

**Cherbourg Aboriginal Shire Council**  
DWQMP Regular Review

October 2019



# **Cherbourg Aboriginal Shire Council**

## **DWQMP Regular Review**

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## 1. Introduction

Cherbourg Aboriginal Shire Council (CASC) is operating under an approved Drinking Water Quality Management Plan (DWQMP or plan), as required by the *Water Supply (Safety and Reliability) Act 2008* (the Act).

The DWQMP was approved by the Water Supply Regulation unit within the Department of Natural Resources, Mines and Energy (WSR DNRME or regulator).

A condition of the approval requires CASC to undertake regular reviews of the approved DWQMP. This report includes the outcomes and recommendations from the DWQMP regular review undertaken. The review due date as per the Approval Notice is 30 October 2019.

### 1.1. Scope

The scope of the DWQMP review included:

- undertake the review in accordance with the requirements of the Act and the *Drinking Water Quality Management Plan Review and Audit Guidelines*
- prepare the review report including outcomes and any improvements identified.

The scope excluded development of associated procedures.

### 1.2. Purpose

The purpose of the DWQMP review is to:

- ensure the plan is relevant, accurate and current in terms of the operating environment and implementation
- identify any improvements required to ensure the drinking water remains protective of public health and meets the water quality criteria
- fulfil the statutory requirement for undertaking the regular review.

## 2. Review Process

CASC engaged Viridis Consultants Pty Ltd (Viridis) to facilitate the DWQMP review. The process consisted of:

- desktop review of the approved DWQMP and associated documents – September 2019.
- available water quality data analysis – September 2019.
- review discussions with relevant Council staff – 25/26 September 2019 onsite in Cherbourg. A risk assessment workshop was also undertaken on 26 September 2019. The review team is listed in Table 1.
- preparing the final review report.

Viridis utilised the DWQMP review prompts from the *Drinking Water Quality Management Plan Review and Audit Guideline (2013)*, as well as expertise and practical field experience to facilitate and structure the review to capture all relevant and necessary requirements.

The findings of the DWQMP regulatory audit completed in 2018, and the 2019 *Report on the assessment of Cherbourg Aboriginal Shire Council's drinking water service* commissioned by DNRME were also considered and addressed during the review.

**Table 1 Review Team**

Name	Position	Relevance
Jason Baker	Operations Manager	DWQMP in charge
Kelli Robertson	Environmental Health Officer, Darling Downs Public Health Unit (PHU)	Supports Mentoring and Training at Cherbourg ASC
Glen Luscombe	Process Engineer, Viridis	Review facilitator
Stacey Edwards	Technical Officer, Viridis	Review Support
Tasleem Hasan	DW Manager, Viridis	Technical input, and review

Note, input of senior executives during the review was available through the Operations Manager.

### 3. Findings and Recommendations

The findings are generally structured according to the key requirements of a DWQMP, where possible, for ease and to assist with recommended updates. Table 2 was used to guide and structure the review.

**Table 2 Areas Reviewed**

Areas Considered	Findings	Action/s Required
<b>Service Description</b>		
<ul style="list-style-type: none"> <li>Have any of the provider contact details changed?</li> <li>Do the scheme details still apply?</li> <li>Is the design capacity sufficient for population projections?</li> </ul>	<p>Registered service details included in the plan are current.</p> <p>The scheme details list a population of 2000, although only 1315 residents are noted in the community according to ABS data. This was confirmed with CASC during the review.</p> <p>The treatment plant has sufficient capacity to meet demand into the long term. The raw water source is Bjelke-Petersen Dam, which is currently at 5.2% and is not currently considered at risk in terms of loss of water supply or changing water quality.</p> <p>There is currently no documentation regarding potential water restrictions for Cherbourg. It is proposed that the DWQMP outlines the triggers for water restrictions.</p>	<p>Update the population data. Include water restriction triggers and levels in the description of the scheme.</p>
<b>Details of Infrastructure for Providing the Service</b>		
<ul style="list-style-type: none"> <li>Do the schematics accurately reflect all the components, processes and linkages, from catchment to consumer?</li> <li>Have new chemicals been introduced into the treatment process or the dosing points re-located?</li> <li>Have low pressure areas in the distribution system changed?</li> <li>Has a reservoir undergone refurbishment?</li> <li>Have there been changes in the key stakeholders or engagement process?</li> <li>Have there been any problems with infrastructure or equipment breakdown or deterioration?</li> </ul>	<p>The system schematic requires a number of updates to reflect the installed condition of the plant.</p> <p>The schematic and process description note a number of chemicals not currently in use. Vendor details for these chemicals require update.</p> <p>The schematic does not note reservoirs at Bert Button Lookout, and the plan does not note that only one of Reservoir 1 and 2 is kept in service (unless activated by the Disaster Management Plan). The service reservoir is alternated to allow scouring and cleaning activities.</p> <p>A number of stakeholders have changed, and the key stakeholder list requires update.</p> <p>Equipment condition is a noted issue at Cherbourg WTP. Filter backwash valves have been recently replaced, while the automated clarifier desludging valve was out-of-service during the review (operated manually). Instruments were out of calibration and require service, including online treated water turbidity, chlorine and pH instrumentation. The hatch on the clear water tank is corroded, has a number of holes and is not lockable. Some repair of the vermin screening</p>	<p>The schematic and process description require update to match the currently installed and commissioned processes and other infrastructure.</p> <p>Chemical details, including vendors, requires update.</p> <p>The stakeholder list requires update.</p> <p>Challenges relating to equipment condition, installed instruments and processes are to be reflected in the risk register.</p>

Areas Considered	Findings	Action/s Required
	<p>is required.</p> <p>Decommissioned equipment is located in the plant. To prevent confusion, this equipment should be demolished and removed from the site.</p>	
<b>Water Quality and Catchment</b>		
<p>For this aspect, water quality data was analysed, including for source water, treatment process steps and distribution.</p> <ul style="list-style-type: none"> <li>• Have there been changes to the source water quality?</li> <li>• Have there been any changes to the output quality?</li> <li>• Does water quality data indicate that the level of risk has changed for certain hazards?</li> <li>• Has operational monitoring data identified any poorly functioning treatment processes?</li> <li>• Has there been any significant development or land use changes in the catchment?</li> <li>• Has the nature or frequency of any water quality complaints changed?</li> <li>• Has there been any occurrence of suspected illness following a customer complaint about water quality?</li> </ul>	<p>Limited data was available to assess raw water quality. Raw water turbidity results indicate that there has likely been little change in raw water quality.</p> <p>Records of verification monitoring results for further inspection could not be identified to assess changes in treated water quality. The logsheet indicates that some of the standard water analyses failed, although it was not possible to determine the reason.</p> <p>The operational monitoring program does not include settled water turbidity. This a key measure for operation of the coagulation and clarification processes. The plant does not contain jar testing equipment. CASC has a relationship with South Burnett Regional Council, who undertakes jar testing on their behalf and advises the water operator. CASC are currently procuring jar testing equipment.</p> <p>It is noted that a major upgrade of the plant is being planned utilising an Indigenous Councils Critical Infrastructure Program (ICCI) grant. This upgrade will include additional instrumentation, PLC and SCADA amongst other items.</p> <p>The operational monitoring program does not include filtered water turbidity, a key measure of filtration performance and protection against protozoan pathogens. This is also a key parameter affecting the performance of chlorination. Filtered water turbidity testing has recently commenced, although results indicate that protozoan protection is not being provided by this barrier. The residual risk is not adequately captured in the risk assessment.</p> <p>Data was available for review regarding treated water free chlorine and pH. These show similar performance, although free chlorine is noted as highly variable with results ranging from zero to greater than the ADWG health limit for total chlorine. Chlorination performance is likely affected by high turbidity. This risk is not captured in the risk assessment.</p> <p>Data was not available on colour for raw or treated water. Due to the long-term THM issues noted at Cherbourg, collection of this data may provide</p>	<p>Improved codification of operational and verification monitoring record keeping is required in the plan.</p> <p>An update of the risk assessment is required to capture issues regarding the performance of the conventional treatment process.</p> <p>An update of the improvement plan to include the planned upgrade works and other procurement is required.</p> <p>Update of the operational monitoring plan is required. This should ensure that settled water and filtered water turbidity data is collected. As an improvement item, procurement (and associated training) of a colour instrument is to be undertaken and included in the operational monitoring plan (medium priority).</p>



Areas Considered	Findings	Action/s Required
	guidance to the coagulation process and improve THM levels in treated water.	
<b>Risk Assessment</b>		
<ul style="list-style-type: none"> <li>• Have the personnel (position) responsible for hazard identification and risk assessment changed?</li> <li>• Is the risk assessment methodology still considered appropriate?</li> <li>• Have the existing risk management strategies achieved desired water quality outcomes?</li> <li>• Have new risk management strategies been implemented, and require new assessment of residual risk?</li> <li>• Is the risk assessment (risk levels) current?</li> <li>• Does the risk assessment consider cybersecurity threats and potential breaches?</li> </ul>	<p>The risk assessment methodology was reviewed and is considered appropriate.</p> <p>The existing risk management strategies have not achieved desired outcomes, and additional improvements are required to improve water quality. Significant improvements are required in the following areas:</p> <ul style="list-style-type: none"> <li>• turbidity control and protection against protozoan pathogens</li> <li>• control of the disinfection process</li> <li>• control of disinfection by-products</li> <li>• breakdown of hypochlorite (chlorate)</li> <li>• staffing arrangements and redundancy</li> </ul> <p>CASC have indicated that the current resourcing strategy is to recruit a new trainee to fill the position of an operator on a long-term absence.</p> <p>The risk assessment does not consider the risks associated with insufficient supervisory capacity for the scheme. This includes ensuring water operations activities are undertaken, reinforcement of training, records are being appropriately reviewed and filed and identification of issues.</p> <p>Under the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’, an experienced water operator is providing mentoring and assistance to Cherbourg, however this program is due to finish in December 2019.</p> <p>The creation of an ‘overseer’ or supervisor role had been previously identified by the Operations Manager. It was discussed that this role would be ideal to capture and reinforce the learnings from this program, although it was not possible to obtain sufficient funding.</p> <p>Cybersecurity risks are not assessed.</p>	<p>Update the risk assessment and improvement plan based on the review findings. This includes the cybersecurity risks assessed in the review.</p> <p>As an improvement item, investigate whether a grant is available to allow long-term support and mentoring from an experienced senior water operator.</p>
<b>Operations and Maintenance Procedures</b>		
<ul style="list-style-type: none"> <li>• Do key procedures and practices reflect current operations?</li> <li>• Are the procedures current or past the revision date?</li> <li>• Is there a need to create new operation and maintenance procedures?</li> <li>• Have records related to associated procedures been kept?</li> </ul>	<p>Key procedures do not reflect current operation of the plant. Some procedures and operations manuals are available.</p> <p>Current process control plans are to be reworked into critical control point (CCP) procedures. These are specifically required for filtration and disinfection procedures.</p> <p>Limits for these processes were</p>	<p>Procedures that are no longer relevant to the scheme are to be removed from the plan.</p> <p>Critical control point procedures for chlorination and filtration are to be developed, using the limits as a part of the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’, although not ideal it is an interim measure. To protect</p>

Areas Considered	Findings	Action/s Required
	<p>discussed with the PHU during the review. The PHU has provided flash cards with limits for treated water turbidity and free chlorine in the style of CCPs (with red, amber and green areas). While the limits provided for chlorine were appropriate, the limits for turbidity are not sufficient for controlling protozoan risk at the facility. Discussion with the PHU indicates that CASC are not ready for stricter limits, and that further work is required under the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’ to reinforce filter operation practices before these limits can be tightened.</p>	<p>public health, this procedure will require a condition of notification to DNRME and the PHU where a rain event occurs.</p> <p>As an improvement item, tightening of the filtration CCP limits to improve protection against protozoan risk is required once appropriate control of the filtration process has been established.</p>
<b>Management of Incidents and Emergencies</b>		
<ul style="list-style-type: none"> <li>• Is the process for managing drinking water incidents and emergencies still appropriate and understood by staff?</li> <li>• Do internal and external communication process and protocols work effectively?</li> <li>• Is the list of people to be contacted during emergencies up to date?</li> <li>• Is staff training for incidents and emergencies up to date?</li> <li>• Have incident and excursion records identified changes in risks and hazards?</li> <li>• Does the process for managing drinking water emergencies consider cybersecurity incidents?</li> </ul>	<p>The process for managing drinking water incidents was reviewed. Some issues in the knowledge of reporting incidents was noted during the DNRME assessment.</p> <p>Stakeholder details relating to vulnerable customers was up-to-date, although the contact for the local radio station requires update.</p> <p>Two currently outstanding incidents are being managed by CASC:</p> <ul style="list-style-type: none"> <li>• high turbidity and low chlorine throughout the supply network</li> <li>• high THMs throughout the supply network.</li> </ul> <p>While these items are included in the risk assessment, the residual risks (and control measures) are not reflective of actual conditions.</p> <p>The process for managing incidents does not consider cybersecurity threats.</p>	<p>Additional detail is required to codify the process of managing incidents and emergencies, including detailed description of incident/emergency levels, flow charts for actions and communications. This process must also consider cybersecurity. The risk assessment needs to be updated to reflect the residual risk associated with the recent incidents.</p>
<b>Improvement Program</b>		
<p>The status of actions in the improvement program were reviewed.</p> <ul style="list-style-type: none"> <li>• Were actions in the program completed in the timeframe outlined?</li> <li>• Did the program outlined in the plan achieve the intended outcomes?</li> <li>• Does the program require updating to manage risks effectively, including measures for newly identified risks?</li> </ul>	<p>Improvement actions were reviewed, as were recommendations from the 2018 Regular DWQMP Audit. Some actions have been progressed, although a number of items require targeted implementation dates to be set.</p> <p>The improvement plan requires additional items to manage risks in accordance with the risk assessment. This must also include outstanding items from the 2018 Regular DWQMP Audit and the 2019 DNRME Report on the drinking water supply at Cherbourg.</p>	<p>The improvement plan requires update to add a number of items for new risks identified, as well as tracking the items from the 2018 DWQMP Audit and 2019 supply system review.</p>
<b>Information Management</b>		
<ul style="list-style-type: none"> <li>• Are staff using current versions of documents?</li> <li>• Are the information management, record keeping, and reporting processes being used?</li> </ul>	<p>Current versions of documents are in use, and CASC utilises hard-copy document management for control of operational documents. This was reviewed and found to be appropriate for operational and maintenance</p>	<p>As an improvement item, track the implementation of SWIM for management of water quality records collected by operators.</p> <p>As an improvement item, ensure</p>

Areas Considered	Findings	Action/s Required
	<p>activities for this scheme.</p> <p>Review of record keeping for water quality records found some issues. Additional training and mentoring are required through the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’. Additionally, the suitability of a supervisor role to ensure these activities are being completed and recorded was discussed.</p>	<p>the progression of the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’ with regards to record keeping, particularly for laboratory verification monitoring results.</p> <p>As an improvement item, investigate whether a grant is available to allow long-term support and mentoring from an experienced senior water operator to assist in supervisory activities.</p>
<p><b>Operational Monitoring</b></p> <ul style="list-style-type: none"> <li>• Have changes to the infrastructure or process resulted in a need to revise the monitoring program?</li> <li>• Are the range and frequency of parameters being tested appropriate?</li> <li>• Are the established corrective actions and controls actively applied as stated in the plan and still appropriate?</li> <li>• Have monitoring records been maintained?</li> <li>• Is monitoring equipment being calibrated?</li> </ul>	<p>Changes to the operational monitoring program are required to manage risks associated with the filtration system. Additionally, the monitoring of colour may allow operators to optimise the coagulation process for organics.</p> <p>The plan does not state corrective actions to be undertaken, or limits associated with operational monitoring.</p> <p>Calibration of grab sampling instruments has been recently undertaken, although regular program requires implementation to ensure that ongoing calibrations are undertaken.</p>	<p>Update the operational monitoring program to include settled water and filtered water turbidity.</p> <p>As an improvement item, procurement (and associated training) of a colour instrument is to be undertaken and included in the operational monitoring plan.</p>
<p><b>Verification Monitoring</b></p> <ul style="list-style-type: none"> <li>• Have changes to the infrastructure resulted in a need to revise the monitoring program?</li> <li>• Are the range and frequency of parameters being tested appropriate?</li> <li>• Are the established corrective actions applied as stated in the plan and still appropriate?</li> <li>• Have monitoring records been maintained?</li> <li>• Have ADWG health guideline values changed for any parameters?</li> <li>• Have the arrangements for monitoring, transport arrangement for off-site analysis, or testing laboratory changed?</li> </ul>	<p>The verification monitoring program is generally appropriate, although a new sampling location is required on Fisher Street to capture samples in a new portion of the reticulation network.</p> <p>Review of record keeping for water quality records found some issues. Additional training and mentoring are required through the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’. Additionally, the suitability of a supervisor role to ensure these activities are being completed and recorded was discussed.</p>	<p>As an improvement item, ensure the progression of the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’ with regards to record keeping, particularly for laboratory verification monitoring results.</p>
<p><b>Other Areas</b></p> <ul style="list-style-type: none"> <li>• Have there been any changes in regulations, legislation or formal requirements?</li> <li>• Have there been organisational structure changes that may impact on risk management?</li> <li>• Are critical personnel appropriately qualified or require additional training?</li> <li>• Do the audit outcomes recommend changes to the DWQMP or related processes?</li> </ul>	<p>Critical personnel are currently undergoing training and mentoring under the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’. This program is crucial to support operator skills and enable the delivery of safe drinking water.</p> <p>The 2018 Regular DWQMP Audit and the 2019 DNRME water supply report identified a number of deficiencies that require tracking in</p>	<p>As an improvement item, ensure the progression of the learning outcomes of operators under the ‘Safe and Healthy Drinking Water in Indigenous Local Government Areas Program’.</p> <p>The improvement plan requires update to track the items from the 2018 DWQMP Audit and 2019 supply system review, as well as the findings from this review.</p>

<b>Areas Considered</b>	<b>Findings</b>	<b>Action/s Required</b>
	the improvement plan. These items were discussed and will be captured in the updated improvement plan.	

## **4. Review Outcomes**

The review found that the DWQMP needs to be updated and has identified areas for continuous improvement of the DWQMP.

Actions to assist with the updates to the DWQMP as well as improvements to associated processes which provide an enabling environment for effective implementation of the DWQMP framework, have been identified and agreed.

The revised DWQMP will need to be submitted to the regulator within 30 business days from the completion of the review (by 12 December 19) as an amendment application. CASC has engaged Viridis to assist with the update and submission of the DWQMP.



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