

Removal of micropollutants in the Karlsruhe wastewater treatment plant

Specification of the plant:

Treatment capacity	[PE]	875,000
Load	[PE]	562,000
Inflow volumes:		
▪ Dry weather flow	[l/s]	900
▪ Max. wet weather flow	[l/s]	4,000
▪ Annual wastewater volume	[m³/a]	37,000,000



Process technology:

Mechanical treatment	Screen, aerated sand trap, grease trap
Biological treatment	Pre-denitrification, intermediate clarifier, trickling filter, SC
Chemical treatment	Phosphate precipitation: between sand and grease trap Post-precipitation: prior to adsorption/filtration
Elimination of micropollutants	Separate PAC -stage (Ulm process), 2 lanes
Filtration	Multi-layer sand filter



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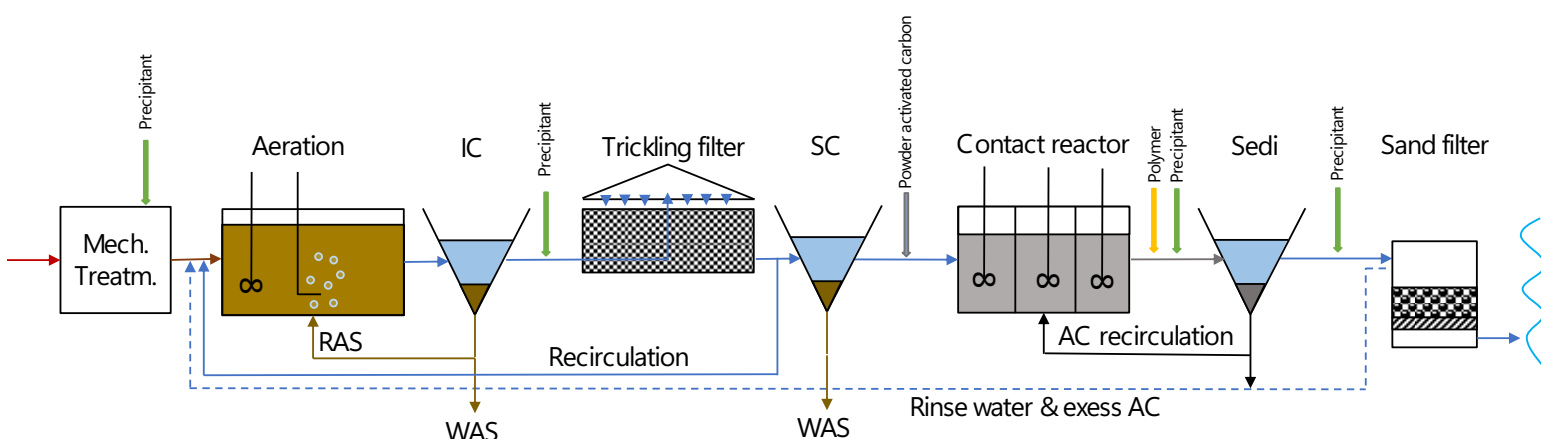


Fig 1: Process diagram of the Karlsruhe wastewater treatment plant

Design of micropollutant removal:

AC=activated carbon
RI=rated inflow

Year of commissioning of the advanced treatment stage				2022
Maximal treatable volume flow [L/s]				2,100
Contact reactor		Sedimentation tank		
▪ Number of basins	6	▪ Number of basins		2
▪ Volumen of the basins [m³]	625	▪ Volume per basin [m³]		8,137
▪ Total volume [m³]	3,750	▪ Total surface area [m²]		4,068
▪ Min. retention time for RI [h]	0.5	▪ Min. retention time for RI [h]		2,2
▪ Typical PAC -dose [mg/l]	8	▪ Max. surface load for RI [m/h]		1.86
Filter				
▪ Configuration	sand filter	▪ Total filter area [m²]		1,253
▪ Material	quartz sand (0,7 m); anthracite (0,7 m)	▪ Max. inflow filter [l/s]		4,000
▪ Number of filter cells	32	▪ Max. filter velocity [m/h]		11.5