



DELIVERABLE 8.5

European Workshop



Dissemination level: **PUBLIC**



WP8

Dissemination, exploitation and transfer



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The SecurEau consortium has organised a European conference by November 2012 (corresponding to the Deliverable 8.5). The objectives were to transfer to the scientific community, water authorities, consumers from non-governmental organisations... some of the key results gained over this 4-years research programme. Such an organisation has been possible thanks to the decision taken by the steering committee - in agreement with the European Commission - to co-organise this workshop with the WCEC5 conference "Water contamination emergencies conference: managing the threats" at Muehleim an der Ruhr, Germany. Having such a co-organization has allowed saving money, enlarging the audience and dissemination, and by the end to permit a successful set of conferences.



The present deliverable summarizes briefly the topics addressed during the conference. The full programme is given at the end of this document.

The conference was organised in 8 sessions: sessions 1 to 7 were open to everybody (with no security restriction), with 4 speakers from SecurEau; second, session 8 "SecurEau security workshop" devoted only to people with up-to-date security clearance. Only speakers from SecurEau (five speakers) have talked during this specific session.

In parallel 35 posters selected by a specific committee have been presented. The poster N°24 presented by F. Gosselin (LCPME -CNRS_ Nancy_F) received the *Poster Award 2012* for the best scientific poster presentation (Annex 2).

Some of the presentation given during the sessions 1 to 7, or presented as posters should be published by Royal Society of Chemistry (<http://wcec.soci.org/>).

Moreover a technical exhibition with 11 industrial partners was organised including Endetec, one of the company born during the SecurEau project within VERI for developing new Kapta sensors for drinking water systems.

Sessions 1 to 7 – Presentations available on <http://www.wcec5.eu/>

Four SecurEau partners have delivered presentations, covering the fields of water quality monitoring (early detection of water quality change), monitoring the pipe wall deposits and decontamination of networks. Other partners were also involved as chairmen and / or as facilitators during the final round-table discussion.

Cyrille Lemoine (partner 03, VERI) presented "Smart sensors network for water quality monitoring - a way to re-invent water supply management?"

The drinking water operators (private and public) try to guarantee the distribution to consumers of safe water every day. Most of time, they succeed. Unfortunately, it is not possible to exclude accidental or intentional contamination of the drinking water network. Even if these events are rare, their consequences could be dramatic. In this case, the detection time is a key parameter

to limit the sanitary impact and of course the size of the network appears to be a serious constraint. VERI intends to increase its capability to deal with these issues by developing smart sensors networks for water quality monitoring.

Early warning systems for rapid detection of deliberate intrusion (Sandrine Galandrin, partner 03, VERI)

The Early Warning System (EWS) is the first step to detect an abnormal change of the water quality. The EWS relies on several key points: the use of sensors to detect a change in water quality, the optimal location of sensors to minimise the impact of the contamination and data handling to confirm it. Biological and chemical contaminations can be detected thanks to the measurements of several parameters related to water quality. It's of interest to couple the multi-parameters Kapta™ 3000 AC4 to optical measurements in order to detect the presence of contaminant. The multi-parameters probes network provides information on the spread of pollution in the drinking water network and the impact of the pollution for the consumers near to the probes.

Monitoring of pipe wall deposits in drinking water distribution systems (Martin Strathmann, partner 04, IWW Water Centre)

In water distribution systems, surface deposits can act as sink and source for contaminants. To gain information about presence and amount of deposits as well as of the success of deposit removal after performing a cleaning procedure the systematic installation of "deposit sensors" or "deposits sampling devices" is important. Such installation of devices should be at locations representative of the distribution system.

Decontamination of drinking water systems after deliberate attack: developments and challenges (Talis Juhna, partner 08, Riga Technical University)

The presentation focused on technological and engineering aspects for decontamination of water supply systems after deliberate attack with CBRN agents. The potentials and limitations of conventional cleaning technologies in dealing with dangerous and persistent contaminants will be addressed. Conceptually new approaches developed in SecurEau project were presented and discussed in terms of security margin and durability. The experience of applying one of the decontamination methods in a full-scale system was presented, thus showing practical and organisational challenges following a deliberate contamination.

Poster presentation.

Five SecurEau partners (Université de Lorraine, F; CNRS, F; University of Southampton, GB; University of Porto, P; and National Institute for Health and welfare, FIN) have taken the opportunity to diffuse the SecurEau results by presenting a total of seven posters during this event:

Gosselin F., Madeira L.M., Juhna T., Block J.C, Heterogeneous Fenton's reaction: a promising way for drinking water biofilm disinfection

Gosselin F., Pollmann P., Colon E., Block J.C, Particle counting for early detection of contaminant intrusion in drinking water distribution systems

Le Guen E. and Block J.C., Shock chlorination in emergency situations for cleaning drinking water pipes.

S. A. Wilks, M. S. Gião, and C. W. Keevil, Comparison of methods for the detection of culturable and VBNC *E. coli* O157:H7 in complex drinking water biofilms

Räsänen, P.S., Ikonen, J., Hokajärvi, A.-M., and Miettinen, I.T, The molecular detection for the viability of *Yersinia* cells during shock chlorination – a pilot scale study

Croudace Ian, Rapid screening of drinking waters and pipeline deposits for radionuclide decontamination

Aaron Dye, S.A.Wilks I.W.Croudace and K.W.Keevil, Nitric oxide – A potential novel release agent to aid disinfection in drinking water network biofilms

Session 8

This session was devoted to the critical review of classified results: sorption/desorption kinetics of CBRN contaminants; modelling contaminant spread in distribution systems, decontamination methods and their limits; how to balance safety, investments and time constraints. At last the summing up of this 4-years research programme.

- The significance of the internal surface of mains pipes in drinking water distribution networks: a SecurEau perspective (Hans-Curt Flemming, Talis Juhna, Luis Melo, Jean-Claude Block)

Deposits and/or biofilms are a crucial factor in case of contamination as they can act as sink and

source of contaminants, *via* adsorption – desorption processes. The contact time between the pipes (and their deposits) and the contaminants appears to be a key factor in case of contamination.

- Contamination source and spread issues (Diogo Costa, Luis Melo, Olivier Piller, Fernando Martins, Talis Juhna)

New models were proposed to define optimal positioning of sensors, sentinel coupons and to model the spread of a contamination. These models are developed with open source tools and are free to use. Trop court ??

- Limitations of remediation techniques for decontaminating drinking water networks (Talis Juhna, Gabriela Schaule, Ilkka Miettinen, Luis M Madeira, Tuukka Turtiainen)

Methods to decontaminate drinking water networks were presented and discussed, depending of the nature of the contaminant. Advanced oxidation processes seem a promising technique.

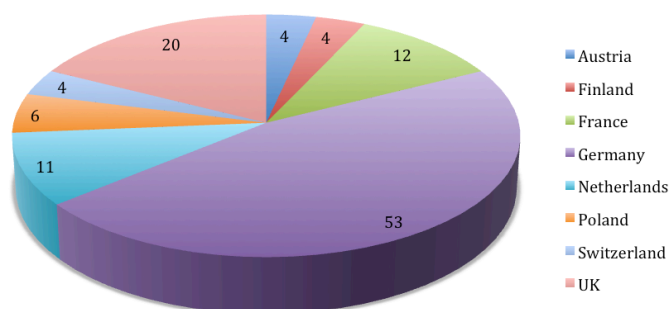
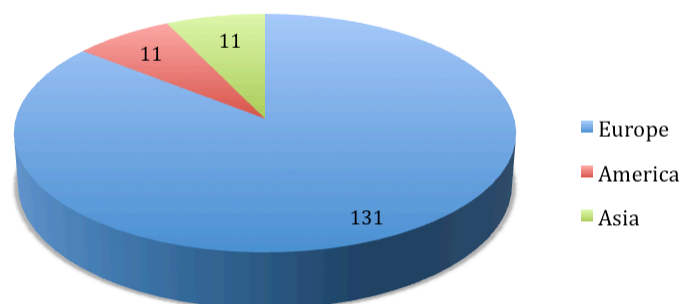
- How to balance CAPEX/OPEX against safety, costs and time constraints (Cyrille Lemoine)

Optimal location of sensors is a difficult task, but in any case, increasing sensors number reinforces security and reduces time to decision.

- Final summing up (Bill Keevil, Jean-Claude Block, Fanny Buvens, Arnaud David, Sylvain Fass, Hans-Curt Flemming, Talis Juhna, Luis Melo, Ilkka Miettinen, Albin Monsorez, Olivier Piller, Tuukka Turtiainen)

This presentation summarises the results presented; one aspect is that most of data obtained and solutions to problems are applicable to everyday life of practitioners, not just after an attack.

To conclude, during this 3-days-workshop, more than 150 participants were present, from 26 countries. Around 25 participants were affiliated to Universities, around 25 to national or international health centers and around 100 to the industry.



Annex 1 - Programme - Monday, 19th November

- 11:30 Registration, refreshments
13:00 *Introduction and welcome* (Ulrich Borchers, IWW Water Centre, and Bill Keevil, Southampton University)
13:00 *Welcome on behalf of the host* (Wolf Merkel, IWW Water Centre)
13:10 *Welcome on behalf of the RSC-WSF and the SCI* (John Gray, RSC Water Science Forum - K Clive Thompson, ALcontrol Laboratories (on behalf of the SCI))
- 13:15 **Session 1: Scene Setting and Background** Chairman: Ulrich Borchers, IWW Water Centre
13:15 *Managing the threats - approaches, examples and solutions in German water supply* (Wolf Merkel, IWW Water Centre)
13:45 *Smart sensors network for water quality monitoring - a way to re-invent water supply management?* (Cyrille Lemoine, Veolia Environnement Recherche et Innovation)
14:15 Refreshments
- 14:45 **Session 2: How do we Assess and Manage the Risks?** Chairman: Joep van den Broeke, Benten Water Solutions
14:45 *Current and future activities financed under the EU FP7 Security Research programme in the area of water security* (Tristan Simonart, EU COM DG ENTR)
15:15 *Consequences of the Japanese earthquake 2011 and the Fukushima power plant accident on the Japanese water environment including drinking water* (Akira Miyazaki (and Nobuyoshi Yamashita), National Institute of Advanced Industrial Science and Technology)
15:45 *A web-based early warning system for water treatment plants safety* (Ioannis Dokas, Cork Constraint Computation Centre, University College Cork)
16:05 *Risk governance and the Board: supporting pervasive risk management in water utilities* (Richard Allan, Cranfield University, Scottish Water Horizons)
16:25 Questions, discussions
16:35 *Relevant harmonised tools for risk assessment and crisis management - an overview on current standards on drinking water* (Thomas Zenz, DVGW, the German Technical and Scientific Association of Gas and Water)
16:55 *Using a hydraulic model for planning your response to a contamination event* (Kenneth Thompson, CH2M HILL)
17:15 Questions, discussions Introduction to the exhibition:
17:25 *Exhibitor presentation* by Barry May, LEAP Scheme Manager, The Food and Environment Research Agency)
17:28 *Exhibitor presentation* by Kristin Schumann, Sales Manager, AJ Blomesystem GmbH)
17:55 Poster session, exhibition and refreshments
18:30 Close

Programme - Tuesday, 20th November

- 09:00 **Session 3: Real Life Examples** Chairman: Bill Keevil, University of Southampton
09:00 *Fukushima contaminated water treatment: AREVA-Veolia Water's solution selected by TEPCO* (Philippe Sébérac, Veolia Water)
09:30 *Recurring drinking water outbreaks - what operators need to understand to convert hindsight into foresight* (Steve Hruday, University of Alberta)
10:00 *Water quality crisis at Przedsiębiorstwo Wodociągów i Kanalizacji* (Marek Przytulski, Water Supply and Wastewater Collection Company Ltd)
10:20 *Spatial integration of sensors and other data streams provides real-time system knowledge for operations* (Kenneth Thompson, CH2M HILL)
10:40 Refreshments, kindly sponsored by Applitek
11:05 *The use of jug filtration to reduce radioactive and chemical contamination in drinking water* (Derek Hammond, Health Protection Agency)
11:35 *Tri- and tetrachloroethylene in groundwater exploited by a municipal waterworks: numerical modelling and mitigative measures* (Ewa Kret, AGH University of Science and Technology)
11:55 *The integration of online flow cytometry to the flexible risk assessment system (HACCP) at Zurich Water Supply* (Jakob Helbing, Zurich Water Supply)
12:15 Questions, discussions
12:35 Lunch
- 10:10 **Session 4: Technological Advances** (optional parallel session) Chairman: Joep Appels, microLAN BV
10:10 *A novel, low cost, spectrophotometer probe for multi-parameter in-pipe online water quality measurements* (Florian Edthofer, scan Messtechnik GmbH)
10:25 *Early warning systems for rapid detection of deliberate intrusion* (Sandrine Galandrin, Veolia Environnement Recherche et Innovation)
10:40 Questions, discussions
10:50 *LC-QTOF/MS in combination with multivariate statistical methods for general unknown screening (GUS)* (Wolfgang Schulz, Landeswasserversorgung German Water Supply Company)
11:05 *Monitoring of pipe wall deposits in drinking water distribution systems* (Martin Strathmann, IWW Water Centre)
11:20 *Best practice protocols for response and recovery operations in contaminated water systems* (Jana Fattic,

Center for Water Resource Studies, Western Kentucky University)
11:35 Questions, discussions

13:45 **Session 5: Lessons Learnt** Chairman: Cyrille Lemoine, Veolia Environnement Recherche et Innovation
13:45 *Health impacts of water shortages in extreme events and other issues* (Virginia Murray, Health Protection Agency)
14:15 *Public health risk of microbial intrusion events in distribution systems* (Michèle Prévost, Ecole Polytechnique de Montréal)
14:35 *What are the real implications on public health of water contamination events?* (Margaret McGuinness, Scottish Water)
14:55 *Protecting the drinking water supply against CBRN threats - the STATuS-project* (Marcel Riegel, DVGW - Technologiezentrum Wasser (TZW))
15:15 *Improved drinking water safety...* (Stephen Brown, ENDETEC/Veolia Water Solutions and Technologies)
15:18 *Particle counting for early detection...* (Paul Pollman, PAMAS)
15:21 *Incident management of lead contamination...* (Gary Lau, Health Protection Agency)
15:24 *A compendium of sensors...* (Joep van den Broeke, Benten Water Solutions)
15:27 *In-stream microbial contamination...* (Pramod Pandey, Iowa State University)
15:30 *A GIS tool for the fast identification...* (Elisabetta Preziosi, IRSA-CNR, Water Research Institute - National Research Council)
15:33 *The molecular detection for the viability...* (Pia Räsänen, National Institute for Health and Welfare/Water and Health Unit)
15:36 *Development of large area micro...* (Noriko Kurose, Ritsumeikan University)
15:39 *Chemical and Biological Risks...* (Philip Hohenblum, Environment Agency Austria)
15:42 *Heterogeneous Fenton's reaction...* (Florence Gosselin, Université de Lorraine)
15:45 Poster session, exhibition and refreshments, kindly sponsored by ENDETEC
16:15 *Establishing a WHO corporate approach to emergencies* (Ute Enderlein, WHO)
16:45 *Preparing for emergency – a pilot project to develop contingency plans for cleaning of water distribution networks by flushing* (Bastian Ruschhaupt, RZVN GmbH and Adrian Rieder, Water Supply Zürich)
17:05 *Risk assessment for chemical spills in the River Rhine* (Paul Eckert, Stadtwerke Duesseldorf)
17:25 Questions, discussions
17:45 Close

19:00 Conference dinner at Muelheim Municipal Hall and Muelheim Water Award
kindly sponsored by RWE Aqua, Muelheim Water Award and ENDETEC

Programme - Wednesday, 21st November

09:00 **Session 6: What can be done in Future?** Chairman: Paul Pollmann, PAMAS GmbH
09:00 *Decontamination of drinking water systems after deliberate attack: developments and challenges* (Talis Juhna, Riga Technical University)
09:30 *Cybersecurity triage for small water utilities* (Lon Dawson, Sandia National Laboratories)
09:50 *The Smart Grid as a public health protection tool* (Graham Symmonds, Global Water Resources)
10:10 *Development and use of a decision support system for the response to contamination events* (Ben Tangena, RIVM)
10:30 Questions, discussions
10:45 Refreshments
11:15 *Poster prize-giving* (Torsten Schmidt University Duisburg-Essen)

11:25 **Session 7: Conclusion, Wash-up, Round-table Discussion** Chairman: K Clive Thompson, ALcontrol Laboratories
11:25 Summary on Session 2
11:35 Summary on Session 3
11:45 Summary on Session 4
11:55 Summary on Session 5
12:05 *Round table discussion* (Facilitators: Bill Keevil, Southampton University, and Jean-Claude Block, University of Lorraine)
Conclusions (K Clive Thompson, ALcontrol Laboratories)

13:00 Lunch

14:00 **Session 8: SecurEau Security Workshop** (security clearance required - see above)
Chairman: Jean-Claude Block, University of Lorraine
14:00 *The significance of the internal surface of mains pipes in drinking water distribution networks: a SecurEau perspective* (Hans-Curt Flemming, Talis Juhna, Luis Melo, Jean-Claude Block)
14:30 *Contamination source and spread issues* (Diogo Costa, Luis Melo, Olivier Piller, Fernando Martins, Talis Juhna)
15:00 *Limitations of remediation techniques for decontaminating drinking water networks* (Talis Juhna, Gabriela Schaule, Ilkka Miettinen, Luis M Madeira, Tuukka Turtiainen)
15:30 *How to balance CAPEX/OPEX against safety, costs and time constraints* (Cyrille Lemoine)
16:00 *Final summing up* (Bill Keevil, Jean-Claude Block, Fanny Buvens, Arnaud David, Sylvain Fass, Hans-Curt Flemming, Talis Juhna, Luis Melo, Ilkka Miettinen, Albin Monsorez, Olivier Piller, Tuukka Turtiainen)



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1st Prize

***Gosselin Florence,
Madeira L.M., Juhna T., Block J.C***

**“Heterogeneous Fenton’s reaction: a promising
way for drinking water biofilm disinfection”**

Mülheim, 21th Nov. 2012

Prof. Dr. Torsten C. Schmidt, Director CWE

Water Contamination
Emergencies V
Managing the Threats

IWW Water Centre
Mülheim an der Ruhr
19th – 21st November

