

# Caulmert Limited

Engineering, Environmental & Planning  
Consultancy Services

**Deerplay Landfill**

**WRG Environmental Limited**

**Environmental Permit Variation Application**

**H1 Surface Water Pollution Risk Assessment**

**Prepared by:**

**Caulmert Limited**

**Office:** Strelley Hall, Main Street, Strelley, Nottingham, NG8 6PE

**Tel:** 01248 672666

**Email:** [andystocks@caulmert.com](mailto:andystocks@caulmert.com)

**Web:** [www.caulmert.com](http://www.caulmert.com)

**Document Reference:** 5987-CAU-XX-XX-RP-O-0300.A0.C1

March 2024



**APPROVAL RECORD**

**Site:** Deerplay Landfill

**Client:** WRG Environmental Limited

**Project Title:** Environmental Permit Variation Application

**Document Title:** H1 Surface Water Pollution Risk Assessment

**Document Ref:** 5987-CAU-XX-XX-RP-O-0300.A0.C1

**Report Status:** **Final**

**Project Manager:** **Andy Stocks**

**Caulmert Limited:** Strelley Hall, Main Street, Strelley, Nottingham, NG8 6PE

<b>Author</b>	Alice Daly Senior Hydrogeologist	<b>Date</b>	30/11/2023
<b>Reviewer</b>	Andy Stocks Director of Environment	<b>Date</b>	08/03/2024
<b>Approved</b>	Andy Stocks Director of Environment	<b>Date</b>	08/03/2024

Revision Log			
Revision	Description of Change	Approved	Effective Date

**DISCLAIMER**

This report has been prepared by Caulmert Limited with all reasonable skill, care and diligence in accordance with the instruction of the above named client and within the terms and conditions of the Contract with the Client.

The report is for the sole use of the above named Client and Caulmert Limited shall not be held responsible for any use of the report or its content for any purpose other than that for which it was prepared and provided to the Client.

Caulmert Limited accepts no responsibility of whatever nature to any third parties who may have been made aware of or have acted in the knowledge of the report or its contents.

No part of this document may be copied or reproduced without the prior written approval of Caulmert Limited.

---

## H1 Surface Water Pollution Risk Assessment

### TABLE OF CONTENTS

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Background .....	1
<b>2.0</b>	<b>DATA COLLECTION .....</b>	<b>2</b>
2.1	Stage 1: Identify pollutants released from your plant.....	2
<b>3.0</b>	<b>SCREENING TESTS FRESH WATER.....</b>	<b>5</b>
3.1	Test 1 Part A Freshwater screening test 1: does the concentration of the substance in the discharge exceed 10 percent of the EQS? .....	5
3.2	Test 2: Does the process contribution (PC) exceed 4 percent of the EQS.....	6
3.3	Test 3: Does your discharge increase the concentration of the pollutant in the river downstream of the discharge by more than 10% of the pollutant's EQS value.....	8
3.4	Test 4: Check whether the PEC is higher than the EQS. ....	9
3.5	Water Impact: Significant Loads .....	10
<b>4.0</b>	<b>CONCLUSION AND DISCUSSION .....</b>	<b>11</b>

### APPENDICES

<b>Appendix 1</b>	H1 Calculations
<b>Appendix 2</b>	Trade Effluent Consent

## 1.0 INTRODUCTION

### 1.1 Background

- 1.1.1 Caulmert Limited have been appointed by WRG Environmental Limited (a wholly owned subsidiary of FCC Environment (UK) Limited) to prepare an environmental permit variation application to vary their existing permit ref. EPR/KP3734LL/V005 for the Deerplay Leachate Treatment Plant site located at Deerplay Landfill. The operator proposes to install a new Reverse Osmosis (RO) Plant within the area that is currently the gas compound on-site. This area will be repurposed for the RO plant and associated infrastructure.
- 1.1.2 The operator has a trade effluent consent in place to allow the discharge of treated landfill leachate (permeate) from the site direct to sewer. The sewer in which the trade effluent will be discharged to is the foul sewer situated on Todmorden Road and which ultimately ends up at the Burnley Wastewater Treatment Works.
- 1.1.3 The RO removal rates are based on empirical rates obtained from Calvert RO plant which has been in operation for a number of years. The Calvert RO plant represents the same technology to be employed at Deerplay.
- 1.1.4 A review of the chemical analysis monitoring data from the point of discharge to sewer has been undertaken alongside a H1 assessment using the Environment Agency's Surface water Pollution Risk Assessment for your Environmental Permits (Environment Agency\*). The details of the assessment are as presented below.

---

\* Environment Agency Surface water pollution risk assessment web based guidance accessed 20/11/23,  
<https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit>

## 2.0 DATA COLLECTION

### 2.1 Stage 1: Identify pollutants released from your plant

- 2.1.1 The trade effluent originates from the treatment of landfill leachate which by its very nature contains a wide range of parameters. In accordance with the site's permit the leachate is monitored on a regular basis for a wide range of parameters. This information has previously been used by the operator to agree a trade effluent discharge consent with United Utilities. The site currently has a biological treatment facility to treat landfill leachate that the proposed RO plant will replace. Parameters limited on the discharge consent have been used to assess the applicability of the onward treatment and impact the discharge has upon the receiving water body.
- 2.1.2 The existing trade effluent consent has a generic 10 mg/l for total metal ions which is not readily assessed under the current regulatory regime. Therefore, the raw leachate quality data has been used to determine the parameters and concentrations of metals present within the discharge.
- 2.1.3 Leachate will be treated within the RO plant prior to being discharged to sewer and it is considered concentrations will be reduced significantly within the RO plant prior to the discharge to sewer. Therefore, reduced concentrations have been calculated from the raw leachate concentrations using treatment capabilities within a similar size RO plant (Calvert).
- 2.1.4 Table 1 below, shows parameters present within the incoming leachate stream that are not readily assessed via the discharge consent and the associated removal rates from the RO plant. Each parameter has a minimum and maximum percentage removal rate within the RO plant and therefore as a conservative approach the minimum has been used within the calculations.

**Table 1: Removal rates within RO plant prior to discharge to sewer**

Parameter	% removal rate (Calvert Plant)		Permeate Concentrations (µg/l)		EQS (µg/l)	
	Min	Max	Avg	Max	AA	MAC
Arsenic (Diss)	70.0	91.1	6.623	11.400	50	
Cadmium (Diss)	90.0	90.0	0.022	0.029	0.09	0.6
Chloride	99.9	99.9	1815	12358	250000	
Chromium (Diss)	98.3	98.4	2.399	4.433	4.7	32
Copper (Diss)	80.0	90.0	4.8	13.2	1 (bioavailable)	
Mercury (Diss)	90.0	90.0	0.03	0.03		0.07
Nickel (Diss)	99.0	99.1	2.154	3.250	4 (bioavailable)	34
Zinc (Diss)	70.0	91.1	33.2	80.1	10.9 (bioavailable)	
Lead (Diss)	90.0	90.0	1.1	1.3	1.2 (bioavailable)	14

- 2.1.5 It is noted that following removal within the RO plant that concentrations of chloride are less than 10% of the EQS value and therefore it is considered this parameter will pass the assessment prior to being discharged to sewer. Mercury is also consistently detected below the detection limit within the leachate and therefore these parameters are not carried through to the assessment.
- 2.1.6 Arsenic, cadmium, chromium, copper, nickel and zinc have been taken forward to be included within the assessment. The maximum concentration has been included as a conservative approach. It is noted that the EQS values for copper, nickel and zinc are the bioavailable standards and therefore not directly comparable to the dissolved concentrations.
- 2.1.7 Separable oil and grease. No liquid containing separable oil and grease will be processed through the RO plant due to potential damage to the membranes within the plant. Additional precautions may be employed (oil separator) in order to protect the RO. Therefore, there will be no separable oil and grease within the discharge and it is not assessed further.
- 2.1.8 The discharge is to public sewer following the treatment in the RO plant and therefore sewer treatment reduction factors have been applied to the discharge prior to the assessment of the impact on surface water. The receiving sewage treatment works is Burnley Wastewater treatment works, which discharges to the River Calder. No account of dilution within the WWTW has been included within the assessment.
- 2.1.9 A number of parameters do not have sewage treatment reduction factors as shown in the table below. Many of these parameters are removed in the treatment process, and therefore do not need to be considered past stage 1 of testing. This applied to parameters such sulphide, methane and separable oil and grease.
- 2.1.10 The assessment of the risks to surface water is based primarily on the concentration limits stipulated within the trade effluent consent. However, the collective limit for total metal ions does not distinguish between the various ions present. Therefore, site specific leachate data has been used for these parameters (metal ions) only. The RO removal rates have been only applied to these parameters. It is noted that the RO will also remove most of the other parameters, ammonia, phosphorus etc however in the interest of preventing dual regulation, these parameters have been assessed at the trade effluent consent limits.

**Table 2: Summary of parameters included within the assessment**

Parameter (ug/l)		Percentage removal rate of substance by activated sludge plant	Proportion remaining in activated sludge plant	RC value µg/l
Ammonia	100000	92	0.08	8000
COD*	1000		1	1000000
Cyanide	1000	68	0.32	320
Methane*	140		1	140
Nitrate	1000	52	0.48	480000
Separable grease and oil*	100000		1	100000
Sulphates*	1000000		1	1000000
Sulphides*	1000		1	1000
Phosphorus	15000	20	0.8	12000
<i>Arsenic</i>	<i>11.4</i>	<i>11</i>	<i>0.89</i>	<i>10.15</i>
<i>Chromium</i>	<i>4.43</i>	<i>84</i>	<i>0.16</i>	<i>0.71</i>
<i>Copper</i>	<i>13.2</i>	<i>42</i>	<i>0.58</i>	<i>7.656</i>
<i>Lead</i>	<i>1.3</i>	<i>33</i>	<i>0.67</i>	<i>0.871</i>
<i>Nickel</i>	<i>3.25</i>	<i>24</i>	<i>0.76</i>	<i>2.47</i>
<i>Zinc</i>	<i>80.1</i>	<i>67</i>	<i>0.33</i>	<i>26.433</i>

\* Indicates substances without STRF values. *Italics: metals ions assessed on site specific leachate data. All others based on trade effluent consent limit.*

### 3.0 SCREENING TESTS FRESH WATER

#### 3.1 Test 1 Part A Freshwater screening test 1: does the concentration of the substance in the discharge exceed 10 percent of the EQS?

- 3.1.1 This screening test assesses whether the concentrations of the discharged substances exceed 10 percent of the EQS, irrelevant to the quality and flow of the receiving body of water. Therefore, it purely assesses the quality of the discharged effluent.
- 3.1.2 The phosphate EQS was calculated using the guidance within the Water Framework Directive.<sup>†</sup> The River Calder indicates a poor classification.
- 3.1.3 As the discharge is to sewer, as Sewage Treatment Reduction Factor (STRF) is applied to the concentration of each substance discharged. The STRF is an Environment Agency defined multiplier to simulate the impact on the concentration from treatment at a sewage treatment works. The resulting concentration after the STRF has been applied is hereafter referred to as the corrected release concentration ( $RC_{corr}$ ). These are presented in Table 3 below.

**Table 3: Corrected Data for STRF**

STEP 1 - is RC>10% EQS	RC corr (µg/l)	EQS			10% EQS (µg/l)	Rcorr µg/l > 10% EQS?
		AA	MAC	Selected		
Ammonia	8000	600		600	60	FAIL
COD	1000000	125000	250000	125000	12500	FAIL
Cyanide	320	1	5	1	0.1	FAIL
Methane*	140					PASS
Nitrate	480000	50000		50000	5000	FAIL
Separable grease and oil*	100000					PASS
Sulphates	1000000	400000		400000	40000	FAIL
Sulphides*	1000					PASS
Phosphorus	12000	5016.46		5016.46	501.65	FAIL
Arsenic	10.146	50		50	5	FAIL
Chromium	0.70933333	4.7	32	4.7	0.47	FAIL
Copper	7.656	1		1	0.1	FAIL
Lead	0.871	1.2	14	1.2	0.12	FAIL
Nickel	2.47	4	34	4	0.4	FAIL
Zinc	26.433	10.9		10.9	1.09	FAIL

- 3.1.4 In test 1, many of the parameters exceed 10% of the EQS. As discussed in section 2 a number of other parameters also pass this stage due to having been removed in the treatment process (gases and oil/grease).
- 3.1.5 It is noted that EQS values for parameters copper, lead, nickel and zinc relate to the bioavailable standard and therefore are not directly comparable to dissolved concentrations.

<sup>†</sup> [https://www.legislation.gov.uk/ukxi/2015/1623/pdfs/ukxi0d\\_20151623\\_en\\_auto.pdf](https://www.legislation.gov.uk/ukxi/2015/1623/pdfs/ukxi0d_20151623_en_auto.pdf)

### 3.2 Test 2: Does the process contribution (PC) exceed 4 percent of the EQS

3.2.1 The discharge from the site flows to the sewage treatment works in Burnley which discharges to the River Calder. The nearest gauging station is location upstream of the wastewater treatment works. It is noted a tributary joins the river after the gauging station, before the discharge at the wastewater treatment works. However no flow data is available for the joining tributary and as a conservative approach this has not been included within the assessment.

**Figure 1: River gauging station**



Following the assessment methodology of Test 2 – Surface Water Discharges, the process contributions released to the River Calder was calculated as follow:

$$PC = \frac{(EFR * RC_{corr})}{(EFR + RFR)} \quad (1)$$

Where

PC = process contribution ( $\mu\text{g/l}$ )

EFR = effluent flow rate ( $\text{m}^3/\text{s}$ )

$RC_{corr}$  = release concentration (with STRF) from Waste Treatment Facility ( $\mu\text{g/l}$ )

RFR = river flow rate ( $\text{m}^3/\text{s}$ )

3.2.2 The Q95 flow was used from the nearest gauging station, found online from the National River Flow Archive<sup>‡</sup>. This reported:

Gauging Station 71010 – Pendle Water at Barden Lane

Mean Flow: 2.795  $\text{m}^3/\text{s}$

95% Exceedance (Q95): 0.478  $\text{m}^3/\text{s}$

<sup>‡</sup> National River Archive Gauging Station Information – accessed 05/12/2023;  
<https://nrfa.ceh.ac.uk/data/station/meanflow/71010>

- 3.2.3 The proposed effluent flow rate from the site is a mean effluent flow rate of 250m<sup>3</sup>/day (0.003m<sup>3</sup>/s) and a maximum effluent flow rate of 5 litres/s (0.005m<sup>3</sup>/s).
- 3.2.4 Process contributions of all the parameters carried through from test 1 were assessed using the mean effluent flow rate as the operation of the RO plant will be a continuous discharge limited by the daily maximum discharge rates.
- 3.2.5 Test 2 indicates all parameters pass this stage of testing, with the exception of ammonia, cyanide, COD, nitrate and copper and are therefore most parameters are screened out (see table 4 below).

**Table 4: Substances Screened Out at the Freshwater Screening Test 2**

STEP 2 -is PC<4% EQS	RC corr (µg/l)	PC	EQS	4% EQS	PC> 4% EQS
Ammonia	8000	48	600	24	FAIL
COD	1000000	6017	125000	5000	FAIL
Cyanide	320	2	1	0.04	FAIL
Nitrate	480000	2888	50000	2000	FAIL
Sulphates	1000000	6017	400000	16000	PASS
Phosphorus	12000	72	5016	201	PASS
Arsenic	10.146	0	50	2	PASS
Chromium	0.71	0.004	4.7	0.188	PASS
Copper	7.66	0.05	1	0.04	FAIL
Lead	0.871	0.005	1.2	0.048	PASS
Nickel	2.47	0.015	4	0.16	PASS
Zinc	26.43	0.159	10.9	0.44	PASS

### 3.3 Test 3: Does your discharge increase the concentration of the pollutant in the river downstream of the discharge by more than 10% of the pollutant's EQS value.

- 3.3.1 In test 3, the predicted environmental concentration (PEC) in the river downstream of the discharge is calculated by adding the process contribution (PC) to the background concentrations (BC).
- 3.3.2 No background quality data is available for the River Calder, therefore half the Environmental Quality Standard has been used within the assessment.
- 3.3.3 Ammonia, COD, nitrate and copper passed at this stage of testing, as shown in table 5 below.
- 3.3.4 Cyanide failed at this stage of testing using the discharge consent value, and therefore the model has been re-run including cyanide at the concentrations reported within the raw untreated leachate. Cyanide passed at this stage of testing using the raw untreated leachate data, it is also noted that concentrations of cyanide would be reduced significantly within the RO plant prior to discharge, and therefore modelling at the raw leachate concentration is considered a very conservative approach.

**Table 5. Substances Modelled in test 3**

STEP 3 - is (PEC-BC) > 10% EQS	R corr (µg/l)	BC	PEC	PEC-BC	EQS	10% of EQS	PC>10% EQS?
Ammonia	8000	300	346	46	600	60	PASS
COD	1000000	62500	68141	5641	125000	12500	PASS
Cyanide	320	0.5	2.42	1.92	1	0.1	FAIL
Nitrate	480000	25000	27738	2738	50000	5000	PASS
Copper	7.656	0.5	0.54	0.04	1	0.1	PASS
Cyanide Raw data	16	0.5	0.59	0.09	1	0.1	PASS

**3.4 Test 4: Check whether the PEC is higher than the EQS.**

3.4.1 This test looks at the full EQS concentration, rather than 10% of the EQS which is used in test 3. All parameters pass this stage of testing (table 6 below).

**Table 6: Substances Modelled in Test 4**

STEP 4 - is PEC > EQS?	R corr (µg/l)	BC	PEC	EQS	PEC>EQS
Ammonia	8000	300	346	600	PASS
COD	1000000	62500	68141	125000	PASS
Cyanide	320	0.5	2.42	1	FAIL
Nitrate	480000	25000	27738	50000	PASS
Copper	7.656	0.5	0.54	1	PASS
Cyanide Raw data	16	0.5	0.59	1	PASS

### 3.5 Water Impact: Significant Loads

3.5.1 For priority hazardous substances, an additional assessment is required. This screening test assesses whether the annual load for the substance in question exceeds the annual significant load limit, which is the total mass of the substance realised across a single year. The discharge consent does not identify any of the priority hazardous substances listed in table 8 below and therefore this additional screening is not required.

**Table 8: Significant load parameters**

Pollutant	Annual significant load limit in kg
Anthracene	1
Brominated diphenyl ether	1
Cadmium	5
Chloroalkanes C10-13	1
Dioxins	0.0001
Endosulphan	1
Hexachlorobenzene	1
Heptachlor	1
Hexachlorobutadiene	1
Hexachloro-cyclohexane	1
Mercury and its compounds	1
Nonylphenol (4-Nonylphenol)	1
Pentachlorobenzene	1
Polycyclic aromatic Hydrocarbons (PAHs)	5
Tributyltin compounds (Tributyltin-cation)	1

## 4.0 CONCLUSION AND DISCUSSION

- 4.1.1 The operator proposes to install a new RO plant at Deerplay Landfill Site for the treatment of non-hazardous leachate. The assessment of the risks to surface water is based primarily on the concentration limits stipulated within the trade effluent consent. However, the collective limit for total metal ions is not readily assessed and therefore raw leachate quality is used for these parameters.
- 4.1.2 To assess the removal efficiency of the RO plant, data from raw leachate which are treated at Deerplay Landfill site have been processed using removal rates from a similar sized RO plant at Calvert which has been in operation for a number of years. The RO removal rates have been only applied to the metal ions to avoid dual regulation.
- 4.1.3 A number of parameters were screened out following treatment at the RO plant, prior to the surface water screening assessment, as concentrations were below the relevant EQS values prior to discharge to sewer. All other parameters passed the surface water assessment and therefore this assessment has demonstrated that concentrations within the discharge are acceptable with respect to the Surface Water Pollution Assessment methodology.

# APPENDIX 1

H1 Calculations

(Electronic Copy)

RAW TRADE EFFLUENT DISCHARGE CONSENT		Percentage removal rate	STRF (proportion remaining) in activated	RC Value	
Discharge Consent Trade Effluent Summary	Deerplay mg/l			mg/l	ug/l
Ammonia	100	92	0.08	8.00	8000
COD*	1000		1	1000	1000000
Cyanide	1	68	0.32	0.32	320
Methane*	0.14		1	0.14	140
Nitrate	1000	52	0.48	480.00	480000
Seperable grease and oil*	100		1	100.00	100000
Sulphates*	1000		1	1000.00	1000000
Sulphides*	1		1	1.00	1000
Phosphorus	15	20	0.8	12	12000.00
<b>Metals from leachate data</b>					
Arsenic	11.4	11	0.89		10.15
Chromium	4.43	84	0.16		0.71
Copper	13.2	42	0.58		7.66
Lead	1.3	33	0.67		0.87
Nickel	3.25	24	0.76		2.47
Zinc	80.1	67	0.33		26.43
pH max	10				
pH min	6				
Discharge Rate	5	lts/sec		0.005	m3/sec
Discharge volume max daily	250	m3/day			
	0.003	m3/sec			

Gases with 100% removal rate  
nitrogen STRF

STRF for dissolved concs  
STRF for dissolved concs

\*Indicates parameter with no STRF

### UPSTREAM GAUGING STATION

<https://nrfa.ceh.ac.uk/data/station/meanflow/71010>

Period of Record: 1971 - 2022

Percent Complete: >99 %

Base Flow Index: 37%

Mean Flow: 2.795 m<sup>3</sup>/s

95% Exceedance (Q95): 0.478 m<sup>3</sup>/s

70% Exceedance (Q70): 0.834 m<sup>3</sup>/s

50% Exceedance (Q50): 1.33 m<sup>3</sup>/s

10% Exceedance (Q10): 6.68 m<sup>3</sup>/s

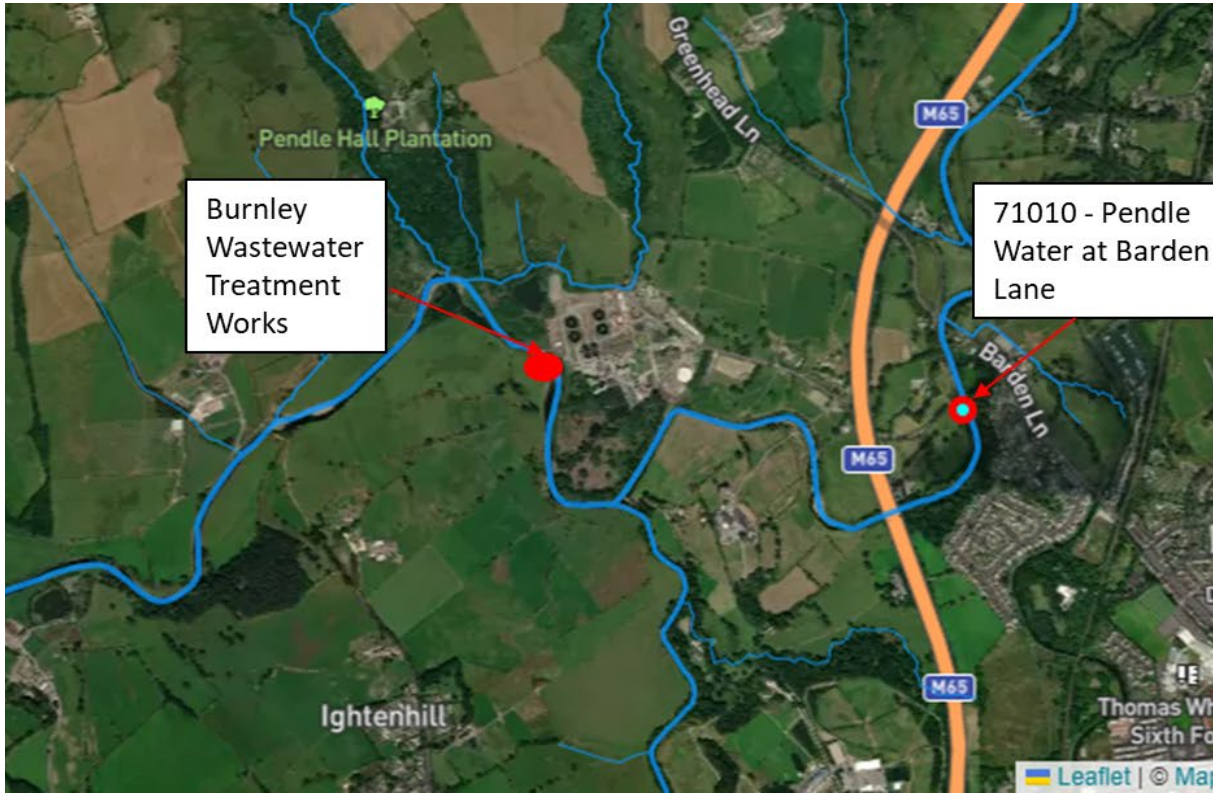
5% Exceedance (Q5): 9.94 m<sup>3</sup>/s

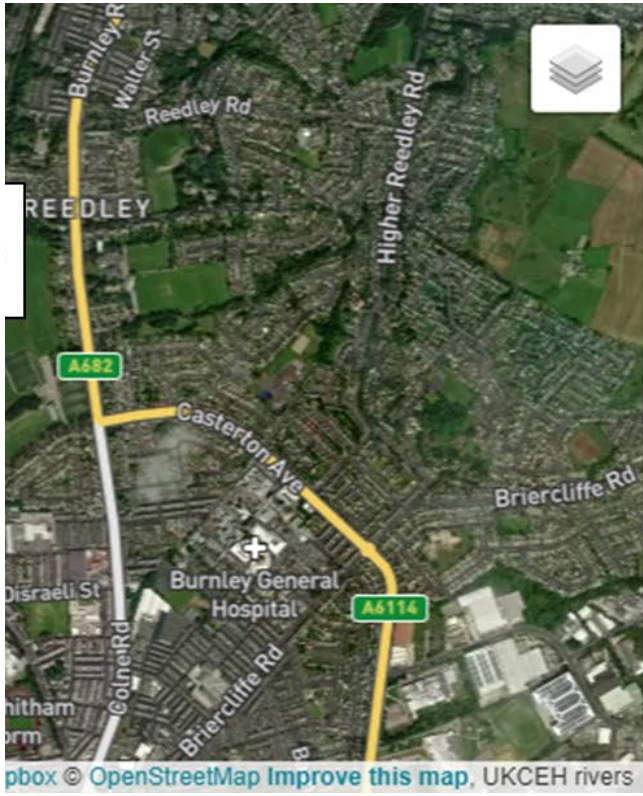
Flow at Treatment Works (Q95) 0.478 m<sup>3</sup>/s

Q70 0.834 m<sup>3</sup>/s

Mean Flow 2.795 m<sup>3</sup>/s







Assessment based on the H1 approach.

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

STEP 1 - is RC > 10% EQS

RC- Effluent concentration ug/l

Discharge Consent Parameters	Units	RC	EQS			justification	10%EQS	RC>10%EQS	Compliance Target Source
			AA	MAC	selected				
Ammonia	ug/l	8000	600		600		60	FAIL	<a href="https://www.wdfuk.org/sites/default/files/Media/Environmental%20sta">https://www.wdfuk.org/sites/default/files/Media/Environmental%20sta</a> lowland and high alkalinity
COD	ug/l	1000000	125000	250000	125000		12500	FAIL	<a href="https://www.gov.uk/government/publications/waste-water-treatment-works-treatment-monitoring-and-compliance-limits/waste-water-treatment-works-treatment-monitoring-and-compliance-limits#ut-for-bod-and-cod">https://www.gov.uk/government/publications/waste-water-treatment-works-treatment-monitoring-and-compliance-limits/waste-water-treatment-works-treatment-monitoring-and-compliance-limits#ut-for-bod-and-cod</a>
Cyanide	ug/l	320	1	5	1		0.1	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Methane*	ug/l	140						PASS	Gases with 100% removal rate
Nitrate	ug/l	480000	50000		50000		5000	FAIL	<a href="https://support.esdat.net/Environmental%20standards/uk/Landfill%20directive%20appendix%208%20selected%20water%20quality%20standards.pdf">https://support.esdat.net/Environmental%20standards/uk/Landfill%20directive%20appendix%208%20selected%20water%20quality%20standards.pdf</a>
Seperable grease and oil*	ug/l	100000						PASS	Removed prior to RO treatment and additionally in sewage treatment works
Sulphates	ug/l	1000000	400000		400000		40000	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Sulphides*	ug/l	1000						PASS	Gases with 100% removal rate
Phosphorus	ug/l	12000	5016.46032		5016.46032		501.646	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Arsenic	ug/l	10	50		50		5	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Chromium	ug/l	1	4.7	32	4.7	CR3	0.47	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Copper	ug/l	8	1		1		0.1	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Lead	ug/l	1	1.2	14	1.2		0.12	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Nickel	ug/l	2	4	34	4		0.4	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>
Zinc	ug/l	26	10.9		10.9		1.09	FAIL	<a href="http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf">http://www.legislation.gov.uk/uksi/2015/1623/pdfs/uksi02_20151623_en_auto.pdf</a>

blue - bioavailable targets

STEP 2 - is PC<4% EQS

where PC = EFR\*RC/(EFR+RFR)

EFR - effluent flow rate

RFR - river flow rate

PC process contribution

EFR	0.003	m3/s	max treatment capacity	Q95	Q70
RFR		m3/s	Q95	0.478	0.834

	Units	RC	PC	EQS	4%EQS	PC > 4%EQS
Ammonia	ug/l	8000	48	600	24	FAIL
COD	ug/l	1000000	6017	125000	5000	FAIL
Cyanide	ug/l	320	2	1	0.04	FAIL
Nitrate	ug/l	480000	2888	50000	2000	FAIL
Sulphates	ug/l	1000000	6017	400000	16000	PASS
Phosphorus	ug/l	12000	72	5016	201	PASS
Arsenic	ug/l	10	0	50	2	PASS
Chromium	ug/l	1	0	4.7	0.188	PASS
Copper	ug/l	8	0	1	0.04	FAIL
Lead	ug/l	1	0	1.2	0.048	PASS
Nickel	ug/l	2	0	4	0.16	PASS
Zinc	ug/l	26	0	10.9	0.436	PASS

STEP 3 - is (PEC-BC) > 10%EQS

where PEC=((EFR\*RC)+(RFR\*BC))/(EFR+RFR)

BC- background concentration

	Units	RC*	BC	PEC	PEC-BC	EQS	10%EQS	PC > 10%EQS	Background Concentration Source
Ammonia	ug/l	8000	300	346	46	600	60	PASS	Half EQS
COD	ug/l	1000000	62500	68141	5641	125000	12500	PASS	Half EQS
Cyanide	ug/l	320	0.5	2	2	1	0.1	FAIL	Half EQS
Nitrate	ug/l	480000	25000	27738	2738	50000	5000	PASS	Half EQS
Copper	ug/l	8	0.5	1	0.04	1	0.1	PASS	Half EQS
Cyanide Raw data	ug/l	16	0.5	1	0.1	1	0.1	PASS	Half EQS

If PEC is calculated by PC + BC

STEP 4 - is PEC > EQS

	Units	RC	BC	PEC	EQS	PEC>EQS
Ammonia	ug/l	8000	300	346	600	PASS
COD	ug/l	1000000	62500	68141	125000	PASS
Cyanide	ug/l	320	0.5	2	1	FAIL
Nitrate	ug/l	480000	25000	27738	50000	PASS
Copper	ug/l	8	0.5	1	1	PASS
Cyanide Raw data	ug/l	16	0.5	1	1	PASS

## APPENDIX 2

### Trade Effluent Consent

**WATER INDUSTRY ACT 1991****NOTICE OF DIRECTION CONCERNING THE DISCHARGE OF TRADE  
EFFLUENT**

To **FCC Waste Services (UK) Limited**

of **Ground Floor West  
900 Pavilion Drive  
Northampton Business Park  
Northampton  
NN4 7RG**

United Utilities Water Limited (hereinafter called "the Company") hereby give you Notice as **owner/occupier** of the trade premises situate at **Deerplay Landfill Site Bacup Road Burnley Lancs BB11 3RL**

that the Company in exercise of the powers conferred upon them by Section 124 of the above Act DIRECT that as from <<date>> all conditions attaching the CONSENT dated the **24 July 2007** to the discharge of trade effluent into the public sewer from the said trade premises as requested by a Trade Effluent Notice dated the **15 August 2005** shall be varied and the following conditions be substituted, namely:

**Nature of  
discharge**

- 1a) Subject to the provisions of conditions 6,7,8 and 9 below the nature or composition of the trade effluent to be discharged under this Notice of Direction shall be solely as specified in the said application form and shall consist solely of waste water derived from **endogenous leachate and associated effluent from landfilling of non-hazardous waste.**
- 1b) The trader shall give to the Company prior written notice of any change in the process or the process materials or any other circumstances likely to alter the constituents of the trade effluent as set out in condition 1(a). In such circumstances, no substance of which the Company has not had previous notice, may be discharged unless and until the Company has agreed to accept the substance at a limit imposed by the Company which shall then be deemed to be incorporated in this Notice of Direction by agreement and shall not prejudice the right of the Company to serve a Direction earlier than two years from the date of such incorporation.

The Trader shall also give not less than seven days written notice to the Company of any change in the name of the occupier or owner.

**Sewer  
affected**

2. The sewer into which the trade effluent may be discharged and the point of discharge is the foul sewer situate at **Todmorden Road (MH at HS).**

- Connections** 3. No connections shall be made to the said sewer without the prior approval of the Company and all such connections shall be constructed and maintained to the satisfaction of the Company at the expense of the Trader.
- Maximum volume of discharge** 4. The maximum amount of the trade effluent discharged in any one day of twenty four hours shall not exceed **500 m<sup>3</sup>**, of which not more than **200 m<sup>3</sup>** shall be treated leachate, without prior written consent of the Company.
- Maximum rate of discharge** 5. The highest rate at which the trade effluent may be discharged shall not exceed **7 litre/sec**.
- Matters to be eliminated prior to discharge to sewers** 6. The following matters shall be eliminated from the trade effluent before it is discharged into the sewers of the Company:
- a) petroleum spirit;
  - b) calcium carbide;
  - c) carbon disulphide;
  - d) except as provided in paragraph 7 hereof, the prescribed substances listed in Schedule 1 to The Trade Effluents (Prescribed Processes and Substances) Regulations 1989, as amended from time to time, insofar as they are in concentration greater than the background concentration (as defined in the said Regulations);
  - e) where the trade effluent derives from a prescribed process mentioned in Schedule 2 to the said Regulations, and except as provided in paragraph 7 hereof, asbestos (as defined in the said Regulations) and chloroform in concentration greater than the background concentration (as defined in the said Regulations);
  - f) organo-halogen compounds including pesticide residues and degreasing agents;
  - g) any substances which either alone or in combination with each other or with any other matter lawfully present in the said sewers would be likely to;
    - i) cause a nuisance or produce flammable, harmful or toxic vapours either in the sewers or at the sewage works of the Company;
    - ii) injure the sewers or interfere with the free flow of their contents or affect prejudicially the treatment and disposal of their contents or have injurious effects on the sewage treatment works to which it is conveyed or upon any treatment plant there;
    - iii) be dangerous to or cause injury to any person working in the sewers or at the sewage treatment works;
    - iv) affect prejudicially any watercourse, estuary or coastal water into which the treated effluent will eventually be discharged.

**Matters to be limited prior to discharge to sewer**

7. The trade effluent shall not contain
- a) Ammonia and its compounds as N in excess of **100 mg/l**
  - b) Cyanides and cyanogen compounds which produce hydrogen cyanide on acidification in excess of **1 mg/l**
  - c) Methane in solution in excess of **0.14 mg/l**
  - d) Nitrate (as N) in excess of **1,000 mg/l**
  - e) Nitrate (as N) load in excess of **200 kg/d** in any one period of 24 hours, such load being determined by multiplying the Nitrate (as N) concentration of a composite sample of the trade effluent taken during that 24 hour period and the volume of the trade effluent discharge during that 24 hour period.
  - f) Separable grease and oil in excess of **100 mg/l**
  - g) Settled chemical oxygen demand in excess of **1,000 mg/l**
  - h) Sulphates as SO<sub>4</sub> in excess of **1,000 mg/l**
  - i) Sulphides, hydrosulphides, polysulphides and substances producing hydrogen sulphide on acidification in excess of **1 mg/l**
  - j) Total Phosphorus as P in excess of **15 mg/l**
  - k) Total suspended solids at pH 7.0 and dried at 110° C in excess of **500 mg/l**
  - l) Toxic metals in excess of **10,000 µg/l** either individually or in total ie Antimony, Beryllium, Chromium, Copper, Lead, Nickel, Selenium, Silver, Tin, Vanadium, Zinc;

**Temperature**

8. No trade effluent shall be discharged which has a temperature higher than **43.3°C (110°F)**.

**pH value**

9. No trade effluent shall be discharged having a pH of less than **6** or greater than **10**

**Inspection Chamber**

10. a) An inspection chamber or manhole shall be provided and maintained by the Trader in a suitable position in connection with each pipe through which the trade effluent is discharged and shall be so constructed and maintained as to enable a person readily to obtain at any time samples of the trade effluent so discharged, to the approval of the Company.
- b) There shall be provided, operated and maintained in working order by the Trader a meter in such a position and of such specification as shall be approved by UUWLtd such as will measure and provide a continuous record of the quantity and rate of discharge of any trade effluent being discharged from the premises into the said sewer and following the written request of UUWLtd to have the accuracy of the meter independently tested by an agreed body, and such apparatus or other facilities in such position and of such specification as shall be approved by UUWLtd as will provide

for a continuous flow proportional sample as will enable the nature and composition or constituents as set out in these conditions of any trade effluent being discharged from the premises into the said sewer to be ascertained.

- c) If the measuring and recording apparatus as aforesaid ceases to function satisfactorily, then the Company shall have the right to make estimates of the volume and composition of the trade effluent until such time as the said apparatus is again operating to the satisfaction of the Company.
- d) Records shall be kept by the Trader of the volume, rate of discharge, nature and composition of the trade effluent discharged to the sewer, together with any records required to be kept by the Trader under the provisions of any Notice of Determination issued by the Secretary of State under Sections 120 and 132 of the Water Industry Act 1991. Such records shall be kept available for inspection at all reasonable times by an authorised officer of the Company and copies shall be sent to the Company on demand.
- e) The foregoing provision of this condition shall be deemed to be complied with if other methods of sampling the trade effluent, determining its nature and composition, and measuring and recording the discharge are agreed and confirmed in writing by the Company.

**Dated 26 February 2024**

Issuing Office      Wastewater Services  
Lingley Mere Business Park  
Lingley Green Avenue  
Great Sankey  
Warrington  
WA5 3LP

Signed

  
PP

WASTEWATER ASSET MANAGER  
for and on behalf of United Utilities Water Limited

1. Your attention is drawn to the following provisions of Section 126 (1) of the Water Industry Act 1991 relating to Appeals to the Director General of Water Services. The owner or occupier of any trade premises may within two months of the giving to him under Subsection (5) of the Notice of a Direction under that Section, or with the written permission of the Director at any later time, appeal to the Director against the Direction.
2. The Notice of Direction must state the date, being a date not less than two months after the giving of the Notice on which the Direction is to take effect. If an appeal is brought under Section 126 (1) before that date the Direction shall not take effect until the appeal is withdrawn or finally disposed of. Provided that so far as a Direction which is the subject of an appeal relates to the making of Charges payable by the occupier of the trade premises, it may take effect on any date after the giving of the Notice.

On appeal under Section 126 (3) and (4) the Director General of Water Services shall have power to annul the Direction given by the Sewerage Undertaker and to substitute for it any other Direction, whether more or less favourable to the appellant and any Direction given by the Director of Water Services may include provision as to the charges to be made for any period between the giving of the Notice by the Sewerage Undertaker and the determination of the appeal.

[WWW.CAULMERT.COM](http://WWW.CAULMERT.COM)



Registered Office: InTec, Parc Menai, Bangor, Gwynedd, LL57 4FG

**Tel:** 01248 672666

**Email:** [contact@caulmert.com](mailto:contact@caulmert.com)

**Web:** [www.caulmert.com](http://www.caulmert.com)