Not Duly Made Question 9:
Emissions to Sewer Assessment

H Fraser Consulting
Contaminated Land and Hydrogeology

TECHNICAL NOTE

Project No:	30922
Project:	Anochrome Permitting
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H1 SURFACE WATER ASSESSMENT

1 INTRODUCTION

Anochrome Limited (Anochrome) has instructed H Fraser Consulting Ltd (HFCL) to undertake a surface water quality assessment to support upgrade of their facility at Reservoir Road, Walsall, WS2 9RZ.

1.1 Background

Anochrome currently operates in accordance with an Environmental Permit as a Part A(1) installation under the 2016 Environmental Permitting Regulations. The permit was issued on 16 November 2004, reference BN0112IN. A permit variation notice was issued on 24 November 2010, reference EPR /BN0112IN/V002.

Effluent created in the industrial process undertaken on site is discharged to sewer under consent with Severn Trent, consent number 001651V, dated 10 December 2013; this is presented in Appendix A. The receiving sewer is Minworth Sewage Treatment Works, located at Kingsbury Road, Sutton Coldfield B76 9DJ and is managed by Severn Trent. The resulting treated sewer water is discharged into the River Tame at Water Orton (reference number 28003). Thes locations are presented on maps provided by Severn Trent in Appendix B.

An H1 assessment for surface waters was requested by the Environment Agency as part of the variation to the existing permit required for the installation of the upgraded facility.

2 H1 ASSESSMENT

HFCL have carried out an H1 assessment for the surface water discharge of the treated effluent.

The determinands and contaminants of concern that are measured prior to discharge from Anochrome include suspended solids, chromium, copper, lead, nickel, zinc, phosphorus, selenium, cyanide (excluding iron cyanide), chemical oxygen demand (COD) and pH. Of these, the H1 assessment was undertaken for cyanide, chromium, copper, lead, nickel and zinc as these were the only analytes available in the assessment tool.

H1 assessment tool V7.4 was used for the assessment due to V9.2 not having the function to model surface water and V8.0 not able to acknowledge the annual average background river concentrations and not modelling for zinc.

The H1 tool enables screening out from detailed assessment discharges to water or to sewer of effluent streams containing substances which are not 'liable to cause pollution'. The tool works through a series of five tests for freshwater, as follows:

- If Test 1 fails, then Test 2 is undertaken;

- If Test 2 fails, Tests 3, 4a and 4b are undertaken;
- To screen out at this stage all three tests (3, 4a and 4b) must pass.

2.1 Data sources

The data use, sources of origin and justification for use are provided in Appendix C for transparency. For each substance, Anochrome's effluent concentration data was multiplied by a sewage reduction factor to account for treatment at Severn Trent's treatment works (see Appendix C). The H1 assessment for cyanide was run at current concentrations and also at a reduced concentration as it is anticipated that the new acid zinc line will lead to a reduction of approximately 33% cyanide usage on site.

2.2 Results

The results are presented in Table 2.1 below and all results are presented in Appendix D.

Table 2.1: H1 assessment results

Release point code	Substance	Freshwater test 1	Freshwater test 2	Freshwater test 3	Freshwater test 4a	Freshwater test 4b	Further assessment needed?
River Tame at Water Orton	Cyanide	Fail	Fail	Fail	Pass	Fail	Yes
	Cyanide (33% less)	Fail	Fail	Fail	Pass	Fail	Yes
	Chromium (III) dissolved	Fail	Fail	Pass	Pass	Pass	No
	Copper	Fail	Pass				No
	Nickel and its compounds	Fail	Fail	Fail	Pass	Pass	Yes
	Lead and its compounds	Fail	Pass				No
	Zinc	Fail	Fail	Fail	Pass	Pass	Yes

- Chromium (III), copper and lead passed the screening exercise. Copper and lead passed Test 2, and Chromium (III) passed Tests 3, 4a and 4b. No further assessment of these substances is required.
- Cyanide, nickel and zinc failed the screening exercise. They did not pass all three tests (3, 4a and 4b). Further assessment of these substances is required.

3 CONCULSIONS AND RECOMMENDATIONS

The H1 assessment for surface water concluded that Chromium (III), copper and lead passed the H1 screening assessment, and do not need further assessment. However, cyanide, nickel and zinc failed the H1 screening assessment therefore further assessment is required.

APPENDIX A

Consent to Discharge

Severn Trent Water Limited
Water Industry Act 1991

Consent No **001651V**
Direction No **0005**

Direction to vary conditions of consent to the discharge of trade effluent to the public foul water sewer

To: The Company Secretary
Anochrome Limited
Wood Land
Fordhouses
Wolverhampton
WV10 8HN

WHEREAS
Trade effluent is now discharged from the premises known as **Anochrome Limited** and situated at **Reservoir Place, Walsall, West Midlands, WS2 9RZ** under a consent dated 1 May 1985 issued by Severn Trent Water Authority.

NOW THEREFORE Severn Trent Water Limited (hereinafter called "The Sewerage Undertaker")
HEREBY Direct under the powers conferred on them by Section 124 of the Water Industry Act 1991, that subject as hereinafter specified as from 10 February 2014 the Consent dated 1 May 1985 be varied and the following conditions substituted for the conditions previously attached thereto.

Sewer Affected

1. The public sewer into which the trade effluent may be discharged is the foul water sewer situated in **Reservoir Place.**

Nature or Composition

2. The trade effluent to be discharged shall consist solely of waste waters specified in the trade effluent notice served in respect of the premises and derived from **electroplating/ phosphating/ electrophoretic painting.**

Maximum volume

3. The maximum volume of trade effluent to be discharged in any continuous period of 24 hours shall not exceed **750** cubic metres.

Maximum rate

4. The highest rate at which the trade effluent may be discharged shall not exceed **15** litres per second.

Period of discharge

5. The trade effluent shall only be discharged into the public sewer between **00:00** and **23:59** hours.

Quality Conditions

6. a. The trade effluent to be discharged shall not contain any of the substances or properties listed in Appendix I in amounts or proportions other than those which comply with the limits there stated and shall not contain any substances or properties not listed in Appendix I except with the prior written permission of the Sewerage Undertaker and on such terms and conditions as are set out therein.

   b. The trade effluent to be discharged shall not contain any special category effluent (as defined in Section 138 of the Water Industry Act 1991) in a concentration greater than background concentration (as defined in the Trade Effluents (Prescribed Processes and Substances) Regulations 1989).

   c. Where the trade effluent derives from a prescribed process mentioned in Schedule 2 to the Trade Effluents (Prescribed Processes and Substances) Regulations 1989, it shall not contain asbestos (as defined in the said Regulations) and chloroform in a concentration greater than the background concentration (as defined in the said Regulations);

Inspection chamber

7. An inspection chamber or manhole shall be provided and maintained in connection with each pipe through which the trade effluent is to be discharged into the public sewer, and such inspection chamber or manhole shall be so constructed and maintained as to enable a person to readily obtain samples at any time, of the trade effluent so discharged.

Quality and volume measurement

8. a. Apparatus adequate for measuring and automatically recording the volume, rate and composition of trade effluent so discharged shall be provided with every such pipe and such measurement apparatus shall be maintained and tested to the satisfaction of the Sewerage Undertaker.

b. If the measuring and recording apparatus ceases to record or is suspected of not measuring correctly, then the Sewerage Undertaker 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 Sewerage Undertaker.

c. The foregoing provisions of this condition shall be of no effect so long as there is provided and maintained to the satisfaction of the Sewerage Undertaker some other method approved by the Sewerage Undertaker of sampling the trade effluent or determining, measuring and recording the volume and composition of the trade effluent so discharged.

d. Records of the volume and composition of the trade effluent discharged into the sewer shall be kept available at all times for inspection by any authorised representative of the Sewerage Undertaker and copies of such records shall be sent to the Sewerage Undertaker on demand.

Payment

9. Payment shall be made to the Sewerage Undertaker for the reception, treatment and disposal of the trade effluent discharged into the public foul water sewer in accordance with the Sewerage Undertaker's Charging Scheme in force from time to time.

All sums payable to the Sewerage Undertaker under this condition shall become due and payable on demand.

Dated the tenth day of December 2013
For and on behalf of the Sewerage Undertaker

M. Needham
Environmental & Commercial Customer Compliance Manager

Address of the Sewerage Undertaker

Severn Trent Water Limited
Severn Trent Centre
2 St Johns Street
Coventry
CV1 2LZ

NOTE: Your attention is drawn to the right of appeal to the Director General of Water Services conferred by Section 126 of the Water Industry Act 1991.

APPENDIX I

Consent No **001651V**
Direction No **0005**

QUALITY CONDITIONS

1. The temperature of the trade effluent shall not exceed 43 degrees Centigrade.

2. The total of Zinc in the trade effluent shall not exceed 10 milligrams per litre.

3. The total of Suspended Solids in the trade effluent shall not exceed 400 milligrams per litre.

4. The total concentration of Cyanide in the trade effluent, excluding ferrocyanide and ferricyanide, shall not exceed 10 milligrams per litre expressed as CN.

5. The Chemical Oxygen Demand from acidified dichromate (C.O.D.) of the trade effluent shall not exceed 600 milligrams per litre expressed as O.

6. The pH value of the trade effluent shall not be less than 6 nor greater than 12 in the recognised scale.

7. The total of Chromium in the trade effluent shall not exceed 5 milligrams per litre.

8. The total of Nickel in the trade effluent shall not exceed 5 milligrams per litre.

9. The total of Copper in the trade effluent shall not exceed 2 milligrams per litre.

10. The total of Phosphorus in the trade effluent shall not exceed 25 milligrams per litre expressed as Phosphorus (P).

11. The trade effluent shall not contain any substance or substances which either alone, or in combination with any matter in any sewers or receiving sewage treatment works vested in and/or under the control of Severn Trent Water Limited, would give rise to obnoxious, poisonous or inflammable gases, or otherwise a statutory nuisance as defined by the Environmental Protection Act 1990 in such sewers or works, would be deleterious to such sewers or to the processes in use at such works or to the disposal of effluents and sludges produced by such works.

12. The trade effluent shall be free from physically separable oil.

A shaken sample is to be used except for C.O.D., where the sample shall be supernatant after 1 hour settlement

APPENDIX II

Consent No **001651V**
Direction No **0005**

QUALITY AND VOLUME MEASUREMENT

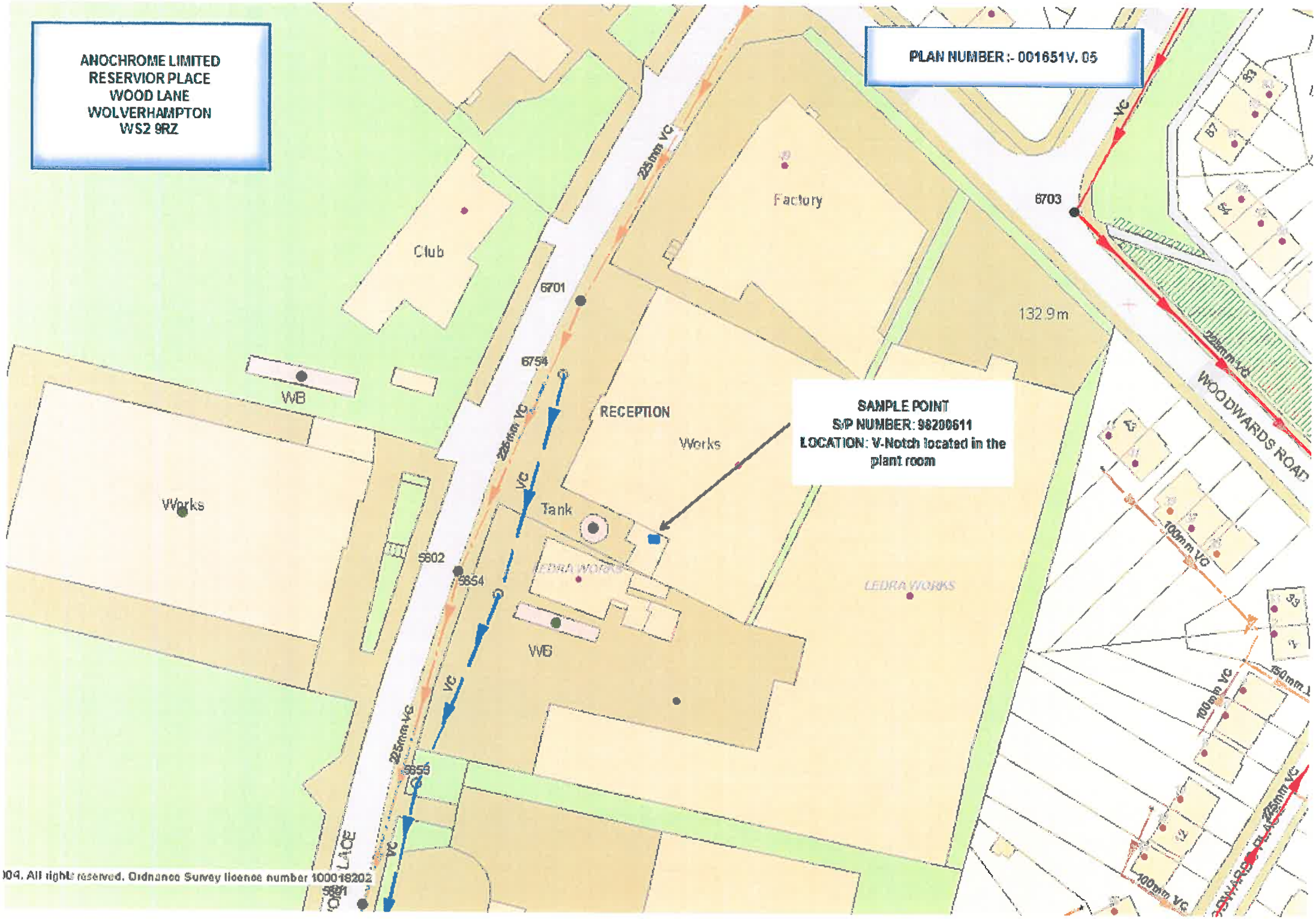
1. Quality measurement
   There shall be provided a recording pH meter which will measure the pH of the trade effluent prior to its discharge to the public sewer. The instrument must be fitted with a recording chart or other data logging device acceptable to the Sewerage Undertaker, and the data so recorded must be kept readily available for on-site examination by authorised representatives of the Sewerage Undertaker.

1.1. Sampling point
   To enable a representative sample of trade effluent to be taken a suitable sampling point shall be provided to the satisfaction of the Sewerage Undertaker at a point marked SAMPLE POINT as shown on the Plan No. 001651V.05 attached hereto.

   The Sample Point is located at the v-notch in the plant room .

   Safe access to and exit from this point for inspection and monitoring purposes by authorised representatives of the Sewerage Undertaker shall be provided.

2. Volume measurement
   There shall be provided a continuous integrating flow recorder which shall record in litres per second and integrate in cubic metres. The volume measured shall be that of the trade effluent excluding domestic sewage, rainwater and uncontaminated surface water. The instrument must be fitted with a recording chart or other data logging device acceptable to the Sewerage Undertaker and the data so recorded must be kept readily available for on site examination by authorised representatives of the Sewerage Undertaker.



APPENDIX III

Consent No **001651V**
Direction No **0005**

TRADE EFFLUENT CHARGE CALCULATION

The payment to be made by the occupier of the premises from which the trade effluent is discharged for the whole or any part of any period of twelve calendar months commencing on 1 April in any year shall be calculated as follows:

1. The volume of trade effluent discharged in cubic metres multiplied by C, where

$$C = R + V + \frac{Ot}{Os} \times B + \frac{St}{Ss} \times S$$

C = Total charge per cubic metre of trade effluent.

R = One third of the amount determined by the Sewerage Undertaker as the average cost to the Sewerage Undertaker for the year of charge of receiving into its sewers (other than those used solely for surface water) and conveying one cubic metre of sewage to the Sewerage Undertaker's sewage treatment works.

V = The amount determined by the Sewerage Undertaker as the average cost for the year of charge of primary treatment and other volumetric treatment costs in the treatment of one cubic metre of sewage at the Sewerage Undertaker's sewage treatment works.

Ot = The Chemical Oxygen Demand (COD) of the trade effluent in milligrams per litre (mg/l) after one hour quiescent settlement.

Os = The estimated average Chemical Oxygen Demand (COD) of settled sewage in milligrams per litre (mg/l) at the Sewerage Undertaker's works as determined by the Sewerage Undertaker for the purposes of the year of charge.

B = The amount determined by the Sewerage Undertaker as the average cost to the Sewerage Undertaker for the year of charge of biological treatment of one cubic metre of sewage at the Sewerage Undertaker's sewage treatment works.

St = The total suspended solids in the trade effluent in milligrams per litre (mg/l) at the pH of the trade effluent.

Ss = The estimated average amount of suspended solids in milligrams per litre (mg/l) determined on a shaken sample, in sewage received for treatment at the Sewerage Undertaker's works as determined by the Sewerage Undertaker for the purposes of the year of charge.

S = The amount determined by the Sewerage Undertaker as the average cost to the Sewerage Undertaker for the year of charge, of primary sludge treatment and disposal of one cubic metre of sewage at the Sewerage Undertaker's sewage treatment works.

2. Minimum charge for small volumes:
Where the product of the volume of trade effluent in cubic metres and the unit charge calculated from the above formula is less than the minimum charge determined by the Sewerage Undertaker for the year of charge, then that minimum charge shall be paid.

3 The Sewerage Undertaker will notify the occupier of the premises from which trade effluent is discharged of the factors in the above formula, on which the Sewerage Undertaker's trade effluent charges will be based for each year of charge, prior to 1 April in any year.

APPENDIX IV

Consent No **001651V**
Direction No **0005**

OFFENCES

Water Industry Act 1991
Your attention is drawn to the provisions of the following Sections:-

Section 121 of the Water Industry Act 1991, which provides interalia that the occupier of the premises from which trade effluent is discharged in contravention of any condition imposed on a consent shall be guilty of an offence and be liable on summary conviction to a fine not exceeding the statutory maximum or on conviction on indictment, to a fine.

Section 111 of the Water Industry Act 1991, the effect of which is given here below, in relation to a discharge of trade effluent which may not comply with either the description stated by the occupier in the trade effluent notice or with any condition in a consent or direction issued under the Act:-

1. No person shall throw, empty or turn, or suffer or permit to be thrown or emptied or to pass, into any public sewer, or into any drain or sewer communicating with a public sewer:
   (a) Any matter likely to injure the sewer or drain, or to interfere with the free flow of its contents, or to affect prejudicially the treatment and disposal of its contents; or
   (b) Any chemical refuse or waste steam, or any liquid of a temperature higher than one hundred and ten degrees Fahrenheit, being refuse or steam which, or a liquid which when so heated, is, either alone or in combination with the contents of the sewer or drain, dangerous, or the cause of a nuisance, or prejudicial to health; or
   (c) Any petroleum spirit, or carbide of calcium.

2. A person who contravenes any of the provisions of this Section shall be liable:
   (a) On summary conviction to a fine not exceeding the Statutory maximum and to a further fine not exceeding £50 for each day on which the offence continues after conviction;
   (b) On conviction on indictment, to imprisonment for a term not exceeding two years or a fine or both.

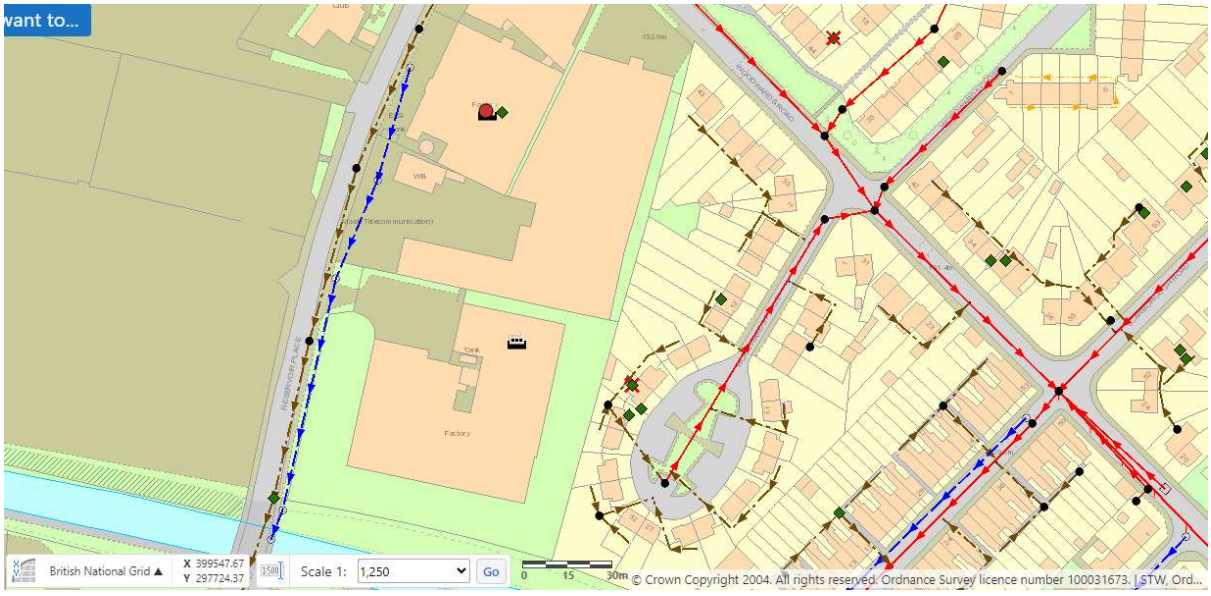
3. In respect of the imposition of a daily penalty;
   (a) the Court may fix a reasonable date from the date of conviction for compliance with any directions given by the Court; and
   (b) where a Court has fixed such a period, the daily penalty shall not be imposed in respect of any day before the end of that period.

4. In this section the expression "petroleum spirit" means any such:
   (a) Crude petroleum
   (b) Oil made from petroleum, or from coal, shale, peat or other bituminous substances; or
   (c) Product of petroleum or mixture containing petroleum, as, when tested in the manner prescribed by or under the Petroleum (Consolidation) Act, 1928, gives off an inflammable vapour at a temperature of less than seventy three degrees Fahrenheit.

APPENDIX B

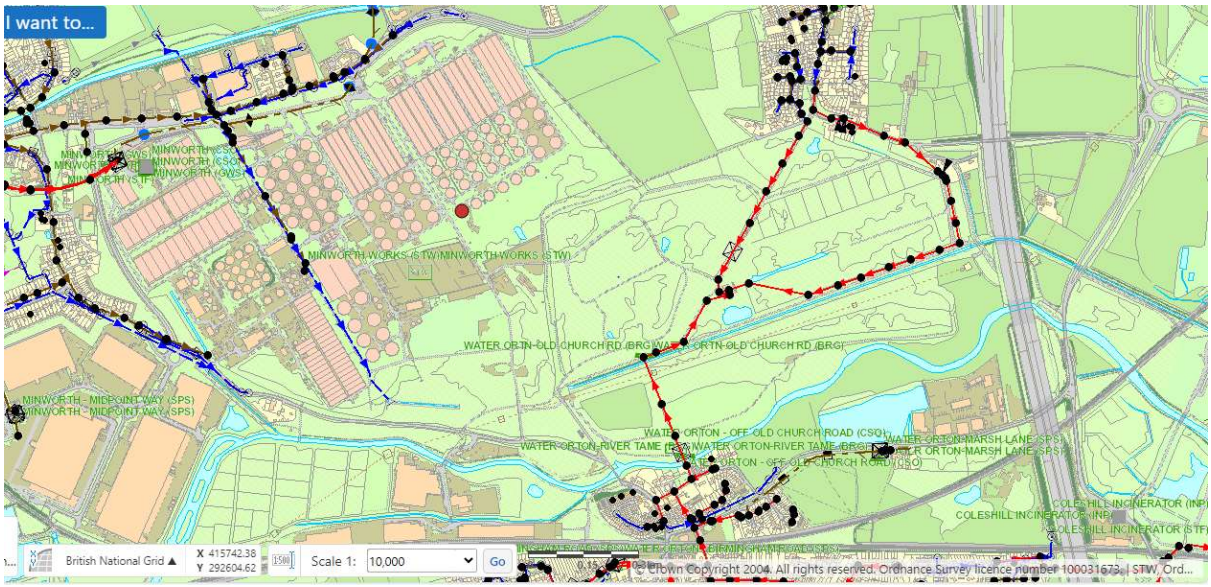
Sewer treatment and discharge locations

a) Location of the nearest public or private foul sewer to the Anochrome Limited site – This would be on Reservoir Place. The brown line is the public foul sewer, and this is where you connect in for your trade effluent which comes to our sewage works . The blue line is the surface water sewer that goes to the canal. – see map below. To determine the exact point of entry, you would need to do a die trace.



b) Location of the receiving sewage works for the effluent from Anochrome Limited – Minworth Sewage Treatment Works, Kingsbury Road, Sutton Coldfield, B76 9DJ

c) Location of the receiving watercourse for treated water from the receiving sewage works – The receiving watercourse is the River Tame, see map below.



APPENDIX C

Assessment source data

Data	Source	Comment
Concentrations of contaminants of concern	Anochrome data set (below) Sewage reduction factor - https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit	Contaminant concentrations following effluent treatment system, between 28 and 36 results. Input contaminant concentrations in the 'Receiving water bodies and release point' section of H1 assessment were calculated from Anochrome data set (below) using Environment Agency (EA) Sewage Reduction factor as downloaded from their EA guidance, due to a bug in Version 7.4 not taking into account sewage reduction factor in calculations. LODs were taken as full concentrations, i.e. not halved for statistical purposes based on EA guidance for calculating sewage reduction factor.
Q95 receiving river	https://nrfa.ceh.ac.uk/data/station/meanflow/28003	Receiving river Tame at Water Orton following treatment and discharge from Minsworth sewage treatment works operated by Severn Trent
Effluent flow rates	Anochrome data	Flow meter data from Anochrome effluent treatment plant
Sewage reduction factor	https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit	Downloaded from EA site
Upstream background data	https://environment.data.gov.uk/water-quality/view/sampling-point/MD-59012815	Data provided from monitoring point at R Tame Timet Uk Ltd 100 M Ds Brookvale Rd. Only concentrations for lead and nickel were available
	https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit	Half the EQS concentration was used based on EA guidance.

	Date:	17/02/2016	21/04/2016	27/06/2016	15/02/2017	10/05/2017	21/07/2017	10/10/2017	24/11/2017	20/02/2018	19/04/2018	11/12/2018	03/04/2019	24/06/2019	15/08/2019
Determinand	**Consent Limits**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**
Suspended Solids (mg/l)	IM 0:400		19.3			11.7		23			51.7	13			12
Chromium (total) as Cr (mg/l)	IM 0: 5	0.527	0.579	0.148	0.39	0.176	0.248	0.303	0.185	0.533	1.49	0.33	0.73	0.12	0.071
Chromium in filtrate as Cr (mg Cr/l)															
Copper (total) as Cu (mg/l)	IM 0: 2	0.0532	0.0355	0.078	0.0485	0.0383	0.0381	0.0205	0.0303	0.0437	0.0331	0.046	0.035	0.078	0.033
Copper in filtrate as Cu (mg Cu/l)															
Lead (total) as Pb (mg/l)		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0003	0.0006	<0.0003	<0.0003
Lead in filtrate as Pb (mg Pb/l)															
Nickel (total) as Ni (mg/l)	IM 0: 5	0.53	0.582	0.871	1.09	0.859	0.591	0.405	0.587	0.382	0.233	0.23	0.16	1.6	0.44
Nickel in filtrate as Ni (mg Ni/l)															
Zinc (total) as Zn (mg/l)	IM 0: 10	8.08	10.3	3.03	6.85	1.68	5.12	5.99	3.88	3.1	6.5	4.7	3.5	4.8	1.7
Zinc in filtrate as Zn (mg Zn/l)															
Phosphorus (total) AS P (mg/l)	IM 0: 25	0.522	0.546	0.136	0.462	0.168	0.255	0.32	0.451	0.206	0.587	0.25	0.37	0.13	0.34
Selenium as mg Se/l															
Cyanide excluding iron cyanide (mg/l)	IM 0: 10	0.767		1.74	1.63		0.639	0.0847	1.32	0.567	0.274		0.081	2.1	
COD 1h settled (mg/l)			171			122					143	105			107
PH	IM 6: 12	10.2	10.5	10.5	9.6	9.6	9.8	9.6	10	9.2	10	10	10	9.7	10

	Date:	24/10/2019	21/11/2019	14/01/2020	05/03/2020	27/05/2020	07/12/2020	19/01/2021	12/04/2021	04/05/2021	02/06/2021	12/08/2021	30/09/2021	04/04/2022	18/05/2022
Determinand	**Consent Limits**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**
Suspended Solids (mg/l)	IM 0:400		22			8				13			4		6
Chromium (total) as Cr (mg/l)	IM 0: 5	0.42	0.37	1.07	0.61	0.16	0.13	0.29	0.14	0.055	0.029	0.029	0.13	0.3	0.039
Chromium in filtrate as Cr (mg Cr/l)															0.012
Copper (total) as Cu (mg/l)	IM 0: 2	0.062	0.021	0.042	0.013	0.01	0.012	0.02	0.025	0.065	0.053	0.026	0.027	0.011	0.027
Copper in filtrate as Cu (mg Cu/l)															0.025
Lead (total) as Pb (mg/l)		0.0003	<0.0003	0.0009	<0.0003	0.0005	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.003	<0.0003	<0.0003
Lead in filtrate as Pb (mg Pb/l)															<0.0003
Nickel (total) as Ni (mg/l)	IM 0: 5	1.7	0.94	0.5	0.084	0.33	1.3	0.85	0.91	1.2	1.3	0.66	0.62	0.4	1.1
Nickel in filtrate as Ni (mg Ni/l)															1.1
Zinc (total) as Zn (mg/l)	IM 0: 10	3	5.9	12.5	2.2	1.8	8.1	2.3	1.8	3	0.84	0.79	4.5	1.6	1.4
Zinc in filtrate as Zn (mg Zn/l)															0.81
Phosphorus (total) AS P (mg/l)	IM 0: 25	0.22	0.82	1.4	1	0.39	0.18	0.23		0.17	0.18	0.078	0.28	0.2	
Selenium as mg Se/l									<0.0006						
Cyanide excluding iron cyanide (mg/l)	IM 0: 10	2.1		0.552	0.146	0.125	0.256	1.1	0.13	0.57	1.6	0.585	3.6		1.1
COD 1h settled (mg/l)			129							112			89		117
PH	IM 6: 12	10	10.7	1	10.6	9.5	7.8	9	9.2	9.8	9.1	9.1	10.5	11	10.3

	Date:	12/09/2022	10/08/2023	03/10/2023	04/01/2024	07/02/2024	23/04/2024	28/06/2024	20/08/2024
Determinand	**Consent Limits**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**	**Result Value**
Suspended Solids (mg/l)	IM 0:400			20			11		
Chromium (total) as Cr (mg/l)	IM 0: 5	0.39	0.24	0.26	0.42	0.585	0.715	0.171	0.874
Chromium in filtrate as Cr (mg Cr/l)		0.21	0.073	0.046	0.27	0.163	0.124	0.0452	0.121
Copper (total) as Cu (mg/l)	IM 0: 2	0.0046	0.027	0.023	0.014	0.0172	0.0141	0.0291	0.0228
Copper in filtrate as Cu (mg Cu/l)		<0.004	0.026	0.024	0.013	0.016	0.014	0.03	0.022
Lead (total) as Pb (mg/l)		<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	0.0004
Lead in filtrate as Pb (mg Pb/l)		<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Nickel (total) as Ni (mg/l)	IM 0: 5	0.084	0.15	0.29	0.029	0.082	0.075	0.212	0.195
Nickel in filtrate as Ni (mg Ni/l)		0.019	0.093	0.18	0.013	0.04	0.018	0.17	0.119
Zinc (total) as Zn (mg/l)	IM 0: 10	2.3	0.92	4.9	0.86	3.14	3.48	4.16	2.97
Zinc in filtrate as Zn (mg Zn/l)		0.35	0.26	0.27	0.14	0.768	0.922	1.81	0.687
Phosphorus (total) AS P (mg/l)	IM 0: 25	0.19		0.6		0.567	0.188	0.224	
Selenium as mg Se/l									
Cyanide excluding iron cyanide (mg/l)	IM 0: 10	0.052			0.071	0.092	0.027	0.267	0.094
COD 1h settled (mg/l)				115			67		
PH	IM 6: 12	10	9.3	9.3	11.3	11.5	11.6	11.5	11.2

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

Information on Sewage reduction factor downloaded from EA website.

Substance	Percentage removal rate of substance by activated sludge plant	Percentage removal rate of substance by water filter	Percentage volatilised	STRF (proportion remaining) in activated sludge plant	STRF (proportion remaining) for water filter	STRF (proportion remaining) after volatilisation
Chromium and compounds - as Cr	84	48	-	0.16	0.52	
Copper (total)	79	79		0.21	0.21	
Cyanides - as CN	68	68	-	0.32	0.32	-
Lead (total)	83	83	-	0.17	0.17	-
Nickel (total)	24	24	-	0.76	0.76	-
Zinc (total)	67	67		0.33	0.33	

Substance	Anochrome Average conc (ug/l)	Average incl. sewer factor for V7	Anochrome Maximum conc (ug/l)	Incl sewer factor for V7
Chromium III (95%ile) (dissolved)	368.25	191.49	1490.00	774.8
Copper	32.69	6.87	78.00	16.38
Lead and its compounds	1.71	0.29	5.00	0.85
Nickel and its compounds	599.19	455.39	1700.00	1292
Cyanide	773.92	247.65	3600.00	1152
Zinc	3935.83	1298.83	12500.00	4125
Cyanide (new treatment)	518.52	165.93	2412.00	771.84

APPENDIX D

H1 Assessment

Main

Enter your information in the relevant cells. Click the "Enter" key of your keyboard to go to the next field.
Select your sector from the dropdown menu

If your sector is not listed then leave this section blank

Facility reference information

Company name:	Anochrome
Location:	Reervoir Road, Walsall, WS2 9RZ
Permit number:	EPR/BN0112IN
Sector:	Non ferrous Metals Industries
Authorising Body:	Environment Agency

Describe the objectives

Depending on the reason for the assessment you will need to complete different parts of the tools

Select the type of assessment:

Environmental assessment of the releases resulting from the facility as a whole

Air	Water	Energy	Raw materials	Waste
No	Yes	No	No	No

Please select whether you have releases in the dropdown menus above

Activities	
1	Discharge to sewer
2	
3	
4	
5	
6	
7	
8	
9	
10	

Identify relevant impacts

If the impacts are not relevant, please select 'No' and justify your omission

You will be able to go back to this page if you click on the 'Identify' button in each of the assessments.

1:Env Assmt

Releases?		Test Impact?	Justification for omission?	Go to Input ..	Go to Test ..
No	Air	No	No release to air		
No	Deposition from air to land	No	No release to air		
Yes	Water	Yes	Discharge to sewer		
No	Waste	No	No release of waste		
No	Visual	No	No visual impact		
	Ozone creation	No			
	Global warming	No			
	BAT-AEL test	No			
	Performance indicators	No			

Receiving water bodies and release points | 2 of 24 | Main | Objectives | Environment | Output Tables | Reference

First | < | > | Last | Air | Water

1. Add release point details in the top table

2. In the lower table, select release point in the 1st column and fill in substance details

Users inputs are shaded in light blue and dropdown menu in yellow.

User input

Formula/calculation

Dropdown menu

Users inputs are shaded in #VALUE!

Environmental Assessment

Add release point | Delete selected row | Copy selected row | Paste row in selected location | Clear the information of selected row

0.015

1	Release point code	Discharge category	Description	Freshwater Q95 flowrate (m3/s)	Location	Via sewer?	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Assessment method
	R Tame at WO	R	sewage discharge poiht	2.068	R Tame at Water C	Yes	0.00225	0.015	Flow meter

Add Substance | Delete Selected Row

Select pollutant from the dropdown menu. Do the same for all other tables and substances within the table

7	Release Point Code	Substance	Measurement method	Operating mode (%)	Average conc (ug/l)	Measurement basis avg	Maximum conc (ug/l)	Measurement basis max	Annual rate (kg/yr)	Significant load (PHS only)	Sewer factor	Mean Eff flow Rate (m3/s)
	R Tame at WO	Cyanide	Spot	100%	247.65	28 readings	1152	Almost monthly	17.5722534	0		0.00225
	R Tame at WO	Chromium III (95%ile) (dissolved)	Spot	100%	191.49	36 readings	774.8	Monthly	13.58736444	0		0.00225
	R Tame at WO	Copper	Spot	100%	6.87	36 readings	16.38	Monthly	0.48746772	0		0.00225
	R Tame at WO	Nickel and its compounds	Spot	100%	455.39	36 readings	1292	Monthly	32.31265284	0		0.00225
	R Tame at WO	Lead and its compounds	Spot	100%	0.29	36 readings	0.85	Monthly	0.02057724	0		0.00225
	R Tame at WO	Zinc	Spot	100%	1298.8	36 readings	4125	Monthly	92.1576528	0		0.00225
	R Tame at WO	Cyanide	Spot	100%	165.93	36 readings, 33%	771.84	Monthly	11.77372908	0		0.00225

Freshwater - Test 1

1. Click on the "screening 1" button to run screening test 1. If you modify anything from the Input table (Receiving water bodies and release points), please rerun the test.

2. Add comments to the last column ("comments") of the table if relevant.

User input

Formula/calculation

Tests

Environmental Assessment

Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Release point	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Sewer factor (%)	Substance	Release conc (ug/l)	Annual EQS (ug/l)	Test 1: Release conc <10% EQS avg	Max release conc (ug/l)	MAC (ug/l)	Test: Release conc <10% EQS max	Comments
R	sewage discharge poiht	2.068	R Tame at WO	0.00225	0.015	0	Cyanide	247.65	1	Fail	1152	5	Fail	
R	sewage discharge poiht	2.068	R Tame at WO	0.00225	0.015	0	Chromium III (95%ile) (dissolved)	191.49	4.7	Fail	774.8	32	Fail	
R	sewage discharge poiht	2.068	R Tame at WO	0.00225	0.015	0	Copper	6.87	1	Fail	16.38	0	N/A	
R	sewage discharge poiht	2.068	R Tame at WO	0.00225	0.015	0	Nickel and its compounds	455.39	4	Fail	1292	34	Fail	
R	sewage discharge poiht	2.068	R Tame at WO	0.00225	0.015	0	Lead and its compounds	0.29	1.2	Fail	0.85	14	Pass	
R	sewage discharge poiht	2.068	R Tame at WO	0.00225	0.015	0	Zinc	1298.8	10.9	Fail	4125	0	N/A	
R	sewage discharge poiht	2.068	R Tame at WO	0.00225	0.015	0	Cyanide	165.93	1	Fail	771.84	5	Fail	

Freshwater - Tests 3, 4a and 4b

1. Click on the "screening 3" button to run screening test 3.

2. If you modify anything from the Input table (Receiving water bodies and release points), please rerun screening test 1 and then 2 and 3.

3. Add the background concentration.

User input

Formula/calculation

Tests

Environmental Assessment

Type of water body	Description	Freshwater Q95 flowrate (m3/s)	Release point	Mean effluent flow rate (m3/s)	Max effluent flow rate (m3/s)	Substance	Release conc (ug/l)	Max release conc (ug/l)	Background conc (ug/l)	PC (ug/l)	PEC (ug/l)	Annual EQS (ug/l)	(PEC-BC)/EQS	Test 3 - (PEC-BC)/EQS>10% annual EQS	%PEC EQS %	Test 4a - PEC >100% EQS	MAC EQS	PC (max) (ug/l)	PEC Max (ug/l)	PEC of MAC	Test 4b: PEC>100% MAC
R	sewage discharge poir	2.068	R Tame at WO	0.00225	0.015	Cyanide	247.65	1152	0.5	0.26915	0.769152	1	0.26915228	fail	77%	pass	5	8.295727	8.7957273	1.75914546	fail
R	sewage discharge poir	2.068	R Tame at WO	0.00225	0.015	Chromium III (95%ile) (dissolved)	191.49	774.8	2.35	0.20812	2.558116	4.7	0.04428004	pass	54%	pass	32	5.579453	7.9294527	0.2477954	pass
R	sewage discharge poir	2.068	R Tame at WO	0.00225	0.015	Nickel and its compounds	455.39	1292	3.2	0.49493	3.694929	4	0.12373234	fail	92%	pass	34	9.303889	12.503889	0.36776143	pass
R	sewage discharge poir	2.068	R Tame at WO	0.00225	0.015	Zinc	1298.8	4125	5.45	1.41157	6.861569	10.9	0.12950171	fail	63%	pass	0	29.70475	35.154753		pass
R	sewage discharge poir	2.068	R Tame at WO	0.00225	0.015	Cyanide	165.93	771.84	0.5	0.18034	0.680337	1	0.18033692	fail	68%	pass	5	5.558137	6.0581373	1.21162746	fail

Results of the air and water assessments

Clic
fail
tabl

Air

Option	Substance	Test 1	Test 2

Freshwater

Option	Type of water body	Release point code	Substance	Freshwater test 1	Freshwater test 2	Freshwater test 3	Freshwater test 4a	Freshwater test 4b
1	R	R Tame at WO	Cyanide	Fail	Fail	Fail	Pass	Fail
1	R	R Tame at WO	Chromium III (95%ile) (dissolved)	Fail	Fail	Pass	Pass	Pass
1	R	R Tame at WO	Copper	Fail	Pass			
1	R	R Tame at WO	Nickel and its compounds	Fail	Fail	Fail	Pass	Pass
1	R	R Tame at WO	Lead and its compounds	Fail	Pass			
1	R	R Tame at WO	Zinc	Fail	Fail	Fail	Pass	Pass