

Destressing the Mediterranean Sea from chemical pollution: application of innovative technologies in the Thriasio Wastewater Treatment Plant

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Athens Water Supply and Sewerage Company S.A. (EYDAP S.A.) aspires to destress the marine environment of the Elefsis Gulf from chemical pollution, aligned with EU Mission 'Restore our Ocean and Waters by 2030' [1] as well as the requirements of the recast of the urban wastewater treatment directive [2], the Water Framework Directive, and the Marine Strategy Framework Directive. EYDAP intends to adopt an innovative technological solution in Thriasio Wastewater Treatment Plant (TWWTP) to remove 'forever chemicals', namely PFAS, heavy metals, PCBs, PAHs, and pesticides, from wastewater before they enter the Elefsis Gulf. The innovative GREEN DUNE® Photobioreactor system [3] developed in the RHE-MEDIation project will be applied in TWWTP to optimize the treatment process by using microalgae technology, since microalgae have demonstrated the ability to remove a wide range of environmental inorganic and organic contaminants. The photobioreactors, to be placed after secondary treatment, are of prismatic shape, which ensures increased microalgae productivity, wastewater treatment capabilities and enhanced water quality. Preliminary analyses of Thriasio wastewater sampled in April-May 2024 identified a significant number of substances of interest, namely 61 Pharmaceuticals, 24 PAHs, 20 PCBs/DDTs/Pesticides, 12 Plant Protection Products, 11 Industrial Chemicals, 11 PFAS, 10 Metals, 9 Surfactants, 4 Drugs of Abuse, 3 Insecticides, 1 Coffee related compound, 1 Naturally Occurring Substance, and 1 nonsteroidal anti-inflammatory drug. Seawater analyses from the Elefsis Gulf identified 44 Pharmaceuticals, 17 Plant Protection Products, 12 Industrial Chemicals, 8 Coffee & Tobacco related compounds, and 4 Surfactants. The RHE MEDIation technology can constitute a tailored approach to remove undesired chemicals as well as both a centralized and decentralized solution.

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References

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