2022 Environmental Measurement Symposium





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Crystal City, Virginia August 1-5, 2022

In-Situ Microbiology Instrumentation for Recreational, Agricultural, Wastewater and Stormwater Measurements

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Est. 2012 Fluidion SAS Los Angeles, USA



Est. 2015 Fluidion US Inc.

Water-borne disease – A real worldwide problem



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Agricultural water

- Testing difficulty: lack of equipment, facilities
- Long time-to-result for existing methods
- Uneven access to clean water and sanitation



Drinking water







Recreational water

Digital microbiological sensors



- Risk management for public health protection requires rapid response
- Current approved methods are slow (>24h) and require complex logistics
- Novel in-situ digital *E.coli* instrumentation with extensive validation
- Established rapid microbiology vendor for the United Nations (Unicef, WHO)
- Automated microbiological risk monitoring applications :
 - Stormwater monitoring (first flush, TMDL, source monitoring)
 - Wastewater effluent and water reuse
 - Recreational water (in-land and coastal)
 - Agricultural irrigation water
 - Environmental data through citizen science
 - Scientific research and special studies
 - Drinking water monitoring

E.coli Instrumentation

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Tested by WHO. Approved for LTA by Unicef.



FLUIDION ALERT TECHNOLOGY



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In-situ

Fully-validated E.coli measurements, in-situ or portable:

ALERT V2 ALERT LAB ALERT LAB TOUCH ALERT One

- Fully autonomous, provides automated alerts
- Battery operation and worldwide wireless communication
- Powerful data repository and analytics platform
- Can combine with other external sensors:
 - Conductivity
 - Turbidity
 - pH
 - Dissolved Oxygen
 - fDOM

- Chlorophyll
- Phycocyanin
- Nitrate
- Total Ammonia



ALERT System V2 :

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The automatic in-situ E.coli analyzer

- Robust field-worthy instrumentation
- Latest-generation electronics and telemetry
- Single-use cartidges for E.coli analysis
- External sensors for full water quality paramet







2-minute field maintenance



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Alert V2 Maintenance

- Simple procedure (2 minutes), no training
- Measurement quality improved
- Human error and contamination risks eliminated





ALERT V2 repeatabilitiy study KWB (Berlin 2021)



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E.coli in Wastewater Raw/Treated (2020-21)



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FLUIDION® ALERT LAB Technology





Effectiveness of Disinfecting Wastewater Treatment Plant Discharges

Case of chemical disinfection using performic acid

Edited by Vincent Rocher and Sam Azimi



ALERT V2: Seine (Ablon)

ABLON: ALERT V2 vs. Laboratory Comparison





River and bathing water monitoring (Paris)



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Installation at Ablon, upstream of Paris CSO and short term pollution monitoring



MAIRIE DE PARIS 🥑

Bathing water monitoring installation Canal de l'Ourcq – La Villette, Paris



Environmental data through Citizen Science



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Seine Water Quality - Measurements by Arthur Germain (La Seine à la Nage) with Fluidion Alert Lab



Distance from the Source of the Seine (kilometers)

Evaluating impact of illegal sewage dumping



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Measuring bacterial contamination in Tijuana river (CA, USA)



Excellent comparison with data from EPA-approved methods over 8 LOG units.



FLuidion/ALERT and Colilert Test Result Comparison



Evaluated and approved by the San Diego WQ board, investigative order issued



Usage by UK environment agency



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Remote monitoring and pollution source identification for the Port of Scarborough









Major deployments **Solution Solution Solution**

The USGS Next Generation Water Observing System
- Fluidion ALERT V2 for *E.coli* monitoring of Delaware river



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LA Sanitation Hyperion: Operation NEXT - Fluidion ALERT V2 for potable reuse pilot for monitoring MBR membrane integrity



LA Sanitation Watershed Protection Division - Fluidion ALERT V2 for watershed monitoring

FREE VS ATTACHED BACTERIA





FREE BACTERIA

UV LIGHT

ATTACHED BACTERIA

Shielding from UV light and disinfectants Will release their bacterial load later, as the particles degrade. Longer persistence on produce.

> Major risk for leafy greens ! May cause propagation of pathogens to final customer !

STANDARD METHOD BIAS

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MPN methods (Colilert)

Membrane Filtration

EXAMPLES OF ALERT DATA

Can measure both free and/or attached E.coli





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Can identify locations prone to high attached bacterial counts.



Science-based validation of ALERT V2 technology





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Thank you !

For any questions or requests: contact@fluidion.com





