

WATER SAFETY PLANS: Managing Drinking-water Quality for Public Health

► Reconsidering traditional approaches

Drinking-water suppliers are usually required to verify that the quality of water supplied to consumers meets specific numerical standards. Yet, by the time tests are completed and results indicate the water is not safe to drink; thousands of people may have already consumed the water and become sick. Notification comes too late. Moreover even with frequent monitoring, the vast majority of water distributed to consumers will never be tested. Therefore an over reliance on so called end-of-pipe monitoring is both inadequate and can be expensive (see Box 1).

Box 1 – An over-emphasis on end-product testing misuses resources

Studies have shown (Mac Kenzie et al., 1994 and Risebro et al., 2007) that water meeting typical end-of-pipe standards, may in fact, cause disease. It is not feasible to test for all pathogens directly and indicators of microbial contamination are imperfect. Important pathogens like *Cryptosporidium*, may be present when the indicator *E. Coli* is absent. Furthermore, testing for an ever-growing number of chemical contaminants that may be of limited health concern or not even present in water is clearly not an optimal use of resources. An over-emphasis on end-product testing can be expensive, time-consuming and of limited benefit.

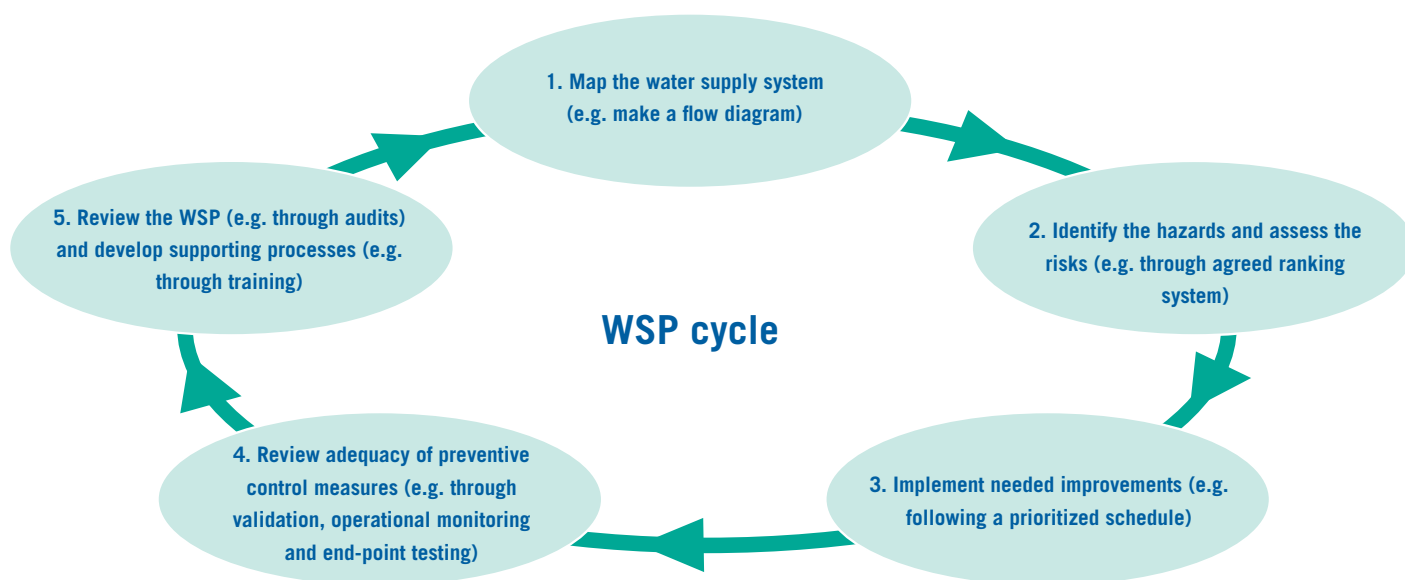


Figure 1 – Water Safety Plan (WSP) cycle

Adapted and simplified from WSP Manual (Bartram et al., 2009)

► Shifting to a modern WSP approach will reduce disease

For these reasons, the WHO Guidelines for Drinking-water Quality and the IWA Bonn Charter recommend pro-active efforts to reduce risks and prevent contamination before water reaches the consumer. This can be achieved by shifting emphasis of drinking-water quality management to a holistic risk-based approach that covers the catchment-to-consumer. Such an approach is called WSPs. Widespread implementation of WSPs can contribute to reducing the portion of the global disease burden attributed to poor drinking-water and inadequate sanitation and hygiene (Box 2).

Box 2 – The health burden

Inadequate water, sanitation and hygiene continue to pose a major threat to human health. These risk factors contribute to millions of unnecessary deaths each year, including 1.8 million diarrhoeal related deaths in children less than 5 years of age. Those who survive this disease are often afflicted by other consequences, including malnutrition, inhibited growth and impaired cognitive development. It is estimated that 860,000 children under the age of 5 die each year as an indirect or direct result of malnutrition caused by lack of sufficient water, sanitation and hygiene (Prüss-Üstün et al., 2008).

► Decision-making framework for all stakeholders

The WSP approach allows for appropriate institutions to work together to make well-informed decisions related to the strategic, financial, operational and legal aspects of drinking-water quality management. Such stakeholder cooperation that is an implicit part of WSPs, for example, facilitates the identification of appropriate barriers to contamination that does not overly focus on expensive treatment processes, but rather considers a range of options that may result in improved raw water quality and maintenance of quality post-treatment.

► Enhancing existing practice for water suppliers

Some components of a WSP – such as the establishment of standard operating procedures – are common practice to many water suppliers; however they are often developed in isolation without consulting key stakeholders or considering the entire water supply chain from catchment-to-consumer. Furthermore, formal documentation and clear allocation of responsibilities of such procedures are sometimes lacking. Implementation of WSPs can help a water supplier to establish more efficient operational procedures, respond quicker to incidences and improve knowledge management of the entire water supply system.

► Practice-oriented standards and regulations to better protect public health

Incorporating the WSP approach into policies, legislations and regulations can complement existing standards and regulations which specify microbial, chemical and physical parameters for drinking-water quality. Such a shift in standards or regulations will require an appropriate surveillance agency to not only monitor against numerical standards but also audit drinking-water quality management practices to ensure compliance. In contrast to traditional monitoring, the WSP approach enables feedback to ensure that the water supplier's ability to manage risks to human health continuously improves. It also provides a more certain indication that the supplied water is indeed safe.

► Informing capital investment requirements

The implementation of WSPs will include the production of an investment/upgrade plan. Such a plan will identify short, medium and long-term improvement needs which can include upgrading existing water supply systems to ensure drinking-water quality is not compromised due to inadequate infrastructure. As this identification is based on a robust risk assessment of the system, it provides a reliable means for governments, donor agencies and international financing institutes to better maximise capital investments (see Box 3).

Box 3 – Maximising capital investments

An estimated US\$ 52 billion (Bartram and Hutton, 2008) is needed annually to maintain and renew existing facilities for populations already with water supply or sanitation coverage and with only around 25% of that finance available, rational capital investment is more needed than ever. Current investments in water and sanitation often neglect or under-estimate costs associated with operating and maintaining system improvements, such as infrastructure. Identification of capital investment requirements should therefore be based on a systematic analysis of the water supply system that prioritises upgrade needs based on risk assessment and implements them incrementally over the long-term.

► Internationally recognized approach

Recognizing these benefits, WSPs are increasingly being promoted by all stakeholders, including governments, donors and NGOs. Water suppliers continue to implement WSPs across the globe. In order to improve water management practices and consequently public health, stakeholders should familiarize themselves with the WSP approach, appreciate its benefits, and take action in a coordinated way. Further information is available at www.wsportal.org and www.who.int/water_sanitation_health/dwq/en/.

References

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