Industry | Partnerships | Management

NWM Northern Water Management

Regular Audit Report

Drinking Water Quality Management Plan
For 7 Small Registered Water Supply Services

SunWater

11 August 2017





Prepared by

Jeff Ballard
Director
Northern Water Management Pty Ltd
ABN 55 150 060 585

8 Grande Parade DOUGLAS QLD 4814
0487 481 424

jeffballard@northernwatermanagement.com.au
www.northernwatermanagement.com.au

Document History

Version	Author	Issue Purpose	Date
0	Jeff Ballard	Frinal	11-Aug-17

Glossary of Terms

Acronym	Definition	Acronym	Definition
BO	Business Objective	OFI	Opportunity for Improvement
CCP	Critical Control Point	HBT	Health Based Targets
C.*t*	The C.t concept describes the relative effectiveness of a disinfectant. It is determined by multiplying the concentration of residual disinfectant (in mg/L) by the contact time (in minutes)	QA	Quality assurance
DEWS	Department of Energy and Water Supply	QC	Quality control
DWQMP	Drinking Water Quality Management Plan	RMIP	Risk Management Improvement Plan
HACCP	Hazard analysis and critical control points	SCADA	Supervisory Control and Data Acquisition
LIMS	Laboratory Information Management System	SOP	Standard Operating Procedure
NWM	Northern Water Management	WTP	Water Treatment Plant
TWS	Town Water Supply	WSS	Water Supply Scheme

Approval

This document is authorised for release once all signatures have been obtained.

In signing this approval, I agree that the document meets the standards required for the project and approve the project to progress.

Northern Water Management Pty Ltd:

Jeff Ballard
Director

Signature

11-Aug-17
Date

Table of Contents

Executive Summary

ES.1 Introduction

NWM has been engaged by SunWater, service provider identification number 204, to undertake the first regular (external) audit of its 7 Small Registered Water Supply Services covered under a single DWQMP.

ES.2 Compliance Statement

The auditor believes that SunWater:

- Has demonstrated an acceptable level of compliance with the regular audit imposed by the *Water Supply (Safety and Reliability) Act 2008* during the audit period;
- Is generally implementing its DWQMP effectively and managing risks to drinking water quality and public health; and,
- Was found to have reasonable processes for managing drinking water incidents and progressing the risk management improvement plan.

There were 2 non-compliances identified and a number of opportunities for improvement were found and are discussed later.

ES.3 Audit Conclusions

The audit concluded that SunWater:

- Provided accurate monitoring and performance data to the regulator;
- Generally implemented the DWQMP to manage risks to public health; and,
- Generally maintained the relevance of the DWQMP.

The overall summary of compliance is shown in Table ES1. In total 70 questions were asked. Where relevant, questions were repeated in the field to confirm that management requirements were promulgated and implemented.

Table ES.1 – Compliance Summary

Compliance Code		Number of Findings
Compliant	Compliant	40
Compliant with Opportunity for Improvement	OFI	18
Minor Non-Compliant	Minor	2
Major Non-Compliant	Major	0
Critical Non-Compliant	Critical	0
Total		**60**

ES.4 Recommendations

The following recommendations have been provided for non-compliances:

- Undertake a series of tests for the presence of pesticides & agricultural fertilisers as per the DWQMP risk assessment (The second last line in the DWQMP - Risk Assessment Page 131 discusses pesticides & agricultural fertilisers. It calls for annual testing for a range of contaminants);

- Complete Improvement Plan Action Item No.2 - Complete base-line hydrocarbon testing of dam storages during a period of heavy recreational use and add hydrocarbon testing to annual heavy metals test regime.

ES.4 Opportunities for improvement

The OFIs are summarised below. These have been expanded from the 18 findings.

- Specific testing for Giardia and Cryptosporidium should be done. It is suggested that this occurs during peak inflow events in the treated and raw water. As this is a relatively expensive and often returning clear or inconclusive results, it may be prudent to look at models or refer to the HBT guidelines from WSAA;
- Determine which labs provide signatures for verification monitoring reports for the multiple sites within the DWQMP, and liaise with those who do not. Request them to provide signed reports;
- Provide additional information in the relevant work instructions to adjust the SCADA alarms for seasonal changes to the 3 relevant sites.
- Update the work instructions to include a stop supply procedure and circumstances where tankered water and/or bottled would be required;
- It is recommended that each site undergo a mock incident where incidents have not yet occurred and document the findings and update procedures if required;
- Investigate improvements to mobile coverage or alternative ways of communicating information faster;
- As the plan review is due by 17/8/17 there will be a timing conflict and suggest future audits be conducted earlier and ahead of plan revisions;
- It is suggested that Work Instruction - NMA-FAI-SITE: NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include date checking of operational and reagent chemicals;
- It is suggested that Work Instruction - NMA-FAI-SITE: NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include Australian Standard or WaterMark checking of pipes and related products;
- The is an opportunity to enhance operable effectiveness and reduce risk by allowing a short duration of filtrate water (after backwash is complete) to either return this water to the clarifier or to waste;
- There may be an opportunity to check if buffering (60-200 mg/L CaCO3) is needed. No information was available to support a position that no buffering is needed;
- Better or more frequent operator procedural awareness training is likely to be needed with follow up management oversight. Subject to viewing the content of the Clare WTP Operation and Maintenance Manual, it is recommended that the jar testing frequency be documented, such as 3 monthly and upon first or heavy rain in the catchment;
- Given that there have been no recorded positive E.coli results, the auditor has not proposed a non-compliance due to a departure from the DWQMP, however, it is recommended that the network chlorine residual be further investigated and the DWQMP be updated to reflect a distribution system chlorine residual lower than 0.5 mg/L. Literature suggests a residual >0.2 mg/L, however, operational targets should be higher than this to avoid compliance target thresholds;
- Storage volume management should also be investigated;
- Add a procedure for active pH management;
- It is suggested that Work Instruction - NMA-FAI-SITE: NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include instrument calibration and records;
- Review the DWQMP risk assessment in regards to either improving operator training or more frequent verification testing or both;

- There is an opportunity to add target parameters in addition to threshold parameters. This may assist in avoiding poor water quality events.
- The infrastructure was inspected from the source water (the irrigation channel) through the WTP and to the town water tower and 2 sampling points (the base of the water tower and the school). The DWQMP description was generally consistent. The schematic Dwg 220508 Rev C - "BURDEKIN HAUGHTON WATER SUPPLY SCHEME, CLARE SECTION, WATER TREATMENT PLANT, PROCESS SCHEMATIC - EXISTING", will require a minor revision. We have marked up the drawing to show the changes needed.

1 Introduction

1.1 Background

NWM has been engaged by SunWater, service provider identification number 204, to undertake the first regular (external) audit of its 7 Small Registered Water Supply Services covered under a single DWQMP.

As required by the Water Supply (Safety and Reliability) Act 2008 (the Act), SunWater is operating a drinking water service under an approved DWQMP.

SunWater received a re-issued approval for its DWQMP on 1 November 2016. SunWater is required to complete the first regular audit of its approved DWQMP by 15 August 2017.

This report includes the findings and conclusions from the first regular audit of the SunWater's DWQMP.

This audit covers SunWater's 7 water supply schemes:

Region	Water Supply Scheme
Far North Queensland	▪ Mareeba Dimbulah WSS – Mutchilba TWS ▪ Burdekin Haughton WSS – Burdekin Falls Dam ▪ Burdekin Haughton WSS – Clare TWS
North Queensland	▪ Proserpine River WSS – Peter Faust Dam ▪ Bowen Broken WSS – Eungella Dam
Central Queensland	▪ Nogoa MacKenzie WSS – Fairbairn Dam
South West Queensland	▪ Upper Condamine WSS – Leslie Dam

1.2 Objectives

The objectives of the audit were to:

- To provide a 'standard regular' audit of the way in which the service provider complies with its approved DWQMP to:
  - Verify the accuracy of the monitoring and performance data provided to the regulator under the plan;
  - Assess the service provider's compliance with the plan; and,
  - Assess the relevance of the plan in relation to the provider's drinking water service.
- To conduct that audit on behalf of the Department of Energy and Water Supply (DEWS) under the *Water Supply (Safety and Reliability) Act 2008* (Qld) (the Act) and to report the findings of the audit to DEWS.

1.3 Regulatory Regime

The statutory requirements for DWQMP regular audits are detailed in the Act. The relevant provisions of the Act for providing audit reports are:

- Section 99(2)(c) - if the regulator approves the plan, the notice of the decision or information notice for the decision, will state that if the regulator requires audits of the approved plan – the intervals at which the audits must be conducted;
- Section 99(4) - the interval for regular audits will not be less than 2 years;

- Section 108(1) - the provider must arrange for regular audit reports to be prepared about the provider's plans and compliance with the plans;
- Section 108(2) - regular audit reports must be prepared in accordance with the notice given by the regulator under section 99;
- Section 108(3) states that the purpose of the regular audit report for this plan is:

    - To verify the accuracy of the monitoring and performance data provided to the regulator under the plan;
    - To assess the service provider's compliance with the plan; and,
    - To assess the relevance of the plan in relation to the provider's drinking water service.

- Section 108(6) outlines that the regular audit report for this plan must be prepared by a person, other than an employee of the service provider or someone employed in operating the service provider's infrastructure, who is certified under the Drinking Water Quality Management System Auditor Certification Scheme to conduct an audit of the type to which the report relates, or has a qualification the regulator is satisfied is at least equivalent to this qualification;
- Section 108(6) also states that the regular audit report must be:

    - Prepared in accordance with the guidelines made by the regulator about preparing regular audit reports;
    - Given to the regulator within 30 business days after its completion; and,
    - Made available for inspection and purchase.

- Section 575 states that the provider must keep a copy of the audit report available for inspection by the public during office hours on business days at the office of the service provider.

1.4 Audit Scope

The scope of the audit was to:

- Verify the accuracy of monitoring and performance data;
- Assess SunWater's compliance with the DWQMP; and,
- Assess the relevance of the DWQMP in relation to SunWater's drinking water service.

1.5 Audit Criteria

The following audit criteria were used:

- The approved DWQMP (version September 2015); and,
- Repeal and re-issue of the Information Notice for the Decision about an approval of a Drinking Water Quality Management Plan, dated 2 February 2016.

1.6 Audit Period

The audit has covered the operating period from the date of the accepted amended DWQMP to the date of the audit.

1.7 Audit Standard

The principal documents that have set the standard for this audit are as follows:

- Chapter 2 Infrastructure and service, Part 4 Service provider obligations, Division 2 Audit reports and reviews, Clauses 108 to 109 of the Act;
- Drinking Water Quality Management Plan Review and Audit Guideline (DEWS 2013); and,
- ISO 19011:2014 - Guidelines for Auditing Management Systems (the generic auditing Guideline).

2 Audit Method

2.1 Auditor

Jeff Ballard conducted the audit. Jeff's background is below.

- Exemplar Global Lead Auditor (ID 122706) for Drinking Water Quality Management Systems;
- 24 years experience as a civil engineer, with 20 years exclusively in the water sector;
- Author and peer reviewer for a number of DWQMPs;
- Has managed a number of projects for new, or augmentations of, water treatment plant designs and installations;
- Project coordinator on Townsville's drinking water quality enhancement project which involved the upgrade of the Douglas Water Treatment Plant, and the construction of the Northern Water Treatment Plant at Kinduro.
- Experienced with quality assurance systems, and asset management; and,
- Sound practical knowledge which adds value in providing realistic solutions.

The auditor confirms that:

- Sufficient evidence has been cited on which to base audit conclusions;
- The audit findings accurately reflect the professional opinion of the auditor; and,
- The audit findings have not been unduly influenced by the auditee and/or any of its associates.

2.2 Audit Process

The audit comprised of the following steps:

1. Information requests to SunWater, identifying necessary information and documentation required to undertake the audit;
2. Preparation of a site visit plan with timetable, resources required, and safety issues;
3. Development of audit checklist;
4. Development of audit opening and closing meeting checklists;
5. On-site audit and verification, including staff interviews;
6. Follow up discussions and requests for information and clarification;
7. Draft and final audit report preparation; and,
8. Statutory declarations by the auditor and auditee.

2.3 Audit Grades

The current DEWS guidelines do not provide a grading system. The table below identifies the grades used for this audit and has been taken from the document, "Drinking Water Regulatory Audit Guidance Note - Edition 5, December 2015, Victorian Department of Health and Human Services.

Table 2.1 – Audit Grades

Compliance Code		Description
Compliant	Compliant	Sufficient evidence to confirm that the agency has undertaken, prepared and/or implemented all actions in accordance with the legislation and their risk management plan.
Compliant with Opportunity for Improvement	OFI	As above, but the auditor's report has identified opportunities for improvement.

Compliance Code		Description
Minor Non-Compliant	Minor	Non-compliance where there is a low potential for a risk situation and the potential impact of the non-compliance is not likely to be a serious or imminent risk to public health, or compromise public health.
Major Non-Compliant	Major	Non-compliance where there is a high potential for a risk situation, likely to compromise public health if the non-compliance is not rectified.
Critical Non-Compliant	Critical	Non-compliance where a serious or imminent risk to public health is identified.

Recommendations are provided for requirements that are non-compliant, where relevant. An OFI is identified for activities which comply but may also be improved such as an opportunity for process improvement.

2.4 Site Visits

Site visits were undertaken on 13 July 2017 to SunWater's Headquarters in Brisbane, and in the field on 6 July 2017 to the Clare WTP and reticulation network, in accordance with NWM site visit plan which is provided in **Appendix A – Site Visit Plan.**

2.5 Audit Participants

The audit participants are identified in the table below.

Table 2.2 – Audit Participants

Name	Position	Opening Meeting	HQ Visit	Field Visit	Closing Meeting
Travis van den Berg	Environmental Advisor	✓	✓		✓
Nick Stanton	Water Treatment Advisor	✓	✓		✓
Gordon Delaney	Manager Environment and Water Planning	✓	✓		✓
Leigh Chapple	WTP Operator	✓		✓	✓

Given the separation in distance between Brisbane headquarters and the WTP, opening and closing meetings were held at both locations. Only findings that were discovered at the particular location were discussed at the relevant closing meeting. All meeting records were disclosed to all of the above-listed contacts. Copies of the meeting minutes are provided in **Appendix B – Opening and Closing Meeting Details**.

2.6 Reference Documentation

The key reference documents and evidence relied on for the audit are identified in **Appendix C – Photographic Evidence** and **Appendix D – Audit Checklist and Detailed Findings**.

2.7 Quality Assurance Process

This audit was carried out in accordance with NWM's Quality Manual, consistent with ISO 9001:2008. Quality assurance activities undertaken during the audit included compliance with the NWM Quality Manual, and document control and approval processes.

3 Audit Findings

3.1 Summary

The completed Audit Checklist is provided in **Appendix D – Audit Checklist and Detailed Findings**. This provided the detailed findings of the audit. These findings have been summarised in the sections below.

SunWater demonstrated an acceptable level of compliance with the regular audit imposed by the *Water Supply (Safety and Reliability) Act 2008* during the audit period. The overall summary of compliance is shown in the table below. In total 70 questions were asked, 48 at headquarters and 22 in the field. Where relevant, questions were repeated in the field to confirm that management requirements were promulgated and implemented. Where an observation was found that required a compliance code, this was not repeated for any of the duplicated questions.

Table 3.1 – Audit Summary

Compliance Code		Number of Findings
Compliant	Compliant	40
Compliant with Opportunity for Improvement	OFI	18
Minor Non-Compliant	Minor	2
Major Non-Compliant	Major	0
Critical Non-Compliant	Critical	0
Total		**60**

SunWater has established a DWQMP that adequately manages risk to public health and provides a framework for the safe delivery of drinking water to its customers.

The audit found that SunWater is continuously improving its drinking water framework, including the introduction of drinking water quality management related work instructions. Their management structure overlays the DWQMP's framework and in particular, integrates the incident management process displayed in the DWQMP.

The audit concluded that SunWater:

- Provided accurate monitoring and performance data to the regulator;
- Generally implemented its DWQMP to manage risks to public health; and,
- Generally maintained the relevance of the DWQMP.

3.2 Accuracy of Monitoring and Performance Data

3.2.1 Compliance

The audit was required to *verify the accuracy of monitoring and performance data* supplied to the regulator by SunWater under the plan, including data required under any provisions or conditions outlined in the approval notice.

The audit verified that the data supplied was accurate and SunWater was compliant with this audit area. The main findings were:

1. SunWater has a Quality Assurance System in accordance with ISO9001 and undergoes QA audits;
2. Monthly bacteriological testing has been undertaken and documents were viewed for the past 2 years of results;
3. Local labs do testing and has been optimised to ensure fast turnaround times;

4. The monitoring program hasn't changed but the management of it has to improve responsiveness;
5. Given the small size of the scheme, there has been no significant development in the water supply network, if any;
6. Jacobs conducted drinking water management training in 2016;
7. SunWater has a management system that ensures operators are skilled appropriately to a drinking water quality management position;
8. The frequency of sampling is as per the DWQMP. Other tests are conducted daily of 3/week;
9. Additional testing was undertaken at Mutchilba where a pipe burst occurred. SunWater noted that there were septic tanks nearby and actions were taken to minimise the risk. Jacobs advised during the incident to undertake additional E.coli testing. Monthly testing is the minimum and a change in conditions do prompt additional sampling;
10. Work instructions for each month are sent to the operator by either the area supervisor or the operations supervisor. The SAP system auto emails a job position (and that particular person) the month work instruction;
11. Water Quality Data is entered into SAP daily. Each week Jacobs meets with Gordon Delaney of SunWater to review the past week's performance. Jacobs is contracted by SunWater to monitor Water Quality Results and to provide ongoing technical support;
12. For changes, a Change Request is sent to the planners at SunWater Headquarters. The Work Instruction is discussed and feedback occurs. Where agreed, changes are made and an updated document is finalised and added to the SAP system.
13. All monthly testing is laboratory NATA certified. There is a clear process to ensure samples cannot be mixed up;
14. There is a sewerage treatment plant at Fairbairn Dam, however, this is monitored by a separate contractor and therefore has no opportunity for samples to be mixed up;
15. There is a sewerage treatment plant at Burdekin Falls Dam, however, this has no monitoring requirement, hence there is no opportunity for samples to be mixed up;
16. SunWater explained the QA and management process which aligns with the DWQMP flowchart for incidents. A call is made from the laboratory for all failed results. Once the test certificate is complete, this is emailed from the lab to multiple people. These people follow the incident. This incident is lodged in the SIMON system by the first person to see the incident.
17. All results are reported to DEWS in the annual report which is also provided on the SunWater website;
18. We discussed the Fairbairn total Chlorine exceedance: >5 (5.3). Follow up sampling was undertaken. An incident was created in RMSS. The incident was closed out with an email summary. The regulator advised that the recording was acceptable as the concentration could be rounded to 5.0 until the state's reporting guideline;
19. The Mutchilba incident was discussed. This was for a broken water main which was recorded in RMSS along with the work instruction at the time. No E.coli exceedances were found during the incident;
20. Leslie Dam, Eungella Dam, and Mutchilba have an Odis filtration package plant with SCADA and a degree of automation. The use of the SCADA was discussed at length and it was concluded that the SCADA is only used in addition to the manual checking system used for the 8 plants it operates across Queensland. This was later seen in practice in the field where the SCADA is used as a trending guide only and there is a clear distinction between manual sampling where testing is undertaken using hand held instruments, and visually checked and calibrated SCADA;
21. Every required parameter is recorded in SAP e.g. turbidity was checked for inclusion and was observed to be in the system.

3.2.2 Recommendations

The following recommendation has been made in relation to this audit area.

1. Undertake a series of tests for the presence of pesticides & agricultural fertilisers as per the DWQMP risk assessment (The second last line in the DWQMP - Risk Assessment

Page 131 discusses pesticides & agricultural fertilisers. It calls for annual testing for a range of contaminants).

3.2.3 Opportunities for Improvement

Opportunities for improvement have been made in relation to this audit area and are discussed below.

1. Specific testing for Giardia and Cryptosporidium should be done. It is suggested that this occurs during peak inflow events in the treated and raw water. As this is a relatively expensive and often returning clear or inconclusive results, it may be prudent to look at models or refer to the HBT guidelines from WSAA;
2. Determine which labs provide signatures for verification monitoring reports for the multiple sites within the DWQMP, and liaise with those who do not. Request them to provide signed reports;
3. Provide additional information in the relevant work instructions to adjust the SCADA alarms for seasonal changes to the 3 relevant sites.

3.3 Compliance with the Plan

3.3.1 Compliance

SunWater demonstrated adequate compliance with this audit area. The DWQMP is generally implemented effectively to manage risks to drinking water quality. The auditor assessed the following specific components for compliance with this audit area:

1. The plan was checked against the approval notice of 1/11/16 and found no issues;
2. Cited the Mutchilba township and the Fairbairn Dam incidents as evidence to demonstrate compliance with the reporting obligations under the approval notice. The Jacobs contract has conditions on reporting deadlines;
3. As part of the Jacobs contract, Jacobs must undertake a 2 yearly asset condition assessment. This is in addition to the operational and service work instructions where the SAP system produces the required work (monthly, 6 monthly, yearly) to be undertaken under the scheduled maintenance program. Assets can be tracked via their Asset ID. Jacobs provides a heavy maintenance list which is programmed into SAP;
4. The SIMON system is used for safety aspects where a safety team is on call continuously. This system manages responsibilities and progress including sign off. CM01-F3-HSE-Pre-Construction-Risks contains a section on Water Quality which can relate to raw water quality changes due to construction or maintenance work such as channel cleaning. The flowchart from the DWQMP was explained which was found to be satisfactory. There is also a management reporting structure which overlays this process;
5. 2 operators were searched for and were found with the required Certificate III training. From Jacobs, experience was viewed for Nick Stanton. For SunWater experience was reviewed for Gordon Delaney and Travis can van Berg. These were found to be satisfactory;
6. There are a number of locations in the reference work instruction to request maintenance where infrastructure is damaged or worn. This goes into a scheduled maintenance plan with various frequencies depending on the asset e.g. site safety, pumps, motors, filter, etc. For the filter, once maintenance has occurred, it is checked for water quality performance.
7. The WTP site is fully fenced and locked. The sampling point at the Clare town water tower is locked;
8. The 2 Clare WTP clear water storage tanks are fully roofed and sealed with a screw on lid. Vent pipes are screened;
9. The auditor checked the plan and went through the site pipework with the operator and found nothing to suggest that a bypass exists;
10. Safe work method statement, AM28 etc, are downloaded and printed daily or when used to ensure the latest version is used. The paper versions are kept in the daily log book. Generally, all current tasks can be performed using the printouts;
11. There is no SCADA for the Clare WTP. Turbidity, pH and Cl2 residual are measured on a hand held device. These reading are entered into SAP which has an automatic alert for parameters that are exceeded.

3.3.2 Recommendations

The following recommendation has been made in relation to this audit area.

1. Complete Improvement Plan Action Item No.2 - Complete base-line hydrocarbon testing of dam storages during a period of heavy recreational use and add hydrocarbon testing to annual heavy metals test regime.

3.3.3 Opportunities for Improvement

The following opportunities for improvement have been made in relation to this audit area:

1. Update the work instructions to include a stop supply procedure and circumstances where tankered water and/or bottled would be required;
2. It is recommended that each site undergo a mock incident where incidents have not yet occurred and document the findings and update procedures if required;
3. Investigate improvements to mobile coverage or alternative ways of communicating information faster;
4. As the plan review is due by 17/8/17 there will be a timing conflict and suggest future audits be conducted earlier and ahead of plan revisions;
5. It is suggested that Work Instruction - NMA-FAI-SITE: NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include date checking of operational and reagent chemicals;
6. It is suggested that Work Instruction - NMA-FAI-SITE: NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include Australian Standard or WaterMark checking of pipes and related products;
7. There is an opportunity to enhance operable effectiveness and reduce risk by allowing a short duration of filtrate water (after backwash is complete) to either return this water to the clarifier or to waste;
8. There may be an opportunity to check if buffering (60-200 mg/L CaCO3) is needed. No information was available to support a position that no buffering is needed;
9. Better or more frequent operator procedural awareness training is likely to be needed with follow up management oversight. Subject to viewing the content of the Clare WTP Operation and Maintenance Manual, it is recommended that the jar testing frequency be documented, such as 3 monthly and upon first or heavy rain in the catchment;
10. Given that there have been no recorded positive E.coli results, the auditor has not proposed a non-compliance due to a departure from the DWQMP, however, it is recommended that the network chlorine residual be further investigated and the DWQMP be updated to reflect a distribution system chlorine residual lower than 0.5 mg/L. Literature suggests a residual >0.2 mg/L, however, operational targets should be higher than this to avoid compliance target thresholds;
11. Storage volume management should also be investigated;
12. Add a procedure for active pH management;
13. It is suggested that Work Instruction - NMA-FAI-SITE: NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include instrument calibration and records;
14. Review the DWQMP risk assessment in regards to either improving operator training or more frequent verification testing or both;
15. There is an opportunity to add target parameters in addition to threshold parameters. This may assist in avoiding poor water quality events.

3.4 Relevance of the Plan

3.4.1 Compliance

The audit was required to assess the relevance of the DWQMP. The auditor assessed the following components for compliance:

1. The major change has been the introduction of the work instructions for each site. The DWQMP incident management flow chart will be updated to reflect management structure changes where required but it is currently in a sound state;
2. There has been no change in water source or plant;
3. SunWater's management processes are adequate to capture improvement needs;
4. The annual report is used to notify DEWS of any changes;
5. The differences identified above are not significant in terms of water quality risk. The Burdekin catchment down to the Clare intake was discussed and found to not have seen any significant changes.

3.4.2 Recommendations

No recommendations have been made in relation to this audit area.

3.4.3 Opportunities for Improvement

The following opportunity for improvement has been made in relation to this audit area:

1. The infrastructure was inspected from the source water (the irrigation channel) through the WTP and to the town water tower and 2 sampling points (the base of the water tower and the school). The DWQMP description was generally consistent. The schematic Dwg 220508 Rev C - "BURDEKIN HAUGHTON WATER SUPPLY SCHEME, CLARE SECTION, WATER TREATMENT PLANT, PROCESS SCHEMATIC - EXISTING", will require a minor revision. We have marked up the drawing to show the changes needed.

Appendix A – Site Visit Plan

Project	2017-0009 Regulatory Audit of SunWater & Border Rivers' Drinking Water Quality Management Plans	Date	5/07/2017
Client	SunWater		
Sites	1. Clare WTP (Field audit of the 7 Small Registered Water Supply Services); 2. SunWater Head Office, Brisbane (combined audit of both DWQMPs); and, 3. Glenlyon Dam WTP, Stanthorpe (Field audit of the Border Rivers' DWQMP).		

Participants	**Name**	**Organisation**
	Jeff Ballard	NWM
	Leigh Chapple (Clare WTP)	SunWater
	Nick Stanton (Brisbane Head Office)	SunWater
	Travis van den Berg (Brisbane Head Office)	SunWater
	Gordon Delaney (Brisbane Head Office)	SunWater
	Brendon Swan (Glenlyon Dam WTP)	SunWater

1. Background

Site visits are required for the Regulatory audits (2 of). General details are below.

Item	Details
Audit dates	Thursday 06/07/2017 Clare WTP Thursday 13/07/2017 Brisbane Office Friday 14/07/2017 Glenlyon Dam
Objectives	▪ To provide 'standard regular' audits of the way in which the client complies with its approved Drinking Water Quality Management Plans (DWQMPs) to: o Verify the accuracy of the monitoring and performance data provided to the regulator under the plan; o Assess the service provider's compliance with the plan; and, o Assess the relevance of the plan in relation to the provider's drinking water service. ▪ To conduct that audit on behalf of the Department of Energy and Water Supply (DEWS) under the *Water Supply (Safety and Reliability) Act 2008* (Qld) (the Act) and to report the findings of the audit to DEWS and the client.
Audit Standard	The principal documents that will set the standard for this audit are as follows: ▪ Chapter 2 Infrastructure and service, Part 4 Service provider obligations, Division 2 Audit reports and reviews, Clauses 108 to 109 of the Act. ▪ Drinking Water Quality Management Plan Review and Audit Guideline (DEWS 2013) ▪ ISO 19011:2011 - *Guidelines for auditing management systems* (the generic auditing Guideline).
Scope	▪ Audit type: 'Standard regular' audits of the DWQMPs. ▪ Criteria: o Relevant clauses of the Act, associated DEWS regulations and guidelines and any relevant notices provided to the client by DEWS; o Relevant components of the Australian Drinking Water Guidelines (ADWG); o Follow up of recommendations from previous audits, if relevant; ▪ Sites: The audit will sample randomly selected sites to be agreed with the client; ▪ Records: The audit will sample randomly selected records to be agreed with the client; ▪ Services: Drinking water; ▪ Audit period: From the date the plan was approved, as per the approval notice, or from the date of the last Regulatory audit, through to the date of this audit.
Deliverables and timing	▪ June 2017: Project award. ▪ June 2017: Selection of sites and records to review and finalisation of audit agenda. ▪ July 2017: Supply of background data and information to the auditor. ▪ July 2017: Site audits x 3. ▪ Mid to late July 2017: Draft audit report to the client for review (Border Rivers);

Item	Details
	▪ Late July 2017: Final audit report to the client and DEWS (deadline 31 July 2017) (Border Rivers). ▪ Early August 2017: Draft audit report to the client for review (7 Small Registered Water Supply Services); ▪ Mid-August 2017: Final audit report to the client and DEWS (deadline 15 August 2017) (7 Small Registered Water Supply Services).
Personnel	▪ Lead Auditor: Jeff Ballard. o Exemplar Global Lead Auditor (ID 122706) for Drinking Water Quality Management Systems; o 24 years experience as a civil engineer, with 20 years exclusively in the water sector; o Author and peer reviewer for a number of DWQMPs; o Has managed a number of projects for new, or augmentations of, water treatment plant designs and installations; o Project coordinator on Townsville's drinking water quality enhancement project which involved the upgrade of the Douglas Water Treatment Plant, and the construction of the Northern Water Treatment Plant at Kinduro. o Experienced with quality assurance systems, and asset management; o Sound practical knowledge which adds value in providing realistic solutions. ▪ Quality assurance: Dan Deere, Water Futures.

2. General Reporting and Auditing Format

The audit report will generally follow the structure below with 3 aspects being presented:

Details	Evidence	Compliance
Summary of what was being audited and what was observed	Details of records viewed, who was spoken to and infrastructure or scheme components sighted.	Summary of compliance status: ▪ Compliant; ▪ Opportunity for Improvement. ▪ Minor non-compliance; ▪ Major non-compliance; or, ▪ Critical non-compliance.

Topic Area	Information Source: Headquarters or Field Audit
Verify accuracy of monitoring and performance data	
Verification monitoring	Headquarters
Operational monitoring	Headquarters
Additional monitoring and performance data (if any)	Headquarters
Assessment of compliance with the plan	
The provisions and conditions in the approval notice	Headquarters
Implementation of all preventive measures for managing hazards and hazardous events as described in the plan	Headquarters and Field
Implementation of operational and maintenance procedures	Headquarters and Field
Implementation of the process for managing incidents and emergencies as described in the plan	Headquarters
Implementation of the operational and verification monitoring programs as described in the plan	Headquarters and Field
Implementation of the risk management improvement program as described in the plan	Headquarters
Maintaining records using the information management systems as described in the plan	Headquarters and Field
Undertaking regular reviews at the frequency specified in the approval notice.	Headquarters
Assessment of relevance of the plan as it currently exists	

Topic Area	Information Source: Headquarters or Field Audit
Assessing whether the service description and details of infrastructure in the plan reflect the current circumstances for each scheme	Headquarters and Field comparison
Confirming the information in the plan used to identify hazards and hazardous events reflects the current circumstances for each scheme (including catchment characteristics, water quality information and infrastructure)	Headquarters and Field comparison

3. Site Visit Agenda

Time	Location	Staff	Audit Topic	Audit Questions and Actions
			Clare Field Audit	
			Opening Meeting	
9:00	Clare Office		Introduction and welcome	Clarify the audit period;
				Finalise the audit agenda;
				Run through opening meeting checklist.
			Safety Induction – if required	
9:15	Clare Office		-	-
			7 Schemes DWQMP Part 4 - Assessment of compliance with the plan	
9:30	Clare Office/WTP		Implementation of all preventive measures for managing hazards and hazardous events as described in the plan	How are assets maintained in a secure, functional and readily operable state in order to protect water quality outcomes?
				Are water and wastewater crews, tools and equipment are largely separated? (if relevant).
				How are parts, fittings and chemicals that might come into contact with drinking water stored? Are they clean, in good condition, and in date?
				How are the stored materials that may come into contact with water (e.g. pipes and jointing compounds) sourced and quality assured (inventory kept and traced)?
				Is the site fully fenced and secured?
				How are vermin prevented from getting into the clear water storage? Is the ladder locked? Condition of infrastructure.
				How well are you aware of cross-contamination risks?
				Water stabilisation - is there enough buffering capacity and corrosion inhibition of the distributed water (pH control)?
				Does the plant have a bypass? If so, is there any chance that untreated water can bypass the plant and enter the drinking water system?
			Implementation of operational and maintenance procedures	Can I see where you store the site procedures? Are these up to date? Can you perform all of your inspections using these procedures? Are there any missing?
				Do you have jar testing equipment on site? Are they functional? Is there a jar testing procedure?
			Implementation of the operational and verification monitoring	What are the operational monitoring instruments reading during the audit, how does that compare to the DWQMP, and how are the instruments and SCADA outputs routinely verified and calibrated?

Time	Location	Staff	Audit Topic	Audit Questions and Actions
			programs as described in the plan	What are the SCADA system process control set points during the audit, how do they compare to the DWQMP, and how are they modified and controlled? i.e. Are SCADA set points entered correctly into the system and match the monitoring plan? Check Turbidity, Cl2, and pH. Record real time and last 6 months of data.
				How are chemicals, standards and reagents stored and maintained to ensure their quality and efficacy? Consider both treatment chemicals that are added to the water and laboratory chemicals used for monitoring purposes.
				Are instruments adequately housed? Are they identified for QA control - calibration?
				How often are the critical limit parameters checked?
				Can you show me the calibration records for a turbidity meter (look for compliance frequency)?
				Are there independent checks undertaken by a laboratory?
				Check for a fluoridation plant - if relevant, check for calibration and if QLD Health has also done an audit within the past year.
			Maintaining records using the information management systems as described in the plan	How are records stored and reported as they relate to water quality operational monitoring?
			End of Part 4	Statement to auditee on progress - going well, summarise findings are accurate with auditee.
			7 Schemes DWQMP Part 5 - Assessment of relevance of the plan as it currently exists	
11:45	Clare WTP		Assessing whether the service description and details of infrastructure in the plan reflect the current circumstances for each scheme	How does the infrastructure in the field compare to the DWQMP description? Field inspect random samples from the catchment, source, treatment and network for the selected system and compare to the DWQMP description.
			Confirming the information in the plan used to identify hazards and hazardous events reflects the current circumstances for each scheme (including catchment characteristics, water quality information and infrastructure)	Subject to the above question, if there are differences, are there any significant risk issues? When was this last reviewed?
			End of Part 5	Statement to auditee on progress - going well, summarise findings are accurate with auditee.
			Follow Up Session	
12:30	Clare Office		Follow up	Addressing any minor remaining items that come up during the audit, if required

Time	Location	Staff	Audit Topic	Audit Questions and Actions
				Collation of audit findings and preparation for feedback to field staff
			Closing Meeting	
12:45	Clare Office		Closing meeting	**Summary of findings to field staff - see closing meeting proforma and flagged items** General findings from the site inspection; Any specific operational or safety issues; and, Report timing.
13:00			Close of field audit	
			Headquarters Audit (Combined Audit - Questions below will be asked for both DWQMPs)	
			Opening Meeting	
9:00	HQ		Introduction and welcome	Clarify the audit period;
				Finalise the audit agenda;
				Run through opening meeting checklist.
			Combined Audit Part 1 - Verify accuracy of monitoring and performance data	
9:45	HQ		Verification monitoring	**How does the auditee ensure compliance between the DWQMP and the verification monitoring program?**
				Do you continually actively improve the verification water quality analysis program in various respects?
				How extensive is the current program and covers the full range of chemical, physical and microbial parameters that would be expected for its water supplies?
				Do you regularly review your sampling program and make many improvements to it? For instance, a particular effort has been made to ensure that all reservoir zones are included? (i.e. location based, where relevant).
				Are sampling points changing over time in response to improvements that are identified and in response to growth?
				Does the sample regime provide good coverage of the whole water supply system?
				Where do you sample taps, on public/council/client land or in other public spaces rather than within private properties?
				Are pesticides measured? (if relevant).
				How does the auditee ensure the reliability of monitoring results? Consider sampling site selection, sampling, transport of samples, analysis, quality assurance and control, reporting and communication.
				Have there been any move to have most treated water verification samples collected by laboratory staff rather than operators, with the exception of some remote samples.
				Does the laboratory provide training in sampling and calibration to operators? Or do you go to a registered training organisation?
				Do operators take part in the Certificate III module relating to water sampling and making chlorine measurements?

Time	Location	Staff	Audit Topic	Audit Questions and Actions
				What are the sampling frequencies? Do these generally match or exceed the ADWG 'defaults'? (Ref: ADWG Table 9.4 >100,000 = 6/wk/monitoring zone + 1/mon for each 10,000 above 100,000; 5,000–100,000 = 1/wk/monitoring zone + 1/mon for each 5,000 above 5,000; 1,000–5,000 = 1/wk/monitoring zone; or, <1000 = 1/wk/monitoring zone, but balance with logistics.
				Do you examine water quality in terms of quality at the meter, and quality at the customer tap? The question is in relation to internal plumbing fittings influencing results.
				How are sampling schedules set up (in a database and can be viewed in calendar view mode and Excel format)?
				How is the chain of custody managed? NATA?
				Are water and wastewater samples separated to avoid a false positive? (if relevant).
				How are the test results kept? Is there a traceable history?
				How are the results reported internally? i.e. for negative results, what happens? Any highlighting? Process improvement notice?
				How are target exceedances managed in comparison to ADWG exceedances?
				Can any of the negative samples be left and not addressed? How is this avoided?
				Audit some records of a sample of results through from sample receipt to reporting.
				Look at a sample - has client measured temperature data with every microbial test sample.
				How have such monitoring results been reported to DEWS?
			Operational monitoring	**How does the auditee ensure compliance between the DWQMP and the SCADA systems?**
				Are the relevant parameters measured on SCADA? - check plan again screen information.
				How are they monitored, constantly, or by alarm?
				What occurs after hours? (telemetry)
				How does the auditee ensure the reliability of monitoring results? Consider analyser sample line site selection, verification and calibration, reporting and communication.
				Audit some records of a sample of results from the SCADA systems through to reporting.
				Is there a process of updating the SCADA alarms in line with monitoring program changes or seasonal changes?
				How have such monitoring results been reported to DEWS?
			Additional monitoring and performance data (if any)	Are there additional data sets worth noting?
			End of Part 1	
12:00			Lunch	
			Combined Audit Part 2 - Assessment of compliance with the plan	

Time	Location	Staff	Audit Topic	Audit Questions and Actions
12:30	HQ		The provisions and conditions in the approval notice	Auditor to review plan against approval notice for accuracy.
				Is there an updated approval notice?
				How have you actively recorded and tracked compliance with its obligations under the approval notices?
			Implementation of all preventive measures for managing hazards and hazardous events as described in the plan	How is sewage to potable water cross-contamination mitigated? (if relevant).
				How is suspected contamination of compromised mains identified and mitigated?
				Do you have sufficient storage to avoid being forced to supply breached water in the event of short exceedances? How long can you store water for?
			Implementation of operational and maintenance procedures	How are assets maintained in a secure, functional and readily operable state in order to protect water quality outcomes?
				How are materials that may come into contact with water (e.g. pipes and jointing compounds) sourced, stored and quality assured?
			Implementation of the process for managing incidents and emergencies as described in the plan	How does the auditee maintain readiness to response to water quality incidents? Consider detection and communication of incident triggers, duty arrangements, incident management facilities and documents.
				Have there been any examples of incidents during the audit period?
				How have incidents been reported to DEWS? If no examples, how would this be done (e.g. flowchart, escalation reporting protocol, names and phone numbers)? What is sent to QLD Health? What is sent to the public?
				Have you practiced mock incidents during the audit period?
				Can you demonstrate that you have proactively and continually improved your monitoring program (revision control)? We are looking for feedback from the field that triggers changes to the program.
				Are SCADA set points entered correctly into the system and match the monitoring plan? Check Turbidity, Cl2, and pH.
				Let's run through the improvement plan and pick 3 critical examples of actions that should now be complete - are they complete? If not, what is being done?
			Maintaining records using the information management systems as described in the plan	Who is responsible for operating the system and what are their credentials with respect to training, experience and qualifications?
			Undertaking regular reviews at the frequency specified in the approval notice.	What reviews have occurred since the plan approval?
			End of Part 2	
			Combined Audit Part 3 - Assessment of relevance of the plan as it currently exists	

Time	Location	Staff	Audit Topic	Audit Questions and Actions
15:15	HQ		Assessing whether the service description and details of infrastructure in the plan reflect the current circumstances for each scheme	What has changed since the DWQMP was approved by DEWS? These changes may include personnel, procedures, documents, records, responsibilities, environment, infrastructure, regulations, legislation, guidelines or organisational structure and contractors.
			Confirming the information in the plan used to identify hazards and hazardous events reflects the current circumstances for each scheme (including catchment characteristics, water quality information and infrastructure)	How has the risk assessment and DWQMP been updated to reflect those changes? How are improvement needs identified and how are improvements made and managed? How have such changes been reported to DEWS?
			End of Part 3	
			Follow Up Session	
16:00	HQ		Follow up	Addressing any minor remaining items that come up during the audit, if required
				Collation of audit findings and preparation for feedback to field staff
			Closing Meeting	
16:30	HQ		Closing meeting	**Summary of findings to field staff - see closing meeting proforma and flagged items** General findings from the site inspection; Any specific operational or safety issues; and, Report timing.
17:00			Close of HQ audit	
			Glenlyon Dam WTP Field Audit	
			Opening Meeting	
9:00	Glenlyon Dam WTP		Introduction and welcome	Clarify the audit period;
				Finalise the audit agenda;
				Run through opening meeting checklist.
			Safety Induction – if required	
9:15	Glenlyon Dam WTP		-	-
			Border Rivers Scheme DWQMP Part 4 - Assessment of compliance with the plan	
9:30	Glenlyon Dam WTP		Implementation of all preventive measures for managing hazards and hazardous	How are assets maintained in a secure, functional and readily operable state in order to protect water quality outcomes?
				Are water and wastewater crews, tools and equipment are largely separated?

Time	Location	Staff	Audit Topic	Audit Questions and Actions
			events as described in the plan	How are parts, fittings and chemicals that might come into contact with drinking water stored? Are they clean, in good condition, and in date?
				How are the stored materials that may come into contact with water (e.g. pipes and jointing compounds) sourced and quality assured (inventory kept and traced)?
				Is the site fully fenced and secured?
				How are vermin prevented from getting into the clear water storage? Is the ladder locked? Condition of infrastructure.
				How well are you aware of cross-contamination risks?
				Water stabilisation - is there enough buffering capacity and corrosion inhibition of the distributed water (pH control)?
				Does the plant have a bypass? If so, is there any chance that untreated water can bypass the plant and enter the drinking water system?
			Implementation of operational and maintenance procedures	Can I see where you store the site procedures? Are these up to date? Can you perform all of your inspections using these procedures? Are there any missing?
				Do you have jar testing equipment on site? Are they functional? Is there a jar testing procedure?
			Implementation of the operational and verification monitoring programs as described in the plan	What are the operational monitoring instruments reading during the audit, how does that compare to the DWQMP, and how are the instruments and SCADA outputs routinely verified and calibrated?
				What are the SCADA system process control set points during the audit, how do they compare to the DWQMP, and how are they modified and controlled? i.e. Are SCADA set points entered correctly into the system and match the monitoring plan? Check Turbidity, Cl2, and pH. Record real time and last 6 months of data.
				How are chemicals, standards and reagents stored and maintained to ensure their quality and efficacy? Consider both treatment chemicals that are added to the water and laboratory chemicals used for monitoring purposes.
				Are instruments adequately housed? Are they identified for QA control - calibration?
				How often are the critical limit parameters checked?
				Can you show me the calibration records for a turbidity meter (look for compliance frequency)?
				Are there independent checks undertaken by a laboratory?
				Check for a fluoridation plant - if relevant, check for calibration and if QLD Health has also done an audit within the past year.
			Maintaining records using the information management systems as described in the plan	How are records stored and reported as they relate to water quality operational monitoring?
			End of Part 4	
			Border Rivers Scheme DWQMP Part 5 - Assessment of relevance of the plan as it currently exists	

Time	Location	Staff	Audit Topic	Audit Questions and Actions
11:45	Glenlyon Dam WTP		Assessing whether the service description and details of infrastructure in the plan reflect the current circumstances for each scheme	How does the infrastructure in the field compare to the DWQMP description? Field inspect random samples from the catchment, source, treatment and network for the selected system and compare to the DWQMP description.
			Confirming the information in the plan used to identify hazards and hazardous events reflects the current circumstances for each scheme (including catchment characteristics, water quality information and infrastructure)	Subject to the above question, if there are differences, are there any significant risk issues? When was this last reviewed?
			End of Part 5	
			Follow Up Session	
12:30	Glenlyon Dam WTP		Follow up	Addressing any minor remaining items that come up during the audit, if required
				Collation of audit findings and preparation for feedback to field staff
			Closing Meeting	
12:45	Glenlyon Dam WTP		Closing meeting	**Summary of findings to field staff - see closing meeting proforma and flagged items** General findings from the site inspection; Any specific operational or safety issues; and, Report timing.
13:00			Close of field audit	

4. Resources Required

Resource	Preparation
Travel and accommodation	▪ Book: ○ Flights; ○ Accommodation; and, ○ Hire vehicle.
Reference documentation on laptop	▪ Take a laptop; ▪ AC power pack.
QA Documentation	▪ This site visit plan; ▪ opening and closing meeting proformas; and, ▪ site audit checklists highlighting areas for discussion.
Other Documentation	▪ Information found in background documentation highlighting areas for discussion.
Writing resources	▪ Take folder, notebook and pens.

Resource	Preparation
Phone camera with GPS	▪ Phone charged; ▪ GPS turned on recording during inspections; ▪ Power bank and cable.

5. Safety Issues

Concern	Action
General Safety	▪ Adhere to client general induction and site-specific inductions; ▪ Wear appropriate PPE – long pants and shirt, capped boots.
Inspections on road side if relevant	▪ High-Vis Vest; ▪ Keep off road side or stay in vehicle; ▪ Vehicle hazard lights on.
Sun exposure	▪ Appropriate clothing, hat and sunscreen as per client requirements.
Uneven Slopes	▪ Take care when traversing the area.
Dangerous Animals	▪ Snakes – Stay away from long grass, or make noise, walk cautiously, if relevant.
Unfamiliar Site Hazards	▪ Site Induction.
Mechanical hazards	▪ Do not touch the plant.
Electrical hazards	▪ Do not touch plant.
Chemical hazards	▪ Do not touch plant, materials, or test equipment.
Fall from Height if relevant	▪ Require training to participate, follow procedures, if relevant.
Drowning	▪ Stay away from streams, intake, tanks, if relevant.
Becoming lost	▪ GPS and maps.
Dehydration	▪ Carry drinking water throughout the inspection; ▪ Carry water bladder in the vehicle.
Fatigue	▪ Carry snacks.

Appendix B – Opening and Closing Meeting Details

DWQMP AUDIT - OPENING MEETING

Project	2017-0009 Regulatory Audit – SunWater & Border Rivers' DWQMPs	**Date**	13/7/2017
Subject	Drinking Water Quality Management Plan	**Time**	9:00 am/pm
Client	SunWater		
Venue	SunWater Headquarters - Brisbane		

Participants	**Name**	**Organisation**
	Jeff Ballard	NWM
	Nick Stanton	~~SunWater~~ Jacobs.
	Travis van den Berg	SunWater
	Gordon Delaney	SunWater 11 Am.

Apologies Nil

Distribution As above

No.	Item	✓	Details and Comments
1.	▪ Welcome	✓	▪ Welcome to everybody; ▪ Thanks for choosing NWM; ▪ I am looking forward to spending time with you today and get to see how things are going; ▪ 15-20 minutes to cover the details about today's audit.
2.	▪ Introduce your team	✓	▪ Jeff Ballard – Lead Auditor; ▪ Dan Deere – QA.
3.	▪ State the reasons for the audit	✓	▪ As required by the Water Supply (Safety and Reliability) Act 2008 (the Act); ▪ Client is operating its drinking water services under 2 approved DWQMPs; ▪ Client is required to complete the first regular audit of its approved DWQMP by 31 July 2017 and 15 August 2017.
4.	▪ State the standard that you are auditing against	✓	▪ Drinking Water Quality Management Plan Review and Audit Guideline (DEWS 2013); ▪ ISO 19011:2014 - Guidelines for Auditing Management Systems (the generic auditing Guideline).
5.	▪ Clarify the audit period	✓	▪ First audit from the date from the ~~original~~ Revised approved plan. from 201
6.	▪ Finalise the audit agenda and scope – go through Site Visit Agenda	✓	▪ Confirm changes if any.
7.	▪ Check who is available for the audit	✓	▪ Confirm attendees; ▪ Interviews will only be conducted with people at appropriate levels within the audit scope; ▪ If at any time any auditee feels that we are asking questions to the wrong person, that person will need to advise us.
8.	▪ Confirm any logistics (rooms, lunch, guides, etc.)	✓	▪ Rooms; ▪ Lunch; ▪ WTP.
9.	▪ Company Rules / WH&S	✓	▪ The auditors' intention to following all company rules and safety precautions; ▪ Induction required? ▪ If we find an issue of significant risk, where it be WH&S or related to DWQ, we will bring it to the attention of the auditee immediately.
10.	▪ Remind auditees that the audit is confidential	✓	▪ Make a general commitment to maintain confidentiality related to the evidence gathered and conclusions generated during the audit.

No.	Item	✓	Details and Comments
11.	▪ Check that any documents sent to you before the audit are still current i.e. work documents are appropriate to the scope	✓	▪ List work documents received and are appropriate to the scope: 1. Client DWQMPs x 2; 2. Clare WTP water quality Monitoring Results; 3. SunWater dwqmp-annual report 2015_2016 Rev 0; 4. Glenlyon Dam dwqmp-annual report 2015_2016 Rev 0; 5. Glenlyon Dam Water Treatment Plant Water Quality Results.
12.	▪ State that you are only looking at a sample of the system	✓	▪ The audit will be a representative sampling of evidence, not a 100% inspection; ▪ We believe our sample will provide an accurate snapshot of current operations.
13.	▪ How information relevant to audit objectives, scope and criteria is collected	✓	▪ The questions we will ask will mostly be from the list of questions sent to you; ▪ If some are not relevant we will remove them from the scope; ▪ Some additional questions may be asked to clarify the answers provided; ▪ The scope of this audit is how the DWQMP has been implemented; ▪ The criteria are the 3 main sections of the state's auditing guideline as described in the site visit plan. ▪ information is gathered from a variety of sources including: 1. interviews with employees and other persons; 2. observation of activities; 3. documents and records; 4. information systems; and, 5. customer feedback if relevant.
14.	▪ Confirm how you will communicate findings during the audit	✓	▪ Generally, from the structure of the site visit plan; ▪ Verbal information will be reported as verbal; ▪ Only verifiable written information is identified as audit evidence and will need to be recorded for the report; ▪ We are looking for objective evidence, not subjective; ▪ Potential non-conformities will be reviewed with the auditee to ensure evidence is accurate and complete and that reason for nonconformity is understood; ▪ Any unresolved differences of opinion concerning evidence and/or findings are recorded; ▪ There will be a follow up session just prior to the closing meeting to close out any outstanding questions; ▪ Gradings will be: Compliant, Opportunity of Improvement / Minor Non-Compliance / Major Non-Compliance, Critical Non-Compliance.
15.	▪ Confirm time, location and attendees for the closing meeting	✓	▪ From Site Visit Plan.
16.	▪ Allow any questions	✓	▪ Nil ▪ ▪
17.	▪ Thanks again	✓	▪ Thank you again for choosing us, and we look forward to today.
18.	▪ Other notes		▪ Nil ▪ ▪

Jeff Ballard

uditor Name

Auditor Signature

Project	2017-0009 Regulatory Audit – SunWater & Border Rivers' DWQMPs	**Date**	13/7/2017
Subject	Drinking Water Quality Management Plan	**Time**	3.30 ~~am~~/pm
Client	SunWater		
Venue	SunWater Headquarters - Brisbane		

Participants

Name	Organisation
Jeff Ballard	NWM
Nick Stanton	~~SunWater~~ Jacobs.
Travis van den Berg	SunWater
Gordon Delaney	SunWater

Apologies Nil

Distribution As above

No.	Item	✓	Details and Comments
1.	▪ Thankyou	✓	▪ Thank the auditees for their time; ▪ Thank them for allowing you to audit them; ▪ 15-20 minutes to cover the details about today's audit.
2.	▪ Reason for the audit	✓	▪ As required by the Water Supply (Safety and Reliability) Act 2008 (the Act); ▪ The client is operating its drinking water service under an approved DWQMP; ▪ The client is required to complete the first regular audit of its approved DWQMPs by 30 July 2017 and 15 August 2017.
3.	▪ Standard that you audited against	✓	▪ Drinking Water Quality Management Plan Review and Audit Guideline (DEWS 2013); ▪ ISO 19011:2014 - Guidelines for Auditing Management Systems (the generic auditing Guideline).
4.	▪ Confidentiality	✓	▪ Remind everyone that the audit is confidential.
5.	▪ Sample	✓	▪ State that you have only looked at a sample of the system.
6.	▪ State if the audit is invalid	✓	▪ You may have needed to see a specific activity and you did not see this.
7.	▪ Explain how you will present your findings	✓	▪ Show them the audit template; ▪ Show them the scoring system.
8.	▪ Provide a closing summary on how the audit has gone (good points)	✓	▪ See Audit Checklist. ▪ - no non-conformances found but subject to information to be sent to the auditor ✓

No.	Item	✓	Details and Comments
9.	▪ State your conclusions of the audit (compliant etc.)	✓	▪ See previous comment
10.	▪ State any situations encountered during the audit that may affect reliability of results advised by audit team leader	✓	▪ Nil
11.	▪ Tell the auditees when they will receive the audit report	✓	▪ Within 2 weeks.
12.	▪ Tell the auditees what they are expected to do once they receive the report	✓	▪ Under Section 6.2 of the guideline, submit the report, including Statutory Declarations to DEWS.
13.	▪ Allow any questions	✓	▪ Nil
14.	▪ Thanks again	✓	▪
15.	▪ Other notes	✓	▪ Gordon Asked to call him once NWM reached G.L.D.

Jeff Ballard
Auditor Name

Auditor Signature

Project	2017-0009 Regulatory Audit – SunWater & Border Rivers' DWQMPs	**Date**	6/7/2017
Subject	Drinking Water Quality Management Plan	**Time**	9:00 am/pm
Client	SunWater		
Venue	Clare WTP		

Participants	**Name**	**Organisation**
	Jeff Ballard	NWM
	Leigh Chapple	SunWater
Apologies	Nil	
Distribution	As above	
	Nick Stanton	SunWater
	Travis van den Berg	SunWater
	Gordon Delaney	SunWater

No.	Item	✓	Details and Comments
1.	▪ Welcome	✓	▪ Welcome to everybody; ▪ Thanks for choosing NWM; ▪ I am looking forward to spending time with you today and get to see how things are going; ▪ 15-20 minutes to cover the details about today's audit.
2.	▪ Introduce your team	✓	▪ Jeff Ballard – Lead Auditor; ▪ Dan Deere – QA.
3.	▪ State the reasons for the audit	✓	▪ As required by the Water Supply (Safety and Reliability) Act 2008 (the Act); ▪ Client is operating its drinking water services under 2 approved DWQMPs; ▪ Client is required to complete the first regular audit of its approved DWQMP by 31 July 2017 and 15 August 2017.
4.	▪ State the standard that you are auditing against	✓	▪ Drinking Water Quality Management Plan Review and Audit Guideline (DEWS 2013); ▪ ISO 19011:2014 - Guidelines for Auditing Management Systems (the generic auditing Guideline).
5.	▪ Clarify the audit period	✓	▪ First audit from the date from the **original** approved plan.
6.	▪ Finalise the audit agenda and scope – go through Site Visit Agenda	✓	▪ Confirm changes if any.
7.	▪ Check who is available for the audit	✓	▪ Confirm attendees; ▪ Interviews will only be conducted with people at appropriate levels within the audit scope; ▪ If at any time any auditee feels that we are asking questions to the wrong person, that person will need to advise us.
8.	▪ Confirm any logistics (rooms, lunch, guides, etc.)	✓	▪ Rooms; ▪ Lunch; ▪ WTP.
9.	▪ Company Rules / WH&S	✓	▪ The auditors' intention to following all company rules and safety precautions; ▪ Induction required? ▪ If we find an issue of significant risk, where it be WH&S or related to DWQ, we will bring it to the attention of the auditee immediately.
10.	▪ Remind auditees that the audit is confidential	✓	▪ Make a general commitment to maintain confidentiality related to the evidence gathered and conclusions generated during the audit.

No.	Item	✓	Details and Comments
11.	▪ Check that any documents sent to you before the audit are still current i.e. work documents are appropriate to the scope		▪ List work documents received and are appropriate to the scope: 1. Client DWQMP; 2. Clare WTP water quality Monitoring Results 3. SunWater dwqmp-annual report 2015_2016 Rev 0.
12.	▪ State that you are only looking at a sample of the system		▪ The audit will be a representative sampling of evidence, not a 100% inspection; ▪ We believe our sample will provide an accurate snapshot of current operations.
13.	▪ How information relevant to audit objectives, scope and criteria is collected		▪ The questions we will ask will mostly be from the list of questions sent to you; ▪ If some are not relevant we will remove them from the scope; ▪ Some additional questions may be asked to clarify the answers provided; ▪ The scope of this audit is how the DWQMP has been implemented; ▪ The criteria are the 3 main sections of the state's auditing guideline as described in the site visit plan. ▪ information is gathered from a variety of sources including: 1. interviews with employees and other persons; 2. observation of activities; 3. documents and records; 4. information systems; and, 5. customer feedback if relevant.
14.	▪ Confirm how you will communicate findings during the audit		▪ Generally, from the structure of the site visit plan; ▪ Verbal information will be reported as verbal; ▪ Only verifiable written information is identified as audit evidence and will need to be recorded for the report; ▪ We are looking for objective evidence, not subjective; ▪ Potential non-conformities will be reviewed with the auditee to ensure evidence is accurate and complete and that reason for nonconformity is understood; ▪ Any unresolved differences of opinion concerning evidence and/or findings are recorded; ▪ There will be a follow up session just prior to the closing meeting to close out any outstanding questions; ▪ Gradings will be: Compliant, Opportunity of Improvement / Minor Non-Compliance / Major Non-Compliance, Critical Non-Compliance.
15.	▪ Confirm time, location and attendees for the closing meeting		▪ From Site Visit Plan.
16.	▪ Allow any questions		▪ Nil ▪ ▪
17.	▪ Thanks again		▪ Thank you again for choosing us, and we look forward to today.
18.	▪ Other notes		▪ Nil. ▪ ▪

Jeff Ballard — Auditor Name

JR Ballard — Auditor Signature

6/7/2017

Project	2017-0009 Regulatory Audit – SunWater & Border Rivers' DWQMPs	**Date**	6/7/2017
Subject	Drinking Water Quality Management Plan	**Time**	12:57 ~~am~~/pm
Client	SunWater		
Venue	Clare WTP		

Participants	**Name**	**Organisation**
	Jeff Ballard	NWM
	Leigh Chapple	SunWater
Apologies	Nil	
Distribution	As above	
	Nick Stanton	SunWater
	Travis van den Berg	SunWater
	Gordon Delaney	SunWater

No.	Item	✓	Details and Comments
1.	▪ Thankyou	✓	▪ Thank the auditees for their time; ▪ Thank them for allowing you to audit them; ▪ 15-20 minutes to cover the details about today's audit.
2.	▪ Reason for the audit	✓	▪ As required by the Water Supply (Safety and Reliability) Act 2008 (the Act); ▪ The client is operating its drinking water service under an approved DWQMP; ▪ The client is required to complete the first regular audit of its approved DWQMPs by 30 July 2017 and 15 August 2017.
3.	▪ Standard that you audited against	✓	▪ Drinking Water Quality Management Plan Review and Audit Guideline (DEWS 2013); ▪ ISO 19011:2014 - Guidelines for Auditing Management Systems (the generic auditing Guideline).
4.	▪ Confidentiality	✓	▪ Remind everyone that the audit is confidential.
5.	▪ Sample	✓	▪ State that you have only looked at a sample of the system.
6.	▪ State if the audit is invalid	✓	▪ You may have needed to see a specific activity and you did not see this. ok.
7.	▪ Explain how you will present your findings	✓	▪ Show them the audit template; ▪ Show them the scoring system.
8.	▪ Provide a closing summary on how the audit has gone (good points)		▪ Good Points! → Attended Grey Day. → Plants running fine - no Infrastructure issues to address. → Records on Maximo

No.	Item	✓	Details and Comments
9.	▪ State your conclusions of the audit (compliant etc.)	✓	▪ Cl_2 was the main finding – RE: residuals at the sampling points – See Audit checklist for info + report later.
10.	▪ State any situations encountered during the audit that may affect reliability of results advised by audit team leader	✓	▪ Nil.
11.	▪ Tell the auditees when they will receive the audit report	✓	▪ Within 2 weeks.
12.	▪ Tell the auditees what they are expected to do once they receive the report	✓	▪ Under Section 6.2 of the guideline, submit the report, including Statutory Declarations to DEWS.
13.	▪ Allow any questions	✓	▪ Nil
14.	▪ Thanks again	✓	▪
15.	▪ Other notes	✓	▪ Nil.

Jeff Ballard

Auditor Name

Auditor Signature

Appendix C – Photographic Evidence


Clare School Sampling Point
06/07/2017 9:57 am


Clare WTP Intake Coarse Screens
06/07/2017 9:17 am


Clare WTP Intake
06/07/2017 9:16 am


Clarifier
06/07/2017 9:20 am

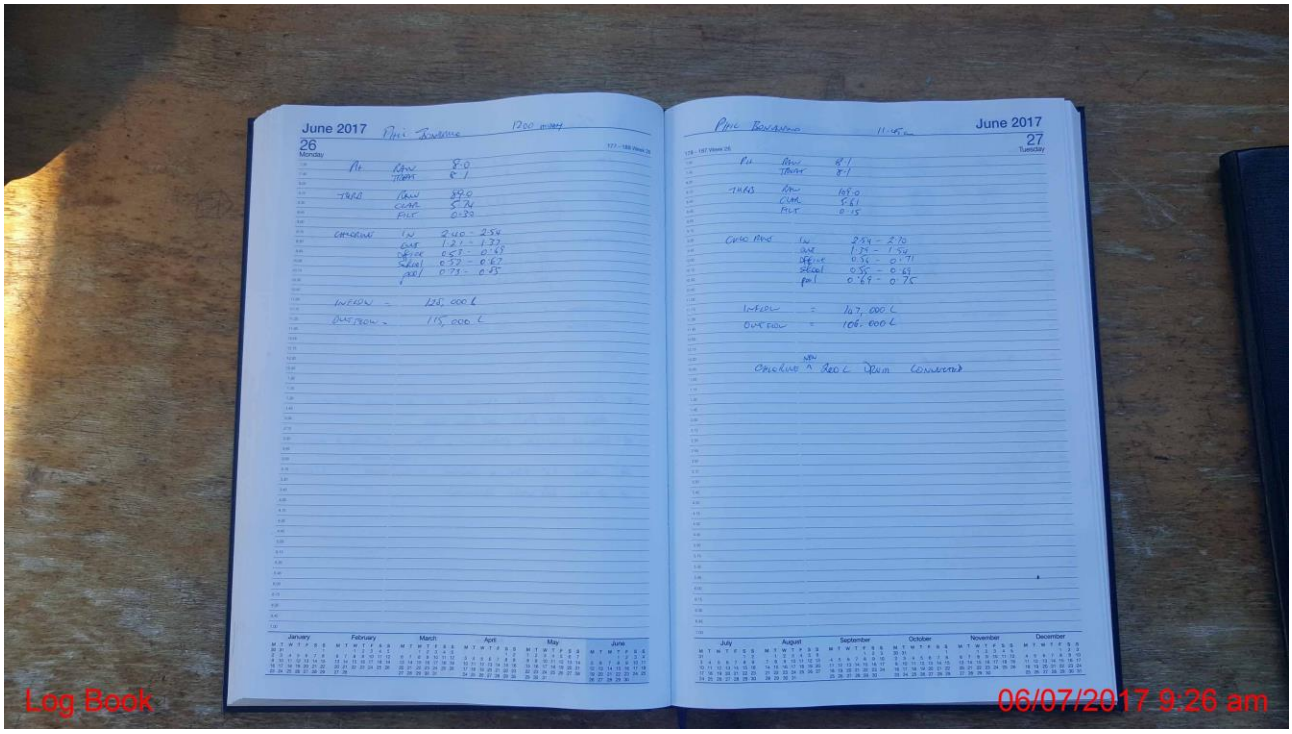

Clarifier Pipework
06/07/2017 11:48 am


Clear Water Storage
06/07/2017 9:34 am


Coagulent Dosing and Hypo tank at rear
06/07/2017 9:21 am

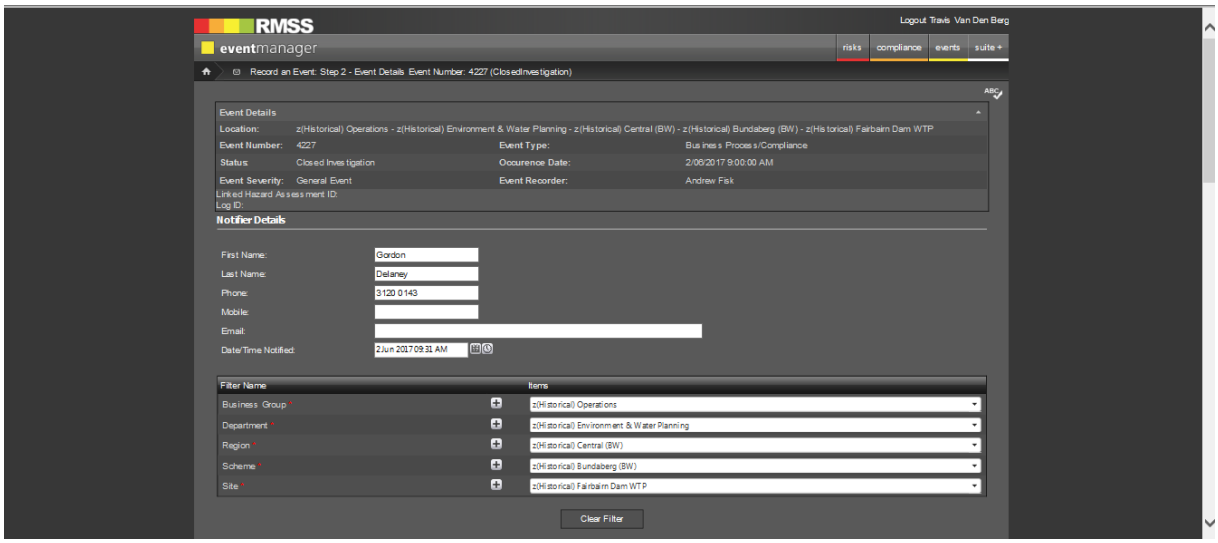

CWS Scour Valve and CL2 sampling point
06/07/2017 9:39 am

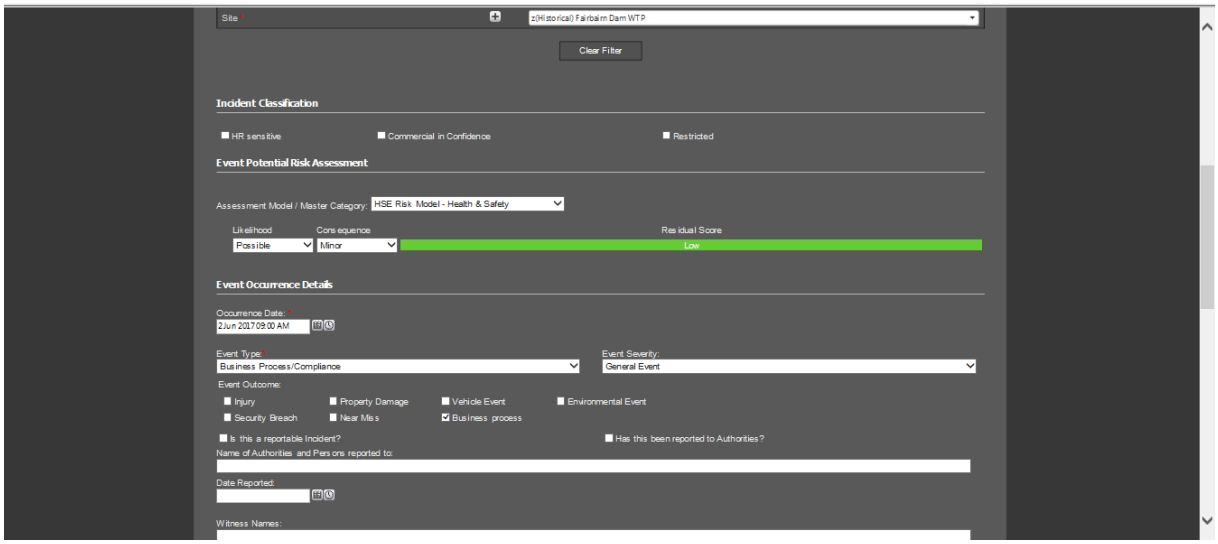

Jar Testing Equipment
06/07/2017 9:24 am


June 2017
26
Monday
June 2017
27
Tuesday
Log Book
06/07/2017 9:26 am

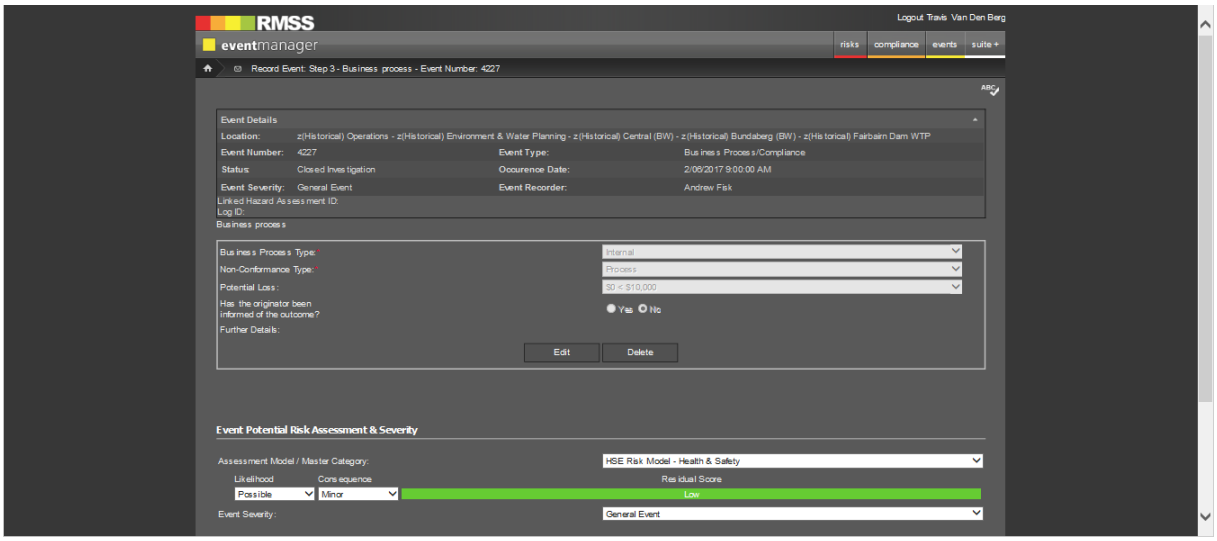

Testing Reagents kept in tidy airconditioned storage room
06/07/2017 11:16 am

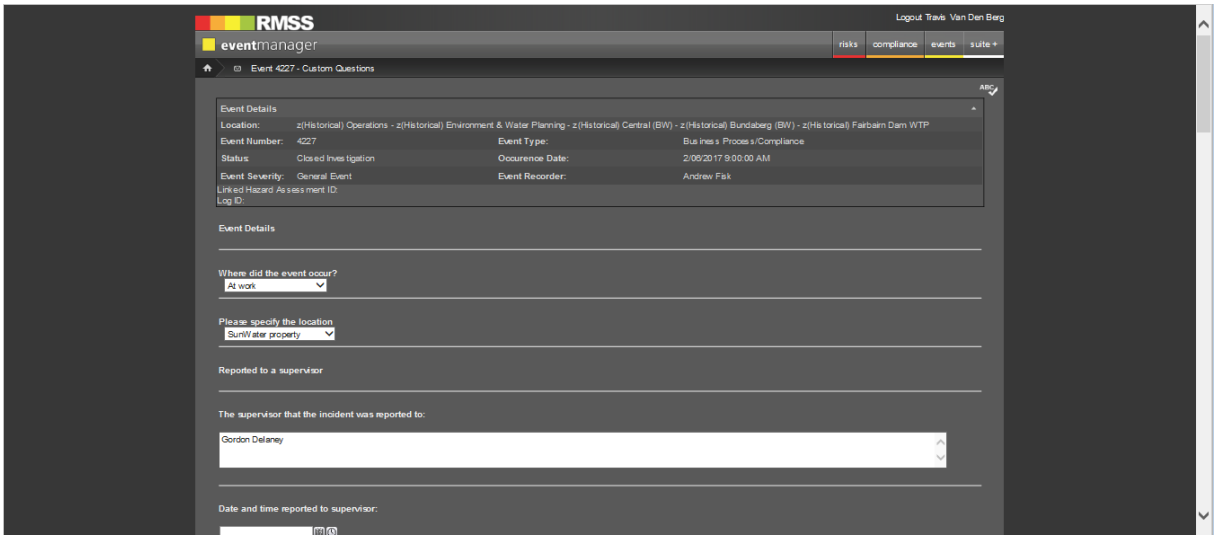

Town Reservoir Sampling Point
06/07/2017 9:53 am

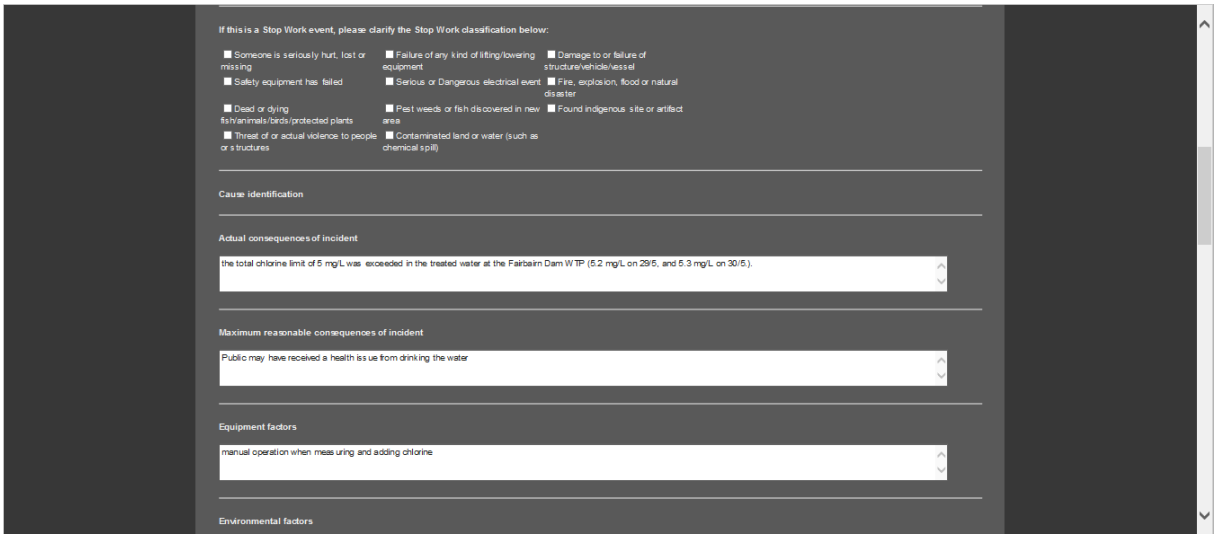

RMSS
Logout Travis Van Den Berg
eventmanager
risks
compliance
events
suite +
Record an Event: Step 2 - Event Details Event Number: 4227 (ClosedInvestigation)
Event Details
Location: z(Historical) Operations - z(Historical) Environment & Water Planning - z(Historical) Central (BW) - z(Historical) Bundaberg (BW) - z(Historical) Fairbairn Dam WTP
Event Number: 4227
Event Type: Business Process/Compliance
Status: Closed Investigation
Occurence Date: 2/06/2017 9:00:00 AM
Event Severity: General Event
Event Recorder: Andrew Fisk
Linked Hazard Assessment ID:
Log ID:
Notifier Details
First Name: Gordon
Last Name: Delaney
Phone: 3120 0143
Mobile:
Email:
Date/Time Notified: 2 Jun 2017 09:31 AM
Filter Name
Items
Business Group *
z(Historical) Operations
Department *
z(Historical) Environment & Water Planning
Region *
z(Historical) Central (BW)
Scheme *
z(Historical) Bundaberg (BW)
Site *
z(Historical) Fairbairn Dam WTP
Clear Filter

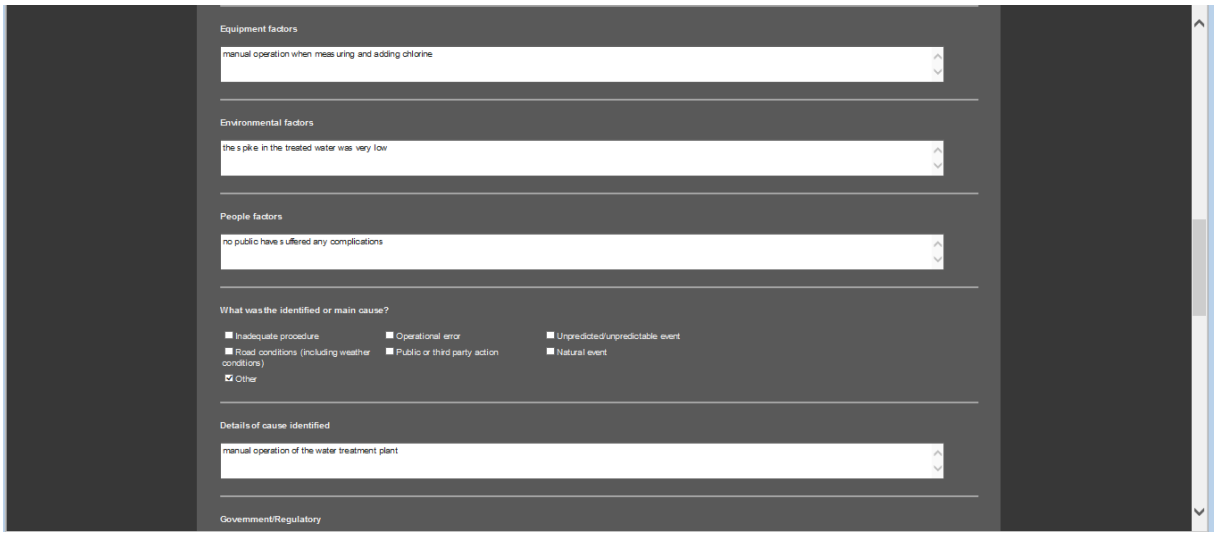

Site *
z(Historical) Fairbairn Dam WTP
Clear Filter
Incident Classification
HR sensitive
Commercial in Confidence
Restricted
Event Potential Risk Assessment
Assessment Model / Master Category: HSE Risk Model - Health & Safety
Likelihood
Consequence
Residual Score
Possible
Minor
Low
Event Occurrence Details
Occurrence Date: *
2 Jun 2017 09:00 AM
Event Type: *
Business Process/Compliance
Event Severity:
General Event
Event Outcome:
Injury
Property Damage
Vehicle Event
Environmental Event
Security Breach
Near Miss
Business process
Is this a reportable incident?
Has this been reported to Authorities?
Name of Authorities and Persons reported to:
Date Reported:
Witness Names:


Event Details
Actual Location:
Activity At Time:
Fairbairn Water treatment plant
What Happened Unexpectedly:
On two occasions (29 & 30 May), total chlorine limit of 5 mg/L was exceeded in the treated water at the Fairbairn Dam Water Treatment Plant
Contributing Factor:
Unknown manual process
Planned interim actions
As this exceedance is reportable, SunWater is making a verbal report (by phone) and also preparing a notification to the drinking water quality regulator at DEWS.
The total chlorine readings for 31/5 and 1/6 are back in spec. This means that the situation is under control.
Injury / Claim / Damage
Was Anyone Injured?
Yes
No
Cost of Claim:
$ 0
Cost of Damage:
=== Select ===
Additional Notes (include Name of Second Risk Assessor)
Notes:
Risk assessment is based on public accessing water that may make them suffer a health affect
factors considered are
the total chlorine limit of 5 mg/L was exceeded in the treated water at the Fairbairn Dam WTP (5.2 mg/L on 29/5, and 5.3 mg/L on 30/5.) We have spoken to Peter Simpson (WTP operator) and he advised me that these readings are correct.


RMSS
eventmanager
Logout Travis Van Den Berg
risks
compliance
events
suite +
Record Event: Step 3 - Business process - Event Number: 4227
Event Details
Location: z(Historical) Operations - z(Historical) Environment & Water Planning - z(Historical) Central (BW) - z(Historical) Bundaberg (BW) - z(Historical) Fairbairn Dam WTP
Event Number: 4227
Event Type: Business Process/Compliance
Status: Closed Investigation
Occurence Date: 2/09/2017 9:00:00 AM
Event Severity: General Event
Event Recorder: Andrew Fisk
Linked Hazard Assessment ID:
Log ID:
Business process
Business Process Type:
Non-Conformance Type:
Potential Loss:
Has the originator been informed of the outcome?
Further Details:
Internal
Process
$0 < $10,000
Yes
No
Edit
Delete
Event Potential Risk Assessment & Severity
Assessment Model / Master Category:
HSE Risk Model - Health & Safety
Likelihood
Consequence
Residual Score
Possible
Minor
Low
Event Severity:
General Event


RMSS
eventmanager
Logout Travis Van Den Berg
risks
compliance
events
suite +
Event 4227 - Custom Questions
Event Details
Location: z(Historical) Operations - z(Historical) Environment & Water Planning - z(Historical) Central (BW) - z(Historical) Bundaberg (BW) - z(Historical) Fairbairn Dam WTP
Event Number: 4227
Event Type: Business Process/Compliance
Status: Closed Investigation
Occurence Date: 2/09/2017 9:00:00 AM
Event Severity: General Event
Event Recorder: Andrew Fisk
Linked Hazard Assessment ID:
Log ID:
Event Details
Where did the event occur?
At work
Please specify the location
SunWater property
Reported to a supervisor
The supervisor that the incident was reported to:
Gordon Delaney
Date and time reported to supervisor:


If this is a Stop Work event, please clarify the Stop Work classification below:
Someone is seriously hurt, lost or missing
Failure of any kind of lifting/lowering equipment
Damage to or failure of structure/vehicle/vessel
Safety equipment has failed
Serious or Dangerous electrical event
Fire, explosion, flood or natural disaster
Dead or dying fish/animals/birds/protected plants
Pest weeds or fish discovered in new area
Found indigenous site or artifact
Threat of or actual violence to people or structures
Contaminated land or water (such as chemical spill)
Cause identification
Actual consequences of incident
the total chlorine limit of 5 mg/L was exceeded in the treated water at the Fairbairn Dam WTP (5.2 mg/L on 29/5, and 5.3 mg/L on 30/5).
Maximum reasonable consequences of incident
Public may have received a health issue from drinking the water
Equipment factors
manual operation when measuring and adding chlorine
Environmental factors


Equipment factors
manual operation when measuring and adding chlorine
Environmental factors
the spike in the treated water was very low
People factors
no public have suffered any complications
What was the identified or main cause?
Inadequate procedure
Operational error
Unpredicted/unpredictable event
Road conditions (including weather conditions)
Public or third party action
Natural event
Other
Details of cause identified
manual operation of the water treatment plant
Government/Regulatory


Was the incident Notifiable to government/regulatory or other authorities?
No
Yes - Advise GM and Corporate Counsel
Authority the incident was reported to (if not recorded elsewhere)
In response to our notification earlier today re Fairbairn Dam WTP (attached), the drinking water supply regulator has responded and classified this incident as non-reportable. Details are below. However, this still needs follow-up within SunWater for our own quality assurance reasons, as the drinking water supplied was very close to being out of specification. If this exceedance is reportable, SunWater is making a verbal report (by phone) and also preparing a notification to the drinking water quality regulator at DEWS.
Date reported
Recommendation for corrective actions
No recommendation as the following interim action is sufficient
1) Jacobs water treatment consultant will follow up with the operators and look at what the issue(s) are that may have led to the occurrence.
Useful Links
No records to display.
Event Attachments

Appendix D – Audit Checklist and Detailed Findings

Audit Checklist

Audit Topic	Audit Questions and Actions	Evidence	Findings and Discussions	Compliance Grade	Recommendation / OFI
Headquarters Audit - 7 Schemes DWQMP					
Combined Audit Part 1 - Verify accuracy of monitoring and performance data					
Verification monitoring	**How does the auditee ensure compliance between the DWQMP and the verification monitoring program?**				
	Do you continually actively improve the verification water quality analysis program in various respects?	Letter from Cairns Regional Council Lab.	SunWater has a Quality Assurance System in accordance with ISO9001 and undergoes QA audits. Monthly bacteriological testing has been undertaken and documents viewed for the past 2 years of results. Local labs do testing and has been optimised where the tests are taken to ensure fast turn around times. Program hasn't changed but the management has. SunWater's management systems were discussed and viewed and are described in detail later.	Compliant	
	How extensive is the current program and covers the full range of chemical, physical and microbial parameters that would be expected for its water supplies?	DWQMP. Latest annual heavy metals test.	Monthly and annual tests are undertaken. Total coliform, E.coli and HPC are undertaken. Specific testing for Giardia and Cryptosporidium isn't done as E.coli is relied upon. Page 131 of the DWQMP - Risk Assessment discusses "Pathogens or nitrates / nitrites" and in particular giardia and protozoa. E.coli is named as the "Operating Parameter" which is not adequate. Cryptosporidium and Giardia are also mentioned as a risk for the Burdekin Dam and should be recorded in the operating log.	OFI	Specific testing for Giardia and Cryptosporidium should be done. It is suggested that this occur during peak inflow events in the treated and raw water. As this is a relatively expensive and often returning clear or inconclusive results, it may be prudent to look at models or refer to the HBT guidelines from WSAA.
	Do you regularly review your sampling program and make many improvements to it. For instance, a particular effort has been made to ensure that all reservoir zones are included? (i.e. location based, where relevant).	See above 2 questions.	Please see the previous 2 questions. There are not many opportunities for changes.	Compliant	
	Are sampling points changing over time in response to improvements that are identified and in response to growth?	NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE and NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE, Peter Faust Envirocheck Report of 11/7/2017. Potable water analysis Ref 170705_DW_SW_ PFD. Cited Burdekin Falls Dam results from email.	No, given the small size of the schemes, there has been no significant development in the water supply networks, if any.	Compliant	
	Does the sample regime provide good coverage of the whole water supply system.		Yes, as the schemes are small the sample regimes are adequate.	Compliant	
	Where do you sample taps, on public/council/client land or in other public spaces rather than within private properties?		The majority is on SunWater land. At Clare they sample at the point of supply. At Peter Faust Dam, they sample at all SunWater properties. Sampling is only for Cl2 and E.coli.	Compliant	
	Are pesticides measured? (if relevant).	No evidence found on these types of tests.	The second last line in the DWQMP - Risk Assessment Page 131 discusses pesticides & agricultural fertilisers. It calls for annual testing for a range of contaminants, however this appears to have been undertaken. There is not information to suggest health impacts however this may to due to a lack of information.	Minor	Undertake a series of tests for the presence of pesticides & agricultural fertilisers as per the DWQMP risk assessment.
	How does the auditee ensure the reliability of monitoring results? Consider sampling site selection, sampling, transport of samples, analysis, quality assurance and control, reporting and				
	Have there been any move to have most treated water verification samples collected by laboratory staff rather than operators, with the exception of some remote samples.	Letter from Cairns Regional Council Lab.	No. All sites are considered remote and the expense outweighs this option. Local labs do testing and has been optimised where the tests are taken to ensure fast turn around times.	Compliant	
	Does the laboratory provide training in sampling and calibration to operators? Or do you go to a registered training organisation?	Clare Water Treatment Plant Operator Training 2016. Training Material 20160608 Clare.	Not training by a lab but Jacobs conducted training in 2016.	Compliant	
	Do operators take part in the Certificate III module relating to water sampling and making chlorine measurements?	Viewed SOL on screen (see screenshot). Cited current operator list on SOL system. Looked for and found known operator Leigh Chapple in the list. Leigh Chapple Employee training transcript - Cert III Water Industry Operations - completed 1/03/2010. Workplace_Compliance_Training_and_Licence_Requirements_Operations.xlsx.	When a new operator starts, his or her name is put to a position which relates to a matrix of required skills. During the audit I viewed the "Compliance Training Matrix (Operations)" inside the SOL system for an 'Operator Maintainer', a Fitter, and an Operator Supervisor. There is a reminder system in place for refresher training. Every site has at least 1 Certificate III operator. As mentioned 1 question earlier, Jacobs has conducted refresher training in 2016.	Compliant	
	What are the sampling frequencies? Do these generally match or exceed the ADWG 'defaults'? (Ref: ADWG Table 9.4 >100,000 = 6/wk/monitoring zone + 1/mon for each 10,000 above 100,000; 5,000–100,000 = 1/wk/monitoring zone + 1/mon for each 5,000 above 5,000; 1,000–5,000 = 1/wk/monitoring zone; or, <1000 = 1/wk/monitoring zone, but balance with logistics.	Viewed the latest Mutchilba monthly test report. Clare WTP monitoring results January to July 2017.	The frequency of sampling is as per the DWQMP. Other tests are conducted daily of 3/week. SunWater is comfortable with the level of frequency. Further discussion on this is made in the field audit. This is discussed again later in the questions relating to implementation of operational and verification programs. Additional testing was undertaken at Mutchilba where a pipe burst occurred. SunWater noted that there were septic tanks nearby and actions were taken to minimise the risk. Jacobs advised during the incident to undertake additional E.coli testing. Monthly testing is the minimum and a change in conditions do prompt additional sampling.	Compliant	

Audit Checklist

Audit Topic	Audit Questions and Actions	Evidence	Findings and Discussions	Compliance Grade	Recommendation / OFI
	Do you examine water quality in terms of quality at the meter, and quality at the customer tap? The question is in relation to internal plumbing fittings influencing results.	Refer to the earlier question.	Refer to the earlier question testing is at the point of supply.		
	How are sampling schedules set up (in a database and can be viewed in calendar view mode and Excel format)?	SAP system viewed. Work Instructions cited.	Work instructions for each month are sent to the operator by either the area supervisor or the operations supervisor. The SAP system auto emails a job position (and that particular person) the month work instruction. Water Quality Data is entered into SAP daily. Each week Jacobs meets with Gordon Delaney of SunWater to review the past week's performance. Jacobs is contracted by SunWater to monitor Water Quality Results and to provide ongoing technical support. For changes, a Change Request is sent to the planners at SunWater Headquarters. The Work Instruction is discussed and feedback occurs. Where agreed, changes are made and an updated document is finalised and added to the SAP system.	Compliant	
	How is the chain of custody managed? NATA?	Tracking number 170119 was viewed and checked on a Clare WTP Monthly Report.	All monthly testing is laboratory NATA certified. Operators take a sample, a sticker is placed on the sample bottle, upon sampling a number is created and copied onto the log sheet with time, data and location of sample. This is a clear process as the ID is unique to the location, date, and time.	Compliant	
	Are water and wastewater samples separated to avoid a false positive? (if relevant).	Not required.	There is a sewerage treatment plant at Fairbairn Dam, however this is monitored by a separate contractor and therefore has no opportunity for samples to be mixed up. There is a sewerage treatment plant at Burdekin Falls Dam, however this has no monitoring requirement, hence there is no opportunity for samples to be mixed up.	Compliant	
	How are the test results kept? Is there a traceable history?	Viewed SAP records for daily, weekly and monthly data.	The operator physically enters the data into SAP which has a tracking number for verification testing. Lab results are checked against entered information and a weekly report is done by Jacobs. The entered information to SAP has a notification system attached to it that sends a group email to 1) a group email address at Jacobs 2) Gordon Delaney and Aaron Bill, 3) Site managers and operators, and the area general manager. A verbal or call is also made on a presumption of a positive result to operators when exported data is reviewed by Jacobs via monthly trends. Adverse results are reported by exception.	Compliant	
	How are the results reported internally? i.e. for negative results, what happens? Any highlighting? Process improvement notice?	SunWater Water/Wastewater Treatment On Call Arrangements 8/9/16 Version 1. WSRO17 Notice of Noncompliance with Water Quality Criteria - Drinking Water form.	SunWater explained the QA and management process which aligns with the DWQMP flowchart for incidents. A call is made from the laboratory for all failed results. Once the test certificate is complete, this is emailed from the lab to multiple people. These people follow the incident. This incident is lodged in the SIMON system by the first person to see the incident. A notice is sent to DEWS. See previous question for additional information.	Compliant	
	How are target exceedances managed in comparison to ADWG exceedances?	Not required.	Only microbiological exceedances are managed. It is recommended that chemical and physical exceedances be also covered under the above *internal* reporting regime to avoid exceedances proactively. Test results for pH and Cl2 were checked during the audit. A separate question has covered this issue.		
	Can any of the negative samples be left and not addressed? How is this avoided?	Viewed the RMSS system on screen.	Multiple people receive the email from the lab. The process used is discussed below: 1) Person opens in RMSS (with action list and traceable actions) 2) A report is sent to the regulator 3) Actions are taken 4) Part B - the investigation is concluded. 5) In addition to this procedure, there is a management in terms of reporting - e.g. Executive General Manager of Operations and Services provides a monthly CEO report 6) Final incident reports cannot be sent to the regulator until it has been closed out. 7) Final signoff must occur in RMSS	Compliant	
	Audit some records of a sample of results through from sample receipt to reporting.	Viewed auto email 1/6/2017 5:01 pm, and email Summary. Mutchilba incident RMSS screenshots taken. Clare WTP monitoring results January to July 2017. DWQMP flowchart to manage incidents, plus RMSS Procedure QS02-G1-Safety-Incident-Management-Guidelines, QS02-G02-Incident-Classification-and-Statistical-Reporting-Guide, QS02-Safety-Incident-Management-Framework.	We discussed the Fairbairn total Chlorine exceedance: >5 (5.3). Follow up sampling was undertaken. An incident was created in RMSS. The incident was closed out with an email summary. The regulator advised that the recording was acceptable as the concentration could be rounded to 5.0 until the state's reporting guideline. The Mutchilba incident was discussed. This was for a broken water main which was recorded in RMSS along with the work instruction at the time. No E.coli exceedances were found during the incident.	Compliant	
	Look at a sample - has client measured temperature data with every microbial test sample.	Peter Faust Envirocheck Report of 11/7/2017, NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily_Weekly_151117	The auditor asked to see where temperature was recorded. A lab report was provided but found to not have reported temperature, however labs do not have to report this. It was later found that temperature is recorded in the field when sampling. This is particularly important for discovering trends in data with seasonal changes. It was however found that there was no signature for the report which questioned if the report was correctly finalised.	OFI	Determine which labs provide signatures for verification monitoring reports for the multiple sites within the DWQMP, and liaise with those who do not. Request them to provide signed reports. Follow up on the report the auditor checked to verify chain of custody has occurred.
	How have such monitoring results been reported to DEWS?	2016 Annual report cited.	All results are reported to DEWS in the annual report which is also provided on the SunWater website. Please also refer back to previous questions on exceedance reporting.	Compliant	
Operational	**How does the auditee ensure compliance between the DWQMP and the SCADA systems?**				

Audit Checklist

Audit Topic	Audit Questions and Actions	Evidence	Findings and Discussions	Compliance Grade	Recommendation / OFI
monitoring	Are the relevant parameters measured on SCADA? - check plan again screen information.	Field verification of practices. Work Instruction NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE and NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE (Operational Monitoring)	4 of the 7 sites do not have SCADA. Leslie Dam, Eungella Dam, and Mutchilba have an Odis filtration package plant with SCADA and a degree of automation. The use of the SCADA was discussed a length and it was concluded that the SCADA is only used in addition to the manual checking system used for the 8 plants it operates across Queensland. This was later seen in practice in the field where the SCADA is used as a trending guide only and there is a clear distinction between manual sampling where testing is undertaken using hand held instruments, and visually checked and calibrated SCADA. The SCADA data older than approximately 1 month is not kept. pH, Cl2, and Turbidity is recorded.	Compliant	
	How are they monitored, constantly, or by alarm?	See previous question.	See previous question.		
	What occurs after hours? (telemetry)	Work Instruction NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE and NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE.	Most of the plants do not operate every day and can be turned off at night. For Mutchilba, this plant is automated and can run over night. There was not enough time to return to this question.		
	How does the auditee ensure the reliability of monitoring results? Consider analyser sample line site selection, verification and calibration, reporting and communication.				
	Audit some records of a sample of results from the SCADA systems through to reporting.	Field verification of practices. Work Instruction NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE and NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE (Operational Monitoring)	SCADA is generally used for alarming and set point control. The only operational monitoring data used is the usual testing undertaken by the operator, which is entered into SAP.	Compliant	
	Is there a process of updating the SCADA alarms in line with monitoring program changes or seasonal changes?	No procedure found.	There is no procedure for this.	OFI	Provide additional information in the relevant work instructions to adjust the SCADA alarms for seasonal changes to the 3 relevant sites.
	How have such monitoring results been reported to DEWS?	Annual report, incident paper trail for Fairbairn Dam.	Please refer back to previous questions on reporting. The SCADA data does not need to be reported.	Compliant	
Additional monitoring and performance data (if any)	Are there additional data sets worth noting?	SAP on screen, Clare WTP monitoring results January to July 2017.	Every required parameter is recorded in SAP e.g. turbidity was checked for inclusion and was observed to be in the system.	Compliant	
End of Part 1					
Combined Audit Part 2 - Assessment of compliance with the plan					
The provisions and conditions in the approval notice	Auditor to review plan against approval notice for accuracy.	12 Aug 2013 version and updated version 1/11/16.	The plan was checked against the approval notice of 1/11/16 and found no issues.	Compliant	
	Is there an updated approval notice?	See previous item.	Yes. No issues found.	Compliant	
	How have you actively recorded and tracked compliance with its obligations under the approval notices?	Annual Report 2016. Jacobs Contract with SunWater.	Cited the Mutchilba township and the Fairbairn Dam incidents as evidence to demonstrate compliance with the reporting obligations under the approval notice. The Jacobs contract has conditions on reporting deadlines.	Compliant	
Implementation of all preventive measures for managing hazards and hazardous events as described in the plan	How is sewage to potable water cross-contamination mitigated? (if relevant).	Not used.	Not relevant.		
	How is suspected contamination of compromised mains identified and mitigated?	Mutchilba township mains break incident documentation including Action ID 3999 in RMSS. CM01-F3-HSE-Pre-Construction-Risks.	Please refer to the previous discussion on the process undertaken. CM01-F3-HSE-Pre-Construction-Risks is used for a range of work buy includes pipe repairs where it directs the operator to the document "Pipe Repairs SWMS - WMS12". This SWMS was found to be acceptable.	Compliant	
	Do you have sufficient storage to avoid being forced to supply breached water in the event of short exceedances? How long can you store water for?	NMA-FAI-1M-BUL-CONM-O-ON-WTP OPERATE	From a discussion with SunWater it would not supply water under such circumstances. For example at Mutchilba bottled water was provided and showering facilities were provided at the SunWater Depot. This is assessed on a case by case basis using the flowchart. A review of the procedures found no evidence of a stop supply procedure or to truck water in.	OFI	Up date the work instructions to include a stop supply procedure and circumstances where tankered water and/or bottled would be required.
Implementation of operational and maintenance procedures	How are assets maintained in a secure, functional and readily operable state in order to protect water quality outcomes?	Jacobs Contract. Operational and Service work instruction NMA-FAI-1Y-BUL-CONM-O-OF-WTP SERVICE, CM01-Corrective - Day to Day Work Order 5202532 5/7/2017.	As part of the Jacobs contract Jacobs must undertake a 2 yearly asset condition assessment. This is in addition to the operational and service work instructions where the SAP system produces the required work (monthly, 6 monthly, yearly) to be undertaken under the scheduled maintenance program. Assets can be tacked via their Asset ID. Jacobs provides a heavy maintenance list which is programmed into SAP.	Compliant	
	How are materials that may come into contact with water (e.g. pipes and jointing compounds) sourced, stored and quality assured?	DM01_F9 checklist from SIMON.	This is undertaken on a project by project basis by Jacobs where requirements are presented in design and construction specifications calling up a relevant Aust Standard. DM01_F9 is used as a high level checklist and relies on persons with a knowledge of DWQM. This question was also asked in the field where an OFI has been suggested.		
	How does the auditee maintain readiness to response to water quality incidents? Consider detection and communication of incident triggers, duty arrangements, incident management facilities and documents.	DWQMP flowchart for incidents and SIMON system, QA system. CM01-F3-HSE-Pre-Construction-Risks.	The SIMON system is used for safety aspects where a safety team is on call continuously. This system manages responsibilities and progress including sign off. CM01-F3-HSE-Pre-Construction-Risks contains a section on Water Quality which can relate to raw water quality changes due to construction or maintenance work such as channel cleaning. The flowchart from the DWQMP was explained which was found to be satisfactory. There is also a management reporting structure which overlays this process.	Compliant	
	Have there been any examples of incidents during the audit period?		Refer to previous discussions. The process undertaken was found to be acceptable.	Compliant	

Audit Checklist

Audit Topic	Audit Questions and Actions	Evidence	Findings and Discussions	Compliance Grade	Recommendation / OFI
	How have incidents been reported to DEWS? If no examples, how would this be done (e.g. flowchart, escalation reporting protocol, names and phone numbers)? What is sent to QLD Health? What is sent to the public?		Yes, refer to previous discussions. The process undertaken was found to be acceptable.	Compliant	
	Have you practiced mock incidents during the audit period?	Nil available.	SunWater advised that this is done informally and at desktop level during the development of the DWQMP flowchart.	OFI	It is recommended that each site undergo a mock incident where incidents have not yet occurred and document the findings and update procedures if required.
Implementation of the operational and verification monitoring programs as described in the plan	Can you demonstrate that you have proactively and continually improved your monitoring program (revision control)? We are looking for feed back from the field that triggers changes to the program.	Emails relating to the Mutchilba event. DWQMP, Work instructions.	SunWater has indicated that, given the small scheme sizes, they have found that the monitoring program is suitable. They found that the Mutchilba incident highlighted the need for better phone reception as the operator had to leave site to return to the office to call in for progress reports.	OFI	Investigate improvements to mobile coverage or alternative ways of communicating information faster.
	Are SCADA set points entered correctly into the system and match the monitoring plan? Check Turbidity, Cl2, and pH.	Not relevant.	SCADA is not available at headquarters for these plants. Please see the field audit for further discussion.		
	Let's run through the improvement plan and pick 3 critical examples of actions that should now be complete - are they complete? If not what is being done?	DWQMP Improvement Plan.	Item 1) Data Collection Improvements in SAP - This is not possible in SAP, instead the system sends an email - this action has been closed within the written time frame. Item 2) Hydrocarbon Testing - This has not been done yet. A reminder system is available inside SAP. Item 3) Clare started - Report done (not provided to the auditor), flash mixer installed, pH not yet installed, filter - local project underway. Action due by the end of the financial year.	Minor	Complete Improvement Plan Action Item No.2 - Complete base-line hydrocarbon testing of dam storages during a period of heavy recreational use and add hydrocarbon testing to annual heavy metals test regime.
Maintaining records using the information management systems as described in the plan	Who is responsible for operating the system and what are their credentials with respect to training, experience and qualifications?	Viewed SOL on screen (see screenshot). Cited current operator list on SOL system. Looked for and found known operator Leigh Chapple in the list. Leigh Chapple Employee training transcript - Cert III Water Industry Operations - completed 1/03/2010. Workplace_Compliance_Training_and_Licence_Requirements_Operations.xlsx.	2 operators were searched for and were found with Certificate III training. From Jacobs, experience was viewed for Nick Stanton. For SunWater experience was reviewed for Gordon Delaney and Travis can van Berg. These were found to be satisfactory. The management systems were reviewed under previous questions and found to meet the DWQMP requirements.	Compliant	
Undertaking regular reviews at the frequency specified in the approval notice.	What reviews have occurred since the plan approval?	September 2015 DWQMP Version.	This is the second version of the plan with the first being written in 2013. SunWater plans to update this version to include: - Decommissioning of a treatment plant. - Removal of Leslie Dam from the DWQMP as this will no longer be under SunWater management. - updates from the Mutchilba local review where there were learnings from the water main break incident. - as a result of this audit. SunWater also plans to update this version to include changes as a result of this audit. As the plan is still current there are no issues currently.	OFI	As the plan review is due by 17/8/17 there will be a timing conflict and suggest future audits be conducted earlier and ahead of plan revisions.
End of Part 2					
Combined Audit Part 3 - Assessment of relevance of the plan as it currently exists					
Assessing whether the service description and details of infrastructure in the plan reflect the current circumstances for each scheme	What has changed since the DWQMP was approved by DEWS? These changes may include personnel, procedures, documents, records, responsibilities, environment, infrastructure, regulations, legislation, guidelines or organisational structure and contractors.	Previously mentioned work instructions.	As above - the major change has been the introduction of the work instructions for each site. The DWQMP incident management flow chart will be updated to reflect management structure changes where required but it is currently in a sound state.	Compliant	
Confirming the information in the plan used to identify hazards and hazardous events reflects the current circumstances for each scheme (including catchment characteristics, water quality information and infrastructure)	How has the risk assessment and DWQMP been updated to reflect those changes? How are improvement needs identified and how are improvements made and managed? How have such changes been reported to DEWS?	Annual report, management systems viewed.	No change in water source or plant. SunWater's management processes are adequate to capture improvement needs. The annual report is used to notify DEWS of any changes.	Compliant	
End of Part 3					

Audit Checklist

Audit Topic	Audit Questions and Actions	Evidence	Findings and Discussions	Compliance Grade	Recommendation / OFI
Clare Field Audit					
7 Schemes DWQMP Part 4 - Assessment of compliance with the plan					
Implementation of all preventive measures for managing hazards and hazardous events as described in the plan	How are assets maintained in a secure, functional and readily operable state in order to protect water quality outcomes?	SAP System plus, Work Instruction - NMA-FAI-SITE : NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117	There are a number of locations in the reference work instruction to request maintenance where infrastructure is damaged or worn. This goes into a scheduled maintenance plan with various frequencies depending on the asset e.g. site safety, pumps, motors, filter, etc. For the filter, once maintenance, it is checked for water quality performance.	Compliant	
	Are water and wastewater crews, tools and equipment are largely separated? (if relevant).	Verbal confirmation that no wastewater crews are part of SunWater's local presence, and there is no reticulated sewerage in the scheme.	Not relevant.		
	How are parts, fittings and chemicals that might come into contact with drinking water stored? Are they clean, in good condition, and in date?	Site visit and photographs.	From the site visit, the chemicals are stored on top of a bunded pallet inside a shed. These were viewed to be generally clean. The chemical containers was viewed however there were no use by date labels on either the PolyDADMAC or Hypo 10 containers. The PolyDADMAC generally has a shelf life of approximately 3 years, the Hypo degrades quickly and has a maximum life of 12 months, temperature dependent. The operator informed the auditor that the Hypo is delivered in a 200L drum and lasts about 2-3 months. The PolyDADMAC is delivered in a batch of about 9-10 drums and approx. 10/L is used. This frequency is considered generally acceptable.	OFI	It is suggested that Work Instruction - NMA-FAI-SITE : NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include date checking of these chemicals.
	How are the stored materials that may come into contact with water (e.g. pipes and jointing compounds) sourced and quality assured (inventory kept and traced)?		Pipes are sourced from a local supplier. The operator informed the auditor that the pipes supplied are not formally checked for suitability with potable water. The only vetting process known for vendors, is likely to only be for commercial purposes. There is also no procedure for pipeline disinfection when repairs occur.	OFI	It is suggested that Work Instruction - NMA-FAI-SITE : NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include Australian Standard or WaterMark checking of pipes and related products. Add a procedure for pipeline repairs.
	Is the site fully fenced and secured?	Site visit and photographs.	The WTP site is fully fenced and locked. The sampling point at the town water tower is locked.	Compliant	
	How is vermin prevented from getting into the clear water storage? Is the ladder locked? Condition of infrastructure.	Site visit and photographs.	The 2 clear water storage tanks are fully roofed and sealed with a screw on lid. Vent pipes are screened.	Compliant	
	How well are you aware of cross-contamination risks?	Dwg 220508 Rev C and site visit.	1) At the WTP, the pipework was inspected and found that no were no opportunities for any short circuiting to occur. 2) The sand filter is backwashed with treated water. The backwash goes directly to the sludge ponds. The operator informed the auditor that there is sufficient clear water to backwash and clean the filter, and upon re-pressuring the sand filter, there is enough treated water volume upstream of the filter to allow the sand filter time to return to effective operation.	OFI	The is an opportunity to enhance operable effectiveness and reduce risk by allowing a short duration of filtrate water (after backwash is complete) to either return this water to the clarifier or to waste.
	Water stabilisation - is there enough buffering capacity and corrosion inhibition of the distributed water (pH control)?	Nil available.	The operator informed the auditor that no lime dosing is required however acid is used. There was no information available to investigate this question. No information found in AM28 or Work Instruction - NMA-FAI-SITE : NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117.	OFI	There may be an opportunity to check if buffering (60-200 mg/L CaCO3) is needed. No information exists to support a position that no buffering is needed.
	Does the plant have a bypass? If so, is there any chance that untreated water can bypass the plant and enter the drinking water system?	Dwg 220508 Rev C and site visit.	The auditor checked the plan and went through the site pipework with the operator and found nothing to suggest that a bypass exists.	Compliant	
Implementation of operational and maintenance procedures	Can I see where you store the site procedures? Are these up to date? Can you perform all of your inspections using these procedures? Are there any missing?	Viewed the Hummingbird / SAP system on the computer terminal.	Safe work method statement, AM28 etc, are downloaded and printed daily or when used to ensure the latest version is used. The paper versions are kept in the daily log book. Generally, all current tasks can be performed using the printouts. This audit check only covered the daily procedure - details on the O&M Manual are discussed below.	Compliant	
	Do you have jar testing equipment on site? Are they functional? Is there a jar testing procedure?	Yes, viewed at the WTP control building.	The equipment found on site is functional, The operator informed the auditor that there is no jar test procedure and tests are performed infrequently and they add coagulant based on previous water quality outcomes. The auditor later viewed the document Work Instruction - NMA-FAI-SITE : NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, which calls for a jar test in accordance with Section 6.7.2 in the Clare WTP Operation and Maintenance Manual for the process to perform this procedure. This document has not been supplied to the auditor. Whilst the raw water quality is only likely to change over the wet season, i.e. be consistent for around 3/4 of the year, it was felt that the procedures needed to be followed more frequently. The DWQMP states that only heavy metals are to be checked annually. The DWQMP does state that monitoring is to be done after cyclonic and flood event, however in practise, this is not done.	OFI	Better or more frequent operator procedural awareness training is likely to be needed with follow up management oversight. Subject to viewing the content of the Clare WTP Operation and Maintenance Manual, it is recommended that the jar testing frequency be documented, such as 3 monthly and upon first or heavy rain in the catchment.
Implementation of the operational and verification monitoring programs as	What are the operational monitoring instruments reading during the audit, how does that compare to the DWQMP, and how are the instruments and SCADA outputs routinely verified and calibrated?		There is no SCADA for the WTP. Turbidity, pH and Cl2 residual are measured on a hand held device. These reading are entered into SAP which has an automatic alert for parameters that are exceeded.	Compliant	

Audit Checklist

Audit Topic	Audit Questions and Actions	Evidence	Findings and Discussions	Compliance Grade	Recommendation / OFI
described in the plan	What are the SCADA system process control set points during the audit, how do they compare to the DWQMP, and how are they modified and controlled? i.e. Are SCADA set points entered correctly into the system and match the monitoring plan? Check Turbidity, Cl2, and pH. Record real time and last 6 months of data.		There is no SCADA for the WTP. There are alarms for 1) system fault - Raw water starts but dosing equipment does not start. 2) Low water level in storage tanks, 3) Low water level in main reservoir. Manual checks are undertaken in lieu of automated checks. These are compared to AM28. A review of the documentation (DWQMP page 168 and Annual Report) showed that the chlorine residual is frequently below 0.5 mg/L and variable. Whilst the DWQMP page 43 and the annual report shows good chlorine residual at the clear water storage, the township residual is often below 0.5 mg/L. The ADWG on page 200 discusses a 0.5 mg/L residual at 30 minutes = 15 mg/L.min. Following the DWQMP, this result should be at the verification locations such as the school. There have been no recorded positive E.coli results however. Page 44 of the DWQMP states that a water treatment contractor was to be engaged for data capture and plant operations. This has occurred and the operator has informed the auditor that this issue has been discussed. This duty engineer is consulted with when required. There is no active management of clear water storage or town reservoir chlorine residual management in terms of volume (e.g. half filling or filling only one tank etc). For pH, whilst the maximum ADWG is 8.5, the pH is often above pH 8.0 which impairs the effectiveness of chlorine. The operator informed the auditor that active acid dosing doesn't often occur.	OFI	Given that there have been no recorded positive E.coli results, the auditor has not proposed a non-compliance due to a departure from the DWQMP, however it is recommended that the network chlorine residual be further investigated and the DWQMP be updated to reflect a distribution system chlorine residual lower than 0.5 mg/L. Literature suggests a residual >0.2 mg/L however operational targets should be higher than this to avoid compliance target thresholds. Storage volume management should also be investigated. Add a procedure for active pH management.
	How are chemicals, standards and reagents stored and maintained to ensure their quality and efficacy? Consider both treatment chemicals that are added to the water and laboratory chemicals used for monitoring purposes.	Site visit and photographs.	From the site visit, the lab chemicals are stored in an air-conditioned room. These were viewed to be in date. An inventory check list comes out once per month where items can be ordered. There is no procedure to ensure that chemicals are checked for expiry.	OFI	It is suggested that Work Instruction - NMA-FAI-SITE : NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include date checking of lab testing chemicals.
	Are instruments adequately housed? Are they identified for QA control - calibration?	Site visit.	There are no records for monthly instrument calibration. The operator informed that auditor that calibrations are done monthly.	OFI	It is suggested that Work Instruction - NMA-FAI-SITE : NMA-FAI-1D-BUL-CONM-O-ON-WTP OPERATIONAL_Daily _Weekly_ 151117, be updated to include instrument calibration and records.
	How often are the critical limit parameters checked?	Site visit.	This is done daily for cl2, pH and turbidity. Verification is done monthly for E.coli. ADWG (page 95) requires a minimum of weekly testing for E.coli. However it also discusses balancing testing on remote sites against logistics, risk profile, and risk mitigation processes. It also discusses regular physical inspections (operational monitoring) can be more beneficial than infrequent E.coli testing. This appears to be the situation in Clare. The DWQMP does not discuss frequency however the 1st item under "other" in the risk assessment discusses increasing the frequency of NATA drinking water quality testing to help manage Non-compliant or poor drinking water quality from lack of operator training, formal qualifications or industry certification.	OFI	Review the DWQMP in regards to either improving operator training or more frequent verification testing or both.
	Can you show me the calibration records for a turbidity meter (look for compliance frequency)?	See previous 2 items.	See previous 2 items.		See previous 2 items.
	Are there independent checks undertaken by a laboratory?	Envirocheck reports cited.	Yes, these were viewed and checked for negative results.	Compliant	
	Check for a fluoridation plant - if relevant, check for calibration and if QLD Health has also done an audit within the past year.	Verbal confirmation that there is no fluoridation plant for the scheme.	Not relevant.		
Maintaining records using the information management systems as described in the plan	How are records stored and reported as they relate to water quality operational monitoring?	SAP system on computer terminal.	The auditor cited the water quality records on the SAP system.	OFI	There is an opportunity to add target parameters in addition to threshold parameters. This may assist in avoiding poor water quality events.
End of Part 4					
7 Schemes DWQMP Part 5 - Assessment of relevance of the plan as it currently exists					
Assessing whether the service description and details of infrastructure in the plan reflect the current circumstances for each scheme	How does the infrastructure in the field compare to the DWQMP description? Field inspect random samples from the catchment, source, treatment and network for the selected system and compare to the DWQMP description.	Site visit, photographs and Dwg 220508 Rev C.	The infrastructure was inspected from the source water (the irrigation channel) through the WTP and to the town water tower and 2 sampling points (the base of the water tower and the school). The DWQMP description was generally consistent. The schematic Dwg 220508 Rev C - "BURDEKIN HAUGHTON WATER SUPPLY SCHEME, CLARE SECTION, WATER TREATMENT PLANT, PROCESS SCHEMATIC - EXISTING", will require a minor revision. We have marked up the drawing to show the changes needed.	OFI	Update schematic Dwg 220508 Rev C.

Audit Checklist

Audit Topic	Audit Questions and Actions	Evidence	Findings and Discussions	Compliance Grade	Recommendation / OFI
Confirming the information in the plan used to identify hazards and hazardous events reflects the current circumstances for each scheme (including catchment characteristics, water quality information and infrastructure)	Subject to the above question, if there are differences, are there any significant risk issues? When was this last reviewed?		The differences identified above are not significant in terms of water quality risk. The Burdekin catchment down to the Clare intake was discussed and found to not have seen any significant changes.	Compliant	
End of Part 5					

NOTES:

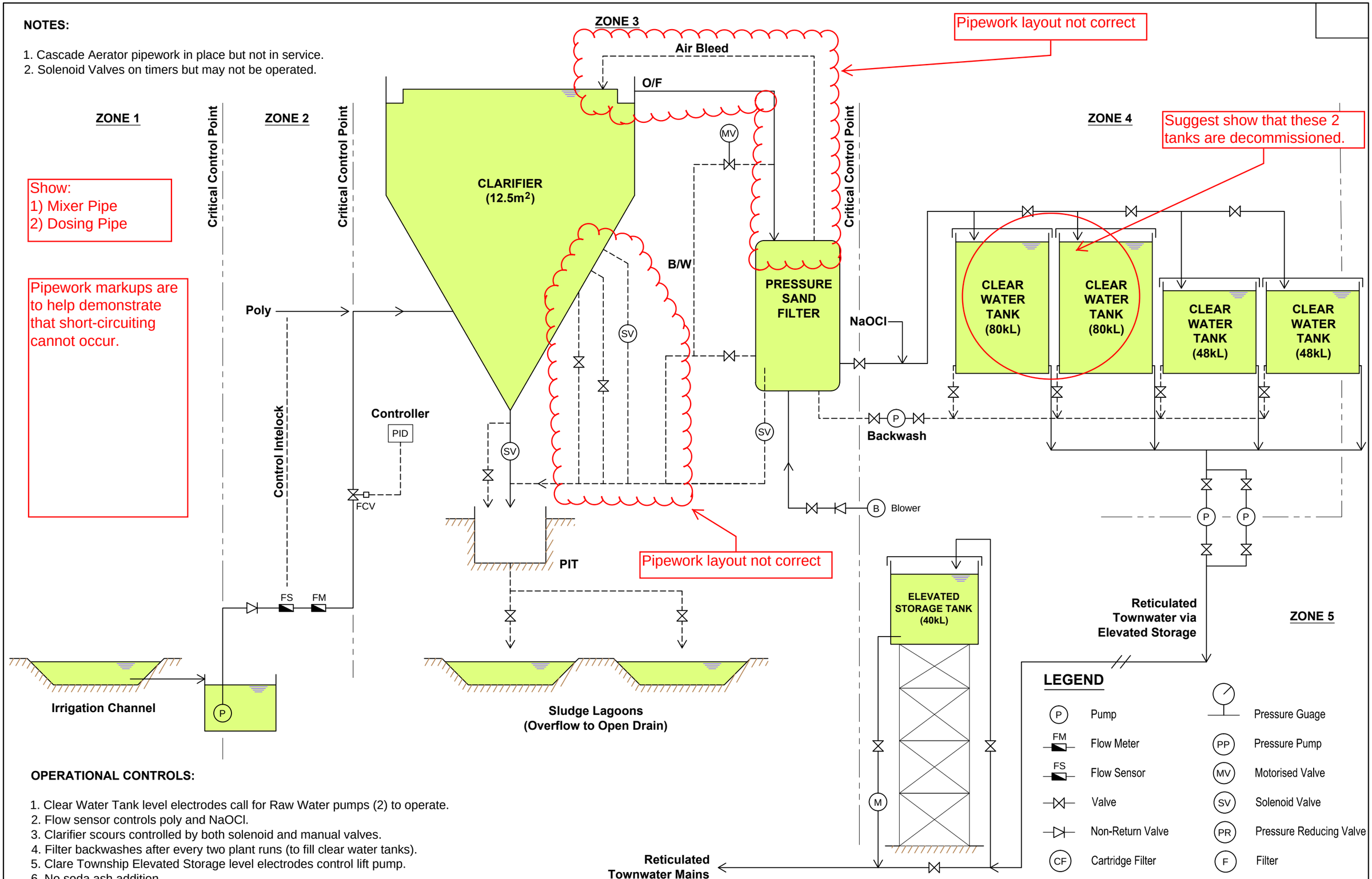
1. Cascade Aerator pipework in place but not in service.
2. Solenoid Valves on timers but may not be operated.

Show:
1) Mixer Pipe
2) Dosing Pipe

Pipework markups are to help demonstrate that short-circuiting cannot occur.

Pipework layout not correct

Suggest show that these 2 tanks are decommissioned.



OPERATIONAL CONTROLS:

1. Clear Water Tank level electrodes call for Raw Water pumps (2) to operate.
2. Flow sensor controls poly and NaOCl.
3. Clarifier scours controlled by both solenoid and manual valves.
4. Filter backwashes after every two plant runs (to fill clear water tanks).
5. Clare Township Elevated Storage level electrodes control lift pump.
6. No soda ash addition.

LEGEND

P	Pump		Pressure Guage
FM	Flow Meter	PP	Pressure Pump
FS	Flow Sensor	MV	Motorised Valve
	Valve	SV	Solenoid Valve
	Non-Return Valve	PR	Pressure Reducing Valve
CF	Cartridge Filter	F	Filter
PFS	Picket Fence Stirrer	FV	Float Valve

T:\Asset Solutions\SW-Electrical Services\Water Treatment Plants\Clare\P&IDs\220508-C.dwg
04 Apr 2013 1:50 PM

179 TURBOT ST,
BRISBANE QLD 4000
TEL: (07) 3120 0000

REVISION				
04-04-13	C	ELEVATED STORAGE TANK ADDED		
05-06-12	B	AMENDMENTS AS SHOWN		CJS
MARCH 07	A	CLEAR WATER TANKS	AJS	NO
DATE		REMARKS	CKD	PSD

REFERENCE DRAWINGS

SCALES (A3 SIZE)

NAMES INDICATE OFFICERS SIGNED ORIGINAL DRAWING

DRAWN	DESIGNED
DAB	CJS
CHECKED	CHECKED
	CJS
APPROVED	
CJS	

BURDEKIN HAUGHTON WATER SUPPLY SCHEME
CLARE SECTION
WATER TREATMENT PLANT
PROCESS SCHEMATIC - EXISTING

CONTRACT NUMBER

DRAWING NUMBER
220508

DATE

A | B | C

Appendix E – Auditor and Auditee Statutory Declarations

Project	2017-0009 Regulatory Audit – SunWater DWQMP (7 Small Registered Water Supply Services)
Subject	Drinking Water Quality Management Plan
Client	SunWater

Oaths Act 1867
Statutory Declaration

QUEENSLAND TO
WIT

I, **Jeffrey Reid Ballard** of 8 Grande Parade, DOUGLAS, QLD, 4814, in the State of Queensland do solemnly and sincerely declare that:

I am **certified under the Drinking Water-Quality Management System Auditor Certification Scheme**.

To the best of my knowledge, information and belief, I have not knowingly included any false, misleading or incomplete information in the report, nor knowingly failed to reveal any relevant information or document to the regulator.

I certify that the report addresses the relevant matters for evaluation and is factually correct and that the opinions expressed in the report are honestly and reasonably held.

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the Oaths Act 1867.

J Ballard
Declarer Signature

Taken and declared at

Townsville
Town or city and suburb

this 8th / August / 2017 , before me.
Date

Witness Signature

JUSTICE OF THE PEACE (QUALIFIED) QUEENSLAND DEPARTMENT OF JUSTICE QUEENSLAND Reg No. 10341

Justice of the Peace / ~~Commissioner for Declarations~~

Project	2017-0009 Regulatory Audit – SunWater DWQMP (7 Small Registered Water Supply Services)
Subject	Drinking Water Quality Management Plan
Client	SunWater

Oaths Act 1867
Statutory Declaration

QUEENSLAND TO
WIT

I, GORDON DELANEY (name of the person making the declaration on behalf of the provider) of 179 TURBOT ST, BRISBANE (Address)

in the State of Queensland do solemnly and sincerely declare that:

I am the MANAGER ENVIRONMENT + WATER PLANNING (position title of person authorised to sign this declaration on behalf of the provider) of SUNWATER (Provider) 17 020 276 523 (ABN)

Through the course of the regular audit of the drinking water quality management plan by Jeffrey Reid Ballard for the audit period ending 2017 (year of audit)

, which has resulted in this regular audit report dated, 31/07/2017 (date)

, that officers and employees of SUNWATER (provider name)

have not knowingly given any false or misleading information, and have given all relevant information to the auditor who conducted the regular audit of the plan mentioned above.

And I make this solemn declaration conscientiously believing the same to be true, and by virtue of the Oaths Act 1867.

Declarer Signature

Taken and declared at

BRISBANE
Town or city and suburb

this 3 / 08 / 2017 (Date), before me.

Witness Signature

JACQUELINE THERESE ROPER
C.DEC NO 65328

Justice of the Peace / Commissioner for Declarations