



**CONSILIUL JUDEȚEAN DOLJ
SPITALUL DE PNEUMOFTIZIOLOGIE LEAMNA**

Operator de date cu caracter personal înregistrat la A.N.S.P.D.C.P. sub nr. **15823**

Com. Bucovăț, Sat Leamna de Sus, Jud. Dolj
Tel/Fax: +4 0251 360 395, +4 0251 360 054
Cod postal: 207129, Cod fiscal: 5046653

Web: spital.leafna.ro
e-mail: spitalul@leafna.ro



“Imminent closure of local hospital due to poor water quality”

The Problem

- **The raw water supplied from a purpose drilled borehole for the use of the hospital had above legal limits for drinking water of the following parameters: -**
 - **Ammonium**
 - **Iron**
 - **Manganese**
 - **Microbiological**
 - **Hardness**
 - **Turbidity**
- **It is a misconceived idea that by drilling a borehole it will provide access to wholesome drinking water. Sadly, this is not always the case.**

The Solution

- **Using our Technology 4.0 Oasis collective drinking water system we are continuously cleaning the water to EU98/83 regulation, the system benefits include: -**
 - Satisfies discerning Customers who want/need an environmentally friendly solution and produces drinking water to EU 98/83 drinking water regulations.
 - All wastewaters can go back to source or diverted to tanks for reuse.
 - No requirement for use and storage of hazardous chemicals.
 - Oasis System disinfection (Paqualyte) made on demand and stored ready for use within the unit.
 - Disinfection made within unit can be used for hard surface disinfection throughout Customer location.
 - Residual disinfection dosing in the water ensures microbiological cultures do not immediately regrow once inside storage vessels.
 - Extremely effective against water borne virus, bacteria, and pathogens
 - No requirement for chlorine dosing or UV solutions.
 - Very low Power consumption and can run utilizing a solar array. (Typically, 300-500 Watts per hour)

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- Simple on and off button for operation with minimal operator training required together with optional flow control via integration with external tanks.
- Fully autonomous operation including Backwashes and chemical cleans ensuring optimal Oasis system efficiency. (Typically, around 85-90%)
- Continual monitoring of processed water quality always guarantees its safe. If potable water is outside of set parameters, it can be diverted back to source.
- Extremely quiet operation.
- Remote monitoring and fault analysis allow monitoring anywhere in the world via GSM phone network or ethernet connection to broadband router.
- Self-analysis of the unit alerts the operator and remote monitoring if there is an immediate issue.
- No complex electronic controls allow quick and easy Oasis system adjustment during commission or maintenance ensuring the Oasis system is up and running in no time.
- Robust and reliable with low maintenance schedule.
- Only consumables utilized are power, source water and small amount of salt (Typically 10kg per month) to operate and maintain the operation of the unit.
- All parts are globally available and easy to replace.
- Modular solutions can be added for water storage, UPS power backup or prefiltration to remove physio-chemical contaminants such as ammonia, nitrates, nitrites, arsenic, turbidity, hardness and hexavalent chromium (chromium 6) as required.

Consequences

The hospital had its own borehole drilled some 90 years ago, expecting to be able to drink fresh water just like being able to breath fresh air. This was indeed the case until legislation was brought in that correctly measured the quality of the drinking water from the borehole.

People generally think that if they drill a borehole in the ground, they will automatically be able to receive wholesome drinking water, but alas, this is sadly rarely the case and treatment is required to meet the ever-tightening legislation.

The hospital was given the option to either fix the situation and stop buying in the large amounts of bottled water it needed to operate, or close down completely transferring services to another facility, but the later would have had incalculable indirect cost. Having patients drinking the dirty water would have its own negative effects such as gastric issues and potential re- hospitalisation if the patient water loss was too severe. This would create its own circle of sickness and costs.

The local Government were initially reluctant to commit to the CAPEX purchase of the Oasis collective drinking water system but were able to see a year on year bottled water capex saving alone which would not take long to recoup to offset the CAPEX cost. Further, it takes approx. 2000 times more energy to produce a litre of bottled water including packaging than it does to produce a litre of water to the tap, so is helping with the environment.

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Finally, with the Solution in place and the Hospital still remaining open, it is able to continue to provide its excellent service of caring for the local population, which is further enhanced by saving lives of all the Covid Patients it had resident during this pandemic period who may potentially have sadly died due to increased distances for help or simply lack of care available.

Hospital Background



The hospital was built from the ground up between 1922-1927 by the French doctor Charles Laugier on a land provided by Mrs. Maria Pop for the isolation and treatment of patients with pulmonary tuberculosis in this area of Oltenia.

The hospital is located in a wooded hilly area with great power of ozonification of air, beneficial for the optimal treatment of pulmonary tuberculosis. This pedoclimate is found only in the baile Herculane area and in the Swiss Alps.

Located about 8 km from Craiova city between the villages of Leamna de Jos and Leamna de Sus in Bucovat commune, the sanatorium offered and offers an addressability and special climatic conditions compared to many similar units in the area.

The unit functioned under the name of Sanatorium TBC Leamna until 27.01.2001 when by ORDER MSF nr. 99 was transformed into the Hospital of Pulmonology

Leamna . Dolj county population is approx. 750,000 inhabiting a rough 50:50 split of rural and urban areas and like in many areas is aging.

The structure of the Pulmonology Hospital

Leamna Pulmonology Hospital has as its unique specialization Pulmonology. The structure of the hospital is as follows:

- 3 departments specialized in pulmonology.
- Emergency room
- Day hospitalization
- Pharmacy
- Integrated outpatient hospital.
- Radiology-medical imaging laboratory.
- Medical analysis laboratory.
- Bronchial endoscopy compartment
- Physiotherapist Room
- Service for the prevention of infections associated with medical assistance.

In more recent times the Hospital has been the tip of the spear in the fight against COVID-19 with the wards

The water issues

The water issue identified through water reports of the incoming water is quite complex. The raw Water has multiple contaminates including Ammonium, Iron, Manganese and Bacterial together with turbidity and Hardness to overcome.

The water must conform to European Drinking Water law EU 98/83 which requires physical, chemical, and microbiological levels to be measured within the limits laid out within the legislation.

The hospital had been informed by the local Government that the water supply had to be cleaned otherwise the whole site would have been closed and the hospital facilities would have been lost to the community. This loss would not only impact the local workforce but loose over 150 patient beds for medium to long term care and a small number for short term where the average length of stay is 35 days.

The appearance of the raw water entering the hospital is brown in appearance and unappetising to drink

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The hospital requested help over many years but only received local replaceable small micro filters and active carbon filters from Contractors against any tenders they raised in the past



Although effective for small flow rates into the kitchen for short periods of time this was not the solution for the whole site and still required boiling before use. These filters although relatively inexpensive still require regular monitoring and replacement requiring the kitchen supply to be momentarily shutoff to replace.

Our Romanian **representativeAgent** shared the information of our water purification successes in Karystos, Greece with the local Government and hospital administration. Within a short time, a budget was agreed, and a plan for a trial of our Oasis collective drinking water system within the hospital began.

During the early Summer an outbuilding infrastructure was built with a concrete hard standing and a 20-foot ISO container framed portacabin erected.

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August saw the Oasis system arrive at the hospital via a truck over a 3-day journey. During this time the Water purification unit was subjected to multiple 5G shocks when the entire cargo was transferred from one truck to another due to a break down and during its unloading on site. No issues were observed following this activity underlining the robustness of the solution.

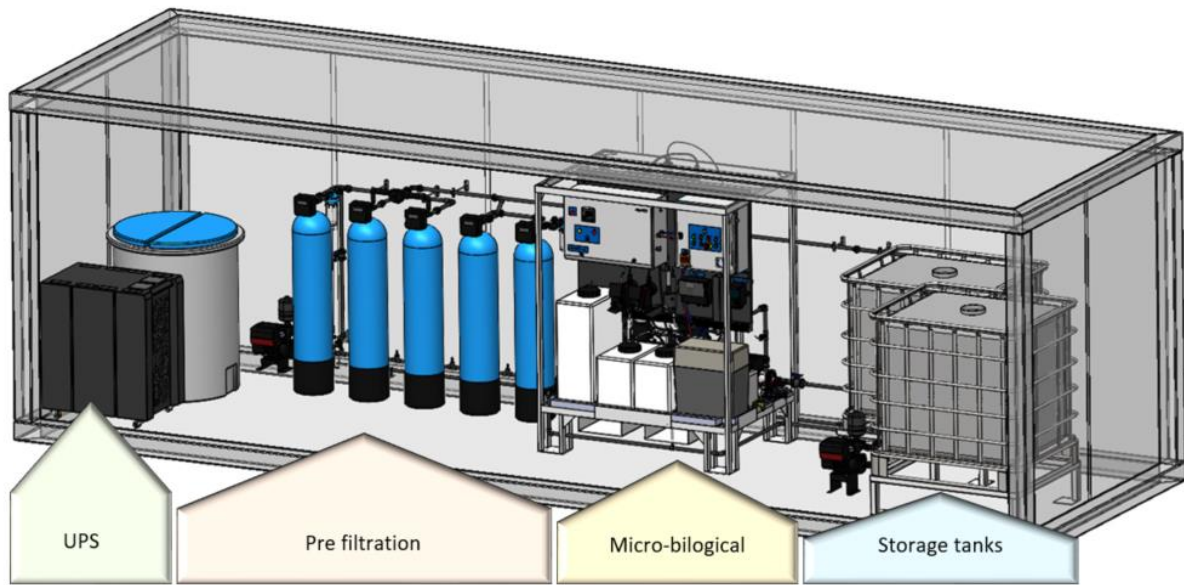
The whole Oasis system in its component parts was quickly brought up to the site using a JCB up the rural approach road and placed into the new portacabin area.



The whole Oasis system solution comprises of 4 main components

1. The prefiltration used to remove the physio-chemical contamination
2. The ultrafiltration system that removes the microbiological and controls the whole solution
3. Storage and transfer tanks
4. Uninterruptible power supply (UPS) used to clean up the power supply and provide battery power to continue to run the entire solution should there be a power outage and fill the time needed to start the emergency generators situated within the hospital grounds.

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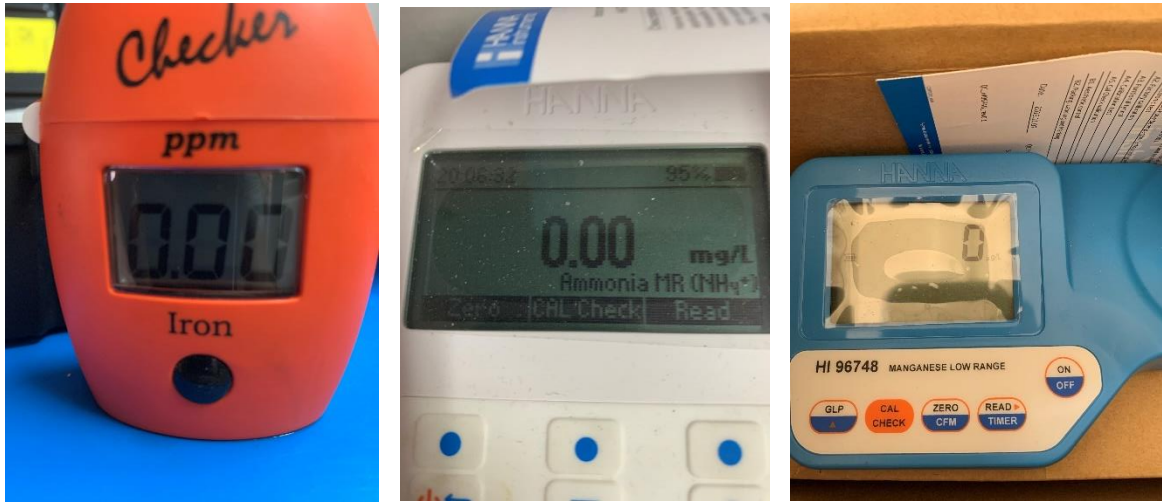
Within 2 days of plumbing and adjustment the entire solution was assembled, interconnected and producing drinking water to EU98/83 standards at a flow rate of 1000 litres per hour. The water was transferred into the hospitals 5000 litre storage tank which then is sent into the hospital infrastructure via a pumping solution.

This solution allows for a continuous delivery of water on demand throughout the day and night without the need to turn of the supply to replace filters. Every part of the hospital can receive the same quality water from a single water purification solution.



Multiple additional physio-chemical tests were repeated over the remainder of the working week to ensure that the key contaminants were consistently under the legal limits according to the EU water regulations and checking the raw water contamination to ensure that this was not simply due to the water supply contamination dropping by itself.

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This marked a momentous milestone as this was the first time since water regulations were introduced that the hospital staff were able to safely drink the water from the taps which was cause for a celebration.



During the next twelve months product authorization trials were conducted with the INSP (Ministry for Health). During the trial period over 5 million litres were produced and delivered to the hospital with the Oasis collective drinking water system running flawlessly every day for the entire trial period.

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At the end of the process the Certificate to Market and sell the Unit in Romania was issued which has a blanket authorisation across all EU member states.

 <p>MINISTERUL SĂNĂTĂȚII INSTITUTUL NAȚIONAL DE SĂNĂTATE PUBLICĂ NATIONAL INSTITUTE OF PUBLIC HEALTH</p> <p>Str. Dr. A. Leana Nr. 1 - 3, cod 050463, București, ROMÂNIA Tel: (+40 21) 318 36 20, Director: (+40 21) 318 36 00, (+40 21) 318 36 02, Fax: (+40 21) 312 426</p>	<p>Sistemul de purificare apă Paqua 1000-D2, format din: sistemul de pre-filtrare (pompa de presiune 1, 5 ionizatoare, rezervor de siguranță, vase filtrante din sistemul de pre-filtrare), sistemul de ultra-filtrare (generatorul Anolyte ANK și 2 membrane de filtrare), sistemul de stocare a apei/sistemul de rezervoare de apă potabilă (javel rezervorului tampon, rezervorul tempor, rezervorul de stocare a apei potabile, pompa de presiune 2, comutatoarele plătoare încorporate).</p> <p>- Sistemul de purificare apă Paqua 1000-D2 reduce: amoniac, oxidabilitatea, zăozi, turbiditatea, duritatea, clorul rezidual liber și total, fier, mangan, elimină bacteriile coliforme, Escherichia coli, enterococii intestinali, măruntul de colorii la 22°C și 37°C.</p>	
<p>CENTRUL REGIONAL DE SĂNĂTATE PUBLICĂ BUCUREȘTI Comisia pentru produse, materiale, substanțe chimice/amestecuri și echipamente utilizate în contact cu apa potabilă</p>	<p>□ Producătorii: PORTSMOUTH AVIATION Ltd 2.1. Adresa: Airport Service Road, Portsmouth, Hampshire PO3 5PF 2.2. Țara: United Kingdom</p>	
<p>Solicitant: SC TECHNO-GRUP SRL ROMÂNIA Județ Dolj, Com. Pielești, Str. Gheorghiu Gheorghiu, Nr. 64, cod 207450 Nr. de înregistrare în Registrul Comerțului: J16/030/1999</p>	<p>Avizarea sanitară a produselor utilizate în contact cu apa potabilă se face în conformitate cu Ordinul ministrului sănătății nr. 275/2012 privind aprobarea procedurii de reglementare necesară pentru punerea pe piață a produselor, materialelor, substanțelor chimice/amestecurilor și echipamentelor utilizate în contact cu apa potabilă și în baza Art. 10 din Legea nr. 458/2002 privind calitatea apei potabile, republicată.</p> <p>Avizul sanitar este valabil pe perioada în care nu se face nicio modificare în compoziția și calitatea produselor. Orice modificare a compoziției și calității produselor duce în mod automat la anularea avizului sanitar.</p>	
<p>AVIZ SANITAR Nr. 14 CRSPR/27.10.2021</p>	<p>MEDIC ȘEF C.R.S.P.B. Dr. Simona FĂRVIU</p> 	<p>Președinte Comisie, Dr. Irina STOIAN</p> 
<p>Comisia pentru produse materiale, substanțe chimice/amestecuri și echipamente utilizate în contact cu apa potabilă din Institutul Național de Sănătate Publică (INSP)/Centrul Regional de Sănătate Publică București (CRSPB), în baza Referinței tehnice de evaluare nr. 14 CRSPB/27.10.2021 decide să (re)autorizeze echipamentul utilizat în contact cu apa potabilă pentru fi comercializat și utilizat în România, conform prevederilor legale în vigoare.</p>		
<p>1. Echipamentul utilizat în contact cu apa potabilă:</p>		
<p>1.1. Denumirea comercială a echipamentului utilizat în contact cu apa potabilă:</p>		
<p>SISTEM DE PURIFICARE APĂ PAQUA 1000-D2</p>		
<p>1.2. Domeniul de utilizare: Echipamentul este utilizat în scop de alimentare cu apă potabilă.</p>		
<p>1.3. Condiții de utilizare: - La comercializare, trebuie menționate informații despre producție și utilizarea produsului; atenționarea sa va face în conformitate cu legislația în vigoare; - Avizul sanitar este dat pentru:</p>		

This document translated to English declares the following: -



MINISTRY OF HEALTH
NATIONAL INSTITUTE OF PUBLIC HEALTH



INSP NATIONAL INSTITUTE OF PUBLIC HEALTH
Str. Dr.A. Leonta Nr. 1 - 3, code 050463, Bucharest, ROMANIA
Tel: 21) 318 36 20, Director: (+40 21) 318 36 00, (+40 21) 318 36 02, Fax: (+40 21) 312 426

REGIONAL CENTER OF PUBLIC HEALTH BUCHAREST
Commission on Products, Materials, Chemicals/Mixtures and Equipment Used
in Contact with Drinking Water

Applicant: SC TECHNO-GRUP SRL ROMANIA

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Dolj County, Com. Pielești, Str. Gheorghică Geolgău, No. 64, code 207450 No of registration with the Trade Register: J 16/830/1999

HEALTH PERMIT

No. 14 CRSPB / 27.10.2021

Commission for materials, chemicals/mixtures and equipment used in contact with drinking water of the National Institute of Public Health (INSP)/Regional Public Health Center Bucharest (CRSPB), based on the Technical Evaluation Report no. 14 CRSPB / 27.10.2021 decides that the next equipment used in contact with drinking water can be sold and used in Romania, according to the legal provisions in force.

o Equipment used in contact with drinking water:

1.1 Trade name of the equipment used in contact with drinking water:

WATER PURIFICATION SYSTEM PAQUA I000-D2

1.2 Field of use:

The equipment is used in drinking water supply networks.

1.3 Terms of use:

- Information on the manufacturer and the use of the product must be attached to the marketing; the labelling will be done in accordance with the legislation in force;- The sanitary permit is given for:

Paqua 1000-D2 water purification system, consisting of: filtration system (pressure pump 1, 5 ionizers, brine tank, filter vessels from the pre-filtration system), the system of ultra-filtration (Anolyte ANK generator and 2 filtration membranes), water storage system /potable water tank system (buffer tank pipes, buffer tank, drinking water storage tank, pressure pump 2, built-in floating switches).

- Paqua 1000-D2 water purification system reduces: ammonium, oxidability, nitrites, turbidity, hardness, free and total residual chlorine, iron, manganese, eliminates coliform bacteria , Escherichia coli, intestinal enterococci , the number of colonies at 22°C and 37°C.

□ Manufacturer: PORTSMOUTH AVIATION Ltd

2.1. Address: Airport Service Road, Portsmouth, Hampshire PO3 5PF

2.2. Country: United Kingdom

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Sanitary approval of products used in contact with drinking water is made in accordance with Order of the Minister of Health no. 275/2012 on the approval of the sanitary regulatory procedure for the placing on the market of products, materials, chemicals/mixtures and equipment used in contact with drinking water and on the basis of Art. 10 of Law No. 458/2002 on the quality of drinking water, republished.

The health notice shall be valid for a period during which no change in the composition and quality of the products has been made. Any change in the composition and quality of the products automatically leads to cancellation of the sanitary permit.

President of the Commission

Dr. Irina STOIAN



CHIEF PHYSICIAN C.R.S.P.B.

Dr. Simona PARVU

A handwritten signature in blue ink, consisting of stylized letters, likely representing "S. Parvu".