ColiMinder

ONLINE MICROBIAL MONITORING

References & Scientific Publications

WWW.COLIMINDER.COM

ColiMinder
ONLINE MICROBIAL MONITORING

Introduction

Microbiological water quality is important in every water application, but manual lab methods need 1 to 5 days to deliver a result. With the ColiMinder, the parameter of microbiological water quality is now available in 15 minutes and thus an an actionable and reliable information for process control and performance monitoring is available.

In any water application, customers use ColiMinder to get an early warning in case of contamination events to be able to take timely countermeasures. Treatment process performance can be monitored, and treatment intensity can be adjusted to actual microbial levels. This increases drinking water safety significantly and supports optimization of process efficiency and costs.

The ColiMinder is fully compliant with the concept of **operational monitoring** and supports the **risk-based approach** in monitoring water quality, as introduced e.g., by WHO and EU drinking water directive. It is the only approach to measure specific fecal indicator organisms.

Protocols for application-based validation of the ColiMinder are available.

Key Features

- ✓ **Fully automated** sampling, measurement, cleaning, calibration
- ✓ **15 minutes** time to result
- ✓ **Results easy to interpret** – "operator-proof"
- ✓ **Most sensitive** instrument on the market
- ✓ Full **autonomy** for up to 1,000 measurements
- ✓ Reagents available for **specific** target organisms

Key Benefits

- ✓ Increased **Water Safety**
- ✓ Generating detailed **data sets** by high frequency measurements (up to 48 per day)
- ✓ Treatment **Process Optimization**
- ✓ Simplified **Quality Control**
- ✓ **Early Warning** to enable quick reaction on Contamination Events
- ✓ **Efficiency** and **Sustainability**

Press and Publication Kit

This brochure means to provide more detailed information through publications and ColiMinder customer use cases.

Target Organisms

- E. coli
- Entero-coccus
- Coliform
- Total Activity
- Total Activity Mineral Water

Application Fields

- Drinking Water
- Water Re-use
- Beverage Production
- Membrane Integrity
- Ultrapure Water
- Desalination
- Waste water
- Surface & Bathing Water
- Process Water

Installations around the Globe

ColiMinder
ONLINE MICROBIAL MONITORING

WSD (Water Supply Department), Hong Kong

WLVNB (Wasserleitungsverband Nördliches Burgenland), Austria

Seine River, Eau de Paris

Romaqua, Romania

Drinking Water Network Monitoring, Dubai

Sydney Water, Australia

Installations around the Globe 1

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WFI (RO Water Production)
Austria

Emergency Water Production
Austrian Military, Austria

F&B Production
Austria

Warm/Cold WFI
Bipso - Germany

Drinking Water Lab
Switzerland

Mineral Water Bottling,
Poland

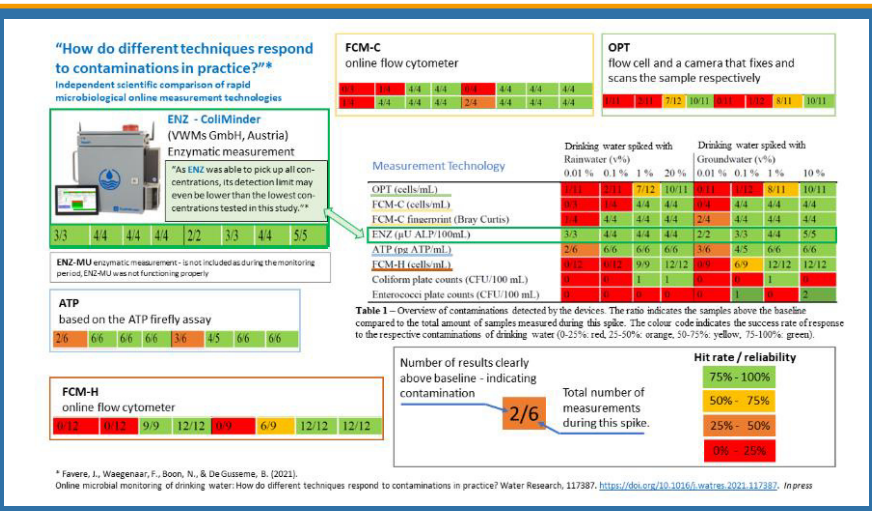
Excerpts of Scientific Publications

Online microbial monitoring of drinking water: How do different techniques respond to contaminations in practice?

Jorien Favere [a,b,1], Fien Waegenaar [a,b,1], Nico Boon [a,b], Bart De Gusseme [a,b,*]

Findings:

- The ColiMinder has shown to be the most sensitive instrument on the market for online bacterial monitoring devices
- According to the author of the study, the " .. detection limit may even be lower than the lowest concentrations tested in this study…".



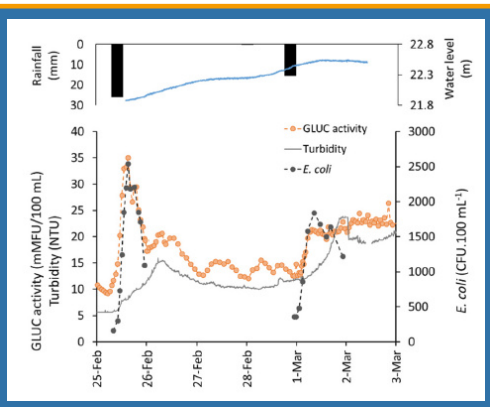
Favere, J. , Waegenaar, F., Boon, N., De Gusseme, B., Online microbial monitoring of drinking water (..), Water Research 202 (2021) 117387

Automated Targeted Sampling of Waterborne Pathogens and Microbial Source Tracking Markers Using Near-Real Time Monitoring of Microbiological Water Quality

Jean-Baptiste Burnet [1,2,*], Marc Habash [3], Mounia Hachad [1], Zeinab Khanafer [1], Michèle Prévost [2], Pierre Servais [4], Emile Sylvestre [1] and Sarah Dorner [1]

Findings:

- "(…) Significant increases in protozoan parasites, microbial source tracking markers and E. coli were measured during short-term (<24 h) fecal pollution episodes (..)"
- "(…) Synchronous triggering of the automated sampler with online GLUC activity measurements further revealed a tight association between the biochemical indicator and culturable E. coli. (..)"



Burnet, J.-B.; Habash, M.; Hachad, M.; Khanafer, Z.; Prévost, M.; Servais, P.; Sylvestre, E.; Dorner, S. (2021). Automated Targeted Sampling of Waterborne Pathogens and Microbial Source Tracking Markers Using Near-Real Time Monitoring of Microbiological Water Quality. Water, 13, 2069.

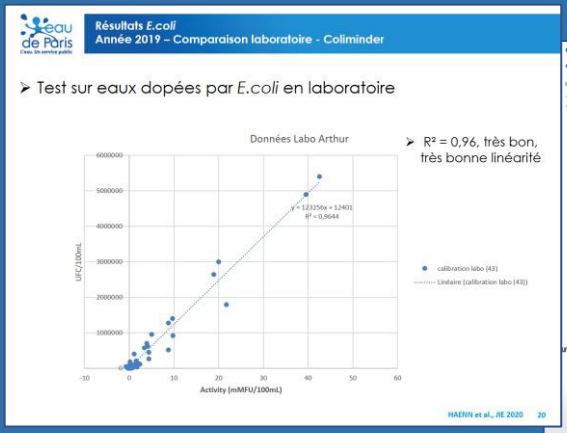
Suivi de la qualité d'eaux de surface par des capteurs microbiologiques en ligne

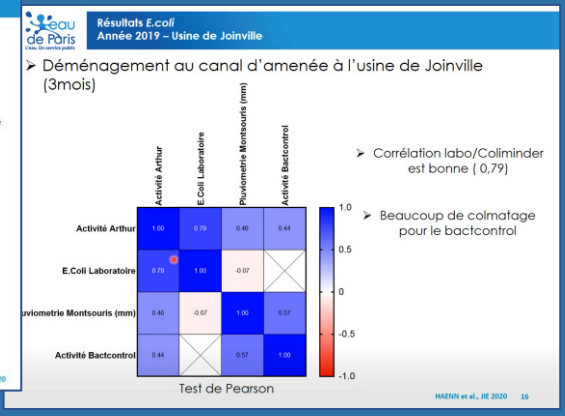
Retour d'expériences

Haenn Sophie, MARTIN Bruno, PUTAS Sarah, DIALLO Alpha, GILLON-RITZ Miguel, MOULIN Laurent

Findings:

- Technology evaluation of ColiMinder vs. other enzymatic assay device showed significantly better results for ColiMinder
- Correlation tests between ColiMinder and culture-based lab method showed correlations of up to R2 = 0,96

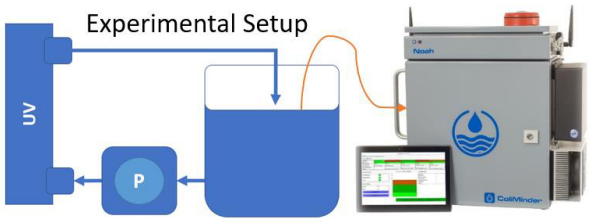




Dr. Sophie Haenn, Eau de Paris, published at „Journées Information Eaux", virtual conference, Oct 6th to 8th, 2020

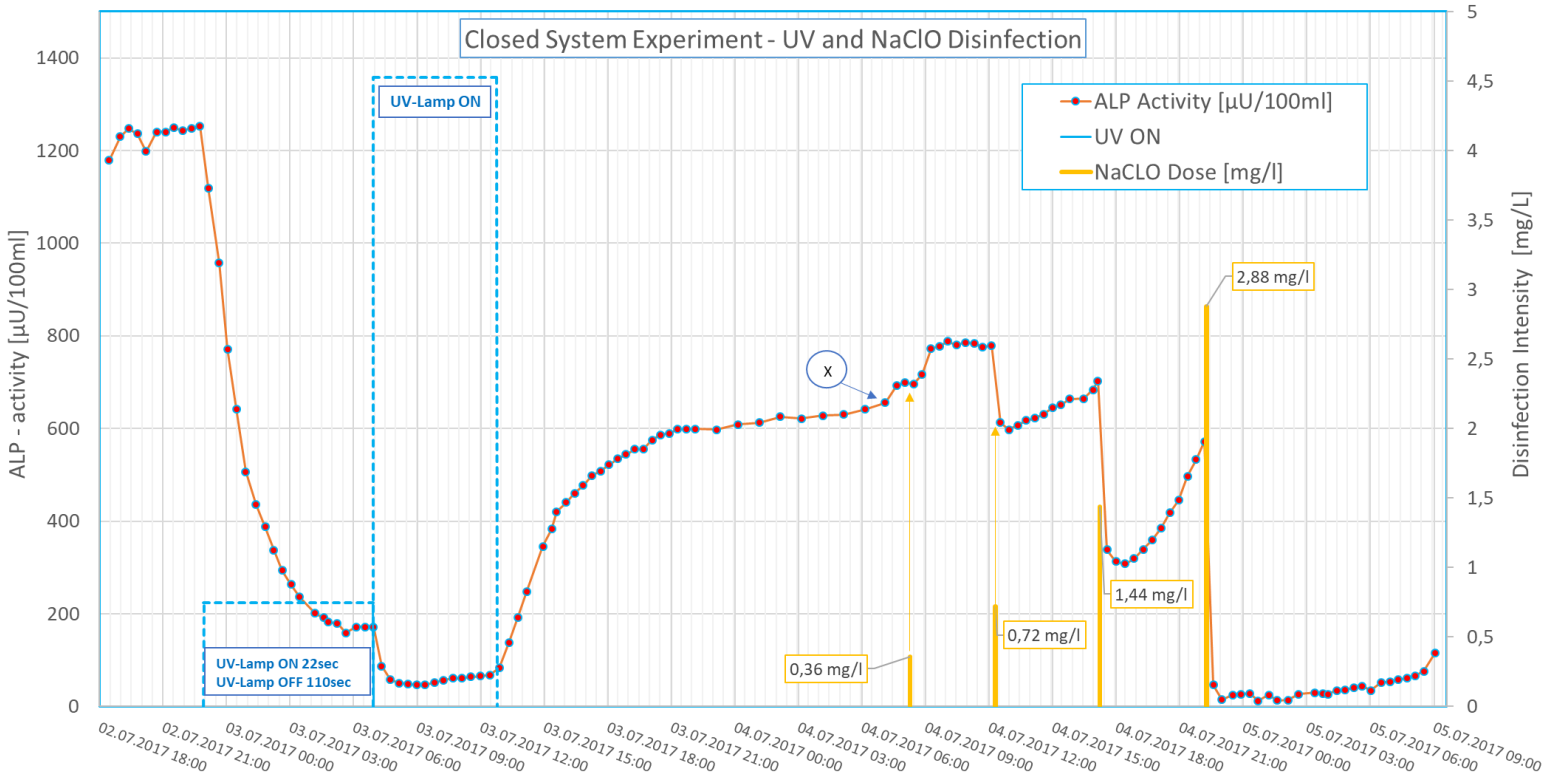
Dynamics: Experiment on UV and NaClO disinfection in a closed system

The experimental setup was a closed system of 5 liters of drinking water taken from a garden hose. It shows a significant microbiological activity (ALP) of 1200 µU/100ml.



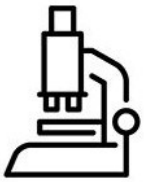
Normal Drinking water in comparison would range between 6 µU/100ml and 20µU/100ml. The sample has been circulated at about 1 liter per minute through a small UV unit designed for swimming pools.

For the first 3 hours the activity remained constant. Different intensities of UV light and NaClO dosing have been applied and the effects being measured over time.
At Point (X) the circulation of the sample has been increased for a few minutes.



Customer Projects and References

Customers from science, R&D, public utilities and private industry use the ColiMinder in different settings and applications. This information serves an excerpt of different projects and deployments.



SCIENCE & RESEARCH

Customer: **Sweden Water Research – Urbana Bad Project, Sweden**

Application: Deployment of 3 ColiMinder devices for monitoring bathing water quality, framed by an urban bathing water project in Helsingborg and Malmö.

Task: Monitoring fecal contamination levels in bathing waters, enabling quick reaction on contamination events.

Target organism: E. coli and Enterococci

Contact: Carina Svensson, Head of Projects at Sweden Water Research
carina.svensson@swrab.se

Customer: **KIT – Karlsruhe Institute of Technology**

Application: Surface water monitoring in different applications. Current project: karstic spring monitoring throughout Europe

Task: scientific studies, validations, research projects in the frame of a karstic spring water project KARMA.

Target organism: E. coli

Contact: Prof. Nico Goldscheider, Nico.goldscheider@kit.edu
Institute of Applied Geosciences

Customer: **Université Polytechnique de Montréal**

Application: monitoring of surface water and raw water in drinking water production, bathing water and sewage plant discharge using 6 ColiMinder devices

Task: scientific validation of the technology; helping municipalities and other institutions to ensure water safety

Target organism: E. coli

Contact: **Sarah Dorner, PhD,** sarah.dorner@polymtl.ca
Canada Research Chair in Source Water Protection
Department of Civil, Geological and Mining Engineering

Customer:	**KWR** Water Research Institute, The Netherlands
Application:	Technology evaluation and validation for Dutch drinking water utilities, comparison with other techniques. ColiMinder was confirmed to be a reliable technology for being used in drinking water.
Task:	Identifying most suitable deployments and use cases of ColiMinder for Dutch Water Utilities.
Target organism:	Total Microbiological Activity (ALP)
Contact:	Marcelle van der Waals, Scientific researcher - Microbial Water Quality and Health phone +31 30 606 9566 | E-Mail: Marcelle.van.der.Waals@kwrwater.nl

Customer:	**LIST** – Luxembourg Institute of Science & Technology
Application:	Online monitoring of microbiological water quality in drinking water production and distribution at different Luxembourg drinking water utilities. Several groundwater projects.
Task:	Ensuring safety of drinking water supply
Target organism:	Total Microbiological Activity (ALP), E.coli
Contact:	**Mr Jean-Baptiste Burnet,** jeanbaptiste.burnet@list.lu Mobile: +352 691 682 273

Customer:	**LZWW – Life Zero Waste Water –** EU funded project with several stakeholders: FCC Aqualia, Canal de Isabel II, Simbiente Ingenería and scientific partners
Application:	Project "Combined treatment of urban waste water and the organic fraction of municipal solid waste in WWTPs with positive energy balance for populations of less than 50,000 IE.
Target organism:	E.coli
Task:	Providing reliable sensor data for a development of the smart system for the control and monitoring of water quality in effluent.
Contact:	via VWMS GmbH I www.lifezerowastewater.com

Customer:	**University of Tokyo**
Application:	surface water monitoring in different public bathing areas and surface waters.
Task:	ensuring safety in bathing waters, enabling quick reaction on contamination events
Target organism:	E. coli
Contact:	**Prof. Hiroyuki Katayama** University of Tokyo, Department of Urban Engineering, Graduate School of Engineering Bunkyo-ku, Tokyo, 113-8656 I Japan

Customer:	Romaqua – Mineral Water Production Romania, 2 ColiMinder in 2 bottling plants
Application:	Online monitoring of microbiological water quality of two mineral water wells and quality control throughout entire bottling process.
Task:	Safeguarding product quality, enable evidence-based decision-making to CIP (Clean in Place) based on information of actual microbiological level, testing final product prior to delivery, increase safety and efficiency of the bottling process.
Target organism:	Total Microbiological Activity (ALP)
Contact:	Mr Radu Lazaroiu, General Manager Romaqua, radu.borsec@romaqua.ro

ROMAQUA GROUP
BORSEC

Customer:	**Refresco**
Application:	ColiMinder used in the lab to replace parts of the manual plate testing. Roll-out as a process monitoring instrument started October 2023.
Task:	Safeguarding microbial quality throughout entire beverage production process, testing of final products prior to dispatch. ROI through reduction off manual lab tests and increased safety.
Target organism:	Total Microbiological Activity (for Mineral Water), E. coli
Contact:	no additional disclosure of information possible.

Refresco
Our drinks on every table

Customer:	**Major international soft drink company,** several plants in South Africa
Application:	Online monitoring of microbial water quality at different steps throughout the water purification process, from incoming water to end product.
Task:	Safeguarding product quality and increase safety and efficiency of the soft drink production process.
Target organism:	Total Microbiological Activity (ALP)
Contact:	no disclosure of information possible due to an NDA.

Customer:	**Rauch Fruchtsaft AG, Austria**
Application:	Using the ColiMinder for continuous monitoring of microbial water quality at different steps in an energy drink bottling process.
Task:	Safeguarding product quality, increase safety and efficiency of bottling process.
Target organism:	Total Microbiological Activity (ALP)
Contact:	through our partner **Sagamo AG** Mr. Reinhold Keller, rk@sagamo.ch, mobile: +41 77 983 5164

RAUCH

DRINKING WATER

Customer:	**WSD** – public **W**ater **S**upply **D**epartment, Hong Kong
Application:	ColiMinder has been successfully validated in a technology evaluation project, and WSD will continue using the ColiMinder for monitoring final drinking water and equip further drinking water plants with the instrument. Next scheduled investment will be a ColiMinder Emergency Response Unit for scanning the drinking water network.
Task:	Ensuring microbial safety in drinking water supply.
Target organism:	Total Microbiological Activity (ALP)
Contact:	through our partner **Guyline Asia Ltd.** Ms Wendy Lai, General Manager, Wendy@guyline.com.hk or GM@guyline.com.hk

Water Supplies Department
The Government of the Hong Kong Special Administrative Region

Customer:	**DEWA** – Dubai Electricity and Water Authority, UAE
Application:	Monitoring microbial water quality in drinking water, also used for R&D
Task:	Ensuring drinking water safety, planned roll-out to more installations within DEWA
Target organism:	Total Microbiological Activity (ALP)
Contact:	through our partner **AIWAEN**: Mr Craysac Fx, CEO, E-Mail: craysacfx@waen.ai

ديوا
dewa

Customer:	**NEOM** –Smart City Project, Saudi Arabia
Application:	Pilot project: monitoring microbial water quality in drinking water production
Task:	Ensuring drinking water safety at different steps in production and distribution.
Target organism:	Total Microbiological Activity (ALP) and E. coli
Contact:	through our partner **AIWAEN**: Mr Craysac Fx, CEO, E-Mail: craysacfx@waen.ai

NEOM نيوم

Customer:	**Wasserleitungsverband Nördliches Burgenland (WLVNB), Austria**
Application:	Austria's 5th biggest water supplier uses the ColiMinder ERU for validation of water quality curing and after construction works at the drinking water network. Reporting results to governmental authorities with the aim to officially approve ColiMinder results.
Task:	Ensuring microbial water quality throughout construction works.
Target organism:	Total Microbiological Activity (ALP), E. coli and Enterococci
Contact:	**Rudolf Stagl,** Head of Maintenance, Rudolf.stagl@wasserleitungsverband.at

WASSERLEITUNGSVERBAND NÖRDLICHES BURGENLAND

Customer:	**Unitywater** - drinking water utility, Australia
Application:	Online monitoring of microbiological water quality of final drinking water in the drinking water network, installed at several reservoirs and pipelines.
Task:	Ensuring safety of drinking water supply.
Target organism:	Total Microbiological Activity (ALP)
Contact:	through **Optimos Solutions**, distribution partner for Australia & NZL Mr. Phil Krasnostein, phil@optimosgroup.com.au, Mobile: +61 409359155

Customer:	**The Water Corporation**, water supply, Perth, Australia
Application:	Piloting the ColiMinder for different application, from raw water for desalination through drinking water to wastewater effluent.
Task:	Ensuring safety of drinking water supply and wastewater effluent.
Target organism:	Total Microbiological Activity (ALP), E. coli Saline
Contact:	through **Optimos Solutions**, distribution partner for Australia & NZL Mr. Phil Krasnostein, Director, phil@optimosgroup.com.au, Mobile: +61 409359155

Customer:	**Bathurst Regional Council,** municipal drinking water supply, Australia
Application:	Online monitoring of raw water quality for drinking water production – installed at pumping station located in a 21 km long pipeline between reservoir and drinking water production facility
Task:	Ensuring safety of drinking water supply
Target organism:	E. coli
Contact:	through **Optimos Solutions**, partner for Australia & NZL Mr. Phil Krasnostein, Director, phil@optimosgroup.com.au, Mobile: +61 409359155

Customer:	**MEKOROT**, Israel's public water supplier
Application:	Online monitoring of raw water network for drinking water supply with ColiMinder ERU
Task:	Ensuring safety of drinking water supply
Target organism:	E. coli and Total Activity (ALP)
Contact:	**Dalit Vaizel-Ohayon,** PhD, Chief Bacteriologist Email: dvaizel@mekorot.co.il

Customer:	**Ville de Laval, municipal drinking water supply, Canada**
Application:	The ColiMinder is installed at raw water intake from river "Rivière des Mille Îles" to a drinking water plant
Task:	Monitoring of microbiological quality of raw water
Target organism:	E. coli
Contact:	via VWMS

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SURFACE & BATHING WATER

Customer:	**Sydney Water** – Sydney's public Water Company
Application:	monitoring fecal contamination of urban bathing water sites at Sydney Harbor to safeguard bathing water quality
Task:	Enabling quick reaction on contamination events
Target organism:	Enterococcus, E.coli
Contact :	through **Optimos Solutions**, partner for Australia & NZL Mr. Phil Krasnostein, Director, phil@optimosgroup.com.au, Mobile: +61 409359155

Customer:	**Eau de Paris -** public water utility for Paris
Application:	using 2 ColiMinder devices for 1. bathing water monitoring in different public recreation areas, especially during **Olympic Games 2024** 2. deployment in raw water monitoring for **drinking water production** 3. monitoring combined sewer overflows in rivers and recreational waters 4. monitoring drinking water production
Task:	ensuring safety in bathing waters / enabling quick reaction on contamination events / monitoring drinking water safety
Target organism:	E. coli, Enterococcus and Total Activity
Contact :	**Laurent Moulin,** Head of R&D, laurent.moulin@eaudeparis.fr

Customer:	**Ville de Paris – Government of the City of Paris**
Application:	using 2 ColiMinder for surface water monitoring of a bathing scene at Seine River, **dedicated for swimming competition at Olympic Games 2024.** As per a decision of the Paris' Olympic Organization Committee in October 2022, ColiMinder results will be used for final decision-making whether to use the Seine for official swimming competition.
Task:	Ensuring safety in bathing waters, enabling quick reaction on contamination events (closing/opening beaches)
Target organism:	E. coli, Enterococcus in some cases
Contact :	**Marion Delarbre,** Bureau de Miguel GILLON-RITZ, Responsable du pôle d'expertise grand cycle et qualité de l'eau, Direction de la Propreté et de l'Eau, marion.delarbre@paris.fr

Customer:	**EKEO, Energizing Kowloon East Office, Smart City Project, together with CEDD (Civil Engineering Development Department), Hong Kong**
Application:	Monitoring E. coli levels at Kwun Tung Typhoon Shelter at the former airport in Hong Kong, an urban development site
Task:	Monitoring fecal contamination in surface & recreational water

Target organism: E. coli saline

Contact : Guyline Asia Ltd. (Distribution partner for Hong Kong)
Ms Wendy Lai, General Manager, GM@guyline.com.hk

Customer: **Ville de L'Assomption**, municipal bathing water and drinking water, Canada

Application: The ColiMinder is installed at raw water intake from a river to a drinking water production, at the same time monitoring a bathing site nearby.

Task: Monitoring of microbiological quality of surface and raw water

Target organism: E. coli

Contact: via VWMS

WASTEWATER

Customer: **DSD - Drainage Service Department**, public wastewater institution Hong Kong

Application: Sewage treatment monitoring and controlled disinfection at Stonecutters Island Sewage Treatment Works (SCISTW), one of the world's largest wastewater treatment plants.

Target organism: E. coli (saline water)

Contact: via VWMS

Customer: **MWR Denver – MetroWaterRecovery Denver / Colorado**

Application: Pilot project for using the ColiMinder to control disinfection

Task: Monitoring of E. coli levels prior to disinfection for adjusting disinfection intensity to actual microbiological load.

Target organism: E.coli

Contact: Mr Dan Freedman, Dfreedman@MetroWaterRecovery.com

Customer: **Ville de Montréal – Canada**

Application: Pilot project for using the ColiMinder to control ozonation

Task: Monitoring of E. coli levels prior and after ozonation to adjust ozonation generator power to actual microbiological load, thus saving process costs.

Target organism: E.coli

Contact: through VWMS or Polytechnique Montréal (see above)

MEMBRANE INTEGRITY

Customer:	**Herlev Hospital in cooperation with DHI Group, Denmark**
Application:	DHI acted as engineering company for a hospital sewage plant discharge quality monitoring, using the ColiMinder to monitor membrane integrity in a public hospital's MBR plant. **Project has been awarded by Danish EPA as "BAT" (Best Available Technology**), roll-out to other hospitals is scheduled for 2025.
Task:	Fully automated contamination monitoring of sewage plant discharge before drained into a recreational area. Automatic warnings in case of increased contamination due to broken UF membranes.
Target organism:	E. coli
Contact:	**Ulf Nielsen (formerly DHI /** Ultraaqua, Denmark), uni@ultraaqua.com

PROCESS WATER

Customer:	**Bipso Bracco, Pharma production, Germany**
Application:	Pilot phase 1 successfully completed, current pilot phase 2 in place. Monitoring of microbiological quality levels in pharma production, from RO water to ultra-pure water and WFI (water for injection).
Task:	Ensuring safety and efficiency of production process, protection from product re-calls.
Target organism:	Total Activity (ALP)
Contact:	VWMs distribution partner for DACH and Western Europe Sagamo AG, Reinhold Keller I rk@sagamo.ch

Customer:	**Producer of metal working fluids, Europe** **(**Must not be named due to an existing NDA).
Application:	Monitoring of microbiological contamination in metal working fluids in industrial production process.
Task:	Automated quality monitoring to enable adjustment of disinfection intensity.
Target organism:	Total Activity (ALP)
Contact:	via VWMS

ColiMinder

ONLINE MICROBIAL MONITORING

VWMS GmbH
Vienna Water Monitoring Solutions
2295 Zwerndorf **I** Austria

+43 2284 20188-0
office@wms.at
coliminder.com