The Pure Eco

WE RESPECT **WATER**

PURECO

THE PURE ECO

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Pureco **The Pure Eco**

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Solution oriented approach

We design-build, operate and maintain water and waste-water treatment facilities with special devotion and professionalism **in the fields of drinking water purification, communal and industrial wastewater and landfill leachate treatment, ground water remediation, stormwater collection and treatment** while respecting site environments whether it is natural or urban.

Pureco and its partners **strongly believe** that the best solution can be born with a strong **cooperation** and collaboration. We are also **giving priority** not only to our projects, products but on **training programs** as well in order to help the local people to operate and maintain our systems, **providing** not only clean water but **jobs** and educational supports. This philosophy and our excellence, reliability, professionalism let Pureco to be unique in the market and provide a fully customized and innovative solutions in all aspects of water management.

We know and highly respect water. We develop optimal and cost-effective, long-life solutions in order to keep our waters safe focusing on added value and sustainability. We are an **international** company with several offices in Central & Eastern Europe and we are also present in Asia, Africa and Middle-East throughout our projects.

Our growth and success are represented with our **increasing** revenues which is around 20% annually in the past five years. Besides Pureco is one of the founding members of the Hungarian Water Cluster with about 28 other corporate members, we rely on the expertise and resources of around 3,000 colleagues with more than 310 million USD turnover per year.

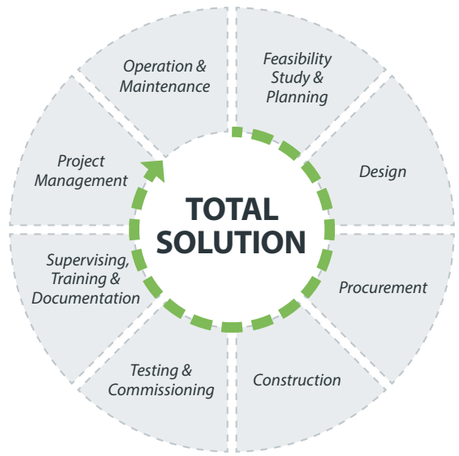
Our experts in the different segments of the water industry possess an outstanding professional and innovative knowledge which have been known and recognized in many parts of the world. Our CEOs play important roles in national and international organizations, e.g. **president of European Water Association,** vice president of Eurasian **ASEM Water** Academic Development Committee, member of the steering group of **European Innovation Partnership** on Water and have been working for several years for the worldwide recognition of the Hungarian professional knowledge in the field of complex water management.

international projects / fully customized solution / serving more than 500,000 people worldwide / cooperation, added-value, innovation

Water related solutions

We believe in people; with our highly qualified and experienced colleagues we are able to provide customized solutions in order to bring you the **added value** in the following core fields of water management:

Pureco is offering a variety of **tailored service levels** in the view of the importance of the **integration.** We work with you, focusing to keep your system running at **maximum performance** and at the **lowest cost of ownership** from the raise of your idea, through design, implementation, operation and maintenance.



Drinking water purification

Natural drinking water for everyone! There are several ways to protect and conserve existing water resources and to provide potable water. From engineering perspective this task is primarily about developing sustainable, efficient and environmentally friendly water management designs, technologies and solutions. Our water purification works (removal of iron, manganese, heavy metals, arsenic, etc.) are conducted in accordance with international standards.

We not only pay special attention to the expansion, the conversion and reconstruction of existing facilities, but we also design-build and manage the construction of river surface water intake facilities, water treatment plants in a sustainable and cost-effective manner. We also give priority to reuse and recycling as a means of introducing new secondary water sources for water supply such as reclaimed wastewater to counteract water scarcity.

Pureco and Budapest Waterworks developed a **containerized drinking water treatment unit** ready to produce potable water even from wastewater which is biologically treated. **ReWater** containerized drinking water treatment system is capable to provide valuable clean water even for **72,000 people** on a daily basis **(180 m³ / d)** where it is most needed such as high risk areas of **water scarcity,** contaminated freshwater sources, in case of **disasters.** Due to its wide tolerance of influent quality it can be used at numerous places having fed from numerous raw water sources.

BUDAPEST WATERWORKS

BDL Environmental Consulting Ltd.

ReWater

drinking water even from treated wastewater / containerized systems / latest technological developments

Water-purification and service system construction in Vietnam

The aim of the Central Vietnam, Quang Binh province water treatment project was the construction of water intake and water management structures to provide the region with healthy drinking water. There are over a 100,000 people living in the service area, north and south of the Gianh River. The project contributed to the increase of the quality of life of the low-income households and families, and to the development of basic infrastructure. Pureco as a member of the project owner, Hungarian Water Cluster, contributed to the development of the water treatment plant with its professional knowledge, design and construction experience. The project was about a 22,000 m³ / day capacity surface water intake structure had been built on the Rao Nan River, which serves as the main water base.

The 22,000 m³ / day capacity water intake structure serves a 10,000 m³ / day capacity water treatment plant, constructed in the first phase and a 12,000 m³ / day capacity water treatment plant, developed in the second phase of the project.

The water purification technology used here:

- Coagulation
- Flocculation
- Clarification
- Sand filtration
- Water storage

Quality of the treated water was tested by laboratory measurements and it is our pleasure to report that the system is operating perfectly and according to the desired limits.

clarification and sand filtration / surface water intake from river / 22,000 m³ / day drinking water network

Wastewater treatment

Based on our professional experience and our products we offer not only the reconstruction of old, outdated sewage treatment plants, or the construction of new systems, but our engineering, consulting and construction works are accompanied by a professional-consciousness throughout the various fields of waste water management as well.

Municipal wastewater treatment technologies:

- Mechanical pre-treatment (fine and coarse screen, sand trap, grease trap, primary clarifier, equalization)
- Biological treatment (activated sludge technology, SBR, fixed -film systems, membrane bioreactors)
- Tertiary treatment
- Surplus aerobic sludge treatment (sludge stabilization, sludge thickening and dewatering)
- \+ Biofilter systems (treat airstreams wherever odour air emissions occur, particularly in wastewater treatment plants, pumping stations, sludge handling units, sewage storage systems where putrefaction potential exist).

For a higher efficiency:

- The BIOCOS (Combined Biological System) technology is the improved version of the aerobic activated sludge process, combining the benefits of conventional biological treatment flow systems and the SBR technology (compared to conventional sludge separation processes it is significantly better, with a minimal mechanical demand, reduced energy consumption and maintenance requirements).

Industrial wastewater treatment (alcoholic and non-alcoholic beverage; dairy, slaughterhouse – meat processing, rendering, addible oil, sugar industry, paper, textile, chemical, petrochemical industry) technologies:

- Mechanical pre-treatment (fine and coarse screen, sand trap, grease trap, primary clarifier)
- Physical- chemical purification (coagulation, flocculation and flotation) anaerobic high rate reactors (UASB, EGSB)
- Aerobic reactors (SBR, Continuous, Active sludge flotation, MBR, MBBR)
- Membrane technologies (UF, NF, RO)
- Activated sludge treatment (sludge thickening and dewatering, aerobic sludge stabilization)
- Anaerobic sludge digestion

industrial and municipal waste water treatment / reconstruction and new systems / biofilters for odour treatment

Municipal and industrial WWTP

In Bulgaria, experts of Pureco developed and modernized the **municipal wastewater** treatment plant of Vratsa. The engineers used an individual biological technology, and as a result of the development works the capacity of the plant has increased to 18,000 m³/day and the quality of the treated water complied in every aspect with the European standards.

- Screen building
- Preliminary settlement tanks
- Biological treatment
- Sludge dewatering building
- Chemical dosing system
- UV disinfection

Parameter		Limits	Cleaning Effect
BOD_5	mg/l	25	70–90%
Nitrogen	mg/l	15	70–80%
Phosphorus	mg/l	2	80%

Pureco successfully delivered and commissioned a physical-chemical pre-treatment based **industrial wastewater treatment plant** (WWTP) to a duck slaughterhouse in Kiskunmajsa, Hungary. The slaughterhouse generated wastewater, where the flow rate is 120 m³ on daily base, the high concentration of non-dissolved materials like suspended solids, oil and grease are successfully removed due to the dissolved air flotation unit. The technological steps are as follows:

- Fine grid as drum filter
- Flocculation
- Flotation

Parameter	Design raw water parameters (mg/l)	Removal Efficiencies (%)
COD	7,111	78%
BOD_5	3,556	78%
TSS	2,560	40%
TKN	427	85%
TP	71	92%
Oil & Grease	1,564	95%

municipal and industrial waste water treatment plants / biological treatment chemical flotation / excellent effluent quality

Landfill leachate treatment

Domestic waste, has been / being placed on communal landfills, contains highly concentrated biodegradable organic materials. Treatment of leachate – arising from its moisture and rainfall – is difficult due to its unstable characteristics, high organic and ammonia content, but is essential to avoid huge environmental risks.

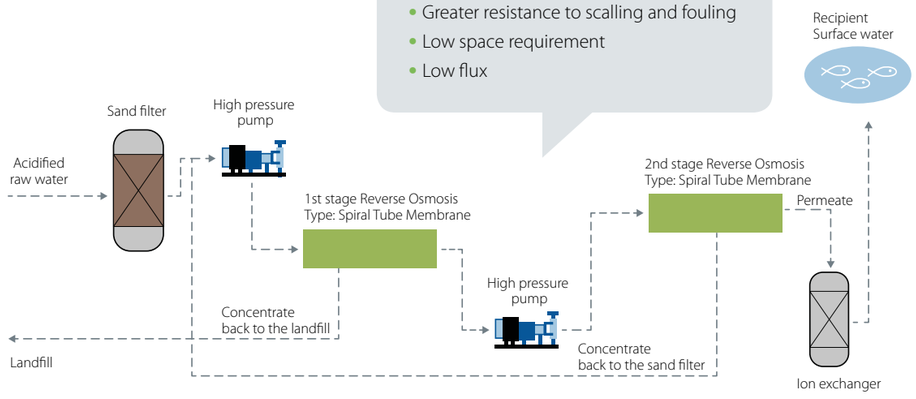
Pureco provides turn-key, containerized leachate treatment units, equipped with Reverse Osmosis after suitable pre-treatment. Making the technology available in container means transportable complex, easy to install solution for purifying the dirtiest water of human consumption.

Membrane advantages:

- No sludge generation from pre-treatment process
- High rejection of contaminants such as COD; BOD; TDS & heavy metals etc.
- Large surface area of membrane
- Greater resistance to scalling and fouling
- Low space requirement
- Low flux

Partner in production

HIDR FILT



technological development / compact solution / containerized system / membrane technology

Leachate treatment in Oradea, Romania

Pureco delivered a great solution for landfill leachate treatment that meets with the requirements of the strict Romanian regulations. With a two-stage reverse osmosis system that is placed in a 40 feet ISO container (PURE-RO/LTC) 120 m³ / day contaminated water of landfill of Oradea can be treated on daily basis and with the recovery rate of around 60%.

Main Technological Steps of PURE-RO/LTC:

- Sand filtration to remove core TSS particles
- Cartridge filtration to remove the fine TSS particles
- DT® designed in one, two or in three-staged configuration depending on the required discharge parameters and influent concentrations

Parameter	Dimension	Raw Leachate Analysis	Design Parameters	Effluent Requirements
Flow of raw leachate	m³/d	120	120	120
pH	-	8.48	6.5–8.5	6.5–8.5
Temperature	°C	26.4	20	
COD	mg/l	9,910	9,910	<125
BOD_5		1,390	1 390	<25
Conductivity	microS/cm	36,900	36,900	<600
NH_4^+-N		1,634	1,634	<2

Our environmental friendly, cost-effective and unique leachate treatment technology focuses on added value as well as on predictability, liability, flexibility and multi-faceted approach.

As dedicated our activitites of environmental protection with the reation and conservation of a livable and clear natural environment in mind, we developed our technology for leachate treatment in a complex and sustainable way.

reverse osmosis technology / PURE-RO/LTC / membranes / transportable, easy to install solution

Groundwater remediation

The detection of residual contamination accumulated in groundwater, the exploration of the extent of contamination, the mitigation and elimination of residual environmental damages are all part of the tasks of environmental remediation activities. Not only the professional design and construction of the water delivery systems can protect our irreplaceable resources, the **drinking water sources and groundwater,** but we also have to take care of the **protection and purification** of said **water resources.**

We have exceptional references in the field of ground water remediation, in which projects highly concentrated toxic compounds were removed from the excavated ground water flow. Via these remediation projects, Pureco has contributed to the sustainability of water resources with the design and implementation of these unique water management systems.

Pureco provides a comprehensive set of services for the elimination of soil and groundwater contamination, encompassing engineering, consultancy and construction works. Our aim is to return a "clean" environment to our clients after the contamination assessment, demarcation and reclamation.

Remediation procedures:

- Exploration of soil and groundwater contamination
- Exploratory drilling
- Development of sampling and monitoring wells
- Exsitu and insitu soil and groundwater treatment
- Extraction and disposal of waste
- Contaminated soil treatment
- Reclamation works
- Operation & maintenance

BDL Environmental Consulting Ltd.

unique water management systems / protection and purification of water resources / toxic removal / remediation

The remediation of the leather factory at Simontornya

As a result of the factory's 150 years of operation a large amount of pollutants drained into the ground waters: brine protein, lime and sulfur solutions, solutions containing calcium salt, chromium (VI), and chromium based tanning material, aliphatic hydrocarbons and toxic metals from paints, solvents and treatment agents.

Our company, based on the preparatory studies, licensee plans, field measurements and laboratory experiments, developed a complex water treatment process, created its construction plans, built it and is currently operating the water management system.

Main technical parameters:

- The amount of contaminated groundwater in total: 232,500 m^3
- The amount of groundwater that is crucial to be purified: 168,200 m^3
- Establishment of 10 extraction wells Q = 500–600 m^3 / d total capacity
- 500 m^3 / day capacity continuously operating water pre-treatment system
- 4 pieces, in total of 1,934 meters in length, drain leakage system
- 1,157 m^2 infiltration area
- 6.94 l/s continuous flow of purified water to infiltrate

As a result of the project, the threat to the nearby water source is neutralized, the people living in and around Simontornya can live in a cleaner environment, and on the remediated area can welcome new businesses thus creating new jobs in the region.

toxic metal removal from ground water / 500 m^3 / day capacity / continuously operating system / 1,157 m^2 infiltration area

Stormwater management

Rain water is a great treasure and at the same time, it is a great controversy. The rainfall retention and re-use contribute significantly to the improvement of water management of the land, the flora and fauna, and the protection of our water resources, as well as the protection of our lands and cities from floods that follow great seasonal rainfalls.

The rainfall once on the surfaces often gets contaminated – just think of the pollutants on the paved surfaces – so the challenge is not only the collection and the possible recycling, reuse of the storm water, but the cleaning and infiltration of the not utilized water are also crucial. Our goal to preserve the environment and to properly manage storm waters successfully can only be realized through complex solutions.

We offer:

- Patented product (**ENVIA TRP oil separator**) for stormwater treatment
  - Developed by Pureco for filtering and retaining the contaminants washed away by storm water, flowing down from linear engineering structures such as **roads, motorways, parking lots**
  - Easy to install, simple to operate
  - Installable also in existing storm water drainage systems,
  - The process it applies to cause oil drops to flow up and for retainment is well-known, tried, and tested
- Special systems for dewatering municipal, industrial surface
- Unique stormwater drainage systems
- Infiltration and storage equipment capable for fire water as well

85,000 l/s treating capacity oil separators sold by every year / complex stromwater management at Airport of Budapest, Hungary

Patented solution for rainwater treatment

Arad bypass highway construction work for water management – ENVIA TRP

Due to the erosion caused by high-intensity rainfalls and pollutants washed off of paved surfaces, today the runoff water can only be introduced into the recipient after a proper pre-treatment when the water quality reaches the required levels.

The Arad bypass was completed in 2012 in Arad County, Romania. Pureco proposed a special solution for the treatment of the rainwater, collected from approximate 12 km of the highway: the ENVIA TRP® drift and light liquid separator installable in open-surface stormwater drainage channels. In this project, we have used 50 pieces of different sizes of equipment, between 60 and 225 l/s nominal flow capacity.

Debrecen M35 motorway bypass – water management construction work – ENVIA TRP

The newly built junction was realized at a small area of the existing M35 road, Hungary, at the intersection of the railway, the road and rail overpass, and of natural waters. According to the original plans, the stormwater would have been infiltrated into a basin and vaporized, but due to the risk of the road and rail embankment soakage leading to deterioration of stability, this solution was not feasible. The new concept sees the pre-treated water being deposited into the Tócó-stream.

Budapest Airport – stormwater treatment

Due to the Budapest Airport's (Hungary) environmentally conscious attitudes over the past few years, several improvements have been made in order to protect the natural environment around the airport. In the frame of this initiative the stormwater treatment of the airport's runways, taxiways, other traffic and technical areas, paved walkways, roads, parking areas with polluted river channels was developed, and an accident emergency system was created with Pureco solutions.

As part of the project, nearly thirty open trench ENVIA TRP sludge and oil separation equipment were installed, with a total of 5,800 l/s cleaning capacity In order to clean the contaminated stormwater.

5,800 l/s purification / 1,400 l/s flow / installed in open-surface stormwater channels / treated stormwater is natural-safe

Stormwater management

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Believing in

the strong cooperation we provide fully customized solutions in all aspects of water management.

Contact us

if you are looking for an innovative, solution-oriented company with excellent references on national and international levels.