



Trade Effluent Discharge Risk Assessment Summary

H Westons & Sons Ltd.



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SITE DETAILS

H Weston and Sons Ltd

The Bounds

Much Marcle

Ledbury

HR8 2NQ

OPERATOR DETAILS

H Weston and Sons Ltd

The Bounds

Much Marcle

Ledbury

HR8 2NQ

PERMIT REFERENCE

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APPENDICES

REFERENCE	TITLE	DATE
Appendix A	Trade Effluent Analysis – Onsite Sampling Data	2018 - 2024
Appendix B	Laboratory Analysis Results	

TABLES

TABLE	TITLE
Table 1	Table 1 Surface Water Features
Table 2	Table S3.1 Point Source emissions to water (other than sewer) – emissions limits and monitoring requirements.

1. INTRODUCTION

This document is a summary of the Risk Assessment produced for the amendments to the Trade Effluent Discharge permit (EPR/FP3249GD) for the Waste-Water treatment plant (WWTP) at The Bounds, Much Marcle, Ledbury, HR8 2NQ. The site is located at National Grid Reference SO 6433 8714. This system processes water used for the pressing of apples, the production of Cider and the treatment of factory derived effluent.

The site has been producing Cider in the same location since the late 1800's and the current trade effluent discharge permit has been in operation since 2016. The operator, H Weston & Sons Ltd., require the volume of the discharge consent to be increased from 200m³ to 400m³.

The application has been prepared by Wiser Environment Limited on behalf of the applicant H Weston & Sons Ltd, company number 00672234.

1.1. Aims

The aim of this document is to provide the Environment Agency with sufficient evidence on the risks posed to surrounding environment from increasing the trade effluent discharge.

2. ENVIRONMENTAL SETTING

2.1. Hydrological Setting

There are 23 surface water features located within 250 m of the site. There is one Water Framework Directive (WFD) surface water body catchment (Preston Brook - source to confluence of River Leadon, water body ID GB109054039590) located on site. The operational catchment for this surface water body is Leadon, and the management catchment is Severn Vale.

Records identified one WFD surface water body (Preston Brook - source to confluence of River Leadon) located 269m E of the site. The overall rating and ecological rating of this river is poor and a failed chemical rating.

A WFD groundwater body (Severn Vale - Secondary Combined) is also found on site with water body ID (GB40902G204900) and good overall rating.

Table 1 below shows the surface water features within 1km of the site. Further information is included in the Environmental Risk Assessment (ref: K499.2~09~002).

Table 1 Surface Water Features

Description	Nearest location from site (approx.)	Direction from site
Wetland near Watery Lane	Onsite	Onsite
Pond beside Traditional Orchard	Onsite	Onsite
Pond near the A449	380 m	ESE
Pond near Caerswall Farm	640 m	WNW
Pond near Bodenham Bank Cottage	830 m	SSE

2.2. Environmentally Sensitive Sites

Environmentally sensitive sites that surround the site include Sites of Special Scientific Interest (SSSI); Special Areas of Conservation (SAC); Special Protection Areas (SPA); RAMSAR sites; National Nature Reserves (NNR); Ancient Woodlands (AW); Local Nature Reserves (LNR); County Wildlife Sites (CWS); World Heritage Sites; Areas of Outstanding Natural Beauty (AONB); National Parks; and Biodiversity Action Plan (BAP) priority habitats. Further information is included in the Environmental Risk Assessment (ref: K499.2~09~002).

2.3. Geology & Hydrogeology

The site is underlain by Made ground undivided of artificial deposits (LEX Code MGR-ARTDP). The permeability of the artificial ground onsite is very high to low and of a mixed flow type.

Records within 500 m of the site shows Alluvium superficial geological deposits (LEX Code ALV-XCZSV) located 106m N. These rocks are described as clay, silt, sand and gravel.

The underlying bedrock varies and there are 7 records of differing bedrock geology within 500m of the site proximity. These include;

- Downton Castle Sandstone Formation – Sandstone (LEX Code DCS-SDST) found onsite, 44 m N, 135 m N, and 180 m SE.
- Upper Ludlow Shales Group – Siltstone of Ludfordian age (LEX Code ULUS-SLST) found on site and 293 m NW.
- Raglan Mudstone Formation - Siltstone and Mudstone, Interbedded (LEX Code RG-SIMD) found on site.

The bedrock permeability onsite and 7m N of the site is moderate to low and of a fractured flow type.

Records within 500 m of the site show that there are 4 bedrock faults, described as fault, inferred, displacement unknown located 1m n, 103 m N, 180 m N and 302 m N of the site respectively.

2.4. Hydrogeology

A secondary A superficial aquifer is located 106m N of the site. Described as a permeable layer 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.

There are 6 records of bedrock aquifers within 500 m of the site.

Two secondary A aquifers are found on site, and one secondary A aquifer is found 187 m S of the site. Secondary B aquifers can be found on site, 173m S and 247 m S of the site.

4 boreholes are located 250 m from the site. These include Westons Cider Factory, Much Marcle, 28m N (NGR 365130 233490), Westons Cider, Much Marcle, 46m W (NGR 365100 233300), Westons Cider, the Cricket Pitch, Much Marcle, 49m N (NGR 365100 233500) and Westons Cider, Factory Much Marcle, 100m N (NGR 365180 233560).

TRADE EFFLUENT MONITORING METHODOLOGY

2.5. Introduction

This section provides a summary of the ongoing trade effluent monitoring that is conducted by H Westons & Sons Ltd. as per the current permit requirements.

The trade effluent sampling methodology includes the following

- Monitoring points and sample observations;
- Physio-chemical measurements;
- Collecting surface water samples;
- Laboratory analysis; and
- Quality control procedures for monitoring.

2.6. Monitoring Point & Frequency

Trade effluent discharge samples are collected from three monitoring points. These are;

- Ex-factory: This sample point is outside of the factory and samples the surface water that feeds the wetland area.
- Post DAF: This is a sample point within the WWTP before the effluent enters the activated sludge treatment. This sample point assesses the effluent prior to the treatment process.
- Permeate: This samples the trade effluent.

2.7. Collecting Trade Effluent Quality Samples

The surface water samples are taken using a telescopic sample pole and placed in bottle types provided by the laboratory in accordance with the parameters being sampled. All procedures relating to pre-treatment and sample preservation (as dictated by the laboratory) will be followed (e.g. wearing sampling gloves whenever a sample is being collected and replacing the gloves between samples).

Any visual evidence of contamination is recorded during the sample collection. This data is recorded by the operator and stored electronically.

All samples will be stored in cool boxes containing ice blocks to preserve the samples and will be transported to the laboratory quickly and securely by the selected courier once monitoring is complete.

2.8. Monitoring Frequency

Daily sampling and onsite testing are conducted by the onsite health, Safety & Environment department of H Westons & Sons Ltd. The data is recorded by the operator and stored electronically. A copy of this data is shown in Appendix B.

Surface water samples have been collected from the 3 monitoring points and submitted for laboratory analysis on 1st July 2025 & 21st July 2024. Surface water samples were also collected from the Outlet 1 sampling point on 21st and 27th March 2024. From July 2025, surface water will be sampled from the 3 monitoring points biannually.

2.9. Laboratory Analysis Parameters

The parameters listed below are tested for as part of the daily onsite sampling:

- Chemical Oxygen Demand (COD)
- Phosphate
- Ammonium (N)
- pH
- Total Suspended Solids (TSS)
- Temperature
- Nitrates (NO₃ as N) and,
- Turbidity.

The samples submitted for laboratory analysis were sent to a United Kingdom Accreditation Service (UKAS) MCERTs accredited laboratory for the following laboratory analysis:

July 2025 & July 2024 samples:

- Ammoniacal Nitrogen as N
- Nitrate as N
- Nitrite as N
- Phosphate
- TSS
- Biological Oxygen Demand (BOD)
- COD
- Ammonium

March 2024 samples:

- Phosphorus
- Magnesium
- Silica
- Manganese
- Sulphate
- Potassium
- TSS
- Sodium
- Strontium
- COD
- BOD
- Total Organic Carbon
- Sulphide
- Fluoride
- Redox Potential

3. PERMIT REQUIREMENTS

3.1. Current Permit Limits

As stated in Table S3.1 of the current discharge permit (EPR/FP3429GD), there are ongoing permit limits for several parameters. A copy of this table is listed below:

Table 2 Table S3.1 Point Source emissions to water (other than sewer) – emissions limits and monitoring requirements.

Effluent (s) and discharge point (s)	Parameter	Limit (including unit)	Reference Period	Monitoring frequency
Sewage and trade effluent consisting of Cider processing water via Outlet 1	Maximum rate of discharge	2.35 litres per second	Instantaneous	Continuous
	15-minute instantaneous or averaged flow	No limit set	15 minute	Continuous
	ATU-BOD as O ₂	11 mg/l	Instantaneous (spot sample)	N/A
	Suspended solids	10 mg/l	Instantaneous (spot sample)	N/A
	Ammoniacal Nitrogen	5mg/l	Instantaneous (spot sample)	N/A
	Total Phosphorus as P	1 mg/l	Instantaneous (spot sample)	N/A
	pH	6 to 9	Instantaneous (spot sample)	N/A
	Visible oil or grease	No significant trace present so far as is reasonably practicable	Instantaneous (visual examination)	N/A

Currently only spot samples are required for the laboratory analysis parameters, therefore H Westons & Sons Ltd. have collected sporadic samples for laboratory analysis. The analysis results are shown in Appendix C.

4. DATA INTERPRETATION

4.1. Methodology & EA Guidance

Wiser Environment have compared the provided trade effluent laboratory analysis results and analysed parameters to the Environmental Quality Standards (EQS) for freshwaters and the Environment Agency's specific substances as outlined on Government Guidance¹.

In addition, as the standard screening approach cannot be expanded to sanitary pollutants (EA Guidance Annex D2²). The key sanitary pollutants for continuous trade effluent discharges include the following pollutants and determinants:

- sanitary including BOD, Ammonia and suspended solids,
- phosphorus,
- pH,
- temperature,
- dissolved inorganic nitrogen including nitrate, nitrite and ammonia.

The site is within the River Leadon River basin as part of Preston Brook³. According to the EA, this water body has high levels of specific pollutants such as copper iron, manganese and zinc and this does not require an assessment of priority hazardous substances⁴.

4.2. Laboratory Analysis Screening and Comparison to Current Permit Limits

Wiser have also compared the laboratory analysis results from the monitoring data provided by H Westons & Sons Ltd. to the current permit limits of the trade effluent discharge. The current permit limits are shown in Table 2.

Exceedances to the permit limits were noted for Total Phosphorus, Total Suspended Solids and BOD for samples collected on 21st and 24th March 2024. Elevated concentrations of Total Suspended Solids above the permit limits were also noted from samples collected on 1st and 11th July 2025, with exceedances to the BOD permit limit recorded for the sample collected on 1st July 2025.

¹ <https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit>

² https://assets.publishing.service.gov.uk/media/5a7f8586e5274a2e87db65a3/H1_annex_D2.pdf

³ <https://environment.data.gov.uk/catchment-planning/WaterBody/GB109054039590>

⁴ <https://environment.data.gov.uk/catchment-planning/WaterBody/GB109054039590>

These exceedances indicate further laboratory analysis is required to determine the permit limits for the increased discharge.

5. Effluent discharge environmental impact assessment

In order to determine further the likely impact of the increased discharge, a representative effluent sample was tested for a comprehensive analytical suite. Results used for the risk assessment are reported in table XX, these have been shortlisted according to the guidance as 'specific substances'. The full analytical certificate is reported in Appendix C.

Table 3. specific substances used in the H1 risk assessment

Test Description	Result	Units
Ammoniacal Nitrogen as N	<0.55	mg/l
Chloride as Cl	153	mg/l
Sulphate as SO ₄	<4.4	mg/l
Fluoride as F	0.1	mg/l
Ammonium as NH ₄ (Calc)	<0.70	mg/l
Boron, total as B (mg/l)	0.07	mg/l
Copper, total as Cu (mg/l)	<0.0018	mg/l
Iron, total as Fe (mg/l)	0.208	mg/l
Lead, total as Pb (mg/l)	<0.0003	mg/l
Manganese, total as Mn (mg/l)	0.305	mg/l
Phenol	<0.50	ug/l
Zinc, total as Zn (mg/l)	<0.006	mg/l

The results of this test have been used in the Environment Agency H1 tool in order to assess the to evaluate the environmental impact, in accordance with guidance⁵.

The results of the risk assessment carried out using the Environment Agency's H1 risk assessment tool shows the following:

- Test 1: this test checks whether the concentration of the chemical and element in the discharge is more than 10% of the environmental quality standard (EQS). The estimated release of all substances is above 10% of the substances EQSs.

⁵ <https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit>

Ammonia, boron and sulphate were the parameter to pass test 1. All other substances need to be assessed using test 2.

- Test 2: This test introduces the dilution available in the receiving water, which is used to calculate the process contribution (PC) of the substances. The PC needs to be below 4% of the EQS to pass the test.

The PC of all substances is below 4% of the EQSs. All substances pass Test 2 and can be discounted from further assessment.

Screenshots of the two tests results is reported below. The H1 assessment is provided with the Permit application.

Water Impacts Test 1 - Freshwater Base Option

Go To: **Water Impacts Test 1 - Freshwater**

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			MAC EQS		
	Release µg/l	EQS µg/l	Release conc < 10% EQS	Release µg/l	MAC µg/l	Release conc < 10% EQS
e.g.			Test 1			Test 1
[Outlet 1] Boron (Unnamed tributary of Preston Brook)	70.0000	2000.0000	Pass	70.0000		N/A
[Outlet 1] Chloride (Unnamed tributary of Preston Brook)	154000.0000	250000.0000	Fail	154000.0000		N/A
[Outlet 1] Copper (Unnamed tributary of Preston Brook)	0.9000	1.0000	Fail	0.9000		N/A
[Outlet 1] Fluoride ≤50mg/l CaCO ₃ (Unnamed tributary of Preston Brook)	100.0000	1000.0000	Fail	100.0000	3000	Pass
[Outlet 1] Iron (Unnamed tributary of Preston Brook)	1208.0000	1000.0000	Fail	1208.0000		N/A
[Outlet 1] Lead and it's compounds (Unnamed tributary of Preston Brook)	0.1500	1.2000	Fail	0.1500	14	Pass
[Outlet 1] Manganese and compounds (as Mn) (Unnamed tributary of Preston Brook)	305.0000	123.0000	Fail	305.0000		N/A
[Outlet 1] Pentachlorophenol (Unnamed tributary of Preston Brook)	0.5000	0.4000	Fail	0.5000	1	Fail
[Outlet 1] Phenol (95%ile) (Unnamed tributary of Preston Brook)	2.3000	7.7000	Fail	2.3000	46	Pass
[Outlet 1] Sulphate (Unnamed tributary of Preston Brook)	220.0000	400000.0000	Pass	220.0000		N/A
[Outlet 1] Zinc (Unnamed tributary of Preston Brook)	3.0000	10.0000	Fail	3.0000		N/A

Note that the Process Contribution shown for each substance is the sum of the individual process contributions of each point from which the substance is emitted. Process Contributions obtained from modelling data should incorporate all relevant release points and flow conditions.

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				MAC EQS			
	Annual Avg EQS µg/l	PC µg/l	Modelled PC	% PC of EQS	MAC EQS µg/l	PC µg/l	Modelled PC	% PC of MAC
Chloride (Unnamed tributary of Preston Brook)	250000	240.8893		0.10		240.8893		-
Copper (Unnamed tributary of Preston Brook)	1	0.0014		0.14		0.0014		-
Fluoride ≤50mg/l CaCO ₃ (Unnamed tributary of Preston Brook)	1000	0.1564		0.02	3000	0.1564		0.00522
Iron (Unnamed tributary of Preston Brook)	1000	1.8896		0.19		1.8896		-
Lead and it's compounds (Unnamed tributary of Preston Brook)	1.2	0.0002		0.02	14	0.0002		0.00168
Manganese and compounds (as Mn) (Unnamed tributary of Preston Brook)	123	0.4771		0.39		0.4771		-
Pentachlorophenol (Unnamed tributary of Preston Brook)	0.4	0.0008		0.20	1	0.0008		0.0783
Phenol (95%ile) (Unnamed tributary of Preston Brook)	7.7	0.0036		0.05	46	0.0036		0.00783
Zinc (Unnamed tributary of Preston Brook)	10.9	0.0047		0.04		0.0047		-

6. ASSESSMENT OF SUBSTANCES WITH ECOTOXIC PROPERTIES FOR USE OF A PREDICTED NO-EFFECT CONCENTRATION (PNEC)

Environment Agency guidance requires the use of a Predicted No-Effect Concentration (PNEC) where a substance does not have an applicable Environmental Quality Standard (EQS), has ecotoxic properties, and is released at a concentration sufficiently high to present a risk of harm to the surface water environment.

The site chemical inventory and Relevant Hazardous Substances assessment identified sodium hypochlorite and TRIBAC as products containing substances with ecotoxic hazard classifications. These chemicals are used within the process at low concentrations (usually below 1%) and, following use, are subject to further dilution and treatment within the site's wastewater treatment system prior to discharge. On this basis, the concentrations potentially present in the final treated effluent are expected to be substantially lower than the concentrations at which the products are used.

In this case, although sodium hypochlorite and TRIBAC have been identified as having ecotoxic properties in their concentrated product forms, their low use concentrations together with subsequent dilution and wastewater treatment mean that they are not expected to be present in the final discharge at concentrations capable of presenting an ecotoxic risk to the receiving surface water. They have therefore not been identified as substances requiring additional PNEC screening within this assessment.

7. BUFFER AND CONTINGENCY STORAGE CAPACITY

Buffer capacity for treated effluent is provided by the wetland and pond system. The system is operated as a closed-loop system, such that effluent can be retained within the pond network and is not required to discharge directly to the receiving watercourse.

The wetland system incorporates a series of operational controls that allow flows to be retained, isolated, diverted or recirculated depending on prevailing conditions. Slider gates between individual ponds allow the primary flow routes between ponds to be physically isolated, while manual valves provide additional control over the direction of flow.

In particular, effluent reaching Pond 9 can be recirculated back to Pond 3, allowing it to pass again through the biological wetland treatment system. Alternatively, the flow can be redirected to the wastewater treatment plant balance tank and subsequently pass through the physicochemical treatment process again. During suitable summer conditions, Pond 9 also functions as the irrigation pond, from which treated effluent can be directed to the surrounding agricultural land through the irrigation system.

These arrangements provide operational buffer capacity by allowing treated effluent to remain within, or be recirculated through, the system where discharge to the receiving water is unavailable or inappropriate. The manual isolation and diversion arrangements also allow the operator to prevent a controlled discharge from taking place where effluent quality or environmental conditions are unsuitable.

As an additional contingency, effluent can be pumped to the Top Orchard pond. This pond is fully lined and provides temporary storage with suitable access for road tankers. Effluent transferred to this pond can therefore be retained and, where necessary, removed from site by tanker rather than being discharged to the environment.

Pond levels are monitored on a fortnightly basis, with results recorded through the E13 Effluent Analysis Form and reported to the Leadership Team. This provides early identification of increasing water levels, blockages or pump failures and allows intervention before available storage capacity is compromised. The system is additionally subject to annual external engineering checks in accordance with the Reservoirs Act 1975.

Overall, the wetland/pond network, recirculation arrangements, isolation controls and lined contingency storage provide a series of barriers to uncontrolled discharge and allow effluent to be retained or redirected where normal discharge is unavailable.

8. CONCLUSION & RECOMMENDATIONS

This Risk Assessment Summary has been prepared to support the amendment of permit EPR/FP3249GD for the WWTP at The Bounds, Much Marcle which will form part of the Wider site's Environmental Permit.

The proposed change is to increase the permitted discharge volume from 200 m³/day to 400 m³/day arising from cider production and associated effluent treatment activities.

Specific substances analysed on a representative sample of the effluent show that the effluent is predicted to not have an environmental impact.



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