

Memorandum

Subject	Afan Waste Water Streams		
To	DCC/NRW		
From	Amy Powell (DCWW)	Check: Anita Manns (MM)	Approve: Anita Manns (MM)
Doc reference	Afan Sch 5 response – wastewater streams Qu5 190825		
Date	19 August 2025		
Notes	a) You need to justify why no progress has been made in implementing the proposed sampling plan since the application was submitted and while the determination has been ongoing. b) To demonstrate a path to compliance with this standard, you must update the sampling plan to include a clear implementation schedule including key milestones of the sampling program and assessment. This should detail any key challenges faced to beginning your sampling program.		

DCWW are committed to undertaking the sampling and analysis in line with BAT 3.

For any sampling and analysis undertaken as part of permit compliance DCWW is committed to ensure that those undertaking the sampling and analysis will be accredited to MCERTs, or equivalent standards, where possible.

These commitments are already provided in the sampling and analysis plan, provided at part of the Afan application submission (doc ref 100123523_SamplingPlan_AFA September 2024)

DCWW has submitted a sampling programme in relation to wastewater streams. The sampling programme will be designed to fully characterise the waste waters discharged to Afan wastewater treatment works (WwTW) from emission point S1, sampled at monitoring points M1 as identified in the site layout plan (doc ref 100123523_SamplingPlan_AFA September 2024).

DCWW have started the initial process of characterisation, with samples taken monthly and analysed at Wessex Laboratories, determinants include;

- Total BOD
- Settled BOD
- Total COD
- Settled COD
- Ammonia
- Suspended Solids
- pH
- Nitrate
- Nitrite
- Alkalinity

The full sample programme will include, but not be limited to a methodology, for a minimum of one 24-hour flow proportional sample a month, for the emission point, for a period of 12 months. The programme will detail the sampling methods/standards used, in accordance with BAT 20 of the Waste Treatment BREF and include the NGRs of the sampling point location.

The programme will establish the characteristics of the liquid wastewater streams and shall include as a minimum for each emission point:

- Average values and variability of flow, pH, temperature and conductivity.
- Average concentration and load values of all relevant substances and their variability.
- Data on bio-eliminability.

The programme will sample for all relevant substances and will include:

- Hydrocarbon oil index (HOI) (mg/l)
- Free cyanide (CN⁻) (mg/l)
- Adsorbable organically bound halogens (AOX) (mg/l)
- Metals and metalloids; arsenic (expressed as As), cadmium (expressed as Cd), chromium (expressed as Cr), hexavalent chromium (expressed as Cr(VI)), copper (expressed as Cu), lead (expressed as Pb), nickel (expressed as Ni), mercury (expressed as Hg), zinc (expressed as Zn) (µg/l)

DCWW has submitted a high-level sampling plan as part of the application and will follow the relevant guidance below, in this case Environment Agency guidance:

- Specific substances and priority hazardous substances – Surface water pollution risk for your environmental permit Surface water pollution risk assessment for your environmental permit - GOV.UK (www.gov.uk).
- Monitoring discharges to water: guidance on selecting a monitoring approach Monitoring discharges to water: guidance on selecting a monitoring approach - GOV.UK (www.gov.uk)

The monitoring programme will be carried out and the monitoring data submitted in accordance with NRW's written approval.

However, this has yet to be fully established or taken forwards due to the characterisation of dewatering (return) liquors discharged into the head of works. The technical challenges of characterising this 'dirty' fraction are considerable and we have still to determine which limits of detection can be achieved in the laboratories. This has been an industry-wide challenge and Water and Sewerage Companies (WaSCs) have engaged with five labs on this (ALS, Socotec, Envirolab, RPS and i2) to varying degrees.

The issues are summarised as follows:

- **Deciding an analytical matrix at a lab** - some laboratories recommend a 'sludge liquid' matrix, others a 'treated sewage effluent' matrix.
- **Solids content** – laboratories are geared up for analysing samples (that are not Total Suspended Solids) where the solids are below 1%. Return liquors from WwTW AD plants are generally above this. Samplers are having to filter samples on site and over 40% of samples are still being returned as too 'dirty'.
- **Ability of labs to analyse the full suite of dets** – only 1 laboratory can do all 172 determinants

- **Limit of Detection (LoD)** – laboratories can report 80 – 90% of determinants at an LOD:EQS sensitivity of less 10%.
- **UKAS accreditation of analysis** - it is possible to undertake analysis of all 172 determinants across the five laboratories, but a total of only 78 determinants (45%) can be analysed utilising UKAS accredited methods. This leaves 55% (94 determinants) which cannot be analysed with UKAS accredited methods.

Discussions with the Environment Agency to date agree that this is not acceptable and that WaSCs need to work with the labs to improve this.

To enable a clearer picture to emerge of what is possible, the Environment Agency are proposing a 2-year extension to the IC deadline set out in the IED permits it has issued. Greater detail will be provided in the Regulatory Position Statement (RPS) when it is published. (This was confirmed via email dated 14/08/2025 from Clive Humphries of the Environment Agency and forwarded to Julie Tate and Jennifer McGuire (NRW)).

All of the above is subject to the agreement of the National RPS Panel. Clive Humphries anticipates confirmation will be forthcoming in the coming 3 weeks.

DCWW is actively working with other (WaSCs) through the Water UK Waste and Recycling Network (WRN).

Appendix 1 attached, details all determinants, those highlighted in green can be processed to the UKAS standard.

DCWW Process Scientists will assess the determinants listed (**Appendix 1**), to determine the likelihood of determinants presence within the wastewater stream and look to progress samples of those that can be processed to the UKAS standard or equivalent. This first stage is expected to take 6 months from permit issue.

Appendix 1

List of determinants across five laboratories with and without UKAS accredited status for each analysis (adapted from a WRc report on 'Evaluation of UK analytical laboratory capability for testing of Sludge Treatment Centre liquors (UC18120.5 March 2025)':

Organochlorine Pesticides				
Aldrin	DDT total	Dieldrin	Endosulphan	Endrin
Heptachlor & heptachlor epoxide	Hexachloro-cyclohexane	Para-para-DDT	Isodrin	Chlorothalonil
Dicofol	Tecnazene - total			
Organophosphorus Pesticides				
Azinphos methyl – dissolved	Chlorfenvinphos	Chlorpyrifos (chlorpyrifos-ethyl)	Coumaphos	Fenchlorphos
Mevinphos	Pirimiphos-methyl	Triazaphos	Dichlorvos	Diazinon
Propetamphos	Pirimiphos-methyl	Triazaphos	Dichlorvos	Diazinon
Dimethoate	Malathion	Fenitrothion	Demetons	Omethoate
Organonitrogen Pesticides				
Acclonifen	Alachlor	Chlorpropham	Carbendazim	Trifluralin

Ioxynil	Methiocarb	Pendimethalin	Pirimicarb	Prochloraz
Propyzamide	Quinoxifen	Thiabendazole	Triallate	
Triazine Pesticides				
Simazine	Atrazine	Terbutryn	Cybutryne	
Phenoxyacetic Acid Herbicides				
MCPA	2,4-dichlorophenoxyacetic acid	Bentazone	Bromoxynil	Bifenox
Mecoprop				
Pyrethroid Pesticides				
Cyfluthrin	Cypermethrin	Permethrin		
Ditho Carbamate Pesticides				
Maneb	Mancozeb			
Uron Pesticides				
Sulcofuron	Linuron	Isoproturon	Flucofuron	
Diuron	Chlorotoluron			
Organotins				
Tributyltin compounds	Triphenyltin			
Inorganics				
Ammonia - un-ionised	COD	Cyanide	Free Cyanide	Hydrogen sulphide
Nitrogen - total	Total organic carbon (TOC)	Phosphorus - total		
Key Chemistry				
AOX	Hydrocarbon oil index	pH	Phenol	Phenol index
Total suspended solids (TSS)	Anions	Fluoride – dissolved	Bromine - total residual oxidant	Sulphate
Chloride	Total anions	Chlorine	Chlorine (total residual oxidant)	
Metals				

Arsenic - total	Boron - total	Cadmium – total	Cadmium and its compounds – dissolved	Chromium - total
Copper – dissolved	Chromium (III) - dissolved	Chromium (VI) - dissolved	Chromium (VI) – total	Cobalt - dissolved
Copper - total	Iron – dissolved	Lead - tot	Lead and its compounds - dissolved	Manganese – total
Mercury - total	Mercury and its compounds – dissolved	Nickel - total	Nickel and its compounds - dissolved	Silver - dissolved
Tin - dissolved	Tin – total	Vanadium - total	Zinc - dissolved	Zinc - total
Semi-Volatile Organic Compounds				
2,4-dichlorophenol 3,4-dichloroaniline	3-chlorophenol 4-chlorophenol - total or individual monochlorophenols	4-chloro-3-methylphenol	Anthracene	Benzo(a)-pyrene (BaP)
Benzo(b)-fluor-anthene	Benzo(g,h,i)-perylene	Benzo(k)-fluor-anthene	Benzyl butyl phthalate	Biphenyl
Di(2-ethylhexyl)-phthalate (DEHP)	Dibutyl phthalate	Diethyl phthalate	Dimethyl phthalate	Dioctyl phthalate
Fluoranthene	Hexachloro-benzene	Hexachloro-butadiene	Indeno(1,2,3-cd)-pyrene Naphthalene	Pentachloro-benzene
Pentachloro-phenol				
VOCs				
1,1,1-trichloroethane	1,1,2-trichloroethane	1,2-dichloro-ethane	Benzene	Carbon tetrachloride
Dichloro-methane	Dichlorobenzene - total dichlorobenzene isomers	Ethylbenzene	Styrene	Tetrachloroethane
Tetrachloro-ethylene	Toluene	Trichloro-benzenes	Trichloro-ethylene	Trichloro-methane (chloroform)
Xylene				
POPs				
Polybrominated diphenyl ethers	C10-13 chloroalkanes	Dioxins and dioxin-like compounds HBCDDPFOS	PFOA	

Other Organic Compounds				
Chloronitro toluenes	Nitrilotriacetic acid	Ethylenediaminetetra	Acetic acid	Formaldehyde
Glyphosate	Tributyl phosphate	Triclosan		
Veterinary Residues				
Abamectin	Ivermectin	Doramectin	Malachite green	PCSDs
Alkyl Phenols				
2-chlorophenol	Nonylphenol (4- nonylphenol)	Octylphenol	Aldrin	DDT total
Dicofol	Tecnazene - total	Dieldrin	Endosulphan	Endrin
Heptachlor & heptachlor epoxide	Hexachloro- cyclohexane	Para-para-DDT	Isodrin	Chlorothalonil
Organophosphorus Pesticides				
Azinphos methyl – dissolved	Chlorfenvinphos	Chlorpyrifos (chlorpyrifos-ethyl)	Coumaphos	Fenchlorphos
Mevinphos	Pirimiphos-methyl	Triazaphos	Dichlorvos	Diazinon
Propetamphos	Pirimiphos-methyl	Triazaphos	Dichlorvos	Diazinon
Dimethoate	Malathion	Fenitrothion	Demetons	Omethoate
Organonitrogen Pesticides				
Aclonifen	Alachlor	Chlorpropham	Carbendazim	Trifluralin
Ioxynil	Methiocarb	Pendimethalin	Pirimicarb	Prochloraz
Propyzamide	Quinoxifen	Thiabendazole	Triallate	
Triazine Pesticides				
Simazine	Atrazine	Terbutryn	Cybutryne	
Phenoxyacetic Acid Herbicides				
MCPA	2,4- dichlorophenoxyacetic acid	Bentazone	Bromoxynil	Bifenox
Mecoprop				
Pyrethroid Pesticides				
Cyfluthrin	Cypermethrin	Permethrin		

Ditho Carbamate Pesticides				
Maneb	Mancozeb			
Uron Pesticides				
Sulcofuron	Linuron	Isoproturon	Flucofuron	Diuron
Chlorotoluron				
Organotins				
Tributyltin compounds	Triphenyltin			
Inorganics				
Ammonia - un-ionised	COD	Cyanide	Free Cyanide	Hydrogen sulphide
Nitrogen - total	Total organic carbon (TOC)	Phosphorus - total		
Key Chemistry				
AOX	Hydrocarbon oil index	pH	Phenol	Phenol index
Total suspended solids (TSS)	Anions	Fluoride – dissolved	Bromine - total residual oxidant	Sulphate
Chloride	Total anions	Chlorine	Chlorine (total residual oxidant)	
Metals				
Arsenic - total	Boron - total	Cadmium – total	Cadmium and its compounds – dissolved	Chromium - total
Copper – dissolved	Chromium (III) - dissolved	Chromium (VI) - dissolved	Chromium (VI) – total	Cobalt - dissolved
Copper - total	Iron – dissolved	Lead - tot	Lead and its compounds - dissolved	Manganese – total
Mercury - total	Mercury and its compounds – dissolved	Nickel - total	Nickel and its compounds - dissolved	Silver - dissolved
Tin - dissolved	Tin – total	Vanadium - total	Zinc - dissolved	Zinc - total
Semi-Volatile Organic Compounds				
2,4-dichlorophenol 3,4-dichloroaniline	3-chlorophenol 4-chlorophenol - total or individual monochlorophenols	4-chloro-3-methylphenol	Anthracene	Benzo(a)-pyrene (BaP)

Benzo(b)-fluor-anthene	Benzo(g,h,i)-perylene	Benzo(k)-fluor-anthene	Benzyl butyl phthalate	Biphenyl
Di(2-ethylhexyl)-phthalate (DEHP)	Dibutyl phthalate	Diethyl phthalate	Dimethyl phthalate	Dioctyl phthalate
Fluoranthene	Hexachloro-benzene	Hexachloro-butadiene	Indeno(1,2,3-cd)-pyrene Naphthalene	Pentachloro-benzene
Pentachloro-phenol				
VOCs				
1,1,1-trichloroethane	1,1,2-trichloroethane	1,2-dichloro-ethane	Benzene	Carbon tetrachloride
Dichloro-methane	Dichlorobenzene - total dichlorobenzene isomers	Ethylbenzene	Styrene	Tetrachloroethane
Tetrachloro-ethylene	Toluene	Trichloro-benzenes	Trichloro-ethylene	Trichloro-methane (chloroform)
Xylene				
POPs				
Polybrominated diphenyl ethers	C10-13 chloroalkanes	Dioxins and dioxin-like compounds HBCDDPFOS	PFOA	
Other Organic Compounds				
Chloronitro toluenes	Nitrioltriacetic acid	Ethylenediaminetetra	Acetic acid	Formaldehyde
Glyphosate	Tributyl phosphate	Triclosan		
Veterinary Residues				
Abamectin	Ivermectin	Doramectin	Malachite green	PCSDs
Alkyl Phenols				
2-chlorophenol	Nonylphenol (4-nonylphenol)	Octylphenol		