



Office
of Water

*Overcoming the obstacles for the implementation of
the Australian Guidelines for Water Recycling in
regional NSW*

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Aim of presentation

- Identify obstacles for implementation of the AGWR
 - Stakeholder feedback
 - Workshop reports
 - Case studies
- How the NSW Office of Water and other organisations are addressing some of the obstacles to ensure that all schemes are designed and operated to reduce risks to acceptable levels
 - Development of policy and guidance
 - Information sheets
 - National Validation Framework

In the good ol'days....

■ Prior to 2006

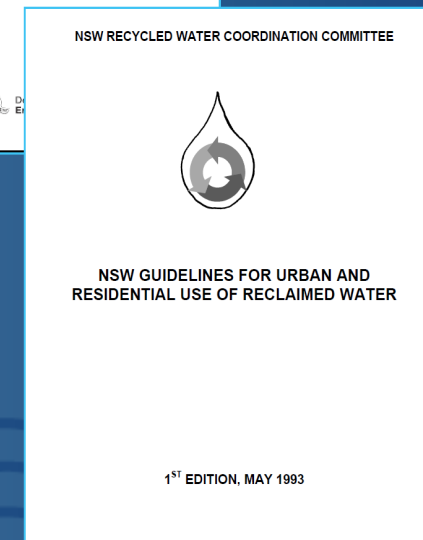
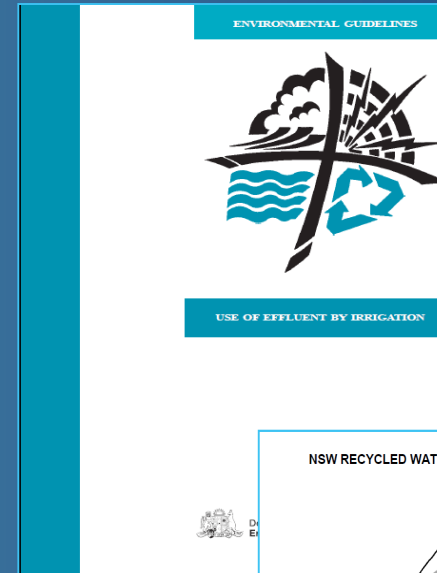
- Environmental protection guidelines

Use of Effluent for Irrigation 2004

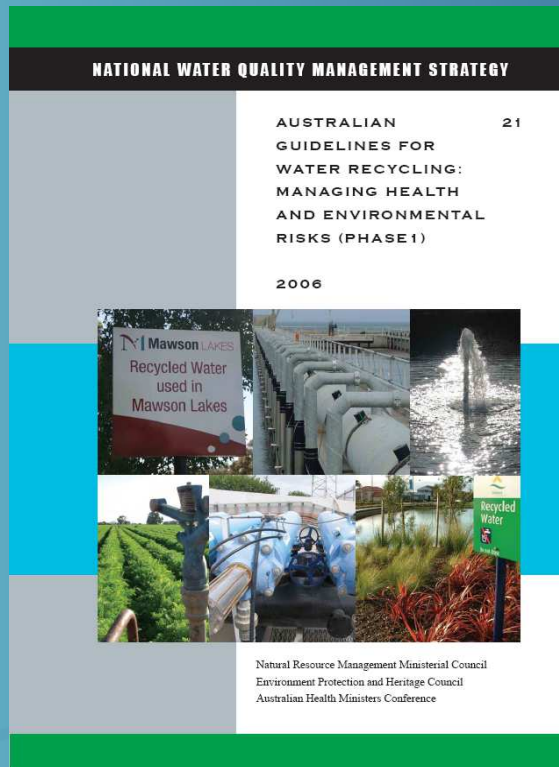
- Urban/residential

NSW Guidelines for urban and residential use of reclaimed water 1993

- Reliance on end point testing and monitoring
- Prescriptive treatment train



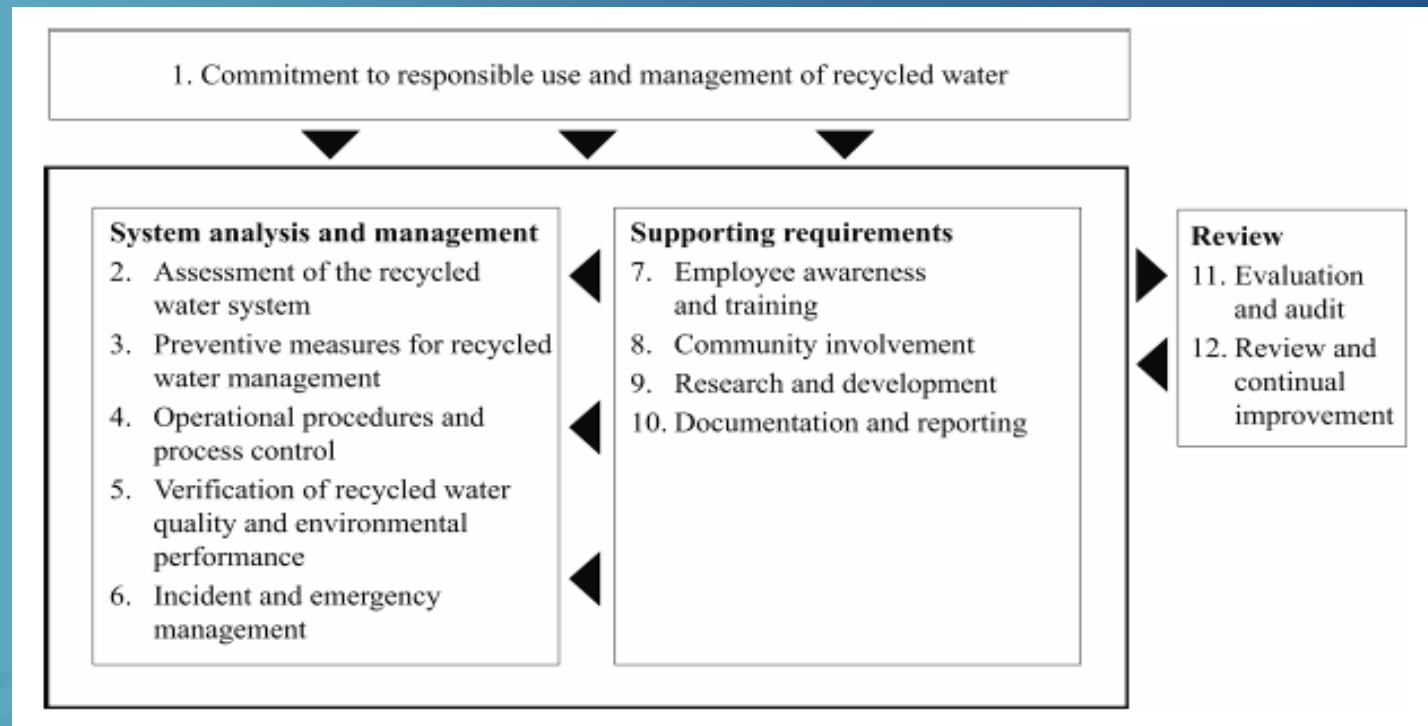
Preventive risk management approach



- *Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1)* NRMCC, EPHC & AHMC
- Adopted by all states, 2006
- General & comprehensive
- Multiple barrier approach, risk assessment & risk management



The framework for management of recycled water quality



Application in of the AGWR in NSW

Local Government Act, 1993 Water Management Act, 2000

60 Council works for which the approval of the Minister for Primary Industries is required

A council must not, except in accordance with the approval of the Minister, do any of the following:

(c) as to sewage—provide for sewage from its area to be discharged, treated or supplied to any person

- 2007- utilities required to develop and submit a recycled water management plan addressing 12 elements AGWR

Water industry Competition Act, 2008

■ Network Operator's Licence

Regulation (Schedule 1, CI 7) - A water quality plan in relation to water infrastructure for non-potable water must be consistent with the AGWR

Stakeholder feedback: regulation and AGWR

Stakeholder consultation for Urban Water Review –WIC Act and LG Act, 2012

- Process for s60 approval too long
- More guidance, support material for s60 application/approval
- Lack of awareness for RW requirements for s60
- Consultative approach with NOW leads to confusion
- Support the AGWR but need guidance

Removing the barriers for water recycling in regional and remote Australia- Asia Pacific Water Reuse Conference, 2013

- Improved understanding of critical control point management

Regional Water Recycling Workshop – Wagga Wagga AWA, 2014

- challenging to negotiate and interpret regulation on recycled water
- support risk-based regulation, consistency in regulation, and the need to streamline the approval process.
- beneficial to workshop with all stakeholders, including operational and regulator, using a risk based approach

AGWR 2006 -departure from past

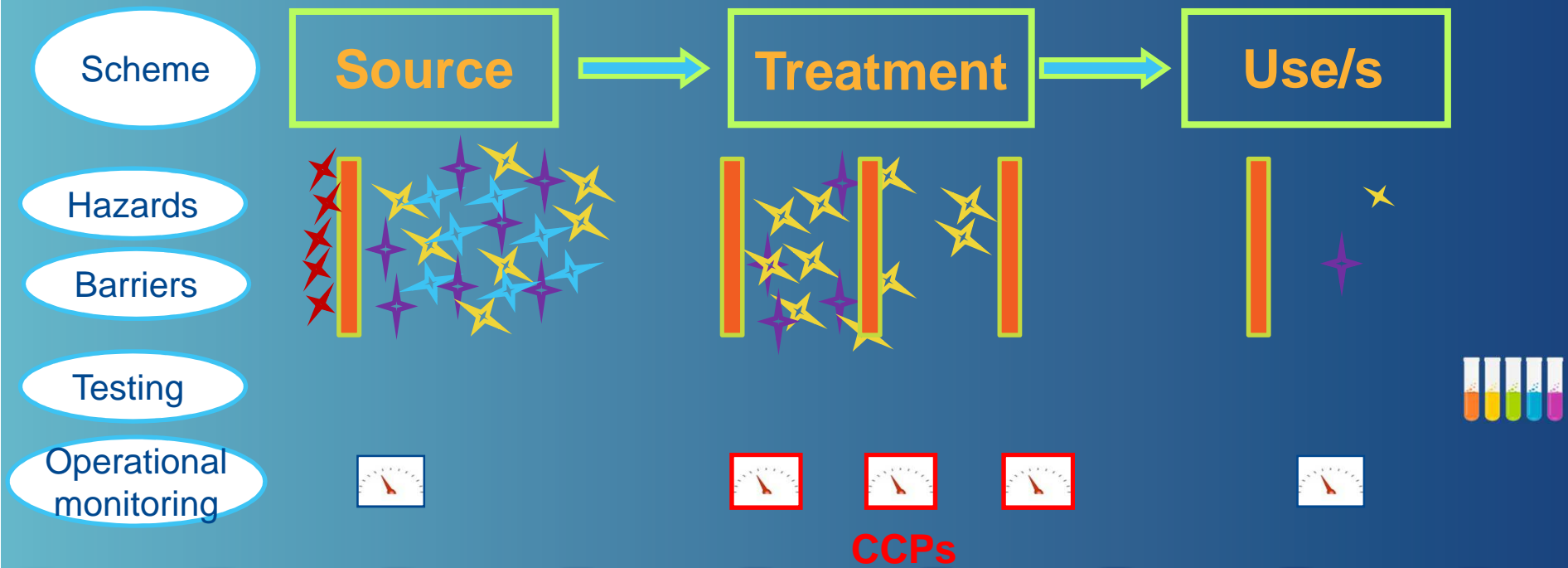
- Evolution from protection of drinking water
 - 2001 – Public consultation for Framework for Management of Drinking Water Quality
 - 2004 Australian Drinking Water Guidelines
 - 2010 – *Public Health Act* Quality Assurance System
 - 2013 - Guidance for Drinking Water Management Systems
- Drinking water and sewage management in utilities can be very separate
- Processes, regulations and guidance for 'effluent disposal' centred on nutrient reductions and environmental discharges

Prescriptive end point targets

Table A1: Guidelines for treatment, disinfection and irrigation controls for the spray application of municipal sewage effluent (cont)

Type of reuse	Level of treatment	Effluent quality ⁴	Effluent monitoring ²	Controls
Food production Raw human food crops not in direct contact with effluent (edible product separated from contact with effluent ¹¹ , e.g. use of trickle irrigation) or crops sold to consumers cooked or processed.	Secondary and Pathogen reduction ⁵	pH 6.5–8.5 ⁷ Thermotolerant coliforms ³ <1,000 cfu/100 mL ⁴	pH weekly BOD weekly SS weekly Thermotolerant coliforms ³ weekly	Application rates limited to protect groundwater quality. Salinity should be considered. Dropped crops not to be harvested from the ground. Crops must be cooked (>70°C for 2 minutes), commercially processed or peeled before consumption.
Food production Pasture and fodder (for grazing animals except pigs and dairy animals, i.e. cattle, sheep and goats)	Secondary and Pathogen reduction ⁵	pH 6.5–8.5 ⁷ Thermotolerant coliforms ³ <1,000 cfu/100 mL ⁴	pH weekly SS weekly Thermotolerant coliforms ³ weekly Disinfection systems daily ⁵	Application rates limited to protect groundwater quality. Withholding period of nominally 4 hours for irrigated pasture. Drying or ensiling of fodder. Helminth controls ⁹ .
Food production Pasture and fodder for dairy animals (with withholding period).	Secondary and Pathogen reduction ⁵	pH 6.5–8.5 ⁷ Thermotolerant coliforms ³ <1,000 cfu/100 mL ⁴	pH weekly SS weekly Thermotolerant coliforms ³ weekly Disinfection systems daily ⁵	Application rates limited to protect groundwater quality. Withholding period of 5 days for grazing animals. Drying or ensiling of fodder. Helminth controls ⁹ .
Food production Pasture and fodder for dairy animals (without withholding period). Drinking water (all stock except pigs). Washdown water for dairies	Secondary and Pathogen reduction ⁵	pH 6.5–8.5 ⁷ Thermotolerant coliforms ³ <100 cfu/100 mL ⁴	pH weekly SS weekly Thermotolerant coliforms ³ weekly Disinfection systems daily ⁵	Application rates limited to protect groundwater quality. No withholding period. Helminth controls ⁹ .
Non-food crops Silviculture, turf and cotton, etc.	Secondary and Pathogen reduction ⁵	pH 6.5–8.5 ⁷ Thermotolerant coliforms ³ <10,000 cfu/100 mL ⁴	pH weekly BOD weekly SS weekly Thermotolerant coliforms ³ weekly	Application rates limited to protect groundwater quality. Restricted public access. Withholding period nominally 4 hours or until irrigated area is dry.

Risk assessment and risk management



Goal posts have moved



Whole new ball game



Pathogen reductions by sewage processes

- AGWR requires log removal values (LRV) for pathogens
 - Virus (Coliphage)
 - Protozoa (Clostridia)
 - Bacteria (Campylobacter)
- Many processes lack specific data
 - Designed for nutrient removal
 - Indicators – *E.coli* or thermotolerant coliforms
 - Low/variable numbers of surrogates
 - Testing?



Pathogen reductions by sewage processes

■ Validation of processes

- linking LRV to monitoring over a range of operational conditions including worst case
- Data not available for many technologies
- *In situ* testing expensive



Overlapping regulations - different objectives

■ s60 LG Act

Approval provides an independent assessment of the proposed works to ensure they are fit for purpose and provide robust, safe, cost-effective and soundly based solutions that meet public health and environmental requirements

- s60 for sewage treatment and additional, separate approval for recycled component

■ *Protection of the Environment Operation Act, 1997*

- Ensuring that scheduled activities minimise impact to the environment
- Environmental Protection Licence (EPL) – targets and end point monitoring



How are recipients of recycled water regulated?

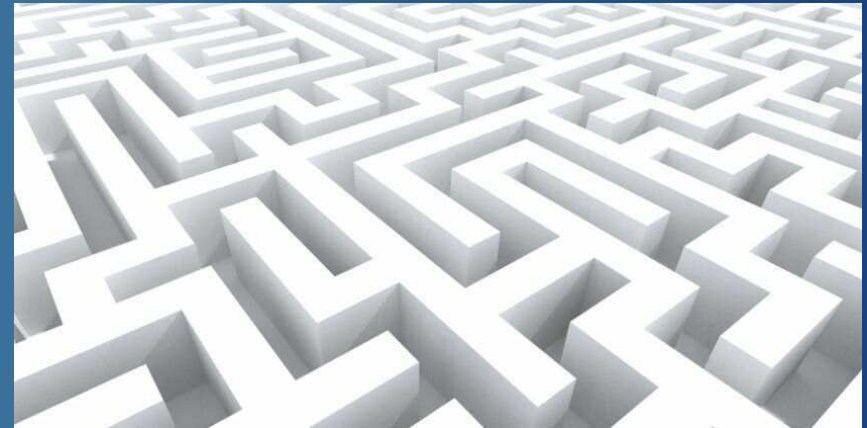
- AGWR – considers the whole system



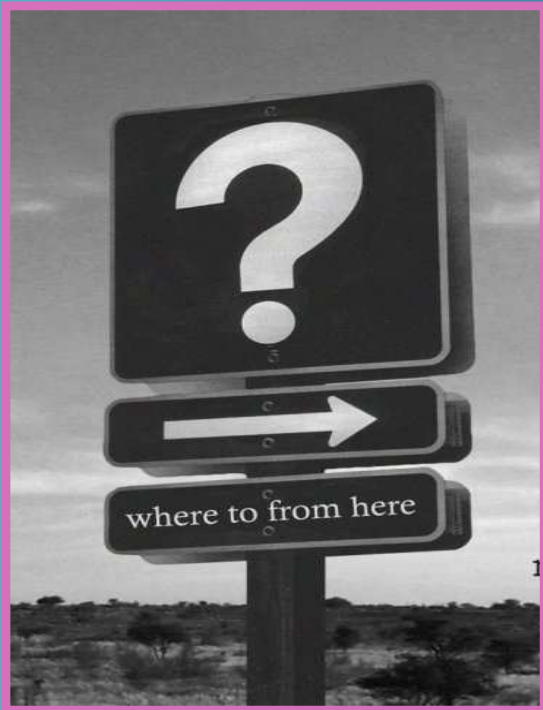
- When recycled water is supplied to 3rd parties
 - what is the role and responsibility of regulator and utility?
 - How is the risk managed when there are on site controls?

Obstacles

- Shift from past
 - Consideration of whole system
 - Application of risk assessment and management
 - Lack of data for pathogen reductions, LRV
- Overlapping regulations
- How are 3rd parties regulated ?



Addressing obstacles in AGWR and regulations



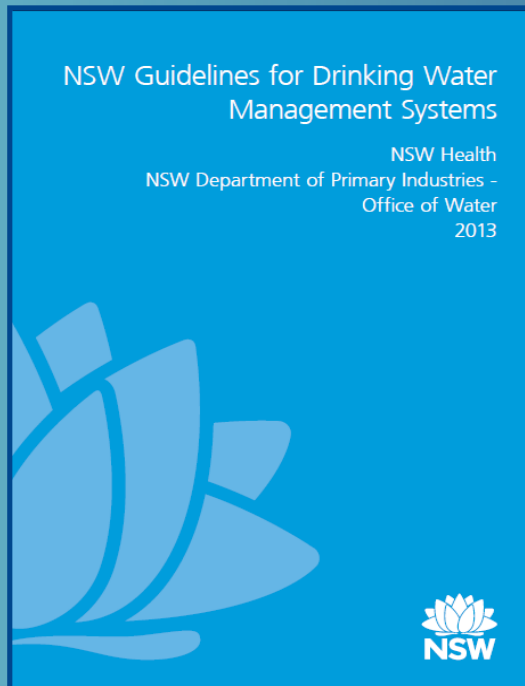
- Office of Water and NSW Health
 - Project purple
- Australian Water Recycling Centre of Excellence
 - National Validation Framework
 - Improving maturation pond treatment systems

Project Purple

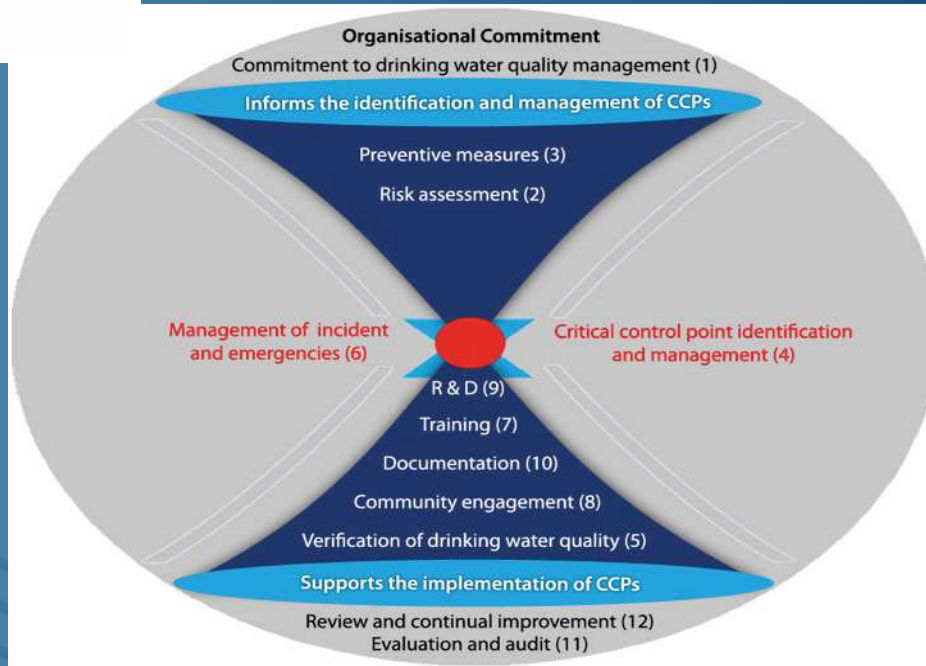
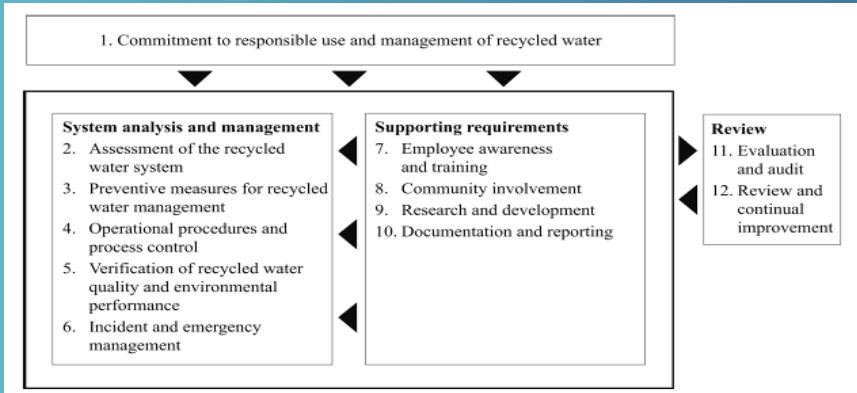
- Guidance
 - Recycled Water Management Systems
 - Information Sheets
- Working party of NOW and NSW Health Officers
- Peer review with selected water utilities and other stakeholders
 - Wagga Wagga October , Orange if there is enough interest
 - National Recycled Water Regulators Forum – National consistency
- Update policy documents
 - Application process and requirements



Guidance document



- Based on the guidance for drinking water management systems
- Same focus on the identification and management of critical control points
- Referenced to AGWR
- Including template, tables and checklist – balance between guidance through a system and 'tick box' exercise



Guidance document

- Unlike drinking water, there is the need to consider more end uses with various levels of public exposure
- Consideration for simplified risk assessment and management for low public exposures eg irrigation of woodlots and agricultural reuse where other regulatory obligations for the protection of workers under the *Work Health and Safety Act, 2011* can be applied
- Case studies



Information sheets

Topic	Content
Benefits of risk assessment and management	Overview preventive risk management highlighting benefits to utilities
Regulatory limits and risks to utilities	Clarification of third parties in approval User agreements and contracts

Information sheets – technical

Topic	Content
Critical Control Points	Defining critical control points, limits and monitoring
Log reduction values (LVR)	Explanation of LRVs Rationale behind each surrogate and reference pathogen and limits of indicators
Getting on site controls right	Clarify how LVR are achieved with onsite controls. Concept of hierarchy of controls
Monitoring	Definition of different monitoring types, frequency and review
Validation and verification	What is the difference When is it done
Incident notification	Define which incidents require notification to NSW Health, how and within what timeframe

Information sheets – technical

Topic	Content
Chlorination	Disinfection of wastewater Primary kill and residual How to achieve and calculate Ct
Getting on site controls right	Clarify how LVR are achieved with onsite controls. Concept of hierarchy of controls
Monitoring	Definition of different monitoring types, frequency and review
Incident notification	Define which incidents require notification to NSW Health, how and within what timeframe

Australian Water Recycling Centre of Excellence

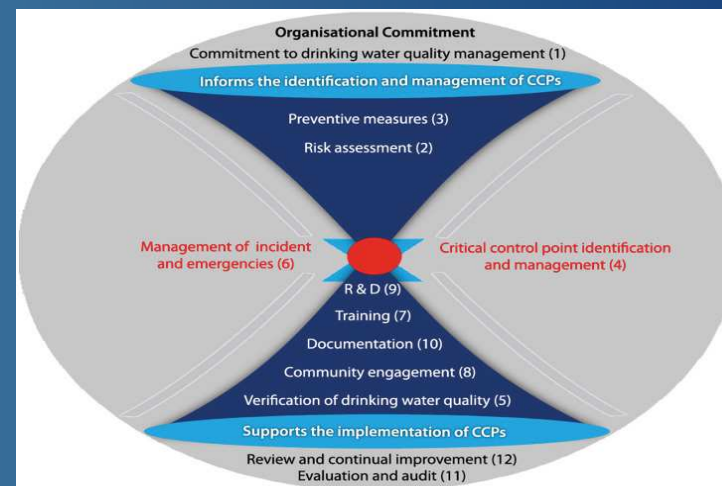
- Establishment of a National Validation Framework for water recycling
 - Road map
 - Cost- benefit analysis
 - Business Case



- 6 research projects
 - Membrane Bioreactor
 - Reverse osmosis
 - Biological system
 - Ozone process
 - Enhanced validation of a multiple-barrier system
 - Standardisation and microbial testing
- Validating pond and lagoon systems

Benefits of AGWR

- Whole of system understanding
- Focus on process and control
- Reliability and confidence
- Proof of due diligence
- Strengthen relationships
 - Within utility - Management to operations
 - With third parties
 - With regulators



Shifts Happen

- Wagga Wagga case study



"[Councils] tend to find [the process] tedious, but at the end of the day worthwhile... I don't know that we have been very good at explaining there is a good reason to do it."

http://waterrecyclinginvestment.com/wpcontent/uploads/2013/11/ISF019_AWRC_D6_Wagga_4-2.pdf