

Terms of Reference

For the Supply and Installation of a Filter Backwash Water Recirculation and Reuse System at the Water Treatment Plant of Kallithea, Municipality of Tanagra.

In the framework of
the “ZERO DROP SCHIMATARI” project

Funded by
The Coca-Cola Foundation

1. Background

1.1. The “ZERO DROP SCHIMATARI” Project

The Municipality of Tanagra, and especially the Municipal Section of Schimatari, as part of the Prefecture of Viotia, is one of the most water stressed areas of the mainland of Greece, while facing water pollution challenges. That is mainly due to the intensive agricultural and industrial activities that take place in the area as well as due to the significant water losses that occur in the distribution system, starting from the municipal water treatment plants. The urban water supply network is struggling to meet demand, particularly in the summer months, and such conditions often fuel tensions at community level between competing water uses. Apart from the increased water demand, the area faces serious water contamination issues and, therefore, relies on limited high quality water resources to cover its needs, rendering the local community more vulnerable to the impacts of climate change.

ZERO DROP SCHIMATARI aims to demonstrate in the urban setting of the area, for the first time ever in Schimatari, a perceptible paradigm shift of efficient water treatment and other pertinent processes to increase water availability. The project will provide several WASH and Climate Resilience benefits to Local Communities and serve as a pilot paving the way for a scaling-up of related projects in the Municipality and other locations in Greece and the Mediterranean region. Additionally, it will promote Environmental and Sustainable Business practices to the public sector.

Building on global and Mediterranean best practices and responding to national political priorities and local operational plans, including as they emerge from the EU Water Framework Directive requirements, the proposed “ZERO DROP SCHIMATARI” Project aims to increase water efficiency and provide replenished water in support of municipal needs in the wider area of the municipal section of Schimatari, contributing to water security and climate change adaptation.

GWP-Med is a leading partner in related action lines for water security and climate resilience of local communities in the Mediterranean. Since 2008, GWP-Med has implemented several successful projects with the support of The Coca-Cola Foundation and the Coca-Cola system and a total of 124 interventions of various scales in Greece, Malta, Cyprus and Italy.

The Project will (i) implement of 1 – 2 technical interventions aiming at replenishing / saving approximately 60,000,000 liters of water on annual base for domestic (e.g. drinking) and other activities, (ii) offer capacity building and youth engagement activities towards technically sound and socially acceptable Non-Conventional Water Resources (NCWR) applications, and (iii) raise inhabitants', visitors' and the general public's awareness on the importance of conserving water. Opportunities to communicate project results and achievements to local, national and international audiences / communities will be further explored while the end of the program will be marked by a public event that will showcase the completed works and will discuss follow-up steps, including towards engaging project partners to follow up activities.

2. Description of the Assignment

2.1. Objective

The objective of the assignment is the “Supply and Installation of a Filter Backwash Water Recirculation and Reuse System at the Water Treatment Plant of Kallithea, Municipality of Tanagra”, based on the information presented in Annex I of the present document.

2.2. Requested Services

The tasks envisaged to be undertaken as part of this work package consist of:

- a) Supply and installation of a Filter Backwash Water Recirculation and Reuse System at the Water Treatment Plant of Kallithea, Municipality of Tanagra”. The purpose of the requested system is to treat the filter backwash water of the said water treatment plant and return it to the raw water tank in order to be retreated by the Water Treatment Plant existing equipment and become potable water.
- b) Setting and starting up the requested system after its installation.
- c) Provision of an “Operation and Maintenance Manual” to the respective Technical Service of the Municipality of Tanagra.
- d) Provision of a training session for the respective employees of the Technical Service of the Municipality of Tanagra.

The technical specifications of the system are presented in the Annex.

2.3. Assignment Outputs

Delivery of a fully operational and on duty Filter Backwash Water Recirculation and Reuse System at the Water Treatment Plant of Kallithea, Municipality of Tanagra” accompanied by an “Operation and Maintenance Manual” and a training session for the respective employees of Technical Service of the Municipality of Tanagra.

2.4. Deliverables

Item	Description	Unit	Quantity
A	Filter Backwash Water Recirculation and Reuse System		
A1	A fully operational and on duty Filter Backwash Water Recirculation and Reuse System at the Water Treatment Plant of Kallithea, Municipality of Tanagra, in compliance with the technical specifications presented in the Annex of the present document. The works included are the following:	System	1
A1.1	Preparatory works	Lump Sum	1
A1.2	Delivery of equipment	Lump Sum	1
A1.3	Hydraulic and electrical connections	Lump Sum	1
A1.4	Testing and starting-up	Lump Sum	1
B	Operation and Maintenance Manual		
B1	Operation and Maintenance Manual, including troubleshooting section.	Manual	1
C	Training		
C1	Training session for the employees of the Technical Service of the Municipality of Tanagra.	Session	1

This tender is not divided into lots, and tenders must be for the study / report indicated.

2.5. Obligations

During the construction phase of the project, the following obligations are put into force:

- All necessary measures (marking, fencing, etc.) to avoid accidents, to protect residents and workers from danger that may be created during the construction of the project, to be taken.
- Storage of materials, even temporary, at the construction area should not present danger to the employees of the Municipality of Tanagra.
- After the completion of the construction, if necessary, the rehabilitation of the construction area needs to be conducted.
- Pictures of the work progress should be collected and sent to GWP-Med.
- A final list of materials and equipment to be sent to GWP-Med.

2.6. Health and Safety Precautions

Responsibility for all aspects concerning health and safety issues for the duration of this project is vested entirely in the contractor entrusted to do this job, who will exercise all control over operations, materials, employees, and all other factors respecting health and safety norms.

2.7. Reporting line

The awarded contractor will communicate directly with Dr. Nikos Skondras, Senior Program Officer at GWP-Med (Contracting Authority).

Additionally, the awarded contractor will consult with and work under the direct supervision of the technical representatives of the Municipality of Tanagra (Supervising Authority).

2.8. Monitoring and Progress Controls

Dr Nikos Skondras, Senior Programme Officer at GWP-Med, and Mr. Charalampos Lappas, Programme Officer at GWP-Med, will be providing oversight and guidance from the side of the Project Team. Coordination calls between the consultant and the Project Team will be held at weekly basis, to monitor the progress of the assigned services.

Services will be rendered and will be considered completed upon approval of the deliverables by the Project Coordinator, the GWP-MED Executive Secretary and the Technical Service of the Municipality of Tanagra.

2.9. Site Visit

The bidders must visit the point of the technical intervention in order to have an understanding of the actual conditions on the spot and be able to prepare their technical offer and assess the situation for the preparation of their financial offer.

The site visit has to be completed at least three days from the publication of the tender (including the date of the tender publication).

3. Duration of the Contract

Delivery of the works should be completed by 31/10/2023.

The overall duration of the contract will be maximum by 30/11/2023.

The date of the commencement of the contract execution shall be the last signing of the contract.

4. Contract Price, Schedule of Payments

The maximum fee for this assignment is **90,000 EUR (excluding VAT)**. This amount includes all other costs, income taxes and any other amount payable or cost that may be required for the completion of the service.

The schedule of payments is as follows:

- 30% payment upon completion of the preparatory works (to be verified by the Technical Service of the Municipality of Tanagra).
- 30% payment upon delivery of the equipment (to be verified by the Technical Service of the Municipality of Tanagra).
- 40% payment upon completion of the remaining works and services (to be verified by the Technical Service of the Municipality of Tanagra).

Each payment will be issued upon receiving the respective deliverables and after the written approval from the technical service of the Municipality of Tanagra.

In the event that there are delays in the execution of the contract the awarded contractor shall be liable to pay compensation in the form of a penalty. The amount of the flat rate compensation

per day of delay (penalty) shall be of 1% of the net contract value per week up to a limit of 10% of the total contract value. For the calculation of penalties, the number of days of delays shall be converted into weeks by rounding down to the nearest week.

The successful consultant must Provide:

Certification of payment of Taxes.

Certification of payment of Social Insurance contributions before contract signing.

5. Guarantee

The awarded contractor will provide a Guarantee on all equipment for a minimum period of 12 months against faulty workmanship and materials and on the operation of the system as a whole. If during this period any parts or equipment have to be changed (due to faulty workmanship and not due to the selected operation conditions), the guarantee on that part is to be renewed for another year from date of replacement. The initial guarantee as well as the replacement guarantee include the equipment cost (transfer, labour cost, taxes, insurance etc.). The cost of the replacement of the faulty equipment or/and the necessary works is to be covered by the awarded contractor.

In the event that there are delays in the execution of the contract the awarded contractor shall be liable to pay compensation in the form of a penalty. The amount of the flat rate compensation per day of delay (penalty) shall be of 1% of the net contract value per week up to a limit of 10% of the total contract value. For the calculation of penalties, the number of days of delays shall be converted into weeks by rounding down to the nearest week.

The awarded contractor agrees to submit to the Contracting Authority one Performance Guarantee accounting to 5% of the contract value.

The successful participant shall, within ten (10) calendar days of the receipt of the contract, sign and date the contract and return it together with a copy of the Performance Guarantee. Any Performance Guarantee issuance expenses bear's the successful participant.

The Performance Guarantee shall be released after the completion of three (3) months from the written acceptance of the works performed by the Municipality of Heraklion.

The Contracting Authority will not affect any payment to the Contractor until the Performance Guarantees have been submitted.

6. Selection Criteria (Pass / Fail)

Successful participants must provide the following documents:

A. Technical Offer:

- Be enrolled in one of the official professional or trade registries at the country of registration.

- Be licensed to perform works in Greece.
- Provide Certification to carry out the requested works (ISO 9001:2015, ISO 14001:2015, ISO 45001:2018 or equivalent on “design, supply, installation, maintenance and support of water treatment systems).
- Provide a statement of availability of resources (e.g. tools, equipment, personnel / technicians) to perform the requested tasks (either own resources or through collaboration). Minimum requirements:
 - Power cutting tools (e.g. angle wheel)
 - Drilling and screwing power tools
 - Testing and measuring equipment for the electrical works (e.g. multi-meter)
 - Small concrete mixer
 - Small crane for moving heavy equipment.
- Provide a statement that at least one certified electrician / installer will be used to perform the electrical works.
- Provide a statement of understanding the requested objective, services and deliverables.
- Provide a Graphic Works Schedule - Program of Works in the form of a Gantt Chart.
- Provide the datasheet of the offered electromechanical equipment.
- Provide a signed statement certifying that the equipment is new and unused.
- Provide the CE or ISO certificates of the pumps, and any other electromechanical equipment which is to be offered.
- Provide a warranty for good operation for at least 1 year for the whole system which is to be installed.
- Provide proof of their average annual turnover for the last three (3) fiscal years being at least equivalent to the maximum amount of this Call.
- Provide proof (contract and accompanying documentation) of having executed at least one work of equal or higher value which included at least four of the five following aspects, in the last three years:
 - Booster water pumps
 - Dosing pumps for chemicals
 - Filtration with Lamella
 - Filtration with pressure filter of at least two layers of filtering media)
 - Control panel
- Provide proof of visiting the location of installation of the requested system in the preset time period.

B. Financial Offer (Annex 2)

7. Awarding Criterion and Evaluation Process

Award criterion is the Most Economically Advantageous offer with criterion the lowest price for the offers satisfying the selection criteria.

8. Submission of Offers

Please refer to the **Call for Offers Document** for the proper submission of the Technical and Financial Offer.

ANNEX I – TECHNICAL SPECIFICATIONS

The following material derived from a technical study that was conducted by an awarded expert at the Water Treatment Plant of Kallithea. The awarded contractor will have access to that study.

1. Water Treatment Plant of Kallithea

No of filters	2
Flow per filter (m ³ /h)	100,00
Backwash water per filter (m ³)	42,00
Total backwash water (m ³ /12h)	84,00
No of backwash per 24 hours	2
Total backwash water (m ³ /24h)	168,00
Annual volume of backwash water (m ³)	61.320,00
Backwash water to be treated (m ³ /h)	7,00
Turbidity of backwash water (NTU)	150
Total Suspended Solids of backwash water (mg/l)	120
Weight of dry mud (kg/d)	0,021

It is noted that the two filters at the Water Treatment Plant of Kallithea do not perform the rinsing phase, but only the backwash phase.

2. Treatment Process of Backwash Water at the Water Treatment Plant of Kallithea

Treatment Stages:

- Tank to balance the flow of the backwash water to be treated.
- Pipe Flocculator
- Dosing of chemicals
- Water feed pump to pipe flocculator
- Sedimentation tank – Lamella type
- Drying unit for the rejected mud from the sedimentation tank
- Intermediate tank before the sand filter
- Filter feed pump
- Pressure filter 36"

Works included:

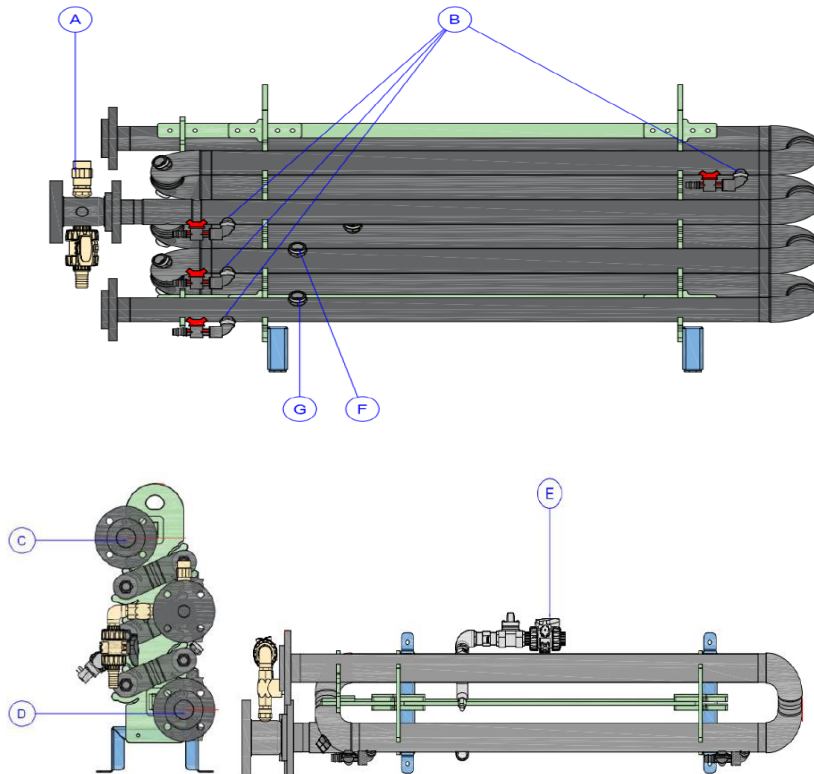
- Installation of a control / electrical panel
- Hydraulic and electrical connection of the equipment (including piping, fittings, cables, etc.).
- Concrete base for the equipment (if needed)

3. Technical Specifications of Equipment

3.1. Balancing Tank

The Water Treatment Plant of Kallithea has two tanks of 25 m³ each. Those will be used to balance the flow of the backwash water from the existing filters. Therefore, there is no need for a new balancing tank.

3.2. Pipe Flocculator



Point	Description	Size
A	Insert point for polymer	3/4"
B	Sampling point	1/2"
C	Effluent after the addition of chemicals	DN 65
D	Influent to be treated	DN 65
E	Cleaning point KIT pH	-
F	Insert point for pH related chemicals	3/4"
G	Insert point for coagulant	3/4"

3.3. Dosing Pumps

3.3.1. Dosing pump for coagulant

A flow of 1,75 l/h is required. The offered dosing pump must be of 0 – 6 l/h at 7 bar

3.3.2. Dosing pump for sodium hydroxide

A flow of 1,75 l/h is required. The offered dosing pump must be of 0 – 6 l/h at 7 bar

3.3.3. Dosing pump for polymer

A flow of 14 l/h is required. The offered dosing pump must be of 0 – 20 l/h at 7 bar

For the startup of the system, the contractor will offer the necessary quantity of at least 25lt of coagulant, sodium hydroxide and polymer.

3.4. Sedimentation Tank – Lamella Type

Technical Specifications	Size
Length (m)	3,10
Width (m)	2,60
Height (m)	1,60
Surface (m ²)	11,10
In / Out (water)	DN 65 / DN 125
In / Out (mud)	DN 65

The sedimentation unit will be made of metal with a plastic layer on the points of contact with the water. Otherwise, it can be of Stainless Steel 304 or Glass Reinforced Plastic (GRP) with a layer of suitable resin or synthetic materials.

The inclined plates, of 10 mm thickness, will be made of plastic of adequate stiffness in order to remain in parallel formation and to avoid deformation during operation. The plates will be removable for maintenance reasons.

3.5. Drying Unit for the Rejected Mud from the Sedimentation Tank

The removal of the sedimented mud will be made with a suitable electrovalve which will be installed at the point of mud rejection on the sedimentation unit. The electrovalve will be controlled in a way that will allow the mud to move to the mud towards a mud thickening unit with bag filters.

The unit will be of double layout with three bag filters in each side.

The surface of the bag filters for the thickening of the mud will be approximately 1,10 m²/day.

3.6. Automatic Pressure Filter System

Technical Specifications	
Flow (m ³ /h)	7,00
Velocity (m/h)	10,66
Filter diameter (inches)	36

Material of filter	Glass Reinforced Plastic
Shape	Vertical, cylindrical, with hemispherical edges
Cylindrical height (mm)	1.170
Maximum pressure of operation (bar)	5
Test pressure	60% more than the maximum operation pressure
Pressure drop	Less than 1 bar
Backwash flow (m ³ /h)	18 (for 10 minutes)
Diaphragm valves	4
Filtering media	
Substrate	
Layer 1	Silica Gravel 10 – 15 mm
Layer 2	Silica Gravel 6 – 10 mm
Layer 3	Silica Gravel 2 – 5 mm
Total height of substrate	420 mm
Filtering Layer 1	Silica Sand 0,5 – 1 mm 380 mm height
Filtering Layer 2	Anthracite 0,8 – 1,6 mm 450 mm height
Filter Pump (including backwash)	
Flow of operation	7,00 m ³ /h
Manometric pressure of operation	1,5 bar
Flow of backwash	18 m ³ /h
Manometric pressure for backwash	1,2 bar

The backwash water of the filter will be directed back to the backwash water tank of the Water Treatment Plant of Kallithea.

3.7. Intermediate Tank Before the Sand Filter

A tank of 10 m³ will be installed before the filter and the sedimentation unit.

3.8. Water Pump to Pipe Flocculator

Flow of operation	7,00 m ³ /h
Manometric pressure of operation	1,5 bar

ANNEX II – BILL OF QUANTITIES

ITEM / EQUIPMENT	QUANTITY
Flow Balancing Tank of 50 m ³	0 (there are two tanks of 25 m ³ each)
Pipe flocculator	1
Dosing pump for polymer (including tank for chemicals)	1
Dosing pump for coagulant (including tank for chemicals)	1
Dosing pump for sodium hydroxide (including tank for chemicals)	1
Sedimentation tank – Lamella type	1
Drying unit for rejected mud	1
Intermediate tank of 10 m ³	1
Pressure filter of 36"	1
Water feed pump to pipe flocculator	1
Filter feed pump	1
Control panel / electric board	1
Electrical connections	1 (lump sum)
Hydraulic connections	1 (lump sum)
Concrete slab (if necessary)	1 (lump sum)
Coagulant for the start-up	25 lt
Polymer for the start-up	25 lt
Sodium hydroxide for the start-up	25 lt

It is noted that the contractor should ensure that the sensitive electromechanical equipment will be protected from the weather conditions.

ANNEX III – DRAWINGS

P&ID and LAYOUT drawings are provided as separate files in .pdf format.

ANNEX IV – WORK PHASES

Phase I	Preparatory works (e.g. cleaning of the area of installation, ground leveling, concrete slab, etc.)
Phase II	Supply and delivery of equipment to the location of installation
Phase III	Hydraulic and electrical connection of equipment and control / electric board
Phase IV	Testing and start-up of the system
Phase V	Operation and Maintenance Manual, including troubleshooting section
Phase VI	Training session for the employees of the Technical Service of the Municipality of Tanagra