Water Use

Supporting Guidance (WAT-SG-05)

Point Source Discharge Constituents

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Update Summary

Version	Description
v1.0	First issue for Water Use reference using approved content from the following documents: *Point Source Discharge Constituents.doc*
v2.0	*Consent* renamed *Licence*, New base template applied, links to docs revised for new SEPA website, Nov 2008
v3.0	Expired CMS links reviewed and updated.
v4.0	Revised to reflect the *Standards Directions 2014*. Section 3 updated, List of Substances now available as standalone table

Notes

References: Linked references to other documents have been disabled in this web version of the document. See the References section for details of all referenced documents.

Printing the Document: This document is uncontrolled if printed and is only intended to be viewed online.

If you do need to print the document, the best results are achieved using Booklet printing or else double-sided, Duplex (2-on-1) A4 printing (both four pages per A4 sheet).

Always refer to the online document for accurate and up-to-date information.

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1. Key Points

The purpose of this document is to provide a reference document for SEPA staff on the pollutants to consider when authorising a discharge. This does not remove the need for the discharger to inform SEPA of the constituents within the discharge however it does provide a checklist for staff which includes priority substances (PS) and priority hazardous substances (PHS).

More detailed documents for some sectors are listed in the references column of Table 1 and the intention is to write documents for each sector which provides greater detail.

In addition Table 2 is intended as a guide on the levels to expect of certain parameters in effluents and in the environment.

The information has been collated from existing guidance and licences with info on PS and PHS provided by WFD Chemistry.

2. Potential Discharge Constituents

Table 1 Potential Constituents Listed by Discharge Type

Sector	Possible Constituents	Potential Constituents (WFD PHS/PS)	References
Potable Water			
WTW Backwash	pH, aluminium/polyelectrolyte residuals, iron. Granulated active carbon residues from the commissioning of granular active carbon plants		*WAT-RM-12*
Service Reservoir Overflow	Chlorine, high flows		*WAT-RM-12*
Service Reservoir Cleaning	Chlorine, ss,		*WAT-RM-12*
Service Reservoir Scour Water	Chlorine, ss,		*WAT-RM-12*
Sludge Settlement Overflow	pH, aluminium/polyelectrolyte residuals, iron		*WAT-RM-12*
Sewage			
STW/CSO/SWO	BOD, ammonia, suspended solids, phosphorus, pH, hardness, total oxidised nitrogen, COD (UWWT), hydrocarbons, faecal coliforms, total coliforms, faecal streps. Also check Industries discharging to the sewerage network e.g. if dye works then copper may be in the final effluent	Trade effluent constituents, diffuse inputs - see industrial sources below.	
DEHP, PAHs, trace metals			
Septic Tanks	BOD, suspended solids, ammonia, phosphorus, faecal coliforms		
Fish Farms			
Tank			
Cage/Tank	Antifoulants, anaesthetics, antimicrobials, antiparasitics, disinfectants		*Fish Farm Manual*
Hatcheries	Antifoulants, anaesthetics, antimicrobials, antiparasitics, disinfectants		

Sector	Possible Constituents	Potential Constituents (WFD PHS/PS)	References
Surface Waters			
Airports	Hydrocarbons, ss, metals, antifreeze e.g. glycol (high BOD)		
Housing and industrial developments	Hydrocarbons, ss, metals, salt, faecal coliforms, other substances stored in industrial areas		*WAT-RM-08*
Industrial Effluents			
Cooling Water	High temperature, possible chemical additions	TBT	
Food Processing	pH, ss, BOD, ammonia		
Brewing Effluent	Copper, zinc, BOD or ammonia		
Distilling Effluent	Copper, zinc, lead, ammonia, suspended solids, BOD, pH		
Mine Water (coal)	Iron, ss, pH, trace metals, conductivity, sulphate, chloride, aluminium		
Open Cast Mine	Iron, suspended solids, polyelectrolyte residuals, pH, trace metals, oils, aluminium		
Open Cast Quarry	pH, aluminium, polyelectrolyte residuals, ss, oils		
Landfill Leachate	pH, ss, iron, ammonia, BOD	Indicative toxic metals, hydrocarbons, pesticides	
Shipyards/Dry Docks	ss, copper,	TBT, TPT, diuron, fluoranthene, anthracene, PAHs	Priority Substances by industry data sheet *
Plastics Industry		SCCP, nonylphenols, DEHP, chloroform, DCM, cadmium	Priority Substances by industry data sheet *
Wood & Wood Products	ss, COD	Anthracene, fluoranthene, naphthalene, PAHs, endosulfan, lindane, mercury, PCP, TBT, TCBs, dieldrin	Priority Substances by industry data sheet *

Sector	Possible Constituents	Potential Constituents (WFD PHS/PS)	References
Pulp, Paper & Printing	ph, BOD, COD, ammonia, ss	Cadmium, lead, nickel, mercury, PCP, TBT, DEHP, SCCP, Chloroform, nonylphenols, octylphenols	Sector Guidance Note IPPC S6.05 Priority Substances by industry data sheet**
Textiles, Leather & Apparel		PBDE, nonylphenols, endosulfan, lindane, chlorfenvinphos, chlorpyrifos, anthracene, SCCP, DEHP, PCP, TBT, TCB, chloroform, chrome 3	Sector Guidance Note IPPC S6.05
Chemicals	Depends on process		
Petroleum Products	Copper, zinc, iron, phenols, oils ah	Anthracene, fluoranthene, naphthalene, PAHs, benzene, nonylphenols, octylphenols, mercury, lead, SCCP	
Electricity Generation		Anthracene, naphthalene, PAHs, benzene, HCB, TBT (cooling waters), cadmium, mercury	
Metal & Metal Products	ph	SCCP, lead, cadmium, mercury, nickel, nonylphenols, anthracene, fluoranthene, naphthalene, PAHs, TCB, HCB, chloroform, DCM	
Electrical & Instrumentation		TCB, PBDE, nonylphenol, DEHP, mercury, nickel, lead, cadmium, anthracene, fluoranthene, PAHs, HCB	
Agriculture: Washing	BOD, ss, ammonia. , phosphate	pesticides	
Agriculture: Crop Application	Fertiliser, BOD, ammonia, phosphate, ss	pesticides	

* In draft, being developed by chemistry WFD
** Public Folders/all public/Departmental+Functional Issues/Science/Chemistry/WFD Issues/21 Priority Substances by Industry

3. WFD Substances

3.1 Definitions

3.1.1 Priority Substances / Priority Hazardous Substances

The European Commission has identified a list of Priority Substances (Directive 2013/39/EU) based on their toxicity, persistence and liability to bio-accumulate in the environment. This list will be reviewed by the Commission every four years and is divided into two categories (depending on the level of concern): Priority Substances and Priority Hazardous Substances

3.1.2 Specific Pollutants

In addition to the Priority Substances, Annex VIII of the Directive provides an indicative list of main pollutants to be considered as Specific Pollutants. Good ecological status also requires concentrations of Specific Pollutants to be below the EQS.

3.1.3 Certain Other Pollutants

This includes substances which have had EQS's established but are not considered a PS or PHS. These substances have been included in previous EU Directives, which have subsequently been repealed. These substances are still regulated to protect the water environment by meeting the EQS.

3.2 Environmental Quality Standards

Refer to *WAT-SG-53: Environmental Quality Standards and Standards for Discharges to Surface Waters* for the current EQS's. Where there is no EQS listed, the *Science Advice Helpdesk* can advise on the use of suitable standards.

4. Environment & Effluent Parameter Levels

Table 2 Indicative parameter levels in the environment and effluents

Parameter	Rivers	GW[a]	Sewage[b]	Trade[c]	
Dissolved Oxygen (D.O)	8- 15mg/l 80- 120%				Can be influenced by algae 150% during the day 0% at night
pH	6.5- 8.5	6.5- 7.5	6.5- 7.5	6.0- 9.0	Fisheries Directive 6.0- 9.0 Lower in peaty areas Can be affected by algae blooms increasing pH during the day
Conductivity	50- 1,000	50- 10,000	500- 2,000	500-10,000	Measure of dissolved salts
BOD (+ atu) Biochemical oxygen demand	1- 5 mg/l	1- 5 mg/l	5- 30 mg/l	5- 50 mg/l dependent on process	ATU suppresses nitrification. Usually controlled by licence
Suspended Solids	2- 30 mg/l rainfall dependent	1- 10 mg/l	10- 100 mg/l	10- 100 mg/l dependent on process	Usually controlled by licence
Ammoniacal Nitrogen (as N)	0.01-0.5 mg/l	0.01- 0.5 mg/l	1- 30 mg/l	0.1- 5.0 mg/l	Fisheries Directive < 0.78
Total Oxidised Nitrogen (TON)	0.5- 10 mg/l	0.5- 10 mg/l	0.1- 25 mg/l	0.1-5.0 mg/l	Measures nitrite (NO2) plus nitrate (NO3)- approx inversely proportional to ammonia in effluent
Chemical Oxygen Demand (COD)	5- 50 mg/l	5- 50 mg/l	50- 250 mg/l	50- 500mg/l	Total oxidisable potential usually 3 – 10x BOD
Hardness	20- 500 mg/l	20- 4000 mg/l	50-500 mg/l	50- 500 mg/l	Hardness can affect Toxicity of other contaminants (e.g. metals)

Notes:
[a] Groundwater
[b] Treated sewage effluent
[c] Trade effluent

Glossary of Abbreviations

Term	Description	PS/PHS*
BOD	Biochemical Oxygen Demand	
COD	Chemical Oxygen Demand	
DCM	Dichloromethane	PS
DEHP	Di(2-ethylhexyl)phthalate	PS
HCB	Hexachlorobenzene	PHS
PAHs	Polycyclic Aromatic Hydrocarbons	PHS
PBDE	Pentabromodiphenylether	PHS
PCP	Pentachlorophenol	PS
SCCP	Short chained chloroparaffins	PHS
SS	Suspended solids	
TBT	Tributyle Tin	PHS
TCB	Trichlorobenzene	PHS

References

NOTE: Linked references to other documents have been disabled in this web version of the document.

See the Water >Guidance pages of the SEPA website for Guidance and other documentation (*www.sepa.org.uk/water/water_regulation/guidance.aspx*).

All references to external documents are listed on this page along with an indicative URL to help locate the document. The full path is not provided as SEPA can not guarantee its future location.

Key Documents

- *WAT-RM-08: Regulation of Sustainable Urban Drainage Systems (SUDS)*
- *WAT-RM-12: Regulation of Discharges from Water Treatment Works*
- *WAT-SG-53: Environmental Quality Standards and Standards for Discharges to Surface Waters*

Other Useful Information

- *Fish Farm Manual* (www.sepa.org.uk)
- *Science Advice Helpdesk* (Intranet page)

Standards

- *Standards Directions 2014*
  - The Scotland River Basin District (Surface Water Typology, Environmental Standards, Condition Limits and Groundwater Threshold Values) Directions 2014
  - The Solway Tweed River Basin District (Surface Water Typology, Environmental Standards, Condition Limits and Groundwater Threshold Values) (Scotland) Directions 2014

NOTE: This link provides access to the documents via a managed SEPA intranet page.The full set of Standards Directions for each river basin district in Scotland can also be found via the Publications page of the Scottish Government website (www.scotland.gov.uk/Publications/)

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