

Environmental Audit Committee February 2021.

Environmental Audit Committee Inquiry : Water Quality and Rivers.

Supplementary Submission 2 of Marinet Limited.

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The Scale of sewage treatment works (STWs) in England fitted with Tertiary Treatment which ensures the neutralisation of all viral, bacterial and parasitic pathogens.

To ensure that human sewage effluent routinely discharged to watercourses and the sea as a result of the sewage treatment process performed at sewage treatment works (STWs) is free of all pathogens (viral, bacterial and parasitic) it is essential that the sewage treatment works is equipped with the appropriate level of tertiary treatment – for an explanation of the various stages of sewage treatment, see: <https://www.youtube.com/playlist?list=PLqI2Zihn7Zma6CKMOJXyuUbZx-TPtckZC>

Primary treatment simply sieves out hard material and the resulting effluent is full of pathogens. Secondary treatment gives moderate to poor treatment depending on the exact secondary process and, although the pathogenic load is substantially reduced by this process, a fair amount of pathogens still remain in the effluent upon its discharge. Tertiary treatment seeks to further refine the quality of the effluent, and in the UK there are four main types of tertiary treatment, see Ofwat, 2011 , via Google: sewage-treatment-work-numbers-2011-1.xlsx and once into this document click on the 'Definitions' tab for a full description of these 4 Tertiary processes. They are labelled TA1, TA2, TB1 and TB2. Only TA1 will fully neutralise all pathogens without the use of an additional intense ultra-violet (UV) light process which is sometimes fitted to TA2, but appears to be rarely fitted to TB1 or TB2. Exposure to intense UV light during the tertiary process will neutralise all pathogens, and it is the recommended treatment process.

Therefore, in terms of Water Quality in Rivers and the sea, how many English sewage treatment works are actually using either TA1 and/or intense UV exposure during the tertiary process? (Note: not all STWs have tertiary treatment, most STWs have at least secondary and a few STWs only primary). We provide below an analysis of the level of the treatment at English STWs, highlighting the degree to which UV and /or TA1 is provided.

Numbers of STWs offering different levels of treatment.

Company	UV	TA1	Lesser Tertiary	Secondary	Primary
Anglian	8	3	419	304	6
Northumbrian	3	0	40	271	103
Severn Trent	0	1	482	536	8
South West Water	67	0	214	341	78
Southern	3	1	162	200	7
Thames	3	3	186	161	3
United Utilities	36	4	147	143	87
Wessex	0	1	144	235	26
Yorkshire	17	4	98	476	48
Totals	151		1,892	2,667	366
	2.97%		37.3%	52.5%	7.2%

Data compiled by B. Morgan (Marinet), 2021.

As can be seen, only around 3% of all English STWs have a standard of treatment that kills all pathogens (viral, bacterial and parasitic) before the STW's treated effluent is discharged to rivers or the sea. Therefore most rivers and many coastal waters, despite the treatment of sewage, are receiving pathogens of a very broad range of types. For an insight into the range of pathogens that may be present in rivers and the sea as a result of poor sewage disposal practices see: *Marinet, Sand, Sea and Sewage, Appendix D* <http://www.marinet.org.uk/campaign-article/sand-sea-and-sewage>

Why do some sewage treatment works provide full neutralisation of all pathogens, whereas others do not? The table below shows that UV and/or TA1 treatment is provided largely at coastal sites which need to comply with the health standards operating in Shellfish or Bathing areas. There are virtually no inland STWs offering such treatment.

STWs with UV Treatment.

District	Shellfish areas	Bathing areas	Totals
Yorkshire	0	8	8
West Midlands west	0	0	0
West Midlands central	0	0	0
Wessex	3	0	0
Thames	0	0	0
Solent and South Downs	3	0	3
North East	0	3	3
Lincolnshire and Northants	3	3	6
Kent, S. London and E. Sussex	3	3	6
Herefordshire and N. London	0	0	0
Manchester, Mersey, Cheshire	16	4	20
East Midlands	0	0	0
Devon and Cornwall	51	16	67
Cumbria and Lancashire	15	2	17
East Anglia	2	0	2
Total	96	39	135

Data compiled by B. Morgan (Marinet), 2021.

Establishing the factual data in these 2 Tables has not been straightforward and it is not readily published by Defra, Ofwat or the water companies in anything approaching the above format. Therefore these figures are prone to error in their compilation, but the fundamental truth is still self evident – unless the law (Shellfish Regulations or Bathing Water Regulations) require the installation of full tertiary treatment (UV/TA1) these standards of water quality and public health are, almost universally, not being provided by the water companies and neither is Government or Parliament currently making this a universal legal requirement. Consequently, there is an attendant public health hazard present in nearly all English waters (and likely throughout the UK) with a wide range of serious pathogens being dispersed into the environment via STW discharges into rivers and the sea. The release of these pathogens, some with antimicrobial resistant characteristics, may be resulting in serious levels of human ill health – see Marinet's primary submission to the Environmental Audit Committee, February 2021.

The specific question that Marinet places before the House of Commons Environmental Audit Committee, with the request that it be asked of DEFRA and the water companies, is:

- **Why is the level of tertiary treatment which will achieve full neutralisation of all pathogens (viral, bacterial and parasitic) not being provided at all STWs in the UK when the public health risk by not doing so is demonstrably clear?**

