

SOUTH WAIRARAPA DISTRICT COUNCIL

15 MAY 2019

AGENDA ITEM D2

MARTINBOROUGH WATER – LUTRA CORRECTIVE ACTIONS RECOMMENDATIONS

Purpose of Report

To provide Councillors with a summary of responses to the corrective actions in the Lutra report.

Recommendations

Officers recommend that Council:

1. *Receive the Martinborough Water – Lutra Corrective Actions Recommendations Report.*
2. *Note the responses to each corrective action.*

1. Executive Summary

Since 2011, the Martinborough water supply (MWS) has been treated with ultraviolet (UV) treatment at the water treatment plant (WTP) located near the bores. It is the only water supply in the Wairarapa that is not chlorinated. Two recent incidents where *E.coli* has been detected in the MWS have led to boil water notices (BWNs) being required to protect the health of residents and visitors to Martinborough, as *E.Coli* indicates contamination of the water supply.

The advice from all experts and also the Havelock North Inquiry (HNI) is that a multiple barrier approach is required. The most effective and timely solution is for the MWS to be chlorinated.

Following the first *E.coli* incident, water consultants Lutra were requested to provide a report about the event and learnings from it. In the report there were a number of recommendations to improve the water supply for the district, as well as Martinborough.

2. Background

Lutra were engaged to provide an independent review of the contamination incident in February 2019. South Wairarapa District Council (SWDC) had the following objectives for this incident review report:

- To describe the incident.
- To identify potential intervention points that could have helped prevent this incident happening.

- To recommend corrective actions that will prevent a repeat of the incident.

The corrective actions from the report are related to the public inquiry into the Havelock North contamination incident identified six principles for safe drinking water (Government Inquiry into Havelock North Drinking Water, 2017) which were used as that benchmark. These are shown in Table 1 (Table 8 in the Lutra report) and reproduced in Appendix 2.

3. Responses

Some of the corrective actions are on-going, i.e. operator training and some have been adopted. Some of the actions are planned to coincide with the permanent solution for Martinborough water supply. This approach is proposed for efficiency to ensure there is no wasted capital expenditure and solutions are fully considered.

A response to each action is shown in Appendix 1 against the Lutra recommendations.

4. Appendices

Appendix 1 – Martinborough Water – Lutra Corrective actions and proposed solutions

Appendix 2 - Six principles for safe drinking water from the Government Inquiry into Havelock North Drinking Water, 2017

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Appendix 1 – Martinborough Water – Lutra Corrective Actions and Proposed Solutions

Table 1 – Corrective Actions from Lutra report March 2019		Proposed Solutions
No.	Details	
Principle 1: A high standard of care must be embraced		
1.1	<p>SWDC should review the importance of drinking water supply within their organisation and those of their contractors specifically:</p> <ul style="list-style-type: none"> a) Review the findings of the Havelock North Stage 1 and Stage 2 Reports. b) Ensure all staff and contractors involved with the supply of drinking water understand their personal responsibility for the health of the public. c) Ensure that the contracts with suppliers and contractors are set up for 24/7 support. d) Ensure that all staff are adequately trained to perform their duties including calibrations. 	<ul style="list-style-type: none"> a) The reports were reviewed by SWDC. The reports have been discussed with the contractors. These discussions are ongoing. b) This has been communicate and will be part of on-going training. c) This is part of contract, and will continue to form an important part of this. d) This is part of on-going training. It should be noted that the operators passed the assessment on 28th March 2019.
1.2	<p>Ensure that the plant documentation is current and relevant, specifically:</p> <ul style="list-style-type: none"> a) Ensure the process schematics (P&IDs) are available and current. b) Ensure the functional description describing plant operation is available and current. c) Provide a detailed operations manual that details the plant functionality, troubleshooting and standard operating procedures for the operators. d) Provide a schedule of maintenance checks, verifications and calibrations for the whole plant. 	<ul style="list-style-type: none"> a) There is a Process and instrumentation diagram (P&ID), this is being updated as part of the permanent solution for Martinborough water supply. b) This is being updated as part of the permanent solution for Martinborough water supply. c) There is a current Operation and Maintenance (O&M) manual. This was kept at the Waiohine Water Treatment Plant, a copy has now been provided for the MBA site. d) This schedule is being developed as part of the Infrastructure Data software system was purchased in April 2019.
1.3	<p>Ensure compliance data is analysed correctly (by a system that has been through adequate quality assurance) and presented in a way that is easily understood, specifically:</p> <ul style="list-style-type: none"> a) Use an independent compliance reporting system to report compliance. 	<p>A software programme “Infrastructure Data” was purchased in April 2019 and is now being used to monitor compliance.</p>
1.4	<p>Replace existing outdated control system with a modern programmable logic controller (PLC) and SCADA system, specifically:</p>	<ul style="list-style-type: none"> a) This is planned to be part of the upgrade for the permanent solution for Martinborough water supply. b) This is planned to be part of the upgrade for the permanent solution for Martinborough water supply.

Table 1 – Corrective Actions from Lutra report March 2019		Proposed Solutions
No.	Details	
	<ul style="list-style-type: none"> a) Any failure will lead to a plant shutdown and the inability to deliver unsafe drinking water. b) Ensure that as-built documentation is accurate such that troubleshooting problems is not constrained because of lack of information. 	
1.5	<p>Ensure that calibrations and verifications are carried out and recorded in accordance with the standards, specifically:</p> <ul style="list-style-type: none"> a) Calibration and verifications are carried out by DWA approved personnel. b) Equipment required for calibrations and verifications is available. c) Calibration and verification records are available for inspection. d) Staff are competent and authorised to carry out calibrations. 	<ul style="list-style-type: none"> a) This is part of on-going training. Note that the operators passed the assessment on 28th March 2019. b) All equipment has been reviewed, provided and calibrated. c) These were available at the Waiohine plant, and a copy will now be available at the Martinborough plant. The new program will also make it available online for contractor managers. d) This is part of on-going training. Note that the operators passed the assessment on 28th March 2019.
Principle 2: Protection of the source water is of paramount importance		
2.1	SWDC should perform a catchment risk assessment and source protection zone study to develop a better understanding of the source risk.	SWDC has a catchment risk assessment produced by consultants Opus, unfortunately this was not requested by Lutra prior to the production of the report so they were not aware of it.
Principle 3: Maintain multiple barriers against contamination		
3.1	Chlorination of the supply is essential to provide a robust multi-barrier treatment process and to protect against contamination of the reticulation system. It is noted that dissolved iron and manganese levels in the source water will cause aesthetic issues when chlorine is added to the water. To avoid these an iron and manganese removal process will need to be installed at the water treatment plant.	<p>The temporary chlorination of Martinborough Water supply planned for 13 May 2019 provides the multiple barrier approach. This was approved by Council at the extraordinary meeting on 24 April 2019.</p> <p>A multiple barrier approach is planned and will be part of the upgrade for the permanent solution for Martinborough water supply. The draft Annual plan budget for 2019/20 provides for installation of a manganese removal plant to enable permanent chlorination of the MWS. Council have committed to consulting with the community prior to any decision to permanently chlorinate. Analysis of manganese levels in each bore indicates that one bore with low manganese levels should be sufficient to provide water through the winter until the manganese plant can be installed.</p>

Table 1 – Corrective Actions from Lutra report March 2019		Proposed Solutions
No.	Details	
Principle 4: Change proceeds contamination		
4.1	<p>Ensure operators, supervisors, and managers are sufficiently trained to understand the importance of change on a treatment plant, specifically:</p> <ul style="list-style-type: none"> a) What constitutes a change. b) What action to take in the event of a change. c) Authority of operators to respond to a change. d) Understanding the change cannot compromise drinking water safety. 	<ul style="list-style-type: none"> a) Operators are now aware of this and it is part of on-going operator training. b) See above c) Operators have that authority, and it will be part of on-going operator training. d) Operators are aware of this and it will be part of on-going operator training.
Principle 5: Suppliers must own the safety of drinking water		
5.1	<p>Operators, supervisors and managers must understand their drinking water supply and understand the importance of each critical element, specifically:</p> <ul style="list-style-type: none"> a) Understanding critical instruments and their function in the water supply. b) Understanding how the plant will respond to upset conditions (e.g. resumption of power after a power cut). c) Eliminate the ability to by-pass the UV treatment process. d) Understanding that a positive <i>E.coli</i> means the water is contaminated with faecal matter. 	<ul style="list-style-type: none"> a) Operators are aware of this and passed their assessments at the end of March 2019. It will also be part of on-going operator training. The water safety plan is also being updated. b) Operators are aware of this and this will be part of on-going operator training. c) This has been actioned and bypass risk minimised. d) This is now known by operators and will be part of on-going operator training.
Principle 6: Apply a preventative risk management approach		
6.1	<p>Undertake a systematic assessment of risks throughout the drinking water system, specifically:</p> <ul style="list-style-type: none"> a) Identify source risks, treatment risks and reticulation risks. b) Identify mitigation measures for each risk. c) Monitor the performance of each barrier. 	<ul style="list-style-type: none"> a) The water safety plan is being updated at present. b) The water safety plan is being updated at present. c) The water safety plan is being updated at present and the monitoring will form part of the permanent solution.

**Appendix 2 - Six principles
for safe drinking water from
the Government Inquiry into
Havelock North Drinking
Water, 2017**

5 Potential Intervention Points

In evaluating the events and actions before, during and after the incident, a benchmark was required. The public inquiry into the Havelock North contamination incident identified six principles for safe drinking water (Government Inquiry into Havelock North Drinking Water, 2017) which were used as that benchmark. These are repeated here for information:

Principle 1: A high standard of care must be embraced

Unsafe drinking water can cause illness, injury or death on a large-scale. All those involved in supplying drinking water (from operators to politically elected representatives) must therefore embrace a high standard of care akin to that applied in the fields of medicine and aviation where the consequences of a failure are similarly detrimental to public health and safety. Vigilance, diligence and competence are minimum requirements and complacency has no place.

Principle 2: Protection of source water is of paramount importance

Protection of the source of drinking water provides the first, and most significant, barrier against drinking water contamination and illness. It is of paramount importance that risks to sources of drinking water are understood, managed and addressed appropriately. However, as pathogenic microorganisms are found everywhere, complete protection is impossible and further barriers against contamination are vital.

Principle 3: Maintain multiple barriers against contamination

Any drinking water system must have, and continuously maintain, robust multiple barriers against contamination appropriate to the level of potential contamination. This is because no single barrier is effective against all sources of contamination and any barrier can fail at any time. Barriers with appropriate capabilities are needed at each of the following levels: source protection; effective treatment; secure distribution; effective monitoring; and effective responses to adverse signals. A "source to tap" approach is required.

Principle 4: Change precedes contamination

Contamination is almost always preceded by some kind of change and change must never be ignored. Sudden or extreme changes in water quality, flow or environmental conditions (for example, heavy rainfall, flooding, earthquakes) should arouse particular suspicion that drinking water might become contaminated. Change of any kind (for example, personnel, governance, equipment) should be monitored and responded to with due diligence.

Principle 5: Suppliers must own the safety of drinking water

Drinking water suppliers must maintain a personal sense of responsibility and dedication to providing consumers with safe water. Knowledgeable, experienced, committed and responsive personnel provide the best assurance of safe drinking water. The personnel, and drinking water supply system, must be able to respond quickly and effectively to adverse monitoring signals. This requires commitment from the highest level of the organisation and accountability by all those with responsibility for drinking water.

Principle 6: Apply a preventive risk management approach

A preventive risk management approach provides the best protection against waterborne illness. Once contamination is detected, contaminated water may already have been consumed and illness may already have occurred. Accordingly, the focus must always be on preventing contamination. This requires systematic assessment of risks throughout a drinking water supply from source to tap; identification of ways these risks can be managed; and control measures implemented to ensure that management is occurring properly. Adequate monitoring of the performance of each barrier is essential. Each supplier's risk management approach should be recorded in a living WSP which is utilised on a day to day basis.