Water -M Project

D1.1 Evaluation of Stakeholders Interactions v1.1

Project Identifier	Water-M
Project Title	**Unified Intelligent Water**
Document Version	1.1

Document Title	Evaluation of Stakeholder Interactions
Work Package	WP1
Document Type	Word
Keywords	Water supply stakeholders

History

Date	Version & Status	Author	Modifications
03/09/2015	V1.0	Kaisa Kerätär (Editor), Kaisu Ainassaari, Kaisa Kerätär, Auli Turkki, Jaakko Rämö (University of Oulu) Ilkka Miettinen (National Institute for Health and Welfare, THL)	First version of the document analyzing stake holders in Finland
09/05/2016	V1.1	Francois Calvier, Kamal Singh (University of Saint Etienne) Abderrahmen Kammoun (Univ of Saint Etienne/City of Saint Etienne)	Added the analyses of stake holders in France and some analyses of questionnaire

Contents

Abstract

This document analyses the interaction between the different stakeholders in the Water Domain, which is one of the key elements of the Water-M project. The main stakeholders are identified as Municipalities, Utilities (water companies and cooperatives) and Consumers (prosumers).
This deliverable includes a characterization of the interactions that occur between the different actors involved in the water management domain. It will be based on a web based questionnaire unveiling the state of the art and especially development needs in view of measurement technology as well as info and data transferring.

1 BACKGROUND

This deliverable covers the different stakeholders of Water-Domain in Finland and France. There are significant differences in managing water between the two countries hence we created separate sections for them.

Finland is known as a land of numerous lakes. There are about 56 000 lakes with a surface area of over one hectare and about 2600 lakes larger than one square kilometer. Because of the relatively cold climate and prevalent bedrock, the rate of weathering is slow and, therefore, the concentrations of inorganic substances in Finnish surface waters are low. By contrast, the concentrations of dissolved organic substances, especially humic acids, can be high, since bogs cover about 30% of the area of the country. The waters of Finnish lakes and rivers are also mainly soft. The shallowness of lakes (average depth about 7 meters) and relatively low discharges of rivers, together with the long period of ice cover, make inland waters sensitive to pollution (SYKE).

The ecological assessment of the status of Finnish waters has been updated in 2013. This assessment, shows that 85% of the surface area of our lakes and 65% of that of Finnish rivers is in good or excellent condition (status is good or high) (SYKE 2015). Groundwaters can generally be characterized by softness, acidity, sometimes high carbon dioxide, iron and manganese containing and low alkalinity. Typical treatment methods include aeration, limestone filtration and UV-disinfection.

In Finland there are about 1500 water supply plants. The 400 biggest plants of those serve nearly 90% of the population. Smaller plants are located mainly on countryside and on sparsely populated areas. About 60% of the water delivered by the water supply plants is ground water or artificial ground water. There are about ten plants which use surface water as raw water.

If we look at France, the country is divided into six geographical areas called "river basins" irrigated by a given river system (a river with all its tributaries and streams that feed it). These areas collect rainfall and contribute to the river flow. Water acquires its chemical composition and reflects the natural processes and human activities taking place there. Because a watershed constitutes a coherent ecological system (composed of different elements: water, earth, mineral, vegetable and animal), France has found it logical that water management be organized around this natural setting.

2 MAIN STAKEHOLDERS IN WATER SUPPLY AND THEIR ROLES

2.1 **Finish** water supply

2.1.1 Municipalities

The municipality is responsible for the organizing of the water supply and sewerage in its area, the water supply plant for its part is responsible for actual water supply services in its area of operation accepted by the municipality. The municipality is also responsible for the general developing of the water supply and sewerage. The municipality and the water supply plant draw up the development plan of the water supply and sewerage of the municipality in cooperation. The development plan includes the new areas to be connected to the services of the water supply plant. (Tolvanen et al. 2002)

According to the Water Services Act, the costs of water supply services must be covered by the payments in the long run and a moderate yield can be entered as income to the owner. The payments have to be also moderate and impartial. The costs of the water supply system consist of the operating costs and of maintenance costs and of investment costs.

2.1.2 Water supply plants and co-operatives

The water supply and sewerage is organized either as own works of the municipality, as business firms or as joint-stock works, or as co-operative societies. The co-operatives owned by the customers are often responsible for the water supply services that has been jointly arranged on the countryside. Also the co-operatives are responsible for the delivery and waste water maintenance of high-quality domestic water and the same duties and quality requirements as the municipal works apply to them.

2.1.3 Users and consumers

In water supply end users include industry and households. The owner or holder of a real estate is responsible for the water supply and sewerage and water equipment up to the joining section. The real estate in the operation area of the water supply plant must be connected to the water pipe and sewer of the system. Only with some legal arguments the real estate can get the liberation from the joining duty. About 90% of the population belongs to the arranged water supply and about 80% of the households to the arranged waste water maintenance. In the sparsely populated areas the waste water maintenance has been arranged on the own solutions of individual real estates.

The payment for the customer consist of user charge of water and sewage water that is based on the amount and quality of used water, a fixed charge or rental of water meter that covers the organizing of

the water supply services, a charge of joining the network that covers building of new network and service charge for services and actions. Recently new remote measuring units for water consumption in households have been developed and installed.

2.1.4 Water and health authorities

Centre for Economic Development, Transport and the Environment (ELY)

Centre for Economic Development, Transport and the Environment (ELY) is responsible for guidance of water supply planning, directing the funding subsidies and partly monitoring the water supply. They also supervise the regional general plans for water supply plants and municipalities' development plans for water supply and can grant support to investments in water supply. (SYKE 2015)

Local authorities

The principal responsibility for practical supervision of environmental health rests with the local authorities. At the level of municipalities, this supervision is performed by a body with multiple members, for example a committee. In communities, the supervision of environmental health issues are carried out by veterinary officers, sanitary inspectors and public health and environmental engineers to whom the committee has delegated part of its competence.

The local government has a statutory duty to provide adequate resources for supervision, and this task is thus usually managed by environmental health supervision units serving a larger area than individual municipalities. These units draw up environmental health supervision plans for themselves, and supervision is carried out both systematically and based on reports received by the supervision units. The health protection authorities of the municipalities supervise the quality of the drinking water. The environmental protection authorities of the municipalities in turn supervise the wastewater treatment and the state of the environment. (Environmental Health)

2.2 **French** water supply

2.2.1 Basin committees and water agencies

As we noted before, France is divided into six geographical areas called "river basins" irrigated by a given river system These areas collect rainfall and contribute to the river flow. Water acquires its chemical composition and reflects the natural processes and human activities taking place there. Because a watershed constitutes a coherent ecological system. Since 1964, the watershed is the cornerstone of French water policy. Each basin corresponds to two instances:

- The basin committee: the parliament of water which brings together the stakeholders and water users in the water basin, is developing a water management policy which will answer to the needs of the territory while respecting the national policy orientations and regulations.

- Water agency: the executive agency to implement the policy decided by the basin committees. These agencies distribute financial aid to the local authorities or to users. Thus, they contribute to the financing of the operations of collective interest for the development and protection of water resources. To subsidize these operations, the agencies collect fees from users of water, calculated on the principle of "polluter pays". This is based on the quantities of pollution discharged and volumes collected.

The information obtained after measurements should be communicated to the water agencies in order to:

- Justify granted aid
- Evaluate the efficiency of the policies adopted by the basin committees

2.2.2 The municipal level (or inter-municipal level)

In France, the distribution of drinking water is allotted to the French municipalities or their groups. Whatever be the mode of management of the water service, the municipal (or inter-municipal) remains the organizing entity of the service and as such is responsible for the quality of service.

All information provided by the service to the users as well as national bodies, are relayed by the collective authority that also reports to the Water Agency, the state or the European authorities. In addition, the municipal (or inter-municipal) organization is responsible for the service provided to the users in terms of both quality and price.

The municipality decides to invest in the water infrastructure, in compliance with regulatory requirements. The municipality or city (or inter-municipality) is legally responsible and held accountable to the different State or European organizations as well as to users who ultimately judge, the quality of its policy.

2.2.3 The operator of the service

Due to a political choice, management of drinking water service may be provided by the community (in-house or by direct management) or delegated to a private company. This management method is most common in France since it concerns 76% of users.

Whatever the chosen management mode, it is up to the service operator to ensure water distribution and continuity of service. The operator is obliged to report its activities to the municipality or inter-municipality. The operator communicates the performance indicators, which in turn are used to justify the quality of the operator’s intervention.

2.2.4 The users

The water distribution must contribute to the well being of the user. For this, the drinking water must not affect the health or cause discomfort. It is important that the user is satisfied. It is therefore essential that the distributed water is protected, monitored and controlled.

Furthermore, the public is entitled to information and the role of the citizens in local affairs in order to further the environmental cause is now getting recognized. As being a user, any subscriber is entitled to claim for any information it considers necessary to judge the quality and price of service rendered to him.

3 MONITORING AND STRATEGIC PLANNING

3.1 Finnish water supply

3.1.1 Self-monitoring

The water supply plant has to make sure that the drinking water delivered by the system fulfils the quality requirements that have been prescribed in the Health Protection Law. Furthermore, the water supply plant has to monitor the amount and quality of the raw water used by it, the condition of the equipment and the loss of water in the network of the plant.

The continuous self-monitoring (own supervision) made by the plant and the supervisory monitoring by the authorities have been described in a supervisory research program which is drawn up by the water supply plant and the health protection authority of the municipality. The quality of drinking water is also controlled by the health protection authority of municipalities.

3.1.2 Monitoring by authorities

Some of the controlling authorities according to the Water Services Act are Centre for Economic Development, Transport and the Environment, as well as and the health protection authority of the municipality and the environment protection authority of the municipality. The authorities control the operation of water supply plant and of municipalities.

The official supervision of drinking water can be purchased from an external laboratory that has been accredited. There are several certified commercial laboratories offering analytical and measurement services for water supply.

The required frequency of the analyses is dependent on the supplied amount of water.

3.1.3 Strategic planning

Ministry of agriculture and forestry (MMM)

The Ministry of Agriculture and Forestry steers the regional Centers for Economic Development, Transport and the Environment and the Finnish Environment Institute in issues concerning the management of water resources. In the water resources sector the Ministry of Agriculture and Forestry is responsible for preparation of State budget and operative and financial planning, preparing the legislation, strategic planning of the activity and EU affairs and international cooperation. (Ministry of Agriculture and Forestry)

Ministry of Social Affairs and Health (STM)

The Ministry of Social Affairs and Health (STM) seeks to identify, prevent and eradicate health hazards from the environment. The Ministry supervises health protection and is responsible for developing legislation in this field. The areas of focus of social and health policy strategy and the government program are e.g. ensuring the supply to consumers of safe drinking water in all situations and improving the capacity of the authorities in investigating epidemics transmitted by food and water. (Ministry of Social Affairs and Health)

National Supervisory Authority for Welfare and Health (Valvira)

The National Supervisory Authority for Welfare and Health (Valvira) improves the management of health risks in the environment as well as legal protection and the quality of services in social welfare and health care. Health protection is regulated through the Health Protection Act. Valvira supervises municipal health protection authorities in controlling compliance with the Health Protection Act, including drinking water issues and legislation related to the surveillance and quality of it (Valvira).

National Institute for Health and Welfare (THL)

The National Institute for Health and Welfare (THL) is a research and development institute under the Finnish Ministry of Social Affairs and Health. THL seeks to serve the broader society in addition to the scientific community, actors in the field and decision-makers in central government and municipalities. The aim is to promote health and welfare in Finland (National Institute for Health and Welfare).

In 1997, a new notification system for waterborne outbreaks was launched in Finland. In this system, municipal health protection authorities have an obligation to notify national authorities of all suspected waterborne outbreaks. The information filled in the notification report is electronically available by national authorities and THL. THL duty is to collects information and statistics on waterborne outbreaks and gives expert and analytical help in controlling and solving the waterborne outbreaks. According to the legislation given in 2007, a nominated expert group for food borne and waterborne outbreaks shall be established in every municipality (Zacheus and Miettinen 2011).

Finnish Water Utilities Association (FIWA)

Finnish Water Utilities Association (FIWA) is the co-operation and member association of the Finnish water and wastewater utilities, established in 1956. FIWA's membership includes about 300 Finnish water utilities which cover about 90 % of water services in Finland. In addition FIWA has about 150 collaborating members (companies, institutes, etc.).

FIWA's main purpose is to facilitate an enabling operational environment for its member utilities and support their functions. FIWA works to safeguard and promote the interests of its member utilities and to enhance their professional skills (Vesilaitosyhdistys 2015).

Finnish Water Co-operatives association (SVOK)

Association of water co-operatives is funded for promotion of interest, education, information services and collaboration.

3.2 French water supply

3.2.1 Management of French water services

In France there are 23.6 million subscribers to a public drinking water service. 360,000 residents are served by private resources, which in turn are not under any public infrastructure. Organizing water service is complex. Around 24,162 communities are responsible for organizing this public service.

The average price of the service (established on a reference consumption of 120 m³ per year) is 2 € / m³, representing an average bill of € 20 / month per household.

For the execution of service, the communities have the possibility to:

- Manage with their own staff (called governance or direct management)
- Entrust the management to a private company (called delegated management). This management can essentially take two forms:
  - Leasing: the operator provides only operation and maintenance of the infrastructure and the relationship to the users. Investment costs are borne by the community
  - Concession: the tasks entrusted in the context of a lease, the dealer is responsible for meeting the costs of investment.

In France, 31% of services are delegated management (but these services represent 61% of the population). Thus, the management of water services in urban communes (most populated) is frequently entrusted to a private company.

3.2.2 A free model guaranteeing fair competition

The law specify the duration of these contracts awarded to private companies (without exceptions or special justifications, it must be less than 20 years). During a period of long duration, the allocated service provider retrieves accurate information and installs as well as operates its equipment. At the end of the contract, the data and equipment belongs back to the municipality that then must again consider the management of this department or delegated management on a competitive basis. With

the objective of ensuring fair competition between the various "water carriers", it is essential that the materials and data be built on free and open models.

3.2.3 Economizing the resources

The climate changes will certainly influence the water resources. Especially the low water levels, the ones most highlighted, are expected to have a major impact on the availability of water resources. Therefore, it is essential to conserve and economize water.

Thus,

- Increased monitoring of the distribution system is essential: in France 1 liter over 5, on an average, is lost through leaks in the pipes. The development of sensors and approaches for data retrieval and mining will allow for an efficient monitoring, which in turn can achieve some ambitious goals. Facing a depletion of their water resources, municipalities are already engaged in this process: by preferring to improve the performance and efficiency of their assets rather than seeking alternative water resources which is costly.
- Consumer information is paramount: to encourage users to adopt a frugal consumption, which in turn can potentially overcome the often costly investments.

However, water services are funded by users using a mixed tariff:

- a fixed tariff (subscription) permits them to access the service
- a variable tariff which is proportional to the volume of water consumed

Water service finance is very particular: it is an "industry" having fixed costs, however the invoices incurred are variable depending on the volumes consumed. This remuneration process weakens the financial equilibrium of the service when water consumption decreases. Thus, in order to conserve resources and avoid overload on new water-resources, focusing on unbilled volumes such as leakages should rather do the economizing. This makes it more important to constantly monitor the water distribution network.

New ideas are emerging to rebuild the economic model by making remuneration proportional to the water distribution performance achieved, therefore partially detaching the remuneration from the volumes sold. The municipality pays the operator directly based on performance measured through precise evaluations. The remuneration is proportional to the objectives respected as well as the volumes of water sold. This model overcomes an old principle that "water pays for water" since it establishes a financing of water utilization by the taxpayer and the subscriber, but does not depends exclusively on the latter. This economic model, which is more qualitative, already exists in some American water services for which water resources are particularly fragile. This perspective requires the availability of novel tools to assess and analyze the service performance.

4 Report on the questionnaire distributed in partner countries

A questionnaire was distributed in partner countries in order to unveil the status-quo and developing needs between different countries. The answers to the questions can be found at the end in the Appendix.

In Turkey, groundwater quality is regularly measured with parameters such as pH, Conductivity, temperature, Manganese, Iron and TOC. The water treatment parameters are extensively provided. Turkey also has investment plans for combustion unit and drying unit for waste water department.

In France, rather than analyzing the ground water, the quality check is done at the point of entry. Many parameters are analysed through lab analyses, but some are analysed online such as pH, conductance, ultraviolet absorbance, turbidity. Additional parameters provided are related to the state of the water distribution network and distribution itself such as pressure. Some of the critical issues are Alarm management, coverage of receptors, quality of measurement and its evolution.

5 References

SYKE. Water quality of lakes, rivers and sea areas in Finland in 2000-2003. Available online: http://www.syke.fi/download/noname/%7B98588B25-E678-4DE2-8006-6CCBACC3F273%7D/30089

SYKE 2015. Available online: http://www.environment.fi/en-US/Waters/State_of_the_surface_waters

Environmental Health. Regional Sate Administrative Agencies. Available online: https://www.avi.fi/en/web/avi-en/ymparistoterveys#.VQvA0_VfsmE

Ministry of Agriculture and Forestry. Available online: http://www.mmm.fi/en/index/frontpage.html

Ministry of Social Affairs and Health. Available online: http://www.stm.fi/en/frontpage

Ministry of the Environment. Available online: www.ym.fi/en

Valvira. Available online: http://www.valvira.fi/en/

SYKE Finnish Environmental Institute. Available online: http://www.syke.fi/en-US/SYKE_Info

National Institute for Health and Welfare. Available online: www.thl.fi/en

Zacheus O and Miettinen IT. 2011. Efficient notification system of suspected waterborne outbreaks enhances water safety. Journal of Water and Health 09.04:763-772.

Vesilaitosyhdistys. Available online: http://www.vvy.fi/in_english

6 Appendix

6.1 Answers from Turkey provided by ACD

WEBSURVEY TO FINNISH WATER WORKS in December 2014/ University Oulu : Answers for Turkey

BACKGROUND INFORMATION

Please answer exclusively the questions dealing with your main fresh water source.

1. How big part (%) of Your produced capacity comes from

_Surface water treatment plants

_Artificial ground water treatment plants

_Ground water treatment plants

2. What is your main plant's

_Last renovation year

_Number of domestic liaisons/contracts

_Number of industrial liaisons/contracts

QUESTIONS DEALING WITH THE FORMATION AREA

3. Are any streamlines of **ground water** or **artificial ground water** followed

_No

_With Doppler scattering

_With tracer

_With some other technique

What?

4. How are the surface levels of the **ground water** followed?

_Manually

_Automatically (laser, float)

_No

_No info available

5. What groundwater **background parameters** are frequently measured?

Depending on the water control analysis regulation and water flow following parameters are frequently measured by governing department automaticly

_pH	X
_Conductivity	X
_Absorbance	
_ORP (Redox)	
_Oxygen	
_Temperature	X
_Manganese	X
_Iron	X
_TOC	X
_COD	
_Other parameter, what?	
_No measurements	

_No info available

6. Are there any automatic measurements for the **chemical** quality performed in observation points or wells?

Followed by governing department

_Ph X

_Conductivity X

_Absorbance

_ORP (Redox)

_Oxygen X

_Temperature X

_Other parameter, what? Water flow,COD,AKM(Askıda Katı Madde)

_No measurements

_No info available

7. Are there any real time measurements dealing with **microbiological** parameters performed in observation points or wells?

There is no real time measurement, public health office measured

_UV254nm, ultraviolet absorbance

_VIS420nm, visible absorbance

_Particle counting

_ATP

_Other parameter, what?

_No measurements

_No info available

8. Are the following parameters measured continuously in observation points or wells?

_Turbidity

_ORP (Redox) X

_Oxygen X

_Conductivity X

_Other parameter, what?

9. Which of the following risk factors are situated in the principle ground water formation area of Your water works? Inner protection zone Outer protection zone Real formation area Ground water area as whole

Large scale industry SME-industry Highway

Railway Airport Cemeta ry Dump Sewage

Dry toilet

Fire rehearsal area Agricultural activities Other, what?

10. Is there any need to increase automatic water quality measurements in the formation area? (pumping wells, measurement station etc)?

_No

_Yes X

QUESTIONS DEALING WITH THE WATER TREATMENT PROCESS

11. **Exclusively the <u>surface water plants</u>:** What are the main phases in the treatment process?

_Coagulation X

_Sedimentation X

_Flotation X

_Sand filtration

_Active carbon

_Chemical primary disinfection X

_UV disinfection

_Post disinfection

_Membrane technologies

_Other, what?

12. **Exclusively the <u>artificial ground water plants</u>**: What are the main phases in the treatment process?

_Aeration

_Alkalization X

_UV

_Membrane technology

_Other, what?

13. **Exclusively the <u>ground water plants:</u>**

_Aeration X

_Alkalization X

_UV

_Membrane technology

_Other, what?

14. Which parameters are analyzed from the fresh water **entering** Your water plant?

	Conventional laboratory analysis	On-line analysis	No
_Iron (Fe)	X		
_Manganese (Mn)	X		
_Calcium (Ca)	X		
_Ph	X		
_Conductance			
_Temperature	X		
_ORP (Redox)			
_Oxygen			
_TOC (Total Organic Carbon)			
_COD (Chemical Oxygen Demand)			
_UV254nm, Ultraviolet Absorbance			
_VIS420nm, Visible Absorbance			
_Other, what?			

15. Which quality parameters are analyzed **in the process** or **from the water entering the network**?

Conventional laboratory analysis	On-line analysis	No
_Iron (Fe)	(LAB)	
_Manganese (Mn)	(LAB)	
_Calcium (Ca)	(LAB)	
_Ph	online	
_Conductance		
_Temperature	online	
_ORP (Redox)		
_Oxygen	online	
_TOC (Total Organic Carbon)		
_COD (Chemical Oxygen Demand)	(LAB)	
_UV254nm, Ultraviolet Absorbance		
_VIS420nm, Visible Absorbance		
_Particle counting		
_ATP		
_Other, what?		
_No info available		

16. Does Your water works possess need to increase automatic water quality measurements?

_No

_**Yes**, what? Yes they need to increase automatic water quality measurements depending on the investment decisions

QUESTIONS DEALING WITH THE NETWORK

17. What is the length of Your

Network
(km)
Sewage
(km)
No answer

18. What is Your network's (the person I have talked about this who has no knowledge)

Pressure range
(bar) Major
piping material

19. List the suppliers and manufacturers of Your networking automation system? In the case of more than one, please mention those according to the section?

Siemens

20. What is the principle documentation method of Your network and sewage?

_Electronic X

_Traditional map

_By some other way, how?

21. Are the equipment and the positions of those also documented?

_No

_Traditionally using map

_Electronically, by what software?

_By some other way, what?

22. Is Your electrical data connected to any other system, for example municipal software system?

_No X

_Yes, to what?

23. What kind of monitoring system does Your plant possess?

_Pressure monitoring

_Stream monitoring

_Other, what? There is no monitoring for pipe network,no pressure monitoring

24. In case there is no on-line monitoring, how the maintenance data of network is kept updated?

There is no planned maintenance ,if there is complaint for the pipe system maintanence person goes there where problem occured

25. Can the **sudden** network pressure alterations be detected in real time?

_No X

_Yes

26. In case network pressure is not monitored in real time, how will water works get the information about sudden pressure alterations?

No control

27. What is Your evaluated percent value of the leakage water annually?

No information

28. Does Your network contain specific sections in which flow measurement should be intensified?

No information

29. Which quality parameters are analyzed continuously in the network?

_pH X

_Conductivity X

_Absorbances

_Turbidity X

_Free chlorine

_Particle counting

_ATP luminously

_UV254

_VIS420

_Other, what? COD,Suspended solid matter,flow,Oxygen

_No info available

30. Which parameters are compared between beginning and end points of the network?

_Residual chlorine X

_Turbidity

_Particle counting

_ATP luminously

_UV254

_UV420

_Other, what?

QUESTIONS DEALING WITH MEASURED INFORMATION AND DATA TRANSFER

31. What data security mechanisms have You used to ensure confidence, robustness and availability?

_No info

_Yes, what?

No information

32. What kind of supervision and record keeping (log information) possibilities are available in Your plant?

in database

33. Does Your plant possess standardized data security practices?

_No

_Yes, what?

No information

34. How is the measured data from formation area, plant or network transferred to the control room (or equivalent)?

No information

35. What are the needed collection frequencies for measured data in the water works?

_Once a minute or under that

_Once in 15 minutes

_Once in an hour or over that

_Other, what? Daily

36. How long delay in the transfer of measured data may exist?

_One minute or under that

_1-5 minutes

_Other, what? 1 day

37. Does Your plant possess targets with especially high accuracy demand, eg. Error under 1%.

_No

_Yes, what? Yes

38. What kind of risk in data transfer You consider the most serious?

_ Disappearance of measurement data X

_ Distortion of measuring data

_ Problems in data confidence (hackers)

_Manipulation of measurement data X

_Other, what?

39. How do You principally prefer to acquire the measured data?

_Directly to Your automation system X

_Via a company producing measuring services

DEVELOPMENT NEEDS AND PLANS

40. Has Your water works recently made any investment plans or decisions?

_No

_Yes, what and when? Yes they have investment plan (combustion unit + drying unit for waste water department)

41. How much are You planning to invest in automatic on-line measurements?

No information

42. What are the most important problems involved in the measured data to be solved?

Need more investment

43. Is it possible to connect this measured data to the alarms and automation/control system?

_No, Why not?

_Yes, how?

_No info

44. To what extent measurements of water quality and quantity and the technologies involved improve Your business? Which are the most important cost factors and extra earnings possibilities?

45. When connecting a new on-line measuring to your system, do You implement the investment

_as Your own work?

_as a purchase from a professional company? X

46. Are You interested in embarking on remote meter reading? If possible, evaluate their benefits and disadvantages as well as potential solutions and timetables? Remote meter reading is implemented by governing department

47. Possible additional comments can be presented beneath.

48. For those who provide contact info, we will offer a Dream experience for one person (value about 100 €)!

_First Name Emre

_Last Name Özer

_Phone Kalite Yöneticisi(Quality Lab.manager)

_Email

_Address

_Zip code

_Company / Organization 2.Cadde Sonu No 3 ESART A.Ş ESKİŞEHİR

6.2 Answers from France provided by City of St-Etienne and Stephanoise des Eaux

WEBSURVEY TO FINNISH WATER WORKS in December 2014/ University Oulu: Answers for France

BACKGROUND INFORMATION

Please answer exclusively the questions dealing with your main fresh water source.

1. How big part (%) of Your produced capacity comes from

_Surface water treatment plants 100%

_Artificial ground water treatment plants 0%

_Ground water treatment plants 0%

2. What is your main plant's

_Last renovation year 2014

_Number of domestic liaisons/contracts

_Number of industrial liaisons/contracts

QUESTIONS DEALING WITH THE FORMATION AREA

3. Are any streamlines of **ground water** or **artificial ground water** followed

_No X

_With Doppler scattering

_With tracer

_With some other technique

What?

4. How are the surface levels of the **ground water** followed?

_Manually

_Automatically (laser, float)

_No X

_No info available

5. What groundwater **background parameters** are frequently measured?

Depending on the water control analysis regulation and water flow following parameters are frequently measured by governing department automatically

_pH

_Conductivity

_Absorbance

_ORP (Redox)

_Oxygen

_Temperature

_Manganese

_Iron

_TOC

_COD

_Other parameter, what?

_No measurements

_No info available

6. Are there any automatic measurements for the **chemical** quality performed in observation points or wells?

Followed by governing department

_Ph

_Conductivity

_Absorbance

_ORP (Redox)

_Oxygen

_Temperature

_Other parameter, what?

_No measurements

_No info available

7. Are there any real time measurements dealing with **microbiological** parameters performed in observation points or wells?

There is no real time measurement, public health office measured

_UV254nm, ultraviolet absorbance

_VIS420nm, visible absorbance

_Particle counting

_ATP

_Other parameter, what?

_No measurements

_No info available

8. Are the following parameters measured continuously in observation points or wells?

_Turbidity

_ORP (Redox)

_Oxygen

_Conductivity

_Other parameter, what?

9. Which of the following risk factors are situated in the principle ground water formation area of Your water works? Inner protection zone Outer protection zone Real formation area Ground water area as whole

Large scale
industry SME-
industry
Highway

Railway
Airport
Cemeta
ry
Dump
Sewage

Dry toilet

Fire rehearsal
area Agricultural
activities Other,
what?

10. Is there any need to increase automatic water quality measurements in the formation area? (pumping wells, measurement station etc)?

_No

_Yes

QUESTIONS DEALING WITH THE WATER TREATMENT PROCESS

11. **Exclusively the <u>surface water plants</u>:** What are the main phases in the treatment process?

_Coagulation X

_Sedimentation

_Flotation

_Sand filtration X

_Active carbon X

_Chemical primary disinfection

_UV disinfection

_Post disinfection

_Membrane technologies

_Other, what? ClO2 cleaning, remineralization, disinfection

12. **Exclusively the <u>artificial ground water plants</u>**: What are the main phases in the treatment process?

_Aeration

_Alkalization

_UV

_Membrane technology

_Other, what?

13. **Exclusively the <u>ground water plants:</u>**

_Aeration

_Alkalization

_UV

_Membrane technology

_Other, what?

14. Which parameters are analyzed from the fresh water **entering** Your water plant?

	Conventional laboratory analysis	On-line analysis	No
_Iron (Fe)	X		
_Manganese (Mn)	X		
_Calcium (Ca)	X		
_Ph	X	X	
_Conductance	X	X	
_Temperature	X		
_ORP (Redox)			X
_Oxygen			X
_TOC (Total Organic Carbon)	X		
_COD (Chemical Oxygen Demand)			X
_UV254nm, Ultraviolet Absorbance	X	X	
_VIS420nm, Visible Absorbance			X
_Other, what? Turbidity	X	X	

15. Which quality parameters are analyzed **in the process** or **from the water entering the network**?

		Conventional laboratory analysis	On-line analysis	No
_Iron (Fe)		X		
_Manganese (Mn)		X		
_Calcium (Ca)		X		
_Ph		X	X	
_Conductance		X		
_Temperature	X			
_ORP (Redox)	X			
_Oxygen	X			
_TOC (Total Organic Carbon)		X		
_COD (Chemical Oxygen Demand)	X			
_UV254nm, Ultraviolet Absorbance		X	X	
_VIS420nm, Visible Absorbance	X			
_Particle counting	X			
_ATP	X			
_Other, what?	Turbidity	X	X	
	Free chlorine	X	X	
_No info available				

16. Does Your water works possess need to increase automatic water quality measurements?

_No X

_**Yes**, what?

QUESTIONS DEALING WITH THE NETWORK

17. What is the length of Your

Network (km) 549

Sewage (km) 195 + 272 unitary

18. What is Your network's (the person I have talked about this who has no knowledge)

Pressure range (bar) 7,5 (average)

Major piping material cast iron

19. List the suppliers and manufacturers of Your networking automation system? In the case of more than one, please mention those according to the section?

20. What is the principle documentation method of Your network and sewage?

_Electronic X

_Traditional map

_By some other way, how?

21. Are the equipment and the positions of those also documented?

_No

_Traditionally using map

_Electronically, by what software? APIC

_By some other way, what?

22. Is Your electrical data connected to any other system, for example municipal software system?

_No X

_Yes, to what?

23. What kind of monitoring system does Your plant possess?

_Pressure monitoring X

_Stream monitoring X

_Other, what? Chlore

24. In case there is no on-line monitoring, how the maintenance data of network is kept updated?

There is no planned maintenance, if there is complaint for the pipe system maintenance person goes there where problem occurred

25. Can the **sudden** network pressure alterations be detected in real time?

_No

_Yes X

26. In case network pressure is not monitored in real time, how will water works get the information about sudden pressure alterations?

27. What is Your evaluated percent value of the leakage water annually?

12,2%

28. Does Your network contain specific sections in which flow measurement should be intensified?

yes

29. Which quality parameters are analyzed continuously in the network?

_pH

_Conductivity

_Absorbances

_Turbidity

_Free chlorine X

_Particle counting

_ATP luminously

_UV254

_VIS420

_Other, what?

_No info available

30. Which parameters are compared between beginning and end points of the network?

_Residual chlorine

_Turbidity

_Particle counting

_ATP luminously

_UV254

_UV420

_Other, what? No info

QUESTIONS DEALING WITH MEASURED INFORMATION AND DATA TRANSFER

31. What data security mechanisms have You used to ensure confidence, robustness and availability?

_No info X

_Yes, what?

No information

32. What kind of supervision and record keeping (log information) possibilities are available in Your plant?

Secured informatics system

33. Does Your plant possess standardized data security practices?

_No

_Yes, what? X

No information

34. How is the measured data from formation area, plant or network transferred to the control room (or equivalent)?

Date stamping on sensor, data sending once a day or on demand (alarm). Transmission using IP, GPRS, RTE, GSM, Radio

35. What are the needed collection frequencies for measured data in the water works?

_Once a minute or under that

_Once in 15 minutes

_Once in an hour or over that

_Other, what? Depends on the data type

36. How long delay in the transfer of measured data may exist?

_One minute or under that

_1-5 minutes

_Other, what? Not relevant because of local data storage

37. Does Your plant possess targets with especially high accuracy demand, eg. Error under 1%.

_No X

_Yes, what?

38. What kind of risk in data transfer You consider the most serious?

_ Disappearance of measurement data

_ Distortion of measuring data

_ Problems in data confidence (hackers)

_Manipulation of measurement data

_Other, what? Alarm management

39. How do You principally prefer to acquire the measured data?

_Directly to Your automation system X

_Via a company producing measuring services

DEVELOPMENT NEEDS AND PLANS

40. Has Your water works recently made any investment plans or decisions?

_No

_Yes, what and when? Already done

41. How much are You planning to invest in automatic on-line measurements?

No information

42. What are the most important problems involved in the measured data to be solved?

Measure quality and its evolution

43. Is it possible to connect this measured data to the alarms and automation/control system?

_No, Why not?

_Yes, how? Already done

_No info

44. To what extent measurements of water quality and quantity and the technologies involved improve Your business? Which are the most important cost factors and extra earnings possibilities?

Water quality, network

45. When connecting a new on-line measuring to your system, do You implement the investment

_as Your own work? X

_as a purchase from a professional company?

46. Are You interested in embarking on remote meter reading? If possible, evaluate their benefits and disadvantages as well as potential solutions and timetables? Remote meter reading is implemented by governing department

Already deployed. Inconvenience: coverage of receptors

47. Possible additional comments can be presented beneath.

48. For those who provide contact info, we will offer a Dream experience for one person (value about 100 €)!

_First Name **Bernard**

_Last Name **PALENC**

_Phone (**33) 4 77 43 00 47 (operating manager)**

_Email **bpalenc@stephanoise-eaux.fr**

_Address

_Zip code

_Company / Organization **Stéphanoise des Eaux**