Response to the National Health & Medical Research Council Draft revised ADWG Chapter 5 on Microbial Quality of Drinking Water

June 2018

CENTRAL NSW COUNCILS

Centroc's Mission is to be recognised as the lead organisation advocating on agreed regional positions and priorities for Central NSW whilst providing a forum for facilitating regional co-operation and sharing of knowledge, expertise and resources; effectively nurturing sustainable investment and infrastructure development.

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Dear Mr Singh,

Comments on Draft Revised ADWG Chapter 5 – Microbial Quality of Drinking Water

Central NSW Councils (Centroc) represents over 200,000 people covering an area of more than 50, 000 sq kms comprising the Local Government Areas of Bathurst, Blayney, Cabonne, Cowra, Forbes, Hilltops, Lachlan, Lithgow, Oberon, Orange, Parkes, Upper Lachlan, Weddin, and Central Tablelands Water.

It is about the same size as Tasmania with half the population and a similar GDP. Centroc's vision is to be recognised as vital to the sustainable future of NSW and Australia. Its mission is to be recognised as the lead organisation advocating on agreed regional positions and priorities for Central NSW whilst providing a forum for facilitating regional cooperation and sharing of knowledge, expertise and resources.

The Centroc Board is made up of the 28 Mayors and General Managers of its member Councils who determine priority for the region. These priorities are then progressed via sponsoring Councils. For more advice on Centroc programming and priorities, please go to our website http://www.centroc.com.au/

This region has a long and strong reputation as leaders in collaboration and on 24 May became the first Joint Organisation in NSW to hold its inaugural meeting.

<u>Centroc Water Utilities Alliance</u>

In NSW, Local Government owned water utilities provide water and sewerage services, delivering public health outcomes for regional NSW.

Local Government management of water utilities in Central NSW including the delivery of quality drinking water is being undertaken on a solid basis through the Centroc Water Utilities Alliance (CWUA).

Formed in 2010, the Alliance aims for Local Government to be recognised as national leaders in delivering secure and quality water supplies and sewerage services to grow Central NSW to 2059 and beyond.

The CWUA's strategic approach delivers effective and efficient services through:

- Regional strategic planning and prioritisation
- Inter-governmental collaboration
- Regional leadership and advocacy
- Operational support to member Councils.

The supply of quality drinking water to Central NSW communities is of the highest priority for Centroc member Councils who are supported by the CWUA in meeting their Drinking Water Management System obligations through innovative regional programming and shared knowledge and resources.

Comments on Draft Revised ADWG Chapter 5

Thank you for the opportunity to provide comments on the National Health and Medical Research Council's (NHMRC) draft revised Chapter 5 on Microbial Quality of Drinking Water and accompanying technical appendix (draft revised Chapter 5 – (DRC5)). These comments follow those made in Centroc's November 2016 submission.

In considering its response the CWUA has sought advice from City Water Technology (CWT). CWT has worked closely with Centroc member Councils over the past two years on a program to improve drinking water management practices across the Central NSW region. This has included evaluation of Centroc member Council's water supply systems against the "Good Practice Guide to the Operation of Drinking Water Supply Systems for the Management of Microbial Risk" (WRA/ WSAA October 2015). This evaluation process has assisted in prioritising upgrades and improvements for the various water supply systems evaluated and has provided an understanding of potential issues that HBT implementation may bring in regional NSW.

This response provides:

- feedback on response in DRC5 to issues raised in the November 2016 Centroc submission;
- advice on any new issues that have been raised and their implications for Centroc member local water utilities; and
- recommendations and conclusions arising from DRC5.

1. Background

The National Health and Medical Research Council (NHMRC), authors of the Australian Drinking Water Guidelines, are seeking stakeholder feedback on a revised Chapter 5 and accompanying technical appendix on the new quantitative health based approach to defining microbial quality of drinking water.

This document summarises our views on these documents.

2. Issues

2.1 Original Draft Framework Submission

In September 2016, the NHMRC initially proposed the inclusion of microbial health based targets (HBTs) in the Australian Drinking Water Guidelines (ADWG) and were seeking public comment on the draft framework. Centroc Water Utilities Alliance (CWUA) made a submission on the draft framework with key comments as follows.

The CWUA membership supports overarching comments made in the submission by the NSW Water Directorate that the evidence on which the Draft Framework on microbial health based targets is based is currently insufficient to justify the potentially enormous infrastructure investment that would be required to meet the Framework.

Specific concerns raised by the Water Directorate and supported by the CWUA were that:

- Typical catchments for western NSW were not well considered in the Deere et al (2014) paper on which the bin or category classification was based;
- No credits are given for environmental land and water inactivation of pathogen infectivity;
- There is little recognition of the proximity of the activity relative to the source water offtake, particularly for run of river systems.

Centroc had a number of additional concerns on the implications of the draft HBT framework being implemented. These included:

- the investment required to comply with the framework,
- the amount of monitoring and data collection required,
- the discrepancy between catchment categorisation based on sanitary survey versus faecal indicators, and
- the insufficient data available to provide a complete HBT approach.

Additionally, Centroc highlighted the desire to participate in a pilot project to investigate potential issues that HBT implementation may bring.

There have been several additions and changes to the DRC5, in relation to the previous issues listed above. The following sections address these changes in relation to Centroc's existing concerns.

2.2 Investment Requirements

The requirements as laid out in the draft HBT framework were expected to require significant capital investment in new infrastructure and improvements to existing facilities, as well as ongoing operational costs.

Centroc requested additional evidence be provided to support the health benefits suggested, and to compare these against other health issues in regional communities.

The Draft Technical Appendix: Derivation of microbial treatment targets for enteric pathogens contains much greater detail into the health outcome target, as well as prevalence rates for reference pathogens

as well as the 'burden of disease' for these key pathogens. This serves as an improved point of comparison to other health issues; however, the concern on levels of investment still stands.

To achieve the HBTs, each water supply system will require multiple capital and operational improvements. This will require millions of dollars for each water supply system. Centroc has more than 30 water supply systems between its member water authorities. The funding required to enable implementation of the new HBTs will easily run into the tens of millions of dollars for Centroc Councils. Additionally, Centroc Councils will require increased resources to implement the changes required. While many of our Councils are reasonably resourced and motivated, others will struggle to manage, provide sufficient expertise for, and program in such significant projects.

In response to this consultation, CWUA member Parkes Shire Council has undertaken a review of the potential infrastructure investment required to implement HBTs, in a low-density catchment typical of those west of the Dividing Range. Notable is that in March 2018 Parkes opened its new water treatment plant which was designed to and meets the requirements of the 2011 Australian Drinking Water Guidelines in March 2018. Refer to Parkes Shire Council Submission to the NHMRC, ADWG Draft Chapter 5 Microbial Quality of Drinking Water.

The NSW State Government has recently commenced the Safe and Secure Water Program which has proven popular and thus appears to be over-subscribed in the short term at least. It has also become clear that this process has significant uncertainty in funding allocation success and timing of funding for projects. Significant consideration will need to be given to an additional funding program with suitable support for water suppliers.

2.3 Data Collection and Monitoring

Box 5.1. Small water suppliers (page 8) relates to the point of limited data and resources available to base a source water classification. The NHMRC suggest that where no E. coli water quality monitoring data are available, a category 4 rating is allocated by default. If a less conservative category (categories 3 or 2) is thought to be suitable by a supplier, this should be demonstrated to the health authority or regulator. This is intended to provide a longer-term incentive to improve system understanding through E. coli monitoring.

NHMRC's position on this issue has not changed since the original draft Chapter 5, and the concern that this could easily result in higher than necessary treatment requirements and therefore inflated operational and infrastructure expenditure remains. We maintain that further support should be provided to water utilities that do not have the population to support greater data collection and monitoring. This would ensure an accurate assessment is able to be made and capital expenditure minimised.

NHMRC should also provide more detailed guidance on the type of evidence required to demonstrate category 2 or 3 classification in the absence of E. coli data and who the relevant authorities will be evaluating this evidence. As it stands this is a rather vague statement that can have a significant financial and resourcing impact on small water authorities

2.4 Source Water Assessment

Most of Centroc member Council's catchments would be given a category 4 classification under the vulnerability assessment. Centroc previously stated that the microbial indicator assessment would place the same systems into category 2 or 3 (and sometimes category 1). However, these same systems admittedly had event based monitoring producing samples reported as 'too numerous to count'.

The DRC5 states that "Samples from event-based monitoring (e.g. during heavy rainfall) should be included in the dataset" and "Given the wide fluctuations that can occur with microbial concentrations in surface water, the peak concentrations should not be disregarded as outliers. For this assessment (i.e. the allocation of source water category) the maximum E. coli result should be used (Walker et al 2015)".

Under this guidance, the example systems above would likely be classified category 4 in both the vulnerability assessment and the microbial indicator assessment. However, there may be measures that can be taken to mitigate these results, such as providing early warning monitoring and enough storage in a water supply system to allow significant storm event associated water to pass the WTP intake, with the water supply system only returning to service when the peaks have subsided (which is often within hours. Designing water treatment systems to manage all potential raw water conditions, even though short lived, leads to over conservative design and excess expenditure.

2.5 USEPA SWTR

As stated in our previous submission, the United States Environmental Protection Agency have employed a similar system to the proposed HBT strategy for many years as part of their Surface Water Treatment Rules (SWTR), and lessons can obviously be learnt from their approach and experience.

Additionally, the USEPA's SWTR were implemented at different rates and to different degrees depending on the size and financial capability of the various water authorities. Well financed, larger organisations can typically achieve higher targets much more rapidly than small remote ones. The larger organisations often also have voluntarily started putting new strategies into practice earlier, which puts them much closer to the end result than the smaller organisations by the time they are officially documented.

The SWTR also contain detailed tables so that calculation of LRV for viruses, bacteria, Giardia and Crypto can be readily calculated. There is no evidence in the DRC5 that any of the experience of the USEPA has been considered or that similar support information is being adapted for the new guidelines.

2.6 Turbidity

The original draft Chapter 5 contained guidance on LRV credits for filtration based on three tiers of filtrate turbidity targets (from <0.15 NTU to <0.3 NTU). Centroc raised the issue that as disinfection is considered compromised when turbidity is >1 NTU, there should be a sliding scale of LRV credits for 0.1-1.0 NTU.

The revised draft Chapter 5 has the following to say:
"The values [provided] are indicative only and do not represent validated LRV for a particular treatment train. The specific LRV achieved by a treatment plant is site specific and dependent upon the water

matrix, specific plant design and operation conditions. The LRV should be validated on a site-specific basis"

This better aligns with Centroc's thoughts on LRV credits as it theoretically allows credits, where they wouldn't have originally been awarded. However, this statement needs to be supported by more clarity on how the LRV can be validated on site specific basis. What are the mechanisms and guidance for this implementation?

2.7 Other Factors

Centroc identified several other factors that may contribute to health risk minimisation including: large storage reservoirs with long retention times, various pre-treatments, improved plant operation and avoiding extraction of water during storm surges. Centroc recommended that these factors be assigned guidance LRV credits and added to the framework. Similar LRV credits have been provided by USEPA for their SWTR.

While these factors are not mentioned specifically in the draft revised framework, there is now recognition that LRVs are awarded based on a site-specific validation process. Should these factors mentioned provide a validated LRV, credit will be given.

Small water authorities on large river systems have limited control over their greater catchments but may be able to better manage local reservoirs or raw water extraction systems to reduce risk.

2.8 WRA/ WSAA Good Practice Guide Evaluation

Centroc have evaluated many of their water systems against the "Good Practice Guide to the Operation of Drinking Water Supply Systems for the Management of Microbial Risk" (WRA/ WSAA October 2015). This evaluation process has assisted in prioritising upgrades and improvements for the various water supply systems evaluated.

We suggest that some credit should be given to those water supply systems that score well in this evaluation. An evaluation process that considers the whole water supply system from catchment to tap, which encourages risk mitigation in several aspects of the management of a water supply system not just in additional infrastructure. Perhaps the GPG could be considered in providing additional guidance in support of the new HBTs.

It is understood that WRA is considering the development of a second edition of the GPG and note that any revisions in the GPG should look closely at providing further support to the proposed ADWG Chapter 5 HBTs.

2.9 Groundwater

We previously commented on the need for an assessment to be made on aquifer and bore integrity including whether it was excluded from any potential surface water incursions, especially during flooding.

RDC5 recognises that groundwater sources can be contaminated with enteric pathogens and provides the following examples:

- direct faecal contamination of a shallow aquifer (e.g. septic seepage)
- surface water contaminated with pathogens recharging the aquifer
- inter-aquifer leakage leading to contamination of deeper (apparently protected) aquifer e.g. through fractures and faults
- leaky boreholes (resulting from a range of events).

To consider a groundwater source to be protected, all pathways for pathogen contamination must be ruled out through bore evaluations and aquifer assessments on a case-by-case basis. Additionally, the following guidance is provided:
"A starting position is to always assume a groundwater resource is unprotected until objective, credible scientific evidence can conclusively demonstrate otherwise."

While this guidance addresses the original concerns, it brings Centroc's groundwater supplies into the issues laid out in sections 2.2 and 2.3.

3. Summary of Recommendations

In summary Centroc's key recommendations for further revision of the RDC5 are as follows:

1. Federal and state governments need to give serious consideration to how the increased investment required by water authorities to meet the revised ADWG Chapter 5 will be provided and how the upgrade projects will be programmed and managed.
2. More detailed guidance should be provided on the type of evidence required to demonstrate category 2 or 3 classification in the absence of E. coli data and who the relevant authorities will be evaluating this evidence.
3. Care should be taken to manage a tendency towards conservative over design based on E.coli and other monitoring through storm events when measures other than significant infrastructure development could be more readily implemented. More guidance should be provided on catchment assessment where local measures can be taken on large river systems. Credit should be given for other factors such as large storage reservoirs and extraction management etc.
4. The lessons learnt from the USEPA SWTR implementation should be considered, especially around rate of implementation of new HBTs dependent on size and capability of water providers. Similar support information should also be provided or referenced.
5. Further guidance should be provided on how LRVs can be validated on a site-specific basis.
6. Water supply system evaluations such as against the WRA Good Practice Guide may have a useful link to risk mitigation to support the new HBTs.

With drinking water quality for communities of Central NSW of the highest priority for the Centroc Board, at the October 2016 meeting, Centroc General Manager's resolved support for this region to work in collaboration with appropriate agencies to pilot a more informed approach to the proposed implementation of the HBT framework, including:

1. Examples of more remote and smaller water supply systems;
2. Examples of larger more high technology systems;

And in each case:

- what operational improvements can be made through training and optimised focus on issues with minimal capital improvement;
- what smaller cost capital improvements can be made that provide significant improvement;
- what larger capital and operational expenditure may be justified.

The offer for the Centroc Water Utilities Alliance to participate in a pilot project to investigate potential issues that HBT implementation may bring still stands.

Thank you, again, for the opportunity to provide comment on the draft revised Chapter 5 on Microbial Quality of Drinking Water and accompanying technical appendix.

If you require further information or clarification on comments in this submission please contact Ms Meredith Macpherson, Program Manager, Centroc Water Utilities Alliance at meredith.macpherson@centroc.com.au or on 0427 451 085.

Yours sincerely,

Cr John Medcalf
Chair
Central NSW Councils (Centroc)