

The benefits of risk-based prevention vs end-point testing

Information sheet – Recycled water

Recycled water

When water utilities supply recycled water they must ensure that the product is fit for purpose and that customers understand what it can and cannot be used for. Water utilities therefore have a 'duty of care' to those people using their products.

Historically, the management of water quality relied on end-point testing to confirm the quality of water supplied. However, since results are received after the water has been supplied to the customer or end point, it could be days before utilities are aware that water has not met appropriate water quality requirements or act to fix problems in production.

The Framework for Management of Drinking Water Quality in 2004 and the Framework for Management of Recycled Water Quality and Use in 2006 (the Framework), introduced the preventive risk management approach currently used by the water industry to ensure risks are adequately managed prior to supply. This approach is similar to the approach used by the food industry, moving away from only relying on end point testing to understanding and monitoring the processes necessary to prevent supply of unsafe water.

The Australian Guidelines for Water Recycling (2006) (AGWR) details how the Framework should be applied to recycled water schemes

What is risk?

The AGWR (2006) defines risk as the likelihood of a hazard causing harm in exposed populations in a specified time frame, including the magnitude of that harm.

Unlike the sources of water that are used for drinking, sewage contains a high concentration of hazards including pathogens, therefore processes for the production of recycled water need to reduce these hazards so they do not create unacceptable risks to the recipients. While the end uses of recycled water may not be as intimate as drinking water, there is always a potential for the inadvertent ingestion of recycled water, e.g. through cross connections or spray drift.

Water utilities must manage risk from source through to end point as part of their overall governance obligations and duty of care i.e. in sourcing, producing and supplying recycled water, in compliance with AGWR.

End point testing

End point testing is the process of obtaining a sample of the final recycled water and subjecting it to tests to see if, at the point of supply, the recycled water met the water quality objectives. End point testing is therefore used to confirm that the processes or preventive strategies have worked.

Risk-based prevention on the other hand, is about having the right processes in place to manage the risks and monitoring these processes rather than just testing the final recycled water quality. End point testing

therefore becomes a useful component in the overall risk prevention strategy rather than the end result in its own right.

Quality of recycled water

The Framework is based on risk-based prevention, i.e. quality assurance rather than quality control. End point testing is still included in the Framework but now forms part of a quality assurance rather than quality control approach. Put simply, the Framework is about understanding what the risks are in your system, how you control the risks and how you know the risks are under control – conducted as part of a continuous improvement cycle.

Table 1: End point testing and risk based prevention

Type	Aim	Characteristics
End point testing (quality control)	To identify defects in the finished product	<ul style="list-style-type: none"> • product focused • reactive
Risk based preventative (quality assurance; AGWR)	To prevent defects in the finished product	<ul style="list-style-type: none"> • process focussed • proactive

Due diligence

Water utilities have an ever increasing body of legal and formal requirements, many of them risk based, including work health and safety legislation and the requirement to have a risk based management systems for the supply of drinking and recycled water.

Part of complying with their obligations involves the water utility being able to demonstrate that it understands the risks and is implementing systems to prevent and react to issues as they arise – this is called due diligence.

For recycled water schemes, due diligence can be demonstrated through implementation of an appropriate recycled water management system (RWMS).

Benefits

Developing and implementing a risk-based RWMS prevention strategy, such as the Framework, provides boards, managers and operators with an excellent way of demonstrating due diligence and compliance. However, there are many benefits other than compliance, in having developed and implemented a risk management system.

Commitment

Implementation of a RWMS requires a commitment from the top down and bottom up. Goals and objectives are clearly defined as are the mechanisms for achieving them.

Prevention

High risk events are considered prior to the system operation and the adequacy of the system to manage these events has been considered. Events are more likely to be prevented before they occur and should they occur, events can be prevented from escalating.

Economic

Many tangible and intangible economic benefits including:

- Pre-planned incident management helps to quickly mitigate events and reduce cost
- Insurance premiums may be lower for those organisations with a sound risk management system in place
- Identification of redundant monitoring
- Streamlining of compliance reporting.

Standard of duty

Adopting a known approach such as the Framework, allows a recycled water supplier to demonstrate adoption of the industry's standard.

Continuing improvement

An RWMS contains a number of areas that focus on continued improvement of the recycled water system. This:

- Allows for identification of gaps
- Ensures continuing currency of the system
- Ensures robustness of implementation.

Due diligence

Those who direct, manage and operate the system can clearly demonstrate that they have taken a conscientious approach and have records to prove that approach.

Increased understanding

Improved system understanding and management across the recycled water supplier's organisation.

Clearer communication

An RWMS has defined communication channels:

- Within and across the utility organisation
- Between the utility and recipients
- Between the utility and regulators.

References

Australian Guidelines for Water Recycling (2006)

For more information

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This information was adapted from the Recycled Water Information Sheet series © Department of Primary Industries, New South Wales Government.