissions Factor are taken from the National Inventory (Tier 2a). A Tier 1 default value Oxidation factor is used. The CO_2 emissions are calculated as a product of AD*NCV*EF*OxF. The uncertainty using this method resolves down to the meter accuracy and this is +/- 1%.

4.1.3 Climate Change Levy

Climate change agreements (CCAs) are voluntary agreements made by UK industry and the Environment Agency to reduce energy use and carbon dioxide (CO_2) emissions. In return, operators receive a discount on the Climate Change Levy (CCL), a tax added to electricity and fuel bills. The Environment Agency administers the CCA scheme on behalf of the whole of the UK.

The permitted activity is covered by the Paper Sector CCA that was established on 6th March 2013 (Ref. **WEPA Paper Sector CCA**).

4.1.4 Management of Energy Use

WEPA is committed to managing and reducing the environmental impact of its operations (wherever possible). Energy reduction programmes are established and maintained throughout the business. The aim of this is to evaluate the environmental impact of WEPA's activities (*i.e.* buildings, processes and transport) and identify opportunities for improvement. These opportunities can be reflected in the site improvement objectives (if deemed feasible). In all cases, these objectives form part of the ISO 14001 EMS. In addition, the regular monitoring of site energy consumption and the planned preventative maintenance of equipment is carried out on a regular inspection cycle.

The facility is in the process of implementing ISO 50001:2018 Energy Management.

4.2 Raw Materials

There is minimal use of raw material use associated with this variation application installation apart from the boiler water treatment chemicals and routine maintenance activities (*e.g.* hydraulics (oils), and grease lubrication).

4.3 Water Use

Paper mills use large volumes of freshwater in the production process for stock preparation and general process water. The process relies heavily on steam for the Yankee dryers which are currently supplied by the CHP plant. The switch from CHP to boilers will not change the required steam demand as that is related to the paper machines and its associated throughput which is not predicted to change.

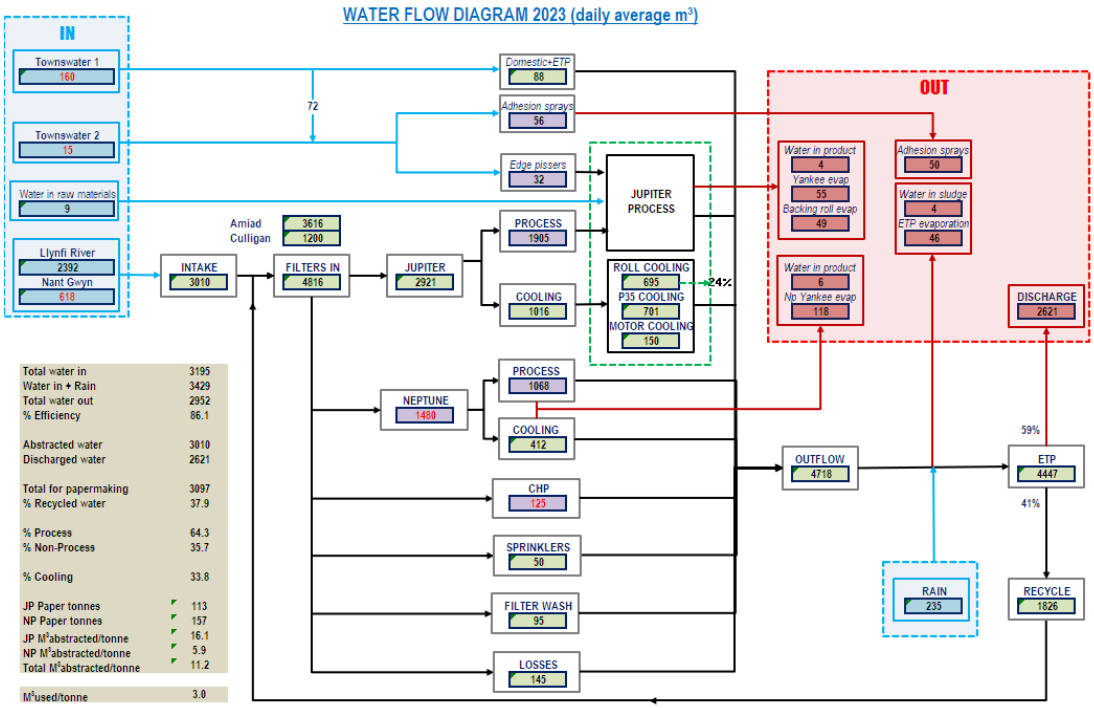


Figure 4-1: *Bridgend Paper Mill Water Balance*

The facility continues to utilise the existing licence to abstract water from the Afon Llynfi (Point A – NGR SS 88030 87300 and Point B – NGR SS 88199 8702) (Ref. **Water Abstraction License 2013**). No changes or increase in abstraction are anticipated.

4.4 Waste Minimisation, Recovery and Disposal

No new waste streams will be generated.

Where residuals are produced, they shall be managed and disposed of off-site in line with the current ISO14001 EMS procedures.

5 Emissions to Air, Water and Land

5.1 Point Source Emissions to Air

Schedule 3 (Table S3.1) of the current environmental permit (Ref. EPR/EP3738NG) outlines the current point source emissions to air from the installation. The required changes, because of this variation application, are outlined in **Table *5-1***.

Table 5-1: *Point source emissions to air (current and proposed)*

Emission Point Ref. & Location	Source	Status
A1 – Gas Turbine (37 m)	Gas turbine stack – CHP plant	Remove from permit
A2 – Shell Boiler (30 m)	Shell boiler Stack – CHP plant	Remove from permit
A3 (N/A)	Not used within the permit.	-
A4 (height 20.3m) Drawing no IPPC - 06	Jupiter Machine Hood Exhaust Vent	The emission point remains active. No changes are required.
A5 (height 6.2m) As shown in drawing No. 50-GP-114 Rev 1	Jupiter PVOH application drum vent	The emission point remains active. No changes are required.
A6 – CHP plant	High pressure natural gas vent (South)	Remove from permit
A7 - CHP plant	High pressure natural gas vent (North)	Remove from permit
A8 (as shown on drawing 050-BR-081)	HVAC (LUWA) dust extraction system including wet scrubber serving Converting Halls 1 and 3, Lines 15, 18 &19	The emission point remains active. No changes are required.
A9 (as shown on drawing 050-BR-081)	Scrubber dust extraction system serving Converting Hall 2, Line 16	The emission point remains active. No changes are required.

Emission Point Ref. & Location	Source	Status
A10 (as shown on drawing 050-BR-081)	Dust extraction system including briquette machine serving Converting Hall 2, Line 17	The emission point remains active. No changes are required.
A11 (height3 0.4m) as shown on plan Appendix 09.02	Neptune Machine Hood Exhaust Vent	The emission point remains active. No changes are required.
A12 (height 27.4m) on plan Appendix 09.02	Wet Dust Exhaust Neptune Machine	The emission point remains active. No changes are required.
A13 (height 27.4m) on plan Appendix 09.02	WEE (MIST REM) roof exhaust	The emission point remains active. No changes are required.
A14 – Gas Boiler (30 m)	Gas boiler stack	Add to the permit.
A15 – Gas Boiler (30 m)	Gas boiler stack	Add to the permit.
Notes: Emission point A3 has not been assigned in the current permit. Light green cells = emission points to remain in the permit (no changes). Dark green cells are new emission points that require adding to the varied permit. Red cells = emission points to be removed from the permit.		

5.2 Point Source Emissions to Surface Water

The paper mill operates a biological treatment plant utilising an activated sludge process. Water demand for the papermaking operations is supported by an internal recycling process at the Effluent Treatment Plant (ETP). All papermaking and associated process wastewater (including boiler blowdown) is subject to treatment at the ETP before discharge into the River Llynfi.

As happens with the current CHP unit the proposed replacement steam boilers will generate a small volume of boiler blowdown from the installed blowdown vessel. The volume and composition will be the same as is currently generated.

There are no new point source emissions to surface water associated with this variation application. Emission point W1 (discharge to River Llynfi) remains active and unchanged.

5.3 Point Source Emissions to Sewer

There are no new point source emissions to the sewer from the installation associated with this variation application.

5.4 Point Source Emissions to Groundwater

There are no new point source emissions to groundwater from the installation associated with this variation application.

5.5 Point Source Emissions to Land (via Soakaway)

There are no new point source emissions to the ground from the installation associated with this variation application.

5.6 Fugitive Environmental Emissions

5.6.1 Introduction

Some types of emission may cause pollution but do not have set limits within permit conditions. In permits, these are called emissions not controlled by emissions limits or fugitive emissions. For there to be a potential impact there needs to be a source, pathway, and receptor (**Figure 5-1**).

Figure 5-1: *Fugitive emissions (Source - Pathway - Receptor)*

The principal means of pollution prevention is the careful handling and storage of potentially polluting substances. In most cases, this is determined by the level of containment of a substance, *i.e.* spill prevention. Three levels of containment have been considered:

- **Primary Containment** – *e.g.* a drum, vessel, pipe, bag, *etc.* containing the substance.

- **Secondary Containment** – *e.g.* a bund, double wall vessel or pipe, vent pipe, catch-pit *etc.* designed to retain the substance in the event of a failure of primary containment.

- **Tertiary Containment** – additional measures provided to contain an unplanned release (*e.g.* an oil interceptor in a surface water drain, a concrete hardstanding for road tankers offloading to a bulk storage tank, *etc.*).

In all cases, the actual technique (*i.e.* the physical control) is supplemented by effective management control through the development and use of appropriate operational procedures with the overall aim of breaking the S-P-R pollution linkage.

5.6.2 Sources

On-site sources that could lead to potential fugitive emissions to land, surface water, sewer or groundwater include:

- leaks and spills from the handling, storage and use of chemicals;
- leaks and spills from on-site vehicles and plant;
- losses to ground from the handling and loose storage of dry materials; and
- fire water run-off and infiltration.

5.6.3 Pathways and Receptors

It is important to note that a pathway, such as groundwater, can be both a pathway and a receptor for site-derived fugitive emissions.

Groundwater

The Site Condition Report (SCR) (Ref. **023-1944 WEPA Permit Variation - SCR REV00**) indicates that the installation is directly underlain by:

- **Artificial ground** – The Site area is not classified by the British Geological Survey (BGS) as artificial ground.
- **Superficial deposits** – The site is partially underlain by alluvium (composed of clay, silt, sand, gravel and till.

- **Bedrock deposits** – The majority of the Site is underlain by Sandstone (Brithdir Member), Mudstone, Siltstone and Sandstone (Hughes Member) and Mudstone, Siltstone and Sandstone (Brithdir Member)

From a review of the environmental database, the hydrogeological deposits are classified as:

- **Superficial Deposits** – The site is partially located on superficial deposits classified as Secondary A aquifer and Secondary (undifferentiated) with a corresponding 'high vulnerability. Secondary A are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers whilst Secondary Undifferentiated is assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

- **Bedrock Deposits** – The bedrock deposits have been designated as a Secondary A Aquifer (high vulnerability). These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

The site is not located within a groundwater Source Protection Zone (SPZ).

Hydrology

The site is located within the Llynfi Valley with all surface water naturally falling towards the Afon Llynfi which is located to the northeast of the site. The Afon Llynfi flows from west to east past the northern boundary of the site. Upstream of the site, the river passes through the urban area of Maesteg as well as agricultural land.

The Nant-Gwyn, a tributary of the Llynfi passes through the site. The section of the Nant-Gwyn through the site (i.e. to the west of the railway line) is culverted and consists of two branches. One approaches the site from the south and one approaches from the west. Both enter culverts on the opposite side of the A4063 to the site. The two branches converge in the southwest of the site in an area that is currently a yard. The Nant-Gwyn has a short section of open channel immediately west of the railway line and is an open channel to the east of the railway line past the treatment works.

The Nant-Gwyn receives runoff from roofs within the application site. While runoff from the yard area on the site does not drain to Nant-Gwn, undeveloped areas of the site do still drain to this watercourse via surface and shallow sub-surface pathways. It is also possible that small amounts of flow from the operational site could drain to this stream via incorrect drainage connections and/or damaged/cracked pipework and hardstanding.

Another tributary of the Afon Llynfi, the Nant Cefnydfa, flows north past the site circa 80 metres to the east of the site.

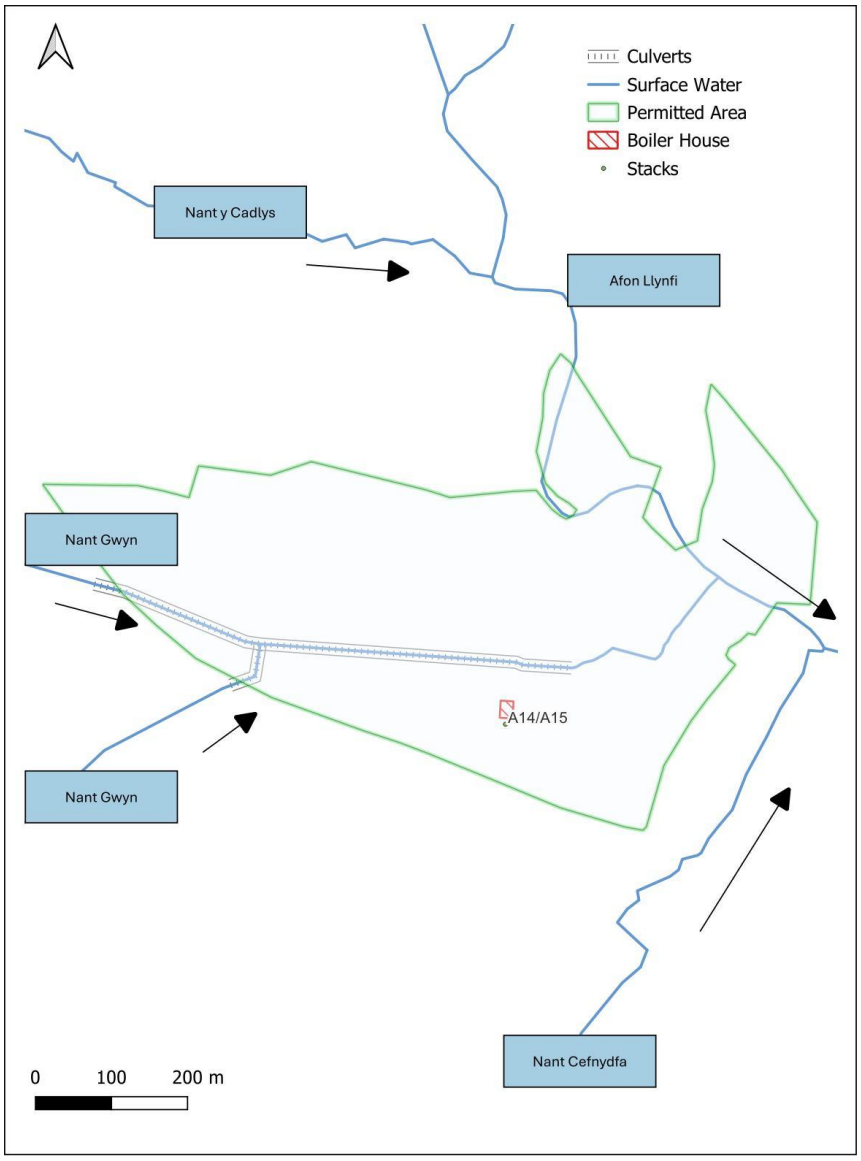


Figure 5-2: *Simplified local hydrological flow*

A full description of the site condition is outlined in the Site Condition Report (Ref. **023-1944 WEPA Permit Variation - SCR REV00**).

5.6.4 Site Surfacing

WEPA has designed appropriate impermeable tertiary containment surfaces for all operational areas (including the new boiler house and surrounding areas), taking into consideration collection surface water capacities, surface thicknesses, strength/ reinforcement, falls, materials of construction, permeability, resistance to chemical attack and inspection and maintenance procedures.

Where required (based on risk) the operational areas have been equipped with impervious surfaces, spill containment kerbs, sealed construction joints and a connection to a sealed drainage system.

5.6.5 Subsurface Structures

WEPA has established and recorded the routing of all the installation drains and subsurface pipework. Inspection and maintenance programmes for all subsurface structures have been established and will be implemented as per the planned preventive maintenance schedule.

5.6.6 Vessels and Above Ground Storage Tanks (ASTs)

The new boiler house includes several above-ground tanks and vessels:

- **Hotwell tank** – The temperature of the water being fed into the boiler is of paramount importance. Hotwell tanks capture returning condensate and provide a strategic store of hot, treated water for the boiler, which is essential for maximum efficiency.
- **Blowdown vessel** – All steam boilers must be regularly blown down to reduce the concentration of suspended and dissolved solids in the water. The wastewater is under pressure and at extreme temperatures, so the blowdown vessel provides a safe means of storing and cooling the water before discarding it to drain/ETP.
- **Accumulator vessel** – Steam accumulators are custom-made steam vessels that are designed to help remove the peaks and troughs in steam demand. This allows the boiler to achieve its preferred operating pressure and maximum efficiency.
- **Water Softener** – Water from the main supply usually contains small amounts of dissolved solids, such as calcium and magnesium, that can cause damage to the tubes inside steam boilers. If these minerals are present in the boiler's water supply,

it can lead to hard-scale buildup on the surface of the tubes, which has the potential to reduce the water heat transfer, ultimately overheating the tubes. The efficiency of a boiler can also be negatively affected by hard water. A small layer of hard scaling can decrease efficiency by as much as 25%. This will make the boiler work harder and consume more fuel. A water softener (integrated with a boiler's control panel and monitoring system) can inject sodium compounds into the water to balance out the hardness. The system contains a salt saturator, a supply brine tank and a softening plant.

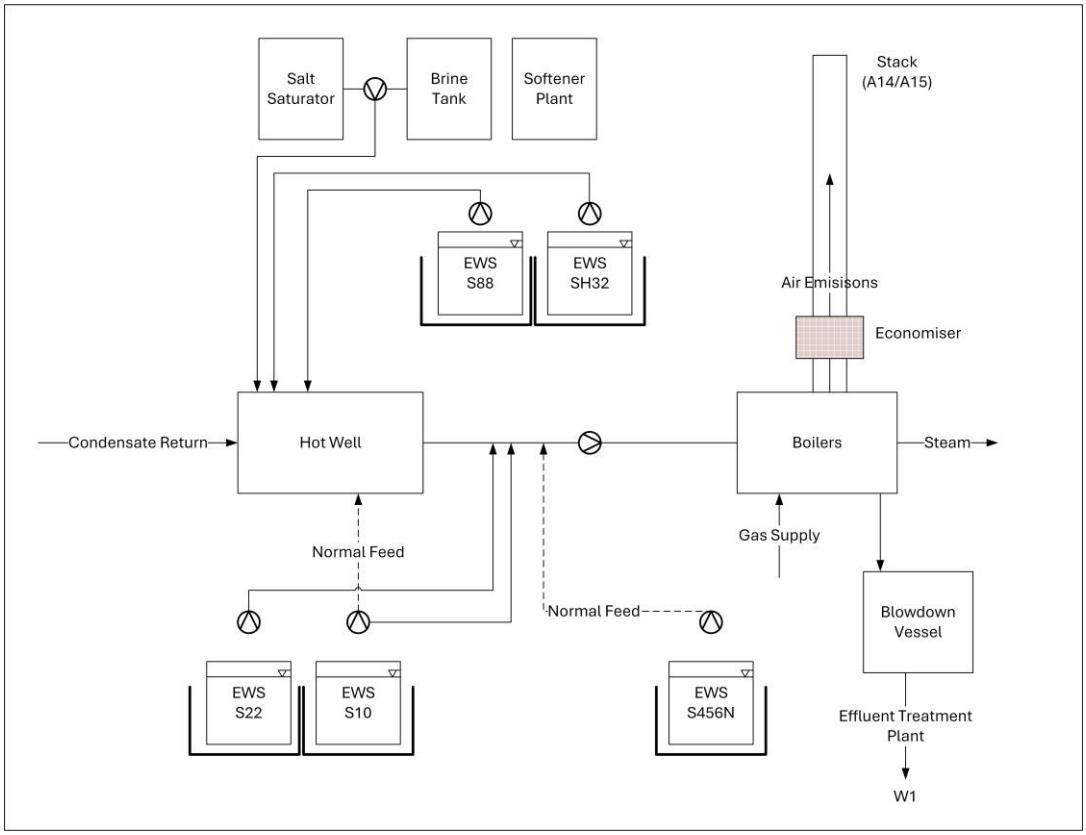


Figure 5-3: *Simplified boiler flow chart*

In addition, the system includes the following dosing equipment:

- EWS S22 – A 2,050-litre tank of polyphosphate and polymer blend (proprietary) with a tank level switch located within secondary containment (110% capacity). A Safety Data Sheet (SDS) is provided within the application package (Ref. **EWS S22 v1**).

- EWS S10 – A 3,050-litre tank of Sodium Hydrogen sulphite (100%) with a tank level switch located within secondary containment (110% capacity). A SDS is provided within the application package (Ref. **EWS S10 v1**).

- EWS88 – A 2,050 litre vented tank of boiler water treatment chemical (proprietary) with a tank level switch located within secondary containment (110% capacity). A SDS is provided within the application package (Ref. **EWS S88 v1**).

- EWS SH32 – A 2,050 litre (insulated) tank of caustic soda with a tank level switch located within secondary containment (110% capacity). A SDS is provided within the application package (Ref. **EWS SH32 v1**).

- EWS S456N – A 2,050-litre tank of boiler water treatment chemical (proprietary) with a tank level switch located within secondary containment (110% capacity). A SDS is provided within the application package (Ref. **EWS S456N v1**).

There will be a suitable spill kit located within the boiler house. All operators will be trained in its use and the Spill Control Procedure (ERP11).

5.6.7 Storage areas for IBCs, drums, bags

Storage areas shall have appropriate signs and notices and shall be clearly marked out, and all containers and packages should be clearly labelled. All raw materials are supplied and stored in labelled UN-approved containers. Incompatible substances shall be kept apart, segregated and/or isolated in line with HSG71 (Health and Safety Executive, 2009).

Where spillage of any stored substance could be harmful to the environment, the area shall be appropriately kerbed or bunded.

Containers shall be stored with lids, caps and valves secured and in place. This approach shall also be applied to nominally emptied containers. All containers, drums and small packages are regularly inspected (at least weekly). Procedures shall be in place to deal with damaged or leaking containers.

Gas cylinders (when present for maintenance activities) shall be located within a Health and Safety Executive (HSE) approved static gas cylinder storage cage. Should incompatible cylinders be stored they shall be separated following the British Compressed Gases Association (BCGA) Codes of Practice and Guidance Notes. It is important to note that gas cylinder use (associated with Hot Work) would be under the permit-to-work system and FPMP requirements.

5.6.8 Management Controls

Emergency spillage kits will be available and will be regularly inspected. Emergency spill kit training is provided to all employees.

All accidents will be logged and investigated, and actions will be undertaken to prevent reoccurrence. The site environmental management plans will be reviewed annually.

5.7 Odour

Based upon the nature of the proposed operations, and their location (concerning sensitive receptors) no significant odour issues are anticipated. Thus, an odour management plan has not been produced.

Although the installation represents a very low risk, monitoring will be undertaken by site staff as part of the weekly site inspections. The presence or otherwise of any offensive odours shall be recorded. If an odour is recorded, the possible source(s) shall be investigated by site staff and preventative action taken. All actions taken shall be recorded within the site diary.

WEPA UK Ltd believes that the operations give no reasonable cause for offence or annoyance regarding odour.

5.8 Pests

Based on the nature of the proposed operations, no significant pest issues are anticipated. Given the limited nature of the potential pest issues, a pest management plan has not been produced.

Although the installation represents a very low risk, monitoring will be undertaken by site staff as part of the weekly site inspections. The presence or otherwise of any pests shall be recorded.

6 Noise and Vibration

6.1 Introduction

Within this section, noise should be taken to refer to noise and/or vibration as appropriate, and detectable beyond the site boundary. Where noise issues are likely to be relevant, the operator is required, in the application, to provide information on the following:

- the main sources of noise and vibration associated with the installation;
- the nearest noise-sensitive sites;
- conditions/limits imposed under other regimes (e.g. planning);
- the local noise environment;
- any environmental noise measurement surveys, modelling or any other noise measurements; and
- any specific local issues and proposals for improvements.

The level of detail supplied should be in keeping with the risk of causing noise-related annoyance at sensitive receptors.

6.2 Noise Impact Assessment

An assessment has been undertaken, in-line with BS 4142:2014+A1:2019 (BSi, 2019), considering the potential sources and associated impacts on the nearest sensitive receptors in the vicinity of the proposed site following the most relevant national and local standards and guidelines. The assessment is presented within a standalone report **Ref. E3726 - WEPA Bridgend_Noise v1-0**.

The assessment has been undertaken using the CadnaA environmental noise prediction software. The model files are provided within the application package **Ref. E3726 - WEPA Bridgend.cna**.

The assessment concludes that, based on the information and considerations as presented within this assessment, the excess of the calculated rating over the background sound level indicates that there is low likelihood of newly introduced adverse impacts due to the proposed boiler house. Consideration of the combined sound levels, inclusive of current on-site activities indicates that the combined rating level would also

fall below the previously accepted background sound levels, which have been adopted for this assessment.

6.3 Noise and Vibration Management Plan

The installation operates a certified ISO14001 management system that includes documented procedures for establishing, implementing and maintaining processes needed to prepare for and respond to potential emergencies (throughout the permitted installation). The documented processes also covers normal and other than normal operating conditions (OTNOC) associated with the installation such as unplanned noise and vibration.

An updated environmental risk and management plan has been provided within this application (Ref. **023-1944 WEPA Risk and Environmental Management Plan REV00**).

7 Emission Limits and Monitoring

7.1 Monitoring of emissions to air

7.1.1 Point source emissions to air

The proposed switch from the CHP plant to the new boiler house will remove four emission points (Ref. A1, A2, A6 and A7) (**Table 5-1**) and create two new ones (Ref. A14 and A15).

The stack (A14/A15 is within a common windshield) will be fitted with a monitoring access point that meets the requirements of EA Guidance - Monitoring stack emissions: measurement locations (Environment Agency, 2022).

NRW is required to set monitoring requirements based on Annex III of the Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants (Official Journal of the European Union, 2015). The required monitoring is as follows:

- Periodic measurements shall be required at least every three years for medium combustion plants with a rated thermal input equal to or greater than 1 MW and less than or equal to 20 MW.
- Measurements shall be required only for: (a) pollutants for which an emission limit value is laid down in this Directive for the plant concerned; (b) CO for all plants.
- The first measurements shall be carried out within four months of the grant of a permit to, or registration of, the plant, or of the date of the start of the operation, whichever is the latest.
- Sampling and analysis of polluting substances and measurements of process parameters as well as any alternatives used as referred to under points 5 and 6 shall be based on methods enabling reliable, representative and comparable results. Methods complying with harmonised EN standards shall be presumed to satisfy this requirement. During each measurement, the plant shall be operating under stable conditions at a representative even load. In this context, start-up and shut-down periods shall be excluded.

The monitoring approach will meet the requirements of the current guidance - Monitoring stack emissions: guidance for selecting a monitoring approach (Environment Agency, 2023).

NRW is required to set emission limit values (ELVs) based on Annex II of the Directive (EU) 2015/2193 of the European Parliament and of the Council of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants (Official Journal of the European Union, 2015). The required ELV for the activity is:

- Table 1 – Emission limit values (mg/Nm^3) for new medium combustion plants other than engines and gas turbines – NOx (natural gas) 100 mg Nm^3

WEPA's preferred supplier for stack monitoring assessments is Anchem Laboratories Limited (UKAS 0934) (Ref. **0934Testing-Multiple**). The Company is accredited to perform the (relevant) tests outlined in **Table 7-1**.

Table 7-1: *Air emission monitoring standards (A14 and A15)*

Stack	Test	Standard
A14 A15	Oxides of Nitrogen	BS EN 14792 Internal procedure – ANC/S/29
A14 A15	Carbon monoxide	BS EN 15058 Internal procedure – ANC/S/29
A14 A15	Oxygen	BS EN 14789 Internal procedure – ANC/S/26

7.1.2 Fugitive Emissions to Air

No ambient air quality monitoring is proposed.

7.2 Monitoring of emissions to surface water

There is a single discharge point to controlled waters associated with the permitted installation (Ref. W1). No changes to the discharge will occur due to the proposed variation.

7.3 Monitoring of emissions to sewer

There are **no** emissions to the sewer from the installation.

7.4 Monitoring of emissions to land

There are **no** emissions to land from the installation.

7.5 Monitoring of emissions to groundwater (via soakaway)

There are **no** emissions to groundwater from the installation.

7.6 Monitoring of noise emissions

No formal (ongoing/planned) environmental noise surveys are proposed once the installation is operational. This will be subject to review if complaints are received.

7.7 Monitoring of odorous emissions to air

Based upon the nature of the proposed operations and their location (concerning sensitive receptors) no significant odours are anticipated (*i.e.* the installation represents a very low risk). No formal odour monitoring is therefore proposed.

8 Environmental Risk and Impact Assessment

8.1 Introduction

This section of the technical submission provides a summary of the assessment of the environmental significance of the emissions from the installation by looking at the Site in the context of its environmental setting and UK guidance for such assessments.

8.2 Impact Assessment – Emissions to Air

An Air Emissions Risk Assessment (AERA) has been undertaken in accordance with current statutory guidance (UK Government, 2024) (Ref. **023-1944 WEPA Air Emissions Risk Assessment v1**).

The two proposed boilers will be fuelled by natural gas, and therefore, the only atmospheric pollutants of concern are the oxide of nitrogen (NOx) with emissions to the atmosphere via a single twin flue 30 m high stack.

The ADMS 6.0 dispersion model has been used to predict ground-level concentrations of the oxide of nitrogen (NOx) and nitrogen dioxide (NO_2) released into the atmosphere from the proposed new boilers.

The principal conclusion of this assessment is that emissions to the atmosphere at their emission limits from the proposed two new boilers give rise to predicted ground-level pollutant concentrations (process contributions, PC) that are not of concern to human health or ecosystems. The impacts are predicted to be insignificant.

No actions have been identified.

8.3 Impact Assessment – Flood Risk

A Flood Risk Assessment (FRA) now referred to as a Flood Consequence Assessment (FCA) was undertaken by Quorum Consulting Engineers in 2019 to support a planning application for the new proposed paper machine, warehouse, dispatch area and ancillary infrastructure. As the report (Ref. **Quorum FRA 2019**) covers the areas within this variation application the report has been provided for information.

No actions have been identified.

8.4 Impact Assessment – Emissions to Surface Water

As previously stated, the proposed switch from the CHP plant (with blowdown) to steam boilers (with blowdown) will not change the quantity or quality of the effluent released from the process into the on-site ETP.

For completeness, the release from emission point W1 has been re-assessed using current 2023 data using H1 (Version 2.7.8 – January 2017). The H1 database is provided in the application package and selected screenshots from the tool are provided below.

8.4.1 Receiving Water Body

The release from the site (from emission point W1) is made into the River Llynfi. According to the closest gauging station (58007 - Llynfi at Coytrahen)[2] the Q95 flow rate is 0.369 m^3/s. Q95 is a low natural river flow that is exceeded for 95% of the year (**Figure *8-1***).

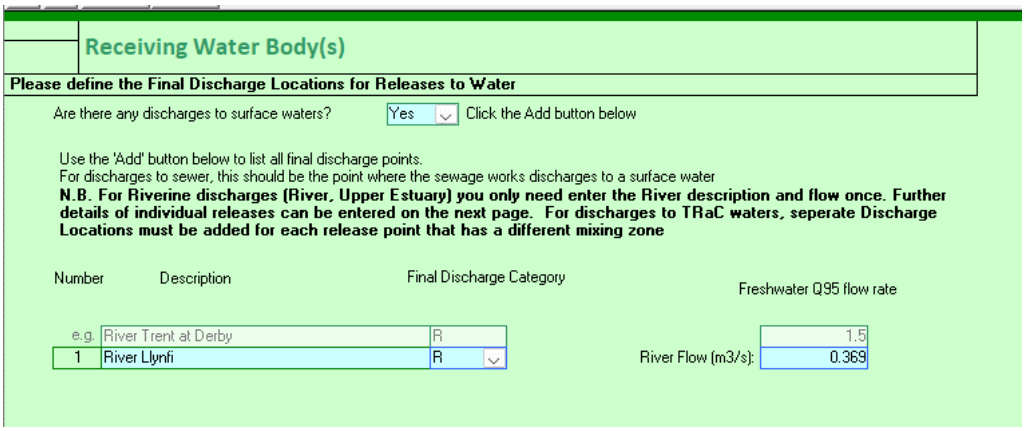


Figure 8-1: *Receiving water body*

8.4.2 Water Release and Flow Data

The water discharge point from the installation (W1) and associated mean and maximum effluent flow rates (2023) are outlined in **Figure *8-2*** and are taken from the 2023 return previously submitted to NRW (Ref. 30/01/2024 using Form Water 1 30/09/2018).

2 https://nrfa.ceh.ac.uk/data/station/info/58007

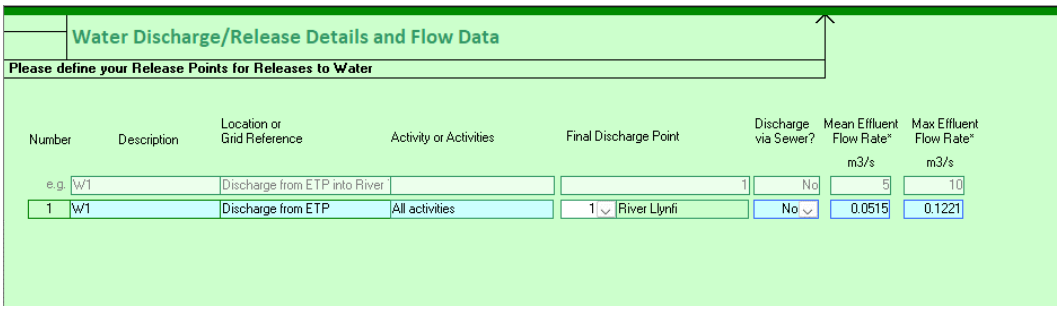


Figure 8-2: *Water discharge, release and flow data*

8.4.3 Water release concentrations

The current permit only requires annual analysis of metals and other priority hazardous substances. The current 2023 data (Ref. 023-1944 Point W1 - 106248 Effluent Analysis 2023) has been utilised as per the NRW 2023 return (Ref. 30/01/2024 using Form Water 1 30/09/2018).

Two samples were taken on 12/12/2023 and analysed by i2 Analytical (UKAS: 4041). The results are summarised in **Table *8-1*** alongside the daily ammonia monitoring undertaken by the site.

Table 8-1: *Environmental; analysis – water discharge W1*

Substance	Sample No.1	Sample No.2	Average (AA)	Maximum (Max)
Ammonia	N/A	N/A	120	960
Zinc	11	15	13	15
Copper	3.7	4.4	4.025	4.4
Cadmium	0.03	<0.02	0.02	0.03
Lead	<0.2	0.2	0.15	0.2
Mercury	<0.05	<0.05	0.025	0.025
Nickel	1.6	1.8	1.7	1.8

Substance	Sample No.1	Sample No.2	Average (AA)	Maximum (Max)

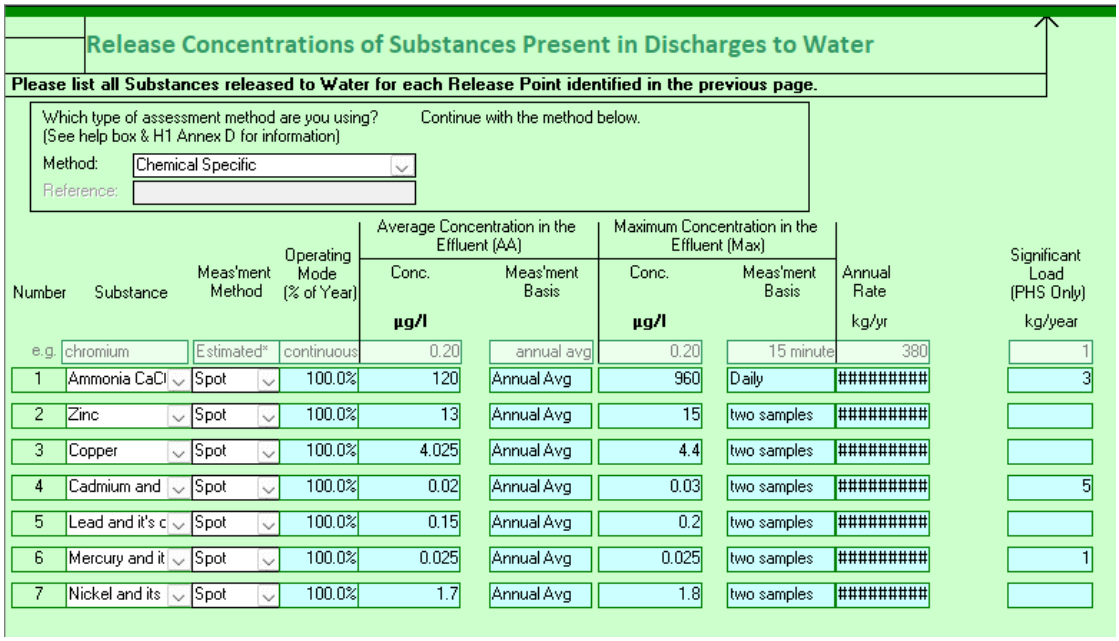
Notes

The ammonia results come from internal WEPA monitoring data.

Where results are <LOD the results (for H1) are taken as 50% (as per EA Guidance LIT 10419 Modelling: surface water pollution risk assessment risk).

All i2 analysis results are ISO17025 accredited.

All µg/l unless stated.



Release Concentrations of Substances Present in Discharges to Water

Please list all Substances released to Water for each Release Point identified in the previous page.

Which type of assessment method are you using? (See help box & H1 Annex D for information) Continue with the method below.

Method: Chemical Specific

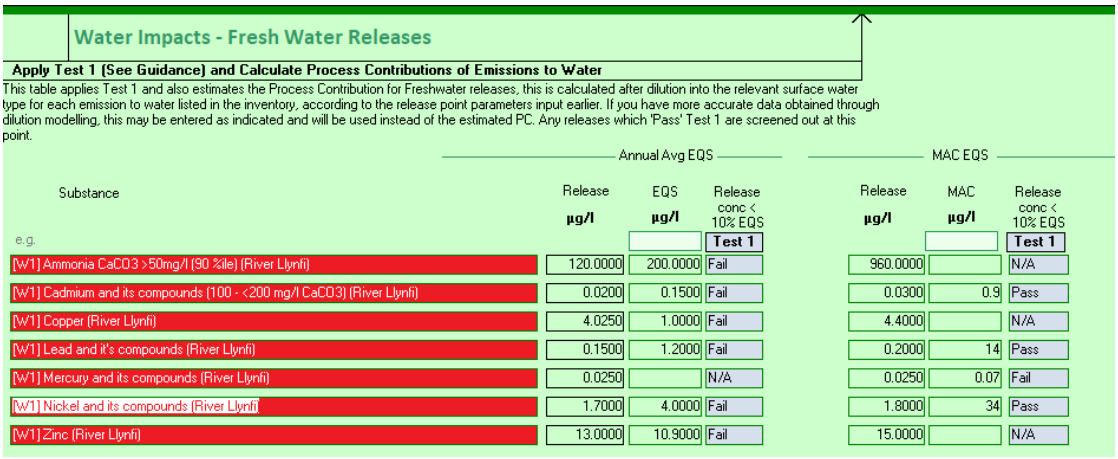
Reference:

Number	Substance	Meas'ment Method	Operating Mode (% of Year)	Average Concentration in the Effluent (AA) Conc. µg/l	Average Concentration in the Effluent (AA) Meas'ment Basis	Maximum Concentration in the Effluent (Max) Conc. µg/l	Maximum Concentration in the Effluent (Max) Meas'ment Basis	Annual Rate kg/yr	Significant Load (PHS Only) kg/year
e.g.	chromium	Estimated*	continuous	0.20	annual avg	0.20	15 minute	380	1
1	Ammonia CaCl	Spot	100.0%	120	Annual Avg	960	Daily	##########	3
2	Zinc	Spot	100.0%	13	Annual Avg	15	two samples	##########	
3	Copper	Spot	100.0%	4.025	Annual Avg	4.4	two samples	##########	
4	Cadmium and	Spot	100.0%	0.02	Annual Avg	0.03	two samples	##########	5
5	Lead and it's c	Spot	100.0%	0.15	Annual Avg	0.2	two samples	##########	
6	Mercury and it	Spot	100.0%	0.025	Annual Avg	0.025	two samples	##########	1
7	Nickel and its	Spot	100.0%	1.7	Annual Avg	1.8	two samples	##########	

Figure 8-3: *Release concentrations from W1*

8.4.4 Test 1 – Release Concentration <10% of the EQS

The first step of the assessment is to calculate the process contribution (PC), which is the concentration of each effluent constituent in surface water after dilution, and to carry out a simple screening assessment to identify insignificant emissions (<10% of the EQS). Any releases that Pass Test 1 are screened out (**Figure *8-4***).



Water Impacts - Fresh Water Releases

Apply Test 1 (See Guidance) and Calculate Process Contributions of Emissions to Water

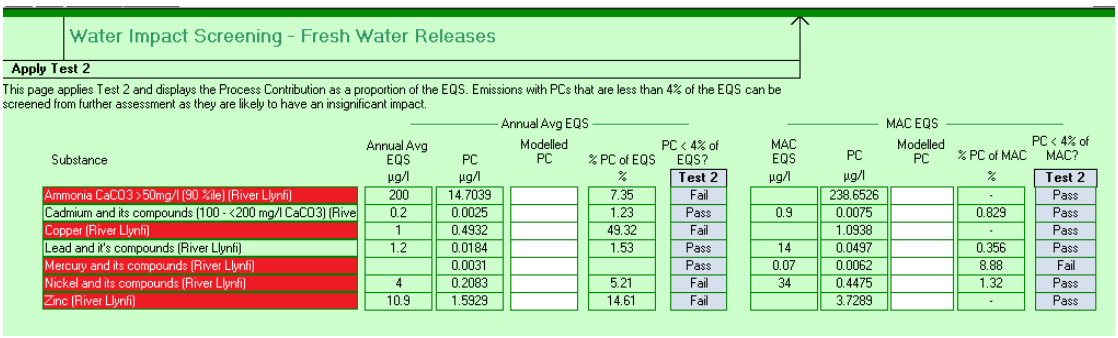
This table applies Test 1 and also estimates the Process Contribution for Freshwater releases, this is calculated after dilution into the relevant surface water type for each emission to water listed in the inventory, according to the release point parameters input earlier. If you have more accurate data obtained through dilution modelling, this may be entered as indicated and will be used instead of the estimated PC. Any releases which 'Pass' Test 1 are screened out at this point.

Substance	Annual Avg EQS Release µg/l	Annual Avg EQS EQS µg/l	Annual Avg EQS Release conc < 10% EQS Test 1	MAC EQS Release µg/l	MAC EQS MAC µg/l	MAC EQS Release conc < 10% EQS Test 1
e.g.						
[W1] Ammonia CaCO3 >50mg/l (90 %ile) (River Llynfi)	120.0000	200.0000	Fail	960.0000		N/A
[W1] Cadmium and its compounds (100 - <200 mg/l CaCO3) (River Llynfi)	0.0200	0.1500	Fail	0.0300	0.9	Pass
[W1] Copper (River Llynfi)	4.0250	1.0000	Fail	4.4000		N/A
[W1] Lead and it's compounds (River Llynfi)	0.1500	1.2000	Fail	0.2000	14	Pass
[W1] Mercury and its compounds (River Llynfi)	0.0250		N/A	0.0250	0.07	Fail
[W1] Nickel and its compounds (River Llynfi)	1.7000	4.0000	Fail	1.8000	34	Pass
[W1] Zinc (River Llynfi)	13.0000	10.9000	Fail	15.0000		N/A

Figure 8-4: *Test 1 release concentration versus EQS*

8.4.5 Test 2 – Process Contribution < 4% of EQS

The second stage is to compare the PC as a proportion of the environmental quality standard (EQS). Emissions with PCs less than 4% of the EQS can be screened out from further assessment (**Figure *8-5***).



Water Impact Screening - Fresh Water Releases

Apply Test 2

This page applies Test 2 and displays the Process Contribution as a proportion of the EQS. Emissions with PCs that are less than 4% of the EQS can be screened from further assessment as they are likely to have an insignificant impact.

Substance	Annual Avg EQS Annual Avg EQS µg/l	Annual Avg EQS PC µg/l	Annual Avg EQS Modelled PC	Annual Avg EQS % PC of EQS %	Annual Avg EQS PC < 4% of EQS? Test 2	MAC EQS MAC EQS µg/l	MAC EQS PC µg/l	MAC EQS Modelled PC	MAC EQS % PC of MAC %	MAC EQS PC < 4% of MAC? Test 2
Ammonia CaCO3 >50mg/l (90 %ile) (River Llynfi)	200	14.7039		7.35	Fail		238.6526		-	Pass
Cadmium and its compounds (100 - <200 mg/l CaCO3) (Rive	0.2	0.0025		1.23	Pass	0.9	0.0075		0.829	Pass
Copper (River Llynfi)	1	0.4932		49.32	Fail		1.0938		-	Pass
Lead and it's compounds (River Llynfi)	1.2	0.0184		1.53	Pass	14	0.0497		0.356	Pass
Mercury and its compounds (River Llynfi)		0.0031			Pass	0.07	0.0062		8.88	Fail
Nickel and its compounds (River Llynfi)	4	0.2083		5.21	Fail	34	0.4475		1.32	Pass
Zinc (River Llynfi)	10.9	1.5929		14.61	Fail		3.7289		-	Pass

Figure 8-5: *Test 2 process concentration versus EQS*

8.4.6 Test 3 and 4 – Predicted Environmental Concentrations

At this stage the Predicted Environmental Concentrations (PECs) are compared to various tests:

- Test 3 – PEC – Background concentration (BC) >10% Annual Average (AA) EQS
- Test 4a – PEC >100% of the AA EQS
- Test 4b – PEC >100% of the Maximum Allowable Concentration (MAC)

Water quality within the receiving River Llynfi is monitored by NRW as part of the *Water Environment (Water Framework Directive) (England and Wales) Regulations 2017* (**Figure *8-6***).

Figure 8-6: *Surface water quality monitoring point*

The monitoring stations are outlined in **Table *8-2***.

Table 8-2: *NRW Surface Water Monitoring Stations (within 1 km)*

Station	Name	Location and Approx. Distance
S70047	R LLYNFI -LLETTY BRONGU STW RB	1km - Upstream
S75708	D/S LLETTY BRONGU CSO	860 metres - Upstream
S70100	R. LLYNFI D/S LLETTY BRONGU STW	680 metres - Upstream
S70226	LLYNFI D/S GEORGIA PACIFIC	166 metres - Downstream
S13023	R LLYNFI AT SHWT BRIDGE	995 metres - Downstream

The data availability for each of the NRW locations is summarised in **Table *8-3***.

Table 8-3: *NRW surface water data availability*

Substance	S70047	S75708	S70100	S70226	S13023
Ammonia	Yes	No	No	No	Yes
Zinc	No	No	No	No	Yes
Copper	No	No	No	No	Yes
Nickel	No	No	No	No	Yes
Mercury	No	No	No	No	No

Surface water data has been obtained directly from NRW for the receiving water body (using downstream station S13023). As the data contains values at or below the NRW method limit of detection these have been accounted for using the United States Environmental Protection Agency (USEPA) ProUCL statistical software package (version 5.2.00) using 'General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method' (**Table *8-4***).

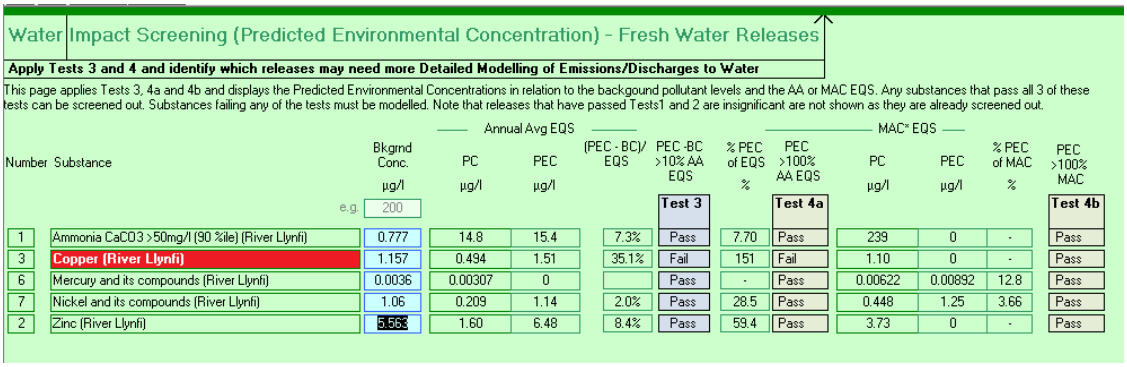
Table 8-4: *Adjusted NRW Water Quality Data (R LLYNFI AT SHWT BRIDGE - S13023)*

Substance	Units	No. Samples	No. NDs	% NDs	KM Mean
Ammonia	µg/l	31	3	9.68%	0.777 µg/l
Zinc	µg/l	22	16	72.73%	5.563 µg/l
Copper	µg/l	22	14	63.64%	1.157 µg/l
Nickel	µg/l	22	14	63.64%	1.06 µg/l

Mercury

There is no available NRW data for Mercury monitoring for the River Llynfi. Information was taken from the paper in the Journal of Environmental Monitoring 'Mercury in rivers in NW England: from rural headwaters to the heartlands of the historic industrial base' (Rowland, et al., 2010). The paper reported a regional median of **3.6 ngl^{-1}** for Total mercury (T-Hg) concentrations in rivers. This has been utilised as a surrogate background value.

All substances that pass all three tests can be screened out. Substances failing any of the tests must be subject to modelling (**Figure *8-7***).



Water | Impact Screening (Predicted Environmental Concentration) - Fresh Water Releases

Apply Tests 3 and 4 and identify which releases may need more Detailed Modelling of Emissions/Discharges to Water

This page applies Tests 3, 4a and 4b and displays the Predicted Environmental Concentrations in relation to the backgound pollutant levels and the AA or MAC EQS. Any substances that pass all 3 of these tests can be screened out. Substances failing any of the tests must be modelled. Note that releases that have passed Tests1 and 2 are insignificant are not shown as they are already screened out.

Number	Substance	Bkgrnd Conc. µg/l (e.g. 200)	Annual Avg EQS PC µg/l	Annual Avg EQS PEC µg/l	(PEC - BC)/ EQS	PEC -BC >10% AA EQS	% PEC of EQS %	PEC >100% AA EQS	MAC* EQS PC µg/l	MAC* EQS PEC µg/l	% PEC of MAC %	PEC >100% MAC
						Test 3		Test 4a				Test 4b
1	Ammonia CaCO3 >50mg/l (90 %ile) (River Llynfi)	0.777	14.8	15.4	7.3%	Pass	7.70	Pass	239	0	-	Pass
3	Copper (River Llynfi)	1.157	0.494	1.51	35.1%	Fail	151	Fail	1.10	0	-	Pass
6	Mercury and its compounds (River Llynfi)	0.0036	0.00307	0		Pass	-	Pass	0.00622	0.00892	12.8	Pass
7	Nickel and its compounds (River Llynfi)	1.06	0.209	1.14	2.0%	Pass	28.5	Pass	0.448	1.25	3.66	Pass
2	Zinc (River Llynfi)	5.563	1.60	6.48	8.4%	Pass	59.4	Pass	3.73	0	-	Pass

Figure 8-7: *Predicted environmental concentrations*

All determinands have been screened out (Test 3, Test 4a and Test 4b) except for Copper.

8.4.7 Copper – M-BAT Re-assessment

The Copper $EQS_{bioavailable}$ is 1µg/l. This is the Generic Predicted No Effect Concentration, sometimes also termed the reference or generic EQS. This is representative of conditions of high bioavailability and is expressed as "bioavailable" metal concentration.

The NRW surface water data (using downstream station S13023) has been processed through the Environment Agency Water Framework Directive (WFD) Metal Bioavailability Assessment Tool (M-BAT) (UKTAG, 2014) to derive a Predicted No Effect Concentration (PNEC) for Copper. The PNEC is a concentration that is derived from the ecotoxicological data and site-specific water quality data using the Biotic Ligand Model (BLM). The BLM is a predictive tool that can account for variations in metal toxicity and calculates a site-specific PNEC using information on the chemistry of local water sources, i.e. pH, calcium concentrations, hardness, and dissolved organic carbon.

The average values from the baseline surface water dataset (using downstream station S13023) were used for pH and calcium (Ca) with a median value adopted for dissolved organic carbon (DOC) used to give an assessment of the annual average bioavailable EQS to be used in the screening exercise, in line with the guidance (UKTAG, 2014).

Table 8-5: *M-BAT Input data (NRW Ref. S13023)*

Substance	Units	No. Samples	M-BAT Input
DOC	mg/l	46	2.73 mg/l (median)

Substance	Units	No. Samples	M-BAT Input
pH	unitless	48	7.84 (mean)
Ca	mg/l	46	20.15 mg/l (mean)
Cu (Dissolved)	µg/l	22	1.157 µg/l (adjusted mean)

The results from the M-BAT assessment are summarised below and in Ref. **m-BAT tool 20150206**:

- Site-specific PNEC Dissolved (Copper) – 9.29 µg/l
- Bioavailability factor (BioF) – 0.11
- Bioavailable Copper Concentration – 0.12 µg/l
- Risk Characterisation Ratio (RCR) – 0.12

The RCR is a commonly used metric in screening risk assessments and indicates whether the site being assessed has passed or failed the EQS and to what extent. The RCR is calculated by comparing the bioavailable concentration determined with the $EQS_{bioavailable}$. Where the RCR is greater than 1 this indicates the bioavailable concentration is above the EQS and therefore at risk.

The site-specific PNEC Dissolved (Copper) has been utilised within the revised H1 assessment (Ref. **023-1944 Copper H1 Assessment - M-BAT Derived PNEC REV00**) as outlined in **Table *8-6***. Tests 1 and 2 of the screening process are progressive i.e. a hazardous chemical or element can be screened out at any stage having failed to be screened out at the previous stage(s). However, a hazardous chemical or element must pass both Tests 3 and 4 to be considered as not liable to cause pollution and requires no additional control.

Table 8-6: *Phase 1 - Part A Screening Tests for Discharges to Freshwaters (H1)*

Test	Description	Assessment
Test 1	This test is to screen out hazardous chemicals and elements. If the concentration of the hazardous chemical or element in the discharge is significantly less than the AA-EQS and/or MAC-EQS, the hazardous chemical or element cannot cause significant deterioration in the watercourse, even if it receives no dilution.	Copper – Fail

Test	Description	Assessment
Test 2	This test introduces the dilution available in the receiving watercourse by calculating the Process Contribution (PC) of the discharged hazardous chemical or element in the receiving water after dilution by the water course.	Copper – Fail
Test 3	This test introduces the existing concentration of the hazardous chemicals and elements in the receiving watercourse. The Predicted Environmental Concentration (PEC), the predicted concentration in the receiving water downstream of the discharge, is calculated using the PC and the background concentration (BC).	Copper – Pass
Test 4	This test assesses whether the discharge, when combined with the existing upstream water quality, will contribute to an EQS failure in the receiving watercourse. It therefore considers the combination effects with existing discharges. If the PEC exceeds the EQS, the hazardous chemical or element is potentially significant and will fail the surface water risk assessment screening process and require further modelling.	Copper – Pass

The results demonstrate that the EQS (copper) is not at risk (RCR = 0.12) and the release concentrations are unlikely to cause pollution and require no additional control.

8.4.8 Water Impact Significant Loads

This assessment displays priority substances and calculates whether the total annual release constitutes a Significant Load (**Figure *8-8***).

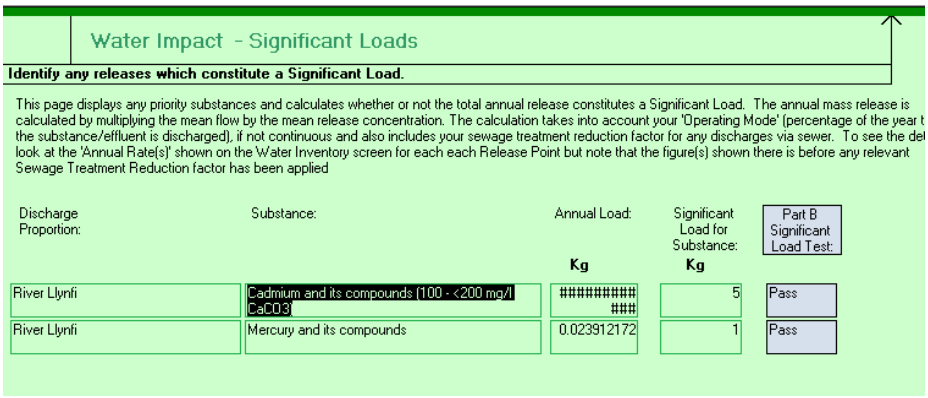


Figure 8-8: *Significant loads*

No actions have been identified.

8.5 Impact Assessment – Environmental Noise

An assessment has been undertaken considering the potential sources and associated impacts on the nearest sensitive receptors in the vicinity of the site following the most relevant national and local standards and guidelines. The assessment is presented within a standalone report **Ref. E3726 - WEPA Bridgend_Noise v1-0**.

The assessment concludes that, based on the information and considerations as presented within this assessment, the excess of the calculated rating over the background sound level indicates that there is low likelihood of newly introduced adverse impacts due to the proposed boiler house. Consideration of the combined sound levels, inclusive of current on-site activities indicates that the combined rating level would also fall below the previously accepted background sound levels, which have been adopted for this assessment.

No actions have been identified.

8.6 Impact Assessment – Global Warming

Details concerning the use and source of energy within the CHP installation and proposed Natural Gas Boilers are outlined in Annexe A of the BAT Assessment (Ref. **023-1944 WEPA Permit Variation - BAT Assessment REV00**).

A summary of the assessment is outlined in **Table *8-7***.

Table 8-7: *Carbon assessment associated with proposed variation*

Section	CHP	Boilers	Units
Scope 1 (Gas)	62,611	38,249	CO_2 tonnes/annum
Scope 2 (Electricity)	14,507	27,646	CO_2 tonnes/annum
Total CO_2 (S1/S2)	**77,118**	**65,894**	CO_2 tonnes/annum

The CO_2 savings after the CHP shutdown and switch to the proposed boilers equates to a saving of 11,223 tonnes/annum of CO_2 (-15%).

A further saving of 27,646 tonnes/annum of CO_2 (-36%) is predicted when the site switches to 100% green grid electricity (REGO-based) in 2024. The proposed 12 MWp solar PV project would save another 2,519 tonnes/annum (-3%) by 2027.

8.7 Best Available Techniques (BAT) Assessment

A BAT assessment has been undertaken in consideration of the current relevant standards:

- European Commission (2015). Best Available Techniques (BAT) Reference Document for the Production of Pulp, Paper and Board, Joint Research Centre Institute for Prospective Technological Studies (European Commission, 2015)
- European Commission (2014). 2014/687/EU: Commission Implementing Decision of 26 September 2014 establishing the best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for the production of pulp, paper and board (notified under document C(2014) 6750) (European Commission, 2014).
- European Commission (2021). Reference Document on Best Available Techniques for Energy Efficiency, February 2009, corrected version as of 09/2021 (European Commission, 2021).

Given the proposed MCP and its associated thermal capacity the Part B Draft Guidance Environmental permitting technical guidance PG1/1(21) Reference document for combustion plant of 20 to 50 MW thermal capacity is not applicable (Environment Agency, 2021) so was not applied to the assessment. Consideration was also given to the use of the IED derogation cost-benefit analysis tool (Environment Agency, 2020) but this was discounted due to the impact of the British Industry Supercharger (BIS) scheme.

The results of the BAT assessment, aligned to NRW requested areas, are summarised within a separate attachment Ref. **023-1944 WEPA Permit Variation - BAT Assessment REV00**.

No actions have been identified.

8.8 Improvement Programme

No potential improvement actions have been identified.