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EU4GREEN RECOVERY EAST

National Baseline Report of Wastewater Treatment Infrastructure in Armenia

Executive Summary

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EU4Green Recovery East – Recovery through a Circular Economy and Pollution Reduction in the Eastern Partnership Countries

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Executive Summary

This baseline report provides a comprehensive assessment of Armenia's wastewater sector, examining infrastructure capacity, treatment performance and regulatory frameworks. The analysis reveals significant gaps between current practices and EU standards, particularly concerning the Urban Wastewater Treatment Directive (UWWTD) while identifying strategic pathways for sector modernisation under the EU4Green Recovery East Programme.

Armenia generates approximately 721.9 million m^3 of wastewater annually, yet only 8% receives any form of treatment. The country operates six centralised municipal wastewater treatment plants with a combined nominal capacity of 666,528 m^3/day, but actual throughput reaches only 196,024 m^3/day—less than 30% of design capacity. All six facilities provide mechanical pretreatment only through coarse screening and, in five cases, fine screening with grit and grease removal. The Aeratsia WWTP in Yerevan pretreats 92% of all treated wastewater in the country, creating a critical single point of vulnerability in the system. In addition, there is a community-level facility with a lagoon system that provides treatment for 0.13% of the total treated wastewater.

The absence of biological treatment results in minimal pollutant removal, with BOD and TSS reduction averaging only 10%. Nutrient removal is non-existent, with total nitrogen and phosphorus reductions of approximately 1–2% at Aeratsia. Consequently, 154.3 million m^3 (21%) of wastewater is discharged without any treatment, while 505.3 million m^3 (70%) is classified as clean according to national standards despite receiving no treatment. This performance falls substantially short of EU requirements for secondary and tertiary treatment.

Infrastructure deterioration compounds operational challenges. Approximately 50% of Armenia's 4,174.3 km sewerage network requires complete replacement, with over 80% of systems in Yerevan and Shirak considered obsolete. Decades of insufficient maintenance have led to severe infiltration and inflow problems, groundwater contamination through leakage and frequent overflows during rainfall or snowmelt periods. The widespread interconnection of stormwater and municipal sewer systems, often without proper planning, exacerbates hydraulic overloading.

Industrial wastewater management presents a critical regulatory gap. Without quantitative or qualitative monitoring systems for industrial discharges, enterprises release effluents directly into municipal networks, surface waters or groundwater without oversight. This unregulated discharge impairs WWTP performance, contaminates water resources and poses public health risks, particularly where groundwater serves drinking or irrigation purposes.

The regulatory framework demonstrates partial alignment with EU directives through the 2002 Water Code and subsequent amendments, yet significant transposition gaps remain. Armenia lacks binding implementation timelines, comprehensive sensitive area designations and enforceable compliance mechanisms comparable to EU standards. The institutional landscape is fragmented across multiple ministries and agencies, with unclear coordination mechanisms and limited enforcement capacity. Veolia Djur CJSC serves 73% of the population across 373 settlements but operates wastewater systems in only 74 of 80 settlements with infrastructure, while many local self-government bodies lack technical and financial capacity for effective service delivery. The six RBMPs all identify urban wastewater as the key priority and delineate large agglomerations requiring rehabilitation and extension of sewer networks as well as enhancement of existing treatment plants or building of new treatment plants to reach secondary or even tertiary treatment. Finally, the RBMPs recommend launching feasibility studies for all agglomerations greater than 500 population equivalents (p.e.), leaving the clear needs of smaller settlements largely unaddressed.

According to the lease agreement between the Water Committee, Veolia Générale des Eaux and Veolia Djur CJSC, signed on 21 November 2016 and entering into force on 1 January

2017, the Public Services Regulatory Commission of Armenia issued a licence to Veolia to serve 380 settlements, including the capital Yerevan, 45 other cities and 334 villages, representing approximately 80% of the population.

Sanitation coverage varies dramatically between urban and rural areas. While 96% of urban residents access improved sanitation, 51% of the rural population relies on unimproved facilities. Of 930 territorial units, approximately 830 lack sewerage services entirely. Many on-site systems discharge directly to surface or groundwater bodies without treatment, creating environmental and health hazards.

Given these conditions, meaningful opportunities for energy efficiency improvements, sludge valorisation or biogas production under Output 2.3.3 are currently unavailable. The specific energy consumption of existing WWTPs (all below 0.1 kWh/m³) reflects the simplicity of mechanical pretreatment rather than optimisation potential. Priority interventions must focus on rehabilitating collection networks and introducing biological treatment processes before advanced resource recovery becomes feasible.

The report recommends redirecting EU4GRE programme efforts towards comprehensive capacity building under Output 2.3.2, targeting decision-makers, municipal engineers and policymakers rather than plant operators. Key priorities include strengthening technical competencies, supporting alignment with EU UWWTD requirements, conducting training needs assessments and empowering stakeholders to develop fundable project proposals for treatment system upgrades. Regulatory reform should adopt a phased approach, prioritizing organic matter and nutrient removal for larger agglomerations while establishing frameworks for future energy recovery and micropollutant removal.

As a general recommendation, nature-based solutions, notably constructed wetlands, represent important options for many rural areas in Armenia to improve treatment and reduce local pollution through relatively simple and low-cost solutions.

Sustainable sector transformation requires coordinated action across infrastructure modernisation, institutional strengthening, regulatory harmonisation and financial mechanisms that ensure cost recovery while maintaining affordability. The baseline established in this report provides the evidence foundation for targeted interventions that will build Armenia's capacity to achieve climate-resilient, energy-efficient wastewater management aligned with EU standards.

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About EU4Green Recovery East

The EU4Green Recovery East programme is a regional programme supporting the EU's Eastern Partnership countries on their path towards a greener, more resilient, and competitive economy. With an EU-contribution of EUR 21.3 million (2025-2028), it builds on the results of a decade of EU support for better water management and green economy adoption and focuses on five key components : circular economy, water resources, legal approximation with EU environmental acquis, environmental data, and cross-border environmental cooperation. The programme is implemented by five partners: Expertise France with the French International Office for Water (OiEau), OECD, UNECE, UNIDO, and the Environment Agency Austria (UBA), as the consortium coordinator.