Department for Environment Food & Rural Affairs

Llywodraeth Cymru
Welsh Government

Cyfoeth Naturiol Cymru
Natural Resources Wales

Environment Agency

Proposed Inventory of Emissions, Discharges and Losses of Substances, and Chemical Analysis Information

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1.0 Introduction to this document

The Environmental Quality Standards Directive (2008/105/EC) (as amended by Directive 2013/39/EU) is a 'daughter directive' of the WFD that has subsequently specified the assessment, reporting, and objectives required for Chemical Status. The inventory of emissions, discharges and losses of priority substances and pollutants is required to be reported under the Environmental Quality Standards Directive (2008/105/EC). It includes diffuse and direct discharges in each of the Dee and Western Wales River Basin Districts for each chemical for which data is available. The inventory will be used to verify that emissions, discharges and losses are making progress towards reduction or cessation objectives for chemicals listed under the Directive.

The emissions inventory for the Severn River Basin District can be viewed at https://ea.sharefile.com/d-sab675d1e4d74e5e8

The chemical analysis information is required by the Priority Substances Directive (2013/39/EU) to present the limits of quantification of the methods of analysis applied.

2.0. Methodology used to derive the inventory of emissions, discharges and losses of priority substances and pollutants.

Riverine point source loads were calculated for each chemical using pollution inventory data, which is based on annual loads reported by operators, for emissions to rivers and estuaries. Marine direct discharges were calculated for each chemical using the pollution inventory for emissions to coastal waters. Data for the 2010 Pollution Inventory were used.

Total riverine loads were calculated using flow data multiplied by measured concentrations for the lowest monitoring point in a catchment. Where there were limited monitoring data for a particular chemical at the bottom of a catchment, data from an upstream site were used. Flow data was specific to the location of the sample point used. Data from 2009 to 2012 were used to increase the number of chemicals for which there were data. Results that were less that the detection limit were taken at face value.

Diffuse riverine inputs were calculated by subtracting the riverine point source loads from the total riverine loads for each chemical.

Whilst all efforts have been made to provide as accurate inventory as possible the following considerations should be acknowledged when using this data:

- Though this inventory provides a baseline, it should be recognised that as we collect more data the baseline may change.
- In some cases environmental monitoring data was limited and therefore we were unable to estimate diffuse loads.
- Environmental monitoring data contain (both flow and chemical monitoring) inherent variability, which will have a direct input on the diffuse source calculations.
- Many substances have a tendency to partition into sediment and biota. We have not taken this into account in our load estimates.
- Methods for collecting and reporting data for some chemicals have differed between the Pollution Inventory and environmental monitoring, and direct comparisons cannot always be made between these data sets which can limit the reporting.

3.1. Inventory of emissions, discharges and losses of priority substances and pollutants - Dee River Basin District.

Substance	Riverine point source load kg/yr	Riverine diffuse load kg/yr	Total point source load kg/yr	Total load kg/yr
Anthracene	0.24	NM	0.24	0.24
Atrazine	0.00	0.47	0.00	0.47
Brominated diphenylethers - penta-, octa- and deca- BDE	0.18	NM	0.18	0.18
Cadmium	4.00	15.10	4.00	19.10
Cyclodiene pesticide - Aldrin, Dieldrin, Endrin & Isodrin	0.00	0.00015	0.00	0.00015
DDT para-para	0.00	0.18	0.00	0.18
Di(2-ethylhexyl)phthalate (DEHP)	136.54	NM[1]	136.54	136.54
Diuron	3.06	0.00	3.06	3.06
Fluoranthene	0.00	2.38	0.00	2.38
Lead	0.00	301.96	0.00	301.96
Mercury	0.16	2.09	0.16	2.25
Nickel	73.60	202.02	73.60	275.62
Nonylphenols	2.70	NM[1]	2.70	2.70
Polycyclic Aromatic Hydrocarbons[2]	NR 2010[3]	3.19	NR 2010[3]	3.19
Pentachlorophenol (PCP)	0.23	0.00	0.23	0.23
Simazine	0.00	2.62	0.00	2.62
Tributyltin and compounds - as TBT	0.06	0.11	0.06	0.17
Trichloromethane	0.00	24.64	0.00	24.64

1 – There are no suitable monitoring data for this reporting period
2 - Polycyclic Aromatic Hydrocarbons (PAHs) is the sum of benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(123-cd)pyrene
3 - PAHs were reported by a different metric in 2010 – Borneff 6 – which is not directly comparable with current reporting requirements

3.2. Inventory of emissions, discharges and losses of priority substances and pollutants - Western Wales River Basin District.

Substance Name	Riverine point source load kg/yr	Riverine diffuse load kg/yr	Marine direct discharge load kg/yr	Total point source load kg/yr	Total load kg/yr
1,2-dichlorethane	0.00	57.30	0.00	0.00	57.30
Anthracene	1.05		2.88	3.93	3.93
Atrazine	0.00	2.72	0.00	0.00	2.72
Benzene	0.00	40.65	23.70	23.70	64.35
Brominated diphenylethers - penta-, octa- and deca- BDE	0.66	NM[1]	1.07	1.73	1.73
Cadmium	2.75	440.28	57.67	60.42	500.71
Carbon tetrachloride	0.00	9.43	0.00	0.00	9.43
Chlorfenvinphos	0.00	4.37	0.00	0.00	4.37
Cyclodiene pesticide - Aldrin, Dieldrin, Endrin & Isodrin	NR 2010	0.03	0.00	0.00	0.03
Cypermethrin	0.00	1.09	0.00	0.00	1.09
DDT para-para	0.00	1.87	0.00	0.00	1.87
DDT total	0.00	0.43	0.00	0.00	0.43
Di(2-ethylhexyl)phthalate (DEHP)	281.09	NM[1]	455.98	737.07	737.07
Dichloromethane	0.00	2149.09	0.00	0.00	2149.09
Dichlorvos	0.00	4.94	0.00	0.00	4.94
Diuron	5.45	0.00	8.28	13.73	13.73
Endosulfan	NR 2010[2]	0.00017	NR 2010[2]	NR 2010[2]	0.00017
Fluoranthene	0.00	19.68	0.00	0.00	19.68
Hexachlorobenzene	0.00	0.03	0.00	0.00	0.03
Hexachlorobutadiene	0.00	0.10	0.00	0.00	0.10
Hexachlorocyclohexane	0.00	0.00016	0.00	0.00	0.00016
Isoproturon	0.00	0.58	0.00	0.00	0.58
Lead	0.00	5171.24	1283.70	1283.70	6454.94
Mercury	0.54	17.87	51.98	52.52	70.39
Naphthalene	NR 2010[3]	5.41	12.50	12.50	17.91
Nickel	1272.00	9735.89	782.30	2054.30	11790.19
Nonylphenols	11.50	81.83	16.23	27.73	109.56
Octylphenol	0.00	6.56	0.00	0.00	6.56
Polycyclic Aromatic Hydrocarbons[4]	NR 2010[5]	26.41	NR 2010[5]	NR 2010[5]	26.41
Pentachlorophenol	0.00	1.56	0.00	0.00	1.56

Substance Name	Riverine point source load kg/yr	Riverine diffuse load kg/yr	Marine direct discharge load kg/yr	Total point source load kg/yr	Total load kg/yr
Simazine	NR 2010[2]	1.80	NR 2010[2]	NR 2010[2]	1.80
Tetrachloroethylene	0.00	9.58	0.00	0.00	9.58
Tributyltin and compounds - as TBT	0.25	0.70	0.23	0.48	1.18
Trichlorobenzenes	0.00	0.000078	0.00	0.00	0.000078
Trichloroethylene	0.00	64.14	0.00	0.00	64.14
Trichloromethane	NR 2010[2]	45.62	NR 2010[2]	NR 2010[2]	45.62
Trifluralin	NR 2010[2]	5.21	NR 2010[2]	NR 2010[2]	5.21

Notes

1 – There are no suitable monitoring data for this reporting period

2 - No Pollution Inventory information was reported for this substance for 2010 but emissions have been reported in later years

3 - No Pollution Inventory information was reported for water industry discharges for this substance for 2010 but emissions have been reported in later years

4 – Polycyclic Aromatic Hydrocarbons (PAHs) is the sum of benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene and indeno(123-cd)pyrene

5 – PAHs were reported by a different metric in 2010 – Borneff 6 – which is not directly comparable with current reporting requirements

4.0 Chemical analysis information.

The analytical data below is for analyses completed by, or on behalf of, Natural Resources Wales. Note that analytical development is an ongoing process and this the table reflects the capability at a point in time.

Substance	Matrix (Both = freshwater (f/w) and saline)	LoQ	Units	Quality Control Standard Concentration	Quality control performance (± 2*sd) Actual%RSD
1,2-dichloroethane	Both	0.2	μgl^{-1}	1.00	3.04
Aldrin	Both	0.0004	μgl^{-1}	0.025	8.73
Anthracene	Both	0.006	μgl^{-1}	0.025	8.36
Atrazine	Both	0.004	μgl^{-1}	0.025	5.95
Benzene	Both	0.2	μgl^{-1}	1.00	4.72
Benzo(a)pyrene	Both	0.0005	μgl^{-1}	0.025	4.81
Benzo(b)fluoranthene)	Both	0.0003	μgl^{-1}	0.025	8.43
Benzo(g,h,i)perylene	Both	0.002	μgl^{-1}	0.025	5.67
Benzo(k)fluoranthene	Both	0.0004	μgl^{-1}	0.025	7.33
Cadmium (Dissolved)	f/w	0.02	μgl^{-1}	1.00	2.34
Cadmium (Dissolved)	Saline	0.07	μgl^{-1}	0.4	6.96
Carbontetrachloride (tetrachloromethane)	Both	0.2	μgl^{-1}	1.00	5.44
Chlorfenvinphos	Both	0.0004	μgl^{-1}	0.025	6.38
Chlorpyrifos (Chlorpyrifos-ethyl)	Both	0.0003	μgl^{-1}	0.025	5.12
DDT ‘pp	Both	0.0002	μgl^{-1}	0.025	4.96
DEHP (Di(2-ethylhexyl)phthalate)	Both	0.4	μgl^{-1}	5	35.76
Dichloromethane	Both	0.2	μgl^{-1}	1.00	9.68
Diuron	Both	0.011	μgl^{-1}	0.1	5.74
Endosulfan (A)	Both	0.0002	μgl^{-1}	0.025	7.54
Endosulfan B)	Both	0.0004	μgl^{-1}	0.025	9.14
Endrin	Both	0.0002	μgl^{-1}	0.025	9.93
Fluoranthene	Both	0.0009	μgl^{-1}	0.025	8.27
Hexachlorobenzene (HCB)	Both	0.0004	μgl^{-1}	0.025	5.21

Hexachlorobutadiene (HCBD)	Both	0.002	μgl^{-1}	0.025	10.14
Hexachlorocyclohexane (HCH) - alpha	Both	0.0003	μgl^{-1}	0.025	2.78
Hexachlorocyclohexane (HCH) – beta	Both	0.0005	μgl^{-1}	0.025	8.51
Hexachlorocyclohexane (HCH) – delta	Both	0.0002	μgl^{-1}	0.025	10.72
Hexachlorocyclohexane (HCH) – eplison	Both	0.0006	μgl^{-1}	0.025	10.00
Hexachlorocyclohexane (HCH) - gamma	Both	0.0005	μgl^{-1}	0.025	4.39
Indeno(1,2,3-cd)pyrene	Both	0.0003	μgl^{-1}	0.025	7.26
Isodrin	Both	0.003	μgl^{-1}	0.025	8.68
Isoproturon	Both	0.011	μgl^{-1}	0.1	6.89
Lead (dissolved)	f/w	0.2	μgl^{-1}	10	2.37
Lead (dissolved)	Saline	0.3	μgl^{-1}	0.4	13.32
Mercury (dissolved)	Both	0.03	μgl^{-1}	0.08	3.91
Naphthalene	Both	0.003	μgl^{-1}	1.0	3.74
Nickel (Dissolved)	f/w	1	μgl^{-1}	10	2.49
Nickel (Dissolved)	Saline	1	μgl^{-1}	2.5	8.78
Nonylphenol 4-Nonylphenol Branched	Both	0.08	μgl^{-1}	0.08	45.46
Pentachlorophenol	f/w	0.02	μgl^{-1}	1.0	3.76
Simazine	Both	0.0005	μgl^{-1}	0.025	8.73
Tetrachloroethylene	Both	0.2	μgl^{-1}	1.00	5.40
Trichlorobenzenes – 123	Both	0.003	μgl^{-1}	0.025	7.89
Trichlorobenzenes – 124	Both	0.003	μgl^{-1}	0.025	7.51
Trichlorobenzenes - 135	Both	0.003	μgl^{-1}	0.025	8.76
Trichloroethylene	Both	0.2	μgl^{-1}	1.00	4.60
Trichloromethane (chloroform)	Both	0.2	μgl^{-1}	1.00	3.39
Trifluralin	Both	0.0003	μgl^{-1}	0.025	1.29
PBDE 28	Biota	0.001	$mgkg^{-1}$	0.00209	2.87
PBDE 47	Biota	0.001	$mgkg^{-1}$	0.00212	8.49
PBDE 99	Biota	0.001	$mgkg^{-1}$	0.00213	4.69
PBDE 100	Biota	0.001	$mgkg^{-1}$	0.00164	1.83

PBDE 153	Biota	0.001	$mgkg^{-1}$	0.00205	8.78
PBDE 154	Biota	0.001	$mgkg^{-1}$	0.00200	3.00
Mercury	Biota	0.001	$mgkg^{-1}$	0.113	0.81
Benzo(a)pyrene	Biota	0.0005	$mgkg^{-1}$	0.25	9.34
Flouranthene	Biota	0.0007	$mgkg^{-1}$	0.25	8.06

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