

Pacific WASH Webinars



Event details:

A Closer Look at Chlorination

30 June 2021

Presenters:

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Participants:

- Environmental Quality Protection Board, Palau
- Kiribati Public Utilities Board
- Kwajalein Atoll Joint Utilities Resources, RMI
- Ministry of Infrastructure, Utilities and Transport, Niue
- Nauru Utilities Corporation
- Pacific Water and Wastewater Association
- Samoa Water Authority
- Solomon Water Authority
- Southern Yap Water Authority, FSM
- To Tatou Vai, Cook Islands
- UNELCO, Vanuatu
- Water Authority of Fiji

Event recording and resources available [here](#).

Chlorination is a critical step in the water treatment process to provide safe, drinking water for public consumption. The Asian Development Bank's (ADB) Pacific WASH Technical Advisory Team is supporting the region's utilities to manage the chlorination process from water catchment to treatment and distribution to customers. By identifying risks at each stage of water treatment Pacific utilities can overcome common challenges in the use of chlorine as a front-line defense against waterborne pathogens.

Workshop Overview

The Asian Development Bank (ADB) has been active in encouraging utilities to build expertise, share local knowledge and provide practical examples of chlorination practices. In June 2021, this virtual workshop, in association with the Pacific Water and Wastewater Association (PWWA) was attended by more than 45 participants from 11 countries across the Pacific region. The workshop provided an overview of how chlorine works, when it is most effective, reviewed conditions suitable for the use of chlorine, common types of chlorination, operational management, managing chlorine residue, and community consultation around chlorination. The workshop included a case study of chlorination practices in Kiribati.

The workshop responded to these key questions:

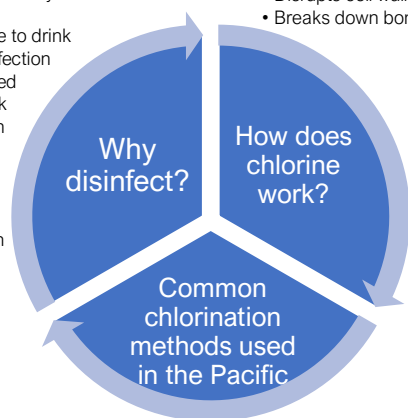
- ❖ Why do we chlorinate?
- ❖ What conditions are best suited to the use of chlorination?
- ❖ What are the common safety and operational considerations?
- ❖ What types of chlorination processes are commonly in use across the Pacific?
- ❖ How should we talk to the community about chlorination?



Workshop Outputs

Presentation Topics

- Kills/inactivates pathogens
- Managing pathogens must be part of the Water Safety Plan for a system
- Makes water safe to drink
- The type of disinfection should be selected relative to the risk assessed in each catchment
- Chlorination manages risk in the potable water distribution network



- Chlorine is a strong oxidant
- Disrupts cell walls of pathogens
- Breaks down bonding proteins

- Suitable to your system and context
- Sodium hypochlorite
- Gas chlorination
- Other disinfection options: chloramination, chlorine dioxide, calcium hypochlorite

Case study and group discussion

CEO, Public Utilities Board (PUB), Kiribati provided an overview of the PUB water cycle, availability and water quality yields at the Bonriki water reserve, water treatment processes, pathogen risks and the proposed approach to chlorination in water treatment. This case study developed into a series of topics in an open discussion forum. Participants were invited to contribute to topics including, the best approach to **selecting technology** relevant to each utility's context, examples of **how to manage chlorine residue** within the network, the common **safety issues** and the management of **safe chlorination practices** and how to engage with local communities to **dispel myths about the use of chlorine**. Each of these discussion topics included an assessment of risk, ways to mitigation risks and implementation pathways.

Learning Snapshots

- **Chlorinated water can taste odd.** Water taste is a contributor to community concern about the safety of chlorine in water often leading to a preference for other water sources. Effective control of chlorine dose rates and managing contaminants in the raw water can be effective at reducing taste and odor of chlorine.
- **Chlorine must be handled safely.** Correct procedures to monitor for gas leakages, safety training and emergency procedures are critical to safe chlorine management. There are also safety concerns to be managed with sodium hypochlorite which can cause burns so appropriate PPE is required such as gloves and goggles.
- **Other compounds can react with chlorine.** Chlorine can be consumed by different agents in the water leading to a decay in active ingredients. This can lead to taste and odours and impacts your ability to provide a chlorine residual to protect the distribution network.
- **Regular chlorine sampling.** Regular sampling across sample sites throughout the water treatment plant and representative sites across the water supply network will indicate water quality, chlorine decay and detect possible points of contamination. These sample locations should be selected to minimize the risk of dead spots (portions of the network with low turnover) and hence low chlorine residual.
- **Reservoir maintenance will assist in managing water quality.** Installing vermin screens, diverting rainwater, minimizing sunlight, ensuring proper seals, and regular cleaning will prevent recontamination of water stored in reservoirs. It may also be necessary to top up the chlorine in the network if there are long residence times.

Upcoming Events

To register for the upcoming 2021 webinar topics, please contact: lfernando@adb.org

ADB continues to support water service providers in the region to build resilience, knowledge and capacity to manage threats in our changing world.