AGENDA

▪ Introduction
   Philip de Souza, Atom Consulting, Australia

▪ Water Safety Planning: Global trends and updates
   Rory McKeown, World Health Organisation, International

▪ Case Study 1: Australia
   Annette Davison, The Risk Edge Group, Australia

▪ Case Study 2: Uruguay
   Alejandro Iriburo, Obras Sanitarias del Estado (OSE), Uruguay

▪ Case Study 3: Brazil
   Mara Ramos, Departamento de Águas e Energia Eléctrica, Brazil

▪ Q&A Panel Discussion
   Speakers & Moderators

▪ Close
   Philip de Souza
WEBINAR INFORMATION

▪ This webinar will be recorded and made available “on-demand” on the IWA Connect Plus platform and IWA Network website, with presentation slides, and other information.

▪ The speakers are responsible for securing copyright permissions for any work that they will present of which they are not the legal copyright holder.

▪ The opinions, hypothesis, conclusions or recommendations contained in the presentations and other materials are the sole responsibility of the speaker(s) and do not necessarily reflect IWA opinion.
‘Chat’ box: please use this for general requests and for interactive activities.

‘Q&A’ box: please use this to send questions to the panelists. (We will answer these during the discussions)

Please Note: Attendees’ microphones are muted. We cannot respond to ‘Raise Hand’.
Welcome
We are thrilled to announce the 6th International Conference for Water Safety, a collaboration between the International Water Association (IWA), Obres Sanitarias del Estado (OSE), Facultad de Ingeniería, Universidad de la República (FingI) and its Fundación Julio Ricaldi (CAR) in Uruguay. The conference will take place from 4-6 September, 2024 in the vibrant city of Montevideo, Uruguay.

Abstract submission
Deadline on 1 May, 2024
Submit

Registration
Opens on 16 March, 2024
Know more
SPEAKERS & MODERATORS

Philip de Souza
Australia

Rory McKeown
International/Ireland

Mara Ramos
Brazil

Annette Davison
Australia

Alejandro Iriburo
Uruguay
Water safety planning
Global trends and updates

RORY MOSES MCKEOWN
TECHNICAL OFFICER

inspiring change
Sustainable Development Goals continue to drive global WSP uptake
WSPs are being supported by an increasingly robust enabling environment.
WSPs are being applied to strengthen the equitable delivery of water services.
Water safety planning for enhanced resilience is a key entry point
External pressures are driving a more wholistic approach to safe drinking-water and sanitation risk management
93 countries have implemented WSPs
80 countries have WSP policies or regulations in place

Source: WHO WSP tracker database (as at May 2024).
Greater interest in developing national WSP auditing schemes

An independent and systematic check of a WSP to confirm its:

☑ completeness
☑ adequate implementation in practice
☑ effectiveness

“Critical element for the effective and sustainable implementation of any WSP”

WHO (2015)
WSP AUDITING

Challenges
Countries identify a lack of enforcement of WSPs as a current and future challenge to WSP implementation

Impacts
Many WSP implementing countries are not actively practising WSP auditing

Opportunities
Opportunity to strengthen WSP implementation, impact and sustainability through increased attention to auditing
• Strong global uptake (> 6k downloads in last 6 months)
• Translation underway (Chinese, French, Spanish...)
NEW GUIDANCE FOR WSP IN SMALL SUPPLIES

Guidance on when to use different risk management approaches and tools.
Water safety planning for urban water supply systems: an introduction

OpenWHO

Water safety planning is a comprehensive risk assessment and risk management approach that encompasses all steps in a drinking-water supply chain, from catchment to consumers. Water safety planning is recommended by World Health Organization (WHO) to ensure drinking-water safety and can help water suppliers achieve drinking-water quality targets.

This course, Water safety planning for urban water supply systems – an introduction, outlines the principles and steps of the water safety planning approach and presents the success factors that underpin effective and sustainable implementation. It also highlights how water safety planning can strengthen resilience to climate threats.

This course has been developed by the WHO Regional Office for South-East Asia.

Photo credits: WHO/Rory Moses McKean

Share: Not

Language: English

Not disease specific

Enrol me for this course
Thank you!

FURTHER INFORMATION AT:
Water Safety Planning – A View from Australia

IWA Webinar May 2024
Overview

A Potted History

It’s Complicated!

Where is Australia Now?

Case Study

Wrap-up
HISTORICAL PERSPECTIVES IN DRINKING WATER QUALITY RISK MANAGEMENT

Chapter Summary

KEY WATER AND SANITATION ADVANCES.

1829 - Sand filter used for treating drinking water in London
1854 - van Fritschn develops the idea of microbial 'indicators' of contamination (Klebsiella)
1880 - Escherich discovers E. coli ('Bacterium coli')
1883 - Altona (Germany) protected from cholera outbreak via sand filtration
1885 - Dr John Snow proves the Broad Street Pump as source of waterborne disease
1886 - Robert Koch discovers the cholera vibrio (bacterium)
1892 - Testing of ozone for disinfection commences in France
1905 - London protected from typhoid outbreak through water chlorination
• Early 2000s, risk introduced to drinking water guidelines:
  ◦ WHO WSP
  ◦ ADWG
  ◦ Bonn Charter
• Risk = impact of uncertainty on [achieving your] objectives
• Reduce uncertainty
• Use a risk-informed approach
• Implement continuous improvement
IT’S COMPLICATED!

Australian Context
A Universal Framework Required
Generally the Framework applies, with each Australian jurisdiction having its own DWQ risk management requirements and nuances - some examples

- **Western Australia:** Model drinking water quality management plan
- **Victoria:**
  - Safe Drinking Water Act 2003
  - Safe Drinking Water Regulations 2015
- **NSW:**
  - Operating Licence Requirements (metro utilities)
  - Water Industry Competition Act requirements (private utilities)
  - Public Health Regulation 2022 - Quality Assurance Program based on the Framework for Management of Drinking Water Quality (water suppliers not exempted by other formal requirements)
- **Queensland:**
  - Water Supply (Safety and Reliability) Act 2008 and Drinking Water Quality Management Plan Guideline Supporting Information

**National:**
- ISO 31000 / Framework for Management of Drinking Water Quality (Australian Drinking Water Guidelines)
Water31K™
Management Framework

Risk Context
- Products and Services (5.4.1)
- Stakeholders (Internal and External) (5.4.1)
- Regulatory Operating Environment (5.4.1)
- Physical Environment (S2E Overarching Flow Diagrams) (5.4.1)
- System Characteristics (5.4.1)
- Physical Environment (S2E Operational Flow Diagrams) (5.4.1)
- Historical Water Quality Data Review (5.4.1)

Risk Identification and Assessment
- Identify Hazards and Events (6.4.2)
- Assess and Evaluate Maximum Risk and Residual Risk (Control Effectiveness) and Uncertainty (6.4.1, 6.4.2, 6.4.3, 6.4.4)

Risk Oversight
- Baseline
- Operational
- Verification
- Validation
- Investigative
- Customer Experience
- Audit / Review
- Monitoring: Types and Key Programs (5.4.2, 6.6)
- Short and Long-term Data Review (6.4.1, 6.6)
- Document Control and Record Keeping (6.3.2, 6.7)
- Reporting (5.4.2, 6.7)
- Top Management Review (5.2, 5.4.2, 5.6, 6.6)

Risk Management
- Overview of Controls: Types and Key Controls (6.4.3)
- Communication and Consultation (5.4.2, 5.4.5, 6.2)
- Emergency Response and Business Continuity Planning (5.5, 6.4.2, 6.4.3)
- Critical Control Points
  - Materials and Chemicals
  - Equipment Capability and Maintenance
  - Operating Procedures (Normal and Correction Operating States)
- Contractor and Employee Awareness and Training (5.4.2, 5.4.4, 5.8)
- Improvement Identification (Risk Treatments) and Planning (5.7, 6.5, 6.5.2, 6.5.3)

Risk Foundations
- Develop Risk Framework (5.1)
- Formalise Commitment (5.2)
- Allocate Resources (Human and Financial) (5.1, 5.4.4)
- Assign Authority, Responsibility and Accountability (5.2, 5.3, 5.4.3)

Figures in brackets are clause numbers from ISO 31000
(Source: Modified from Davison, A. (2026) The Application of ISO 31000 to Water Quality Risk Management: A Practical Approach)
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Ad hoc, verbal and relationship-based processes

Formalisation of processes commenced, reactive responses

Procedures developed and contextualised, proactive responses

Processes measured and validated, outcomes and responses assured, optimisation commenced

Focus on improvements, insights and predictive responses

Initialisation

Proceduralisation

Consolidation

Measurement and Assurance

Optimisation

Increasing Certainty in Achieving Objectives
Multiple Water Products

Source
- Marine catchment.
- Surface water catchment.
- Sewer catchment.
- Groundwater catchment.
- Urban catchment.

Collection
- Dam.
- Lake.
- Weir pool.
- Aquifer.
- Sewerage system.
- Ocean.
- Sea.
- River.
- Drainage system.

Transfer
- Pipes.
- Pumps.
- Channelised systems.
- Natural water courses.

Treatment
- Various, depending on the quality/type of the source water and the end-use requirement. Examples include engineered and nature-based solutions such as wetlands, filtration, disinfection.

Distribution
- Large transfer mains. Pumped and gravity-fed networks.
- Distribution reservoirs. Disinfection boosting (to maintain fitness for purpose).

End Point
- Meter and/or customer’s tap or other handover point as agreed.
- Standpipe.
- Back to source.
Bathurst Regional Council is a local water utility, located in central NSW, Australia.

In 1886, Bathurst became the first regional town with a piped town-water supply.

It provides a range of water products and services including drinking water and sewerage services, to approximately 43,000 residents.

Council operates under the Public Health Act 2010 (NSW).

In 2019, it embarked on a digital maturity journey.
1 FTE, 1 day a week

Weekly report generated in seconds, a >99.9% efficiency increase

Acknowledgements to BRC and D2K Information
1 FTE, 0.25 day a week (depending on season and number of samples)

‘No touch’ of data once sample sent to lab, risk status automated with results in seconds, heat map automated
WRAP-UP

Summary of Key Takeaways
We have come a long way!

A risk management focus has really changed the way we provide water products and services.

It’s important to understand context when water safety planning.

We now have a leading and smart practice playbook for water products and services.

Even smaller utilities can lead the way in moving long the water management system maturity journey.
Thank you
Water Safety Plans in Uruguay
FROM RECOMMENDATION TO REQUIREMENT, TOWARDS UNIVERSALIZATION

ALEJANDRO IRIBURO
OBRAS SANITARIAS DEL ESTADO
URUGUAY: GEOGRAPHY AND DRINKING WATER SUPPLY

- Located in South America, Uruguay covers an area of 176,220 km$^2$ and has a population of 3.44 million inhabitants, with 98% drinking water supply coverage.

- The supply is in charge of the Water and Sanitation utility OSE, which manages almost 570 water supply systems (WSS) of which 90% have less than 5,000 inhabitants and 50% have less than 100 inhabitants. Small systems include Rural Schools and Small Rural Towns.

Images: South América (left), Water Supply Systems managed by OSE (right), source GIS OSE.
WATER MANAGEMENT SCHEME

The Executive Branch (PE) is the National Water authority. Has the power to formulate the National Water Policy.

Responsible for proposing the National Water Policy. The administration, use and control of water resources through and the control of compliance with environmental protection standards (particularly water quality).

Responsible for providing the public drinking water service throughout the country and sanitation (with the exception of Montevideo).

Responsible for establishing environmental health control standards. Attend and control the water supply throughout the country.

Responsible for the regulation and control of the water and sanitation sector.

Responsible, among others, for approving plans for the use and management of soil and water in relation to agricultural activities.

EXECUTIVE

MINISTRY OF ENVIRONMENT

Ministry of Public Health

URSEA

OSE

Ministry of Livestock, Agriculture and Fisheries (MGAP)

Departmental Governments
The first phase focused in learn, raise awareness and encourage adoption of the WSP approach (2006-2011) including the study of the WHO and IWA documents as well as technical publications written by experts, companies and associations, progress was also made in the training of staff in HACCP (as a theoretical basis) and ISO 9001 in addition to certifying a water treatment plant with the aforementioned ISO management system.
1st Phase: Learn, Raise Awareness and Encourage Adoption

2006 - 2011

Water Safety Plan Manual
Step-by-step risk management for drinking-water suppliers

The Bonn Charter for Safe Drinking Water

Guidelines for Drinking-water Quality
First Addendum to Third Edition

International Water Association
2ND PHASE: VOLUNTARY IMPLEMENTATION OF WSP

- The second phase of voluntary implementation of WSP started in 2012 through workshops that included, in addition to the work of local technicians, the participation of specialists with experience in the development of applied methodologies and implementation of WSP in Portugal.
STRUCTURE ADOPTED FOR THE DEVELOPMENT OF WSP

It was defined an organizational structure that reflected the national scale of OSE, its decentralized production and the existence of a large number of WSS, incorporating the model suggested by the WHO (Bartram J, et. Al, 2009) for a large utility.
2ND PHASE: VOLUNTARY IMPLEMENTATION OF WSP

2012 - 2017

RESPONSABLES: OSE. Actores Clave: URSEA, MVOTMA. Intervienen SINAIE, CECOED, C.C.A., actores locales

METAS
Año 3: Aplicación de Planes de Seguridad de Agua en 15 sistemas nuevos, totalizando 22 sistemas.
Años 6: Aplicación de Planes de Seguridad de Agua en 30 sistemas nuevos, totalizando 52 sistemas.

AÑO DE INICIO: Iniciado
DURACIÓN: Largo plazo
3RD PHASE: MANDATORY IMPLEMENTATION OF WSP

Mandatory implementation phase started in 2018, when the Uruguayan regulator for energy and water services promulgated a regulation intended to ensure a strategy that supports and promotes the WSP implementation and auditing in all drinking water supply systems by 2030, considering the interim target for the implementation of WSP in 60% of water systems by 2025.

Montevideo-Uruguay
Marzo 2018

REGLAMENTO DE PLANES DE SEGURIDAD DEL AGUA
“Ad hoc” computer applications were developed by the OSE Information Technology Management and staff was trained in their use; they enabled the management of operational data associated with the Source, Treatment and Distribution components, complementing and integrating the applications already active allowing, among other things, an early warning of water quality changes in sources.
SUPPORTING PROGRAMMES
MANAGEMENT OF WSP DOCUMENTATION AND DATA COMPUTER APPLICATIONS
SUPPORTING PROGRAMMES
TRAINING ON WATER SAFETY PLANNING

- A training program was established with courses on the WSP methodology since 2015 with an average of two editions per year, more than 120 participants have been trained.
SUPPORTING PROGRAMMES
TRAINING ON WATER SAFETY PLANNING

- Workshops and in-person and virtual meetings were held (established after the COVID19 pandemic) promoted by the Technical Secretariat with the Local work teams, deepening the role of each one of the actors and their responsibility in the sustainability of the program.

- An annual meeting of water production supervisors.
Learning and adaptation to the use of virtual meeting platforms by the company's staff has made it possible to intensify the frequency of meetings between the Technical Secretariat and the local work teams and move forward in an agile manner to be able to comply with the schedule of WSP implementation established by the Regulator.

Virtual Meeting, Technical Secretariat and Local Team, preparation of WSP San Gregorio de Polanco
PREPARATION OF GENERAL; LOCAL DOCUMENTS AND SHARED REPOSITORY

MANUAL PARA LA ELABORACIÓN DE PLANES DE SEGURIDAD DE AGUA

Otras Sanitarias del Estado

SISTEMA DE ABASTECIMIENTO SAN JOSÉ

Octubre 2018
RESULTS OBTAINED
WSP IMPLEMENTED IN URUGUAY PER YEAR FROM 2018 TO 2023
CONCLUSIONS

- The previous path taken by OSE with its first WSP pilot and its subsequent dissemination was key to meeting the initial goals set out by URSEA. Regulation of WSP approval by URSEA contributed to giving greater visibility to the WSP within OSE, fundamentally in the areas that are not directly involved with the operation of the purification process, valuing the WSPs in the management of the company.
CONCLUSIONS

- Work of local and departmental work teams, that include personnel from the technical sector, commercial operations and regional laboratories, favors better synergy between related processes and promotes more efficient management.
CONCLUSIONS

- Management of the results of operational monitoring constitutes an important challenge. In that sense the maintenance of the computer tools developed by the company, the management of the online equipment and the transmission of the results obtained, as well as the continuous training and motivation of staff, are keys to the sustainability of WSP.
CONCLUSIONS

- Through the OSE Internal Audit program and the URSEA External Audits, it has been possible to detect opportunities for improvement in the WSPs already implemented, as well as in the documentation of general application.
KEEP MOVING FORWARD

WATER SAFETY PLANNING IN ACTION

SUSTAINABLE DEVELOPMENT GOALS 2015–2030

Goal 6: Ensure the availability and sustainable management of water and sanitation for all.

Target 6.1: By 2030, achieve universal and equitable access to safe and affordable drinking-water for all.

Priority indicator: Percentage of population using safely managed drinking-water services.

GOAL: UNIVERSALIZATION OF WSP IN URUGUAY 2030
THANK YOU!
Advancing Water Safety Planning
Global Practices & Challenges

MARA RAMOS
| São Paulo State | 177.4 inhab./km² |
| Metropolitan Region | 2,714.45 inhab./km² |
São Paulo Metropolitan Region – Main Water Supply Systems
PROTECTED WATER RESOURCES

Located in the Atlantic Forest biome, Sabesp’s four properties highlighted here reflect the environmental essence of the company.

ALTO COTIA SYSTEM
Located in: Reserva Florestal Morro Grande (Morro Grande Forest Reserve)
Dams: Pedro Beicht e Cachoeira da Graça
Area (including water surfaces): 11.1 thousand hectares
Land area (without water surfaces): 10.71 thousand hectares
Green surface index (2017): 100%

CANTAREIRA SYSTEM
Located in: APA Cantareira and Itapetinga, Itaberaba, Jiujeri, and Cantareira State Parks
Dams: Jaguari, Jacare, Cachoeira, Atibainha, Paiva Castro, and Aguas Claras
Area (including water surfaces): 7.17 thousand hectares
Land area (without water surfaces): 8.55 thousand hectares
Green surface index (2017): 75%

RIO CLARO SYSTEM
Located in: Serra do Mar State Park
Dams: Ribeirão do Campo
Area (including water surfaces): 16 thousand hectares
Land area (without water surfaces): 15.80 thousand hectares
Green surface index (2017): 100%

CAPIVARI FARM (GUARAPIRANGA SYSTEM)
Located in: APA Capivari-Monos
Dams: Capivari
Area (including water surfaces): 262 hectares
Land area (without water surfaces): 240 hectares
Green surface index (2017): 100%

SABESP’S TOTAL AREA:
44.53 thousand hectares
SABESP’S TOTAL AREA WITHOUT WATER SURFACES:
35.29 thousand hectares
### Regulatory Agenda – São Paulo State

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<th>Previsão</th>
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<td>Atualização, simplificação e consolidação dos normativos relativos à regulação de usos e inferências.</td>
<td>1.1</td>
<td>2024</td>
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<td>2- Segurança de Barragem</td>
<td>Atualização, simplificação e consolidação dos normativos relativos à fiscalização de uso de recursos hídricos e de segurança de barragem.</td>
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<td>3- Fiscalização</td>
<td>Atualização, simplificação e consolidação dos normativos relativos à fiscalização de uso de recursos hídricos e de segurança de barragem.</td>
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<td>4- Regras para operação dos Reservatórios e Estruturas.</td>
<td>Definição das condições de operação de sistemas hídricos prioritários</td>
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<td>5- Planejamento e Informação de Recursos Hídricos</td>
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Q&A Discussion

MODERATOR: PHILIP DE SOUZA
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