

SOUTH WAIRARAPA DISTRICT COUNCIL

20 NOVEMBER 2019

AGENDA ITEM B7

COMPLIANCE WITH DRINKING WATER STANDARDS

Purpose of Report

To inform Councillors of the compliance status of SWDC water supplies for 2018/19, and seek approval for additional funding for urgent work needed to provide safe drinking water.

Recommendations

Officers recommend that the Council:

1. *Receive the 'Compliance with Drinking Water Standards' Report.*
2. *Note the compliance status of our water supplies for FY2018/19, and that urgent work is needed to achieve compliance and provide safe drinking water.*
3. *Approve additional funding of \$500,000 for the 2019/20 financial year for urgent work needed to improve treatment plant performance generally (including interim improvements at Memorial Park, Greytown and improvements to the Pirinoa water supply), to complete detailed design work for permanent improvements needed at Memorial Park, and to commence the permanent improvement work required.*
4. *Note that the cost of permanent improvement work needed at Memorial Park, Greytown, is to be confirmed following completion of design work, and the permanent improvement work will extend into FY 2020/21.*

1. Executive Summary

The safety of the district's drinking water is a top priority for our Council. We monitor its safety through assessment of compliance with the Drinking Water Standards of New Zealand (DWSNZ), as reported by the Ministry of Health's Central North Island Drinking Water Assessment Unit.

A summary of the compliance status of our water supplies for the 2018/19 financial year is provided in Figure 1:

Table 1: Compliance status 2018-19

Water Supply	Compliant?			Multi-barrier approach in place?
	Bacterial	Protozoa	Chemical	
Featherston/Greytown (Waiohine)	No	No	No	Yes – but improvements needed in alarms, controls and data capture
Greytown (Memorial Park)	No	No	Yes	No
Martinborough	No	No	Yes	No*
Pirinoa	No **			No**

*A multi-barrier approach is now in place following the decision to chlorinate the supply

**Pirinoa does not feature in the CNIDWA report, but we have been advised that the existing treatment in place does not achieve DWSNZ requirements

From the above, it is clear that there is work to be done in order for us to achieve compliance with the drinking water standards and ensure we provide safe and healthy drinking water to our communities.

Earlier this year, we made the decision to join Wellington Water with the objective of improving management and delivery of water services to our communities. We became a shareholder of Wellington Water on 1 October 2019.

Since then, Wellington Water has been making changes to improve the performance of our treatment plants within the current funding allowance. They have identified further urgent improvement work that needs to be implemented quickly to provide safe drinking water and achieve compliance with the standards.

To implement the urgent work identified, initial additional capital investment of \$500,000 is required this financial year. Once Wellington Water have completed options assessments and preliminary design to confirm the full scope of work required, they will advise Council of the full costs of providing safe and healthy drinking water that complies with the DWSNZ.

2. Background

A multi-barrier approach is essential for ensuring safe drinking water for our communities, and is one of the six principles of safe drinking water. As indicated in Table 1, some of our water supplies currently lack multi-barrier protection.

The importance of the six principles of safe drinking water were reinforced following the Havelock North contamination incident in 2016 and subsequent inquiry, and through our own experience with the two boil water notices in Martinborough earlier

this year. These principles will be a key focus of the drinking water regulator that is soon to be established.

On 7 October 2019 we received our annual report on drinking water compliance from the Ministry of Health's Central North Island Drinking Water Assessment Unit (*Report on Compliance with the Drinking-Water Standards for New Zealand 2005 (revised 2018) and duties under the Health Act 1956 for the period 01/07/2018 to 30/06/2019*).

This report shows that for the 2018/19 financial year the Waiohine (Featherston and Greytown), Memorial Park (Greytown), and Martinborough water treatment plants did not meet the requirements for bacteriological and protozoal compliance in the Drinking Water Standards for New Zealand 2005 (revised 2018, DWSNZ). The requirements for chemical compliance were also not met for the Featherston water distribution zone, and the requirements for bacteriological compliance were not met for the Martinborough, Featherston and Greytown distribution zones.

We also operate the Pirinoa supply, though this does not feature in the report, perhaps because the supply falls under the requirements of a 'Small Water Supply' of less than 500 people.

Following the boil water notice events in Martinborough earlier this year, we now have multi-barrier protection in place in Martinborough. Although by the end of the 2018/19 year we had multi-barrier protection in place, the fact that for part of the year we did not, means we do not comply for the year. In order to comply we need to meet all the drinking water standards throughout the whole year.

In April this year, Council made the decision to become a shareholder of Wellington Water, with the objective of improving management and delivery of water services to our communities.

Since we became a shareholder on 1 October 2019, Wellington Water has commenced operation of the treatment plants and supply networks on our behalf, and as part of this has completed the following work:

- visited each of the water treatment plants,
- arranged for process audits of our water treatment plants,
- sought feedback on drinking water matters from the Drinking Water Assessor at Regional Public Health, and
- collated feedback from the treatment plant operators.

Various improvement works required have been identified, with the key issues identified being:

Table 2 – Issues identified from treatment plant process audits

Water supply/treatment plant	Issues identified
Greytown/Memorial Park	<ol style="list-style-type: none"> 1) The Memorial Park treatment plant lacks a Protozoa barrier 2) Chlorine is the only barrier to contamination in place. If this system does not function correctly Wellington Water would have no choice but to issue a boil water notice. It's therefore important to put additional protection in place as soon as possible, or to stop using the supply. Not using the supply is not a viable option at present due to lack of sufficient supply capacity from the Waiohine Water Treatment Plant. Upgrading the Memorial Park supply to compliant status is considered preferable to abandoning it, as this will provide operational flexibility and increased resilience of the Featherston and Greytown water supply generally. 4) The alarms and controls have issues associated with the electronic equipment that need addressing through equipment upgrade and/or replacement. Temporary improvements have been made to the existing equipment to manage supply risk in the meantime. 5) The chemical storage and dosing arrangements do not currently comply with modern standards.
Featherston and Greytown/Waiohine	<ol style="list-style-type: none"> 1) The plant does not currently have sufficient capacity to supply both Greytown and Featherston and needs to be supplemented from the Memorial Park water supply. Installation of an additional supply bore together with lining of an existing storage pond to convert it to a treated water storage facility was initiated earlier this year in an effort to provide additional supply capacity. This work is yet to be completed, is unlikely to be ready for the upcoming peak summer demand period. The sustainable yield achievable is still to be confirmed and will not be known until the new bore is operational. This means there is an ongoing reliance on the Memorial Park bore to supply Greytown. 2) The proposed treated water storage facility will require additional Chlorine dosing equipment. 3) The alarms and controls have issues associated with the electronic equipment that need addressing through equipment upgrade and/or replacement. Temporary improvements have been made to the existing equipment to manage supply risk in the meantime. 4) The pH control system (soda ash) needs replacement. 5) Old equipment and chemicals associated with the mothballed ultrafiltration plant are still onsite, presenting a health and safety hazard and taking up space in the treatment plant building. These need to be removed and disposed off in a safe way.
Martinborough/Ruamahanga	<ol style="list-style-type: none"> 1) The Martinborough Water Treatment Plant telemetry system has reliability issues that have resulted in data loss which has impacted the compliance status for FY 2019/20. Though not impacting the provision of safe water, improvements are needed to avoid future loss of data that will continue to impact compliance status. 2) There are further improvements proposed in the Lutra report that need to be actioned, once the manganese removal plant is installed. 3) New chlorine dosing equipment is needed at the Martinborough reservoirs to reduce health and safety risks for operators.
Pirinoa	<ol style="list-style-type: none"> 1) There are improvements needed to the controls in place to determine or adjust treatment performance. 2) Chlorine is currently dosed manually three into the reservoir. New automated chlorine dosing equipment is needed at the Pirinoa treatment plant to reduce health and safety risks for operators. 3) The ozone treatment facility does not achieve DWSNZ requirements and therefore cannot be relied on to provide a multi-barrier approach. An additional barrier needs to be put in place.

On a general level, Wellington Water considers that the water supplies are vulnerable as they include shallow bores, with little or no storage or flow buffering prior to delivery to customers, and are at risk due to system changes and operational failures with limited operational flexibility at present, due to the way they have developed over time. This relates to the fourth principle of safe drinking water, 'change precedes contamination'.

Wellington Water has indicated that our key risks currently relate to the lack of an adequate multi-barrier approach at Memorial Park in Greytown and at Pirinoa. While we continue to monitor the water quality within Greytown and Pirinoa including testing for possible contamination and testing residual chlorine levels, if the chlorine systems were to fail or malfunction, we would have no effective barriers to contamination in place and would have no choice but to issue a boil water notice as part of our duty of care to mitigate public health risks.

Wellington Water has therefore recommended urgent improvement works are implemented to manage these risks.

There are also a number of lesser risks that need attention to improve system performance and ensure we provide safe drinking water that meets the DWSNZ.

3. Discussion

3.1 Options

Officers have considered the advice from Wellington Water and consider that it is not an option to either do nothing or wait until the next financial year to commence the work to improve our water supplies.

Officers are therefore asking Council to approve additional funding in FY 2019/20 to allow completion of initial urgent improvement works, and to confirm additional funding to address all key risks.

Approval of additional funding in FY 2019/20 will allow:

1. Completion of urgent and interim improvement work at Memorial Park to provide safe water,
2. Completion of urgent improvement work at Pirinoa to provide safe water,
3. Completion of important improvements to electrical, control, and alarm systems at the treatment plants, and
4. Completion of design for permanent improvements needed at Memorial Park treatment plant, providing greater confidence in cost estimates for the remainder of the work to be completed once Council approval has been obtained.

4.1 Consultation

The district water supply is a significant activity under the Council's Annual Plan and Long Term Plan. As such, decisions relating to the water supply are "significant" for the

purposes of decision-making and consultation requirements under the Local Government Act 2002. The Council's Significance and Engagement Policy states at paragraph 6.7 that consultation is not appropriate when there is a threat to public health or safety. Consultation on the decision to approve funding for urgent improvement work is therefore not required. Further consideration will be given to community engagement and consultation as the work develops.

4.2 Legal Implications

Legal implications relating to the Local Government Act are described above. That Act also places obligations on the Council to maintain water services and carry out assessments, from a public health perspective, on the adequacy of the water service.

There are other legal implications associated with the Health Act that required urgent actions to improve the safety of drinking water supplied to our communities.

4.3 Financial Considerations

An additional \$500,000 in capital expenditure is required for FY 2019/20. Wellington Water will confirm the additional funding required following completion of preliminary design, and a further paper will be presented to Council to approve the amount required to complete the remainder of the work. Depending on timing, approval for some of the additional Capital expenditure may be part of the Annual Plan process for FY 2020/21.

The additional \$500,000 capital expenditure is proposed to be funded from the infrastructure reserve and will not impact on rates.

The \$500,000 will cover the following:

- Completion of urgent and interim improvement work at Memorial Park to provide safe water,
- Completion of urgent improvement work at Pirinoa to provide safe water,
- Completion of important improvements to electrical, control, and alarm systems at the treatment plants, and
- Completion of design for permanent improvements needed at Memorial Park treatment plant

Agreeing to this expenditure will minimise risk to provision of safe drinking water pending completion of permanent improvement works, while also allowing design work to be completed to increase confidence in the cost associated with permanent upgrade work at Memorial Park, Greytown.

At present, high level estimates of the total capital expenditure to complete all of the proposed work range from \$2.8 million to \$5.6 million. This range is due to a 100% contingency until there is more certainty around the works to be done. Council will be advised once more accurate estimates are available. (See attached briefing paper Appendix 1 and slide 12 "Cost estimating in Appendix 2 for more information).

5. Conclusion

Work is needed for us to achieve compliance with the drinking water standards and ensure we provide safe and healthy drinking water to our communities.

Earlier this year we made the decision to join Wellington Water with the objective of improving management and delivery of water services to our communities. We became a shareholder of Wellington Water on 1 October 2019.

Wellington Water has identified urgent improvement work that needs to be implemented quickly to provide safe drinking water and achieve compliance with the standards.

To implement the urgent work identified, additional capital investment of \$500,000 is required this financial year, with further investment required for permanent improvements to the Memorial Park bore. The actual amount required will be confirmed following completion of further design work.

Officers are seeking approval from Council to spend for \$500,000 of unbudgeted Capital expenditure to enable this work to proceed.

6. Supporting Information

6.1 Long Term Plan - Community Outcomes

6.1.1. *Healthy & Economically Secure People*

The recommended approach will minimise public health risks and aligns with Wellington Water's service goal 'We provide safe and healthy drinking water'.

It will also better protect the local economy from negative impacts associated with boil water notices due to a lack of multi-barrier approach, and will increase the water supplies' ability to cope with change.

7. Appendices

Appendix 1: Wellington Water briefing to SWDC – 13 November 2019

Appendix 2: Wellington Water briefing to SWDC (powerpoint)

Contact Officer: Harry Wilson, CEO

Appendix 1

Wellington Water Briefing on South Wairarapa District Council Water Supply Matters (13 Nov. 2019)

MEMO

TO South Wairarapa District Council

COPIED TO Ian McSherry, Chief Advisor Service Delivery

FROM Laurence Edwards, Chief Advisor Drinking Water

DATE 13 November 2019

FILE NUMBER

FOR YOUR INFORMATION

Briefing on South Wairarapa District Council Water Supply Matters

South Wairarapa District Council (SWDC) became a shareholder of Wellington Water on 1 October 2019.

As your trusted advisor, it is our role to report to Council on how your assets are performing against our twelve service goals, and to advise where it's necessary to invest to raise the performance against these.

Our number one service goal is to provide safe and healthy water. This goal has had particular focus nationally as a result of shortcomings identified through the Havelock North inquiry in 2016. The Havelock North inquiry highlighted the importance of the six principles of drinking water safety, which are:

- 1) A high standard of care must be embraced
- 2) Protection of source water is of paramount importance
- 3) Maintain multiple barriers against contamination
- 4) Change precedes contamination
- 5) Suppliers must own the safety of drinking water
- 6) Apply a preventative risk management approach

The shortcomings identified by the inquiry were a key factor in the government launching their three waters review, and in their recent decision to establish a new drinking water regulator that will be implemented in the near future.

SWDC's Water Supplies

SWDC currently has public water supplies serving the communities of Featherston, Greytown, Martinborough, and Pirinoa (Attachment A).

Greytown and Featherston are both supplied from the Waiohine Water Treatment Plant which draws water from a series of bores near the Waiohine River. The water is treated using Ultraviolet (UV) and chlorine

disinfection. Much of the existing plant was constructed in 2017 to replace an earlier Ultrafiltration plant on the site that was decommissioned.

Water from the Waiohine plant receives a chlorine boost on its way to Featherston at the Boar Bush reservoir.

There is also a single shallow bore located at Memorial Park in Greytown that is treated using chlorine only, with no Protozoa barrier in place (and is therefore non-compliant). This bore is currently relied upon to operate every day to supply Greytown due to inadequate capacity at the Waiohine plant to supply both Featherston and Greytown, though supply is supplemented from the Waiohine Water Treatment Plant at times using a pressure control valve when the system pressure drops below set points.

Martinborough is supplied from bores located near the Ruamahanga River. The water is treated with UV and chlorine (multi-barrier approach). Chlorine is now permanently dosed into the supply following the two boil water notice incidents in early 2019. However supply is currently restricted to one bore only due to the higher manganese content in the water from the other bores that requires treatment to avoid discolouration of the water and associated complaints. This will be resolved once the manganese treatment plant is constructed, allowing unrestricted supply from all the bores.

The small supply scheme at Pirinoa is supplied from a single shallow bore. The water is treated using Ozone and Chlorine.

On a general level, our observations are that the water supplies are vulnerable as they include shallow bores, with little or no storage or flow buffering prior to delivery to customers, and are at risk due to system changes and operational failures with limited operational flexibility at present, due to the way they have developed over time.

Compliance with Drinking Water Standards - (2018/19)

The Ministry of Health relies on assessment of water supplies against the Drinking Water Standards for New Zealand 2005 (Revised 2018, DWSNZ) to determine if the water supplied to communities is safe.

The Central North Island Drinking Water Assessment Unit's *Report on Compliance with the Drinking-Water Standards for New Zealand 2005 (revised 2018) and duties under the Health Act 1956 for the period 01/07/2018 to 30/06/2019* was received on 7 October 2019.

This report shows that all water treatment plants in South Wairarapa did not meet the requirements for bacteriological and protozoal compliance in the DWSNZ. The requirements for chemical compliance were also not met for the Featherston water distribution zone, and that the requirements for bacteriological compliance were not met for the Martinborough, Featherston and Greytown distribution zones.

The Pirinoa supply does not feature in the report, perhaps because the supply falls under the requirements of a 'Small Water Supply' of less than 500 persons (as it supplies approximately 80 people) and according to Ministry of Health information, the registered water supplier is 'Pirinoa Community'. However the scheme has been operated by SWDC and new regulatory requirements will place responsibility for compliance of the scheme firmly with Wellington Water and SWDC.

The non-compliance means that the water supplied to the communities of South Wairarapa was not demonstrably safe, and work is needed to improve this.

Table 1: Compliance status 2018-19

Water Supply	Compliant?			Multi-barrier approach in place?
	Bacterial	Protozoa	Chemical	
Featherston/Greytown (Waiohine)	No	No	No	Yes – but improvements needed in alarms, controls and data capture
Greytown (Memorial Park)	No	No	Yes	No
Martinborough	No	No	Yes	No*
Pirinoa	No **			No**

*A multi-barrier approach is now in place following Council’s decision to permanently chlorinate the supply

**Pirinoa does not feature in the CNIDWA report, but the existing treatment in place does not achieve DWSNZ requirements

Our Work so Far, and What We Have Learned

Since SWDC became a shareholder of Wellington Water on 1 October 2019, we have visited each of the treatment plants and arranged for audits by a specialist water treatment consultancy, sought feedback on known historical issues and concerns from the Drinking Water Assessor, and collated feedback from the treatment plant operators.

From this we have learned that:

[Greytown Supply – Memorial Park]

- 1) The Memorial Park bore/treatment plant is non-compliant as it lacks a Protozoa barrier, and the plant has had issues with the chlorine dosing system reliability that resulted in residual levels in the network that were at times below levels required by DWSNZ.
- 2) Chlorine is the only barrier to contamination in place at the Memorial Park bore. If this system does not function correctly we would have no choice but to issue a boil water notice as part of our duty of care. It’s therefore important to provide additional protection in place as soon as possible, or to stop using the supply which is not possible due to lack of available supply capacity from the Waiohine Water Treatment Plant.

- 3) Upgrading this supply to compliant status is considered preferable to abandoning it, as this will provide operational flexibility and increased resilience of the Featherston and Greytown water supply generally.
- 4) The alarms and controls have issues associated with the electronic equipment that need addressing through equipment upgrade and/or replacement.
- 5) The chemical storage and dosing arrangements at the Memorial Park bore do not comply with modern standards.

[Featherston and Greytown Supply - Waiohine]

- 6) The Waiohine Water Treatment Plant does not currently have sufficient capacity to supply both Greytown and Featherston alone. Installation of an additional supply bore at the plant was initiated earlier this year, together with lining of an existing storage pond to convert it to a treated water storage facility, in an effort to provide additional supply capacity.
- 7) This work is yet to be completed and is unlikely to be ready for the upcoming peak summer demand period. The sustainable yield achievable from this arrangement is to be confirmed. This means there is an ongoing reliance on the Memorial Park bore to supply Greytown.
- 8) The treated water storage facility will require additional Chlorine equipment dosing into supply prior to delivery to Greytown and Featherston.
- 9) The Chlorine store is non-compliant with relevant standards due to ventilation issues, and potentially other issues (for example the storage fire rating needs to be checked and confirmed).
- 10) The alarms and controls have issues associated with the electronic equipment that need addressing through equipment upgrade and/or replacement.
- 11) The pH control system (Soda ash) is ineffective, resulting in water leaving the treatment plant being corrosive, and this is likely to be impacting the condition of pipelines and pipework downstream.
- 12) Old equipment and chemicals associated with the mothballed ultrafiltration plant are still onsite, presenting a health and safety hazard and taking up space in the treatment plant building.
- 13) The Boar Bush Chlorine contact tank roof (Featherston) is in poor condition, the chlorine dosing system does not comply with relevant standards, and the raw water (untreated) supply from Boar Bush is not sufficiently isolated from the treated water supply to adequately mitigate contamination risk.

[Martinborough Supply - Ruamahanga]

- 14) The Martinborough Water Treatment Plant telemetry system has reliability issues. This resulted in loss of data that has impacted the compliance status for FY19/20. Improvements are needed to avoid future loss of data that will continue to impact compliance status.
- 15) There are further improvements that still need to be actioned since the boil water notice incidents earlier this year, once the manganese treatment plant is installed.
- 16) New chlorine dosing equipment is needed at the Martinborough reservoirs to reduce health and safety risks for operators.

[Pirinoa Supply]

- 17) There are very limited controls in place at the Pirinoa treatment plant to determine treatment performance, and chlorine is dosed manually three times per week into the reservoir at the plant by the operators.
- 18) The ozone treatment facility does not achieve DWSNZ requirements and therefore cannot be relied on to provide a multi-barrier approach.

- 19) New chlorine dosing equipment is needed at the Pirinoa treatment plant to reduce health and safety risks for operators.

What are the key risks we are currently exposed to?

The supplies at Greytown (Memorial Park) and Pirinoa are of particular concern and require urgent upgrade to provide multi-barrier protection to achieve safe water.

We continue to monitor the water quality within Greytown and Pirinoa including testing for possible contamination and testing residual Chlorine levels. If the Chlorine systems for either were found to be inadequate, we would have no effective barriers to contamination in place and so would have no choice but to issue a boil water notice as part of our duty of care to mitigate public health risks.

Work completed and underway

- We have completed initial modifications to some of the alarms, controls and telemetry systems at the Memorial Park and Waiohine Treatment Plants to reduce some significant risks at those sites.
- We are in the process of altering the soda ash dosing system at the Waiohine treatment plant to improve its performance.
- We are working to check the feasibility of using two emergency treatment containers from our Community Infrastructure Resilience project to provide a temporary multi-barrier approach for the Memorial Park bore, pending completion of permanent upgrade work. Installation of these containers would significantly increase the safety of that supply, pending implementation of a permanent solution, though are only a temporary and short-term solution and require continuous manning to function correctly.
- We have initiated a review and refresh of the sampling program to meet the requirements of the drinking water standards. We are also arranging for sampling work to be completed through a contractor engaged directly by the laboratory instead of being carried out by the treatment plant operators (as was the previous arrangement) to free them up to focus on their core work and reduce the risk of human error.

Next steps to address the issues and achieve compliance

Urgent improvement work (Memorial Park and Pirinoa)

- Obtain SWDC approval and funding to fast track design of upgrade of the Memorial Park supply bore and improvements at Pirinoa, for subsequent implementation through our Major Projects team or Program Management Office as appropriate
- Confirm costs following more detailed assessment/preliminary design
- Seek approval for budget needed to implement upgrades
- Complete detailed design and construction
- Commission new treatment equipment

Short-term improvement work

- Complete installation of bore no. 4 at Waiohine WTP (this work is already funded)
- Complete construction and commissioning of treated water storage (this work is already funded) and post-treatment Chlorine dosing system at Waiohine WTP (not currently funded)
- Complete alterations/modifications to Featherston supply including Boar Bush Chlorine contact tank and emergency supply alterations to reduce contamination risks
- Replace electronic equipment at Memorial Park and Waiohine WTPs
- Install standby generator connection points at all treatment plants and bores.
- Implement Chlorine dosing system modifications at Martinborough reservoirs

Longer term improvement work

- Transition Waiohine WTP to caustic dosing system for pH control
- Remove old Ultrafiltration plant equipment from Waiohine WTP

How much will this cost?

We have completed initial assessment work only, and at this stage consider our estimates are 'Level 0' and so include a 100% contingency allowance pending completion of further design work to more accurately determine costs.

In total, the improvements required are estimated to cost between \$2.8M and \$5.6M (Level 0 rough order of cost estimates applying 100% contingency according to our cost estimating manual), though detailed assessment is required to confirm costs. The 100% contingency allowance at this stage reflects the fact that limited assessment work has been carried out and that design work needs to be completed to improve confidence in the estimates.

There are some things we can do immediately (and are doing) with relatively modest cost to improve system performance, such as replacing the undersized pH control dosing system at Waiohine, updating set points on alarms and controls, and improving control and telemetry systems.

Other urgent improvements requiring SWDC funding are needed particularly for the treatment plants at Memorial Park (Greytown) and Pirinoa to provide safe drinking water. These are currently unfunded. The Memorial Park supply is of particular concern, and in the event of failure of the chlorination system we would have no choice but to issue a Boil Water Notice to protect public health.

Longer term improvements are proposed to improve system operation generally.

Summary

- There are some things we can do immediately (and are doing) with relatively modest cost to improve system performance, such as replacing the undersized pH control dosing system at Waiohine, updating set points on alarms and controls, and improving control and telemetry systems.
- Other urgent improvements requiring SWDC funding are needed particularly for the treatment plants at Memorial Park (Greytown) and Pirinoa to provide safe drinking water. These are currently unfunded.

- The Memorial Park supply is of particular concern, and in the event of failure of the chlorination system we would have no choice but to issue a Boil Water Notice to protect public health.
- Longer term improvements are proposed to improve system operation generally. In total, the improvements required are estimated to cost between \$2.8M and \$5.6M (Level 0 rough order of cost estimates applying 100% contingency according to our cost estimating manual).
- As compliance reports are prepared for the period 1 July to 30 June each year, it's likely that SWDC water supplies will also be non-compliant for the 19/20 financial year, though we will be discussing this with Regional Public Health to determine if there is scope for showing and reporting on improvement in performance over this period.
- As the Water Supplier, we have a duty of care to manage system risks to the best of our ability and within the funding available, and as trusted advisor we must inform Council of any significant reputational and public health risks being carried with the existing assets and the urgency of investment needed to address them.

Laurence Edwards

Chief Advisor Drinking Water

Ph: 04 912 4400

laurence.edwards@wellingtonwater.co.nz

Attachment A





Appendix 2

**Wellington Water Briefing Powerpoint
- Water Supply Matters (13 Nov. 2019)**

SWDC Workshop

Safe and Healthy Drinking Water



Your public water company

Wellington Water Service Goals

- what customers experience

Safe and healthy water	Respectful of the environment	Resilient networks support our economy
 We provide safe and healthy drinking water	 We manage the use of resources in a sustainable way	 We minimise the impact of flooding on people's lives and proactively plan for the impacts of climate change
 We operate and manage assets that are safe for our suppliers, people and customers	 We will enhance the health of our waterways and the ocean	 We provide three water networks that are resilient to shocks and stresses
 We provide an appropriate region-wide fire-fighting water supply to maintain public safety	 We influence people's behaviour so they are respectful of the environment	 We plan to meet future growth and manage demand
 We minimise public health risks associated with wastewater and stormwater	 We ensure the impact of water services is for the good of the natural and built environment	 We provide reliable services to customers

Havelock North Inquiry:

- Gastroenteritis outbreak
- Significant outbreak in international terms (Walkerton 2000, Milwaukee 1994)
- 4 people died
- 45 hospitalised
- 5,500 residents ill with campylobacteriosis
- Ongoing health complications for many
- Traced to two bores in Brookvale Road
- Sheep faeces identified as source of campylobacter
- Raised concerns about safety and security of NZ's drinking water



Principles of drinking water safety



High standard of care



Protection of source water



Barriers against contamination



Change precedes contamination



Sense of responsibility



Preventative risk management

The Havelock North Inquiry recommended six fundamental principles of drinking water safety for New Zealand:

- 1. A high standard of care must be embraced:** We care about our customers, and their communities, and will make sure they always have access to safe drinking water now and in the future.
- 2. Protection of source water is of paramount importance:** We will look after our water sources and catchment areas and will work with others to make sure they are protected from potential contamination.
- 3. Maintain multiple barriers against contamination:** Our source to tap approach uses multiple robust barriers to make sure the water we supply our customers is, and remains, safe.
- 4. Change precedes contamination:** We will actively monitor our environment, prepare, and respond quickly to any change that could result in the contamination of the drinking water we supply.
- 5. Suppliers must own the safety of drinking water:** Our people are responsive, knowledgeable, experienced, and committed to making sure we provide safe drinking water to our customers.
- 6. Apply a preventative risk management approach:** We will actively monitor and manage risks to our water supply from source to tap to make sure we prevent contamination.

Principle No.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 No.3: Maintain multiple barriers against contamination

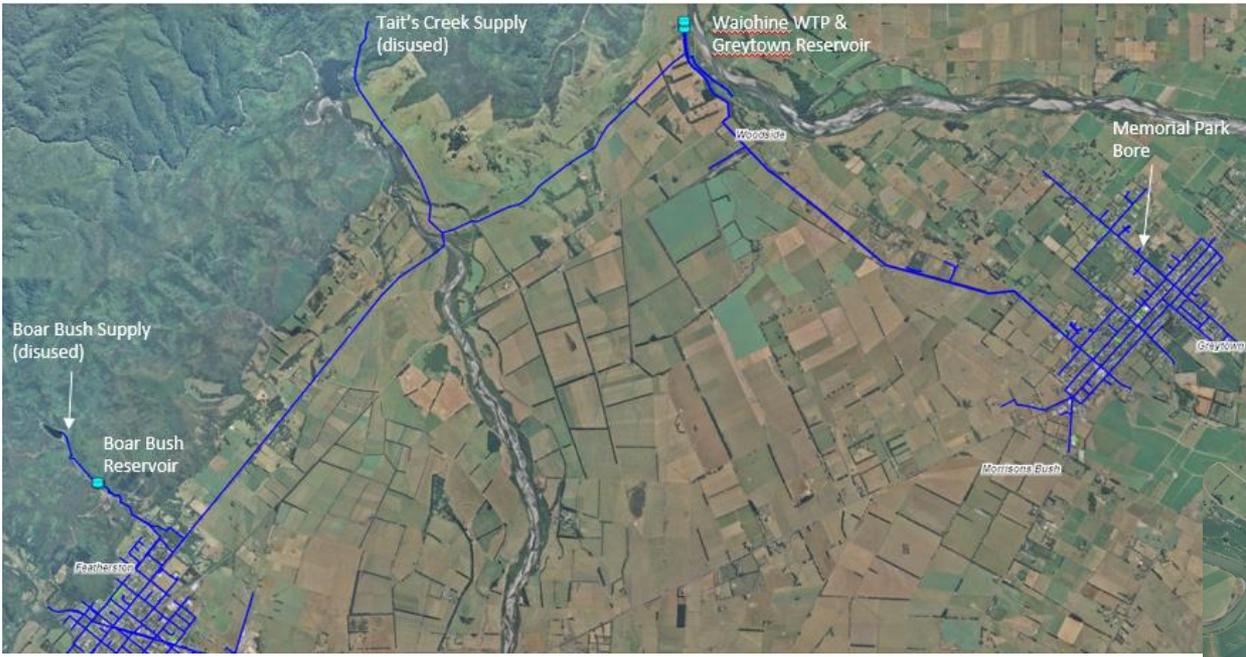
- Any drinking water system must have, and continuously maintain, robust multiple barriers against contamination appropriate to the level of potential contamination.
- This is because no single barrier is effective against all sources of contamination and any barrier can fail at any time.
- Barriers 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 No.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.

Your Water Networks



Our water, our future.

Drinking Water Compliance



All SWDC water treatment plants were non-compliant with the drinking water standards last year:

Water Supply Compliance status 2018-19	Compliant?			Multi-barrier approach in place?
	Bacterial	Protozoa	Chemical	
Featherston/Greytown (Waiohine)	Non-compliant	Non-compliant	Non-compliant	Yes – but improvements needed in alarms, controls and data capture
Greytown (Memorial Park)	Non-compliant	Non-compliant	Compliant	No
Martinborough	Non-compliant	Non-compliant	Compliant	No*
Pirinoa	Non-compliant**			No – the Ozone plant does not provide sufficient protection

Investigations to date



Since Wellington Water go-live on 1 October we have:

- Set up a water safety project team
- Completed site audits of critical assets
- Completed initial urgent modifications to control systems
- Initiated a review and refresh of the sampling program
- Initial planning work to determine what needs to be done (in priority order)
 - 1) ensure safety of operators,
 - 2) provide safe drinking water, and
 - 3) achieve compliance with drinking water standards

Risks

Our work to date has identified the highest risks to be:

1. Greytown Supply – Memorial Park:

There is no multi-barrier protection in place – just chlorination and no protozoa barrier

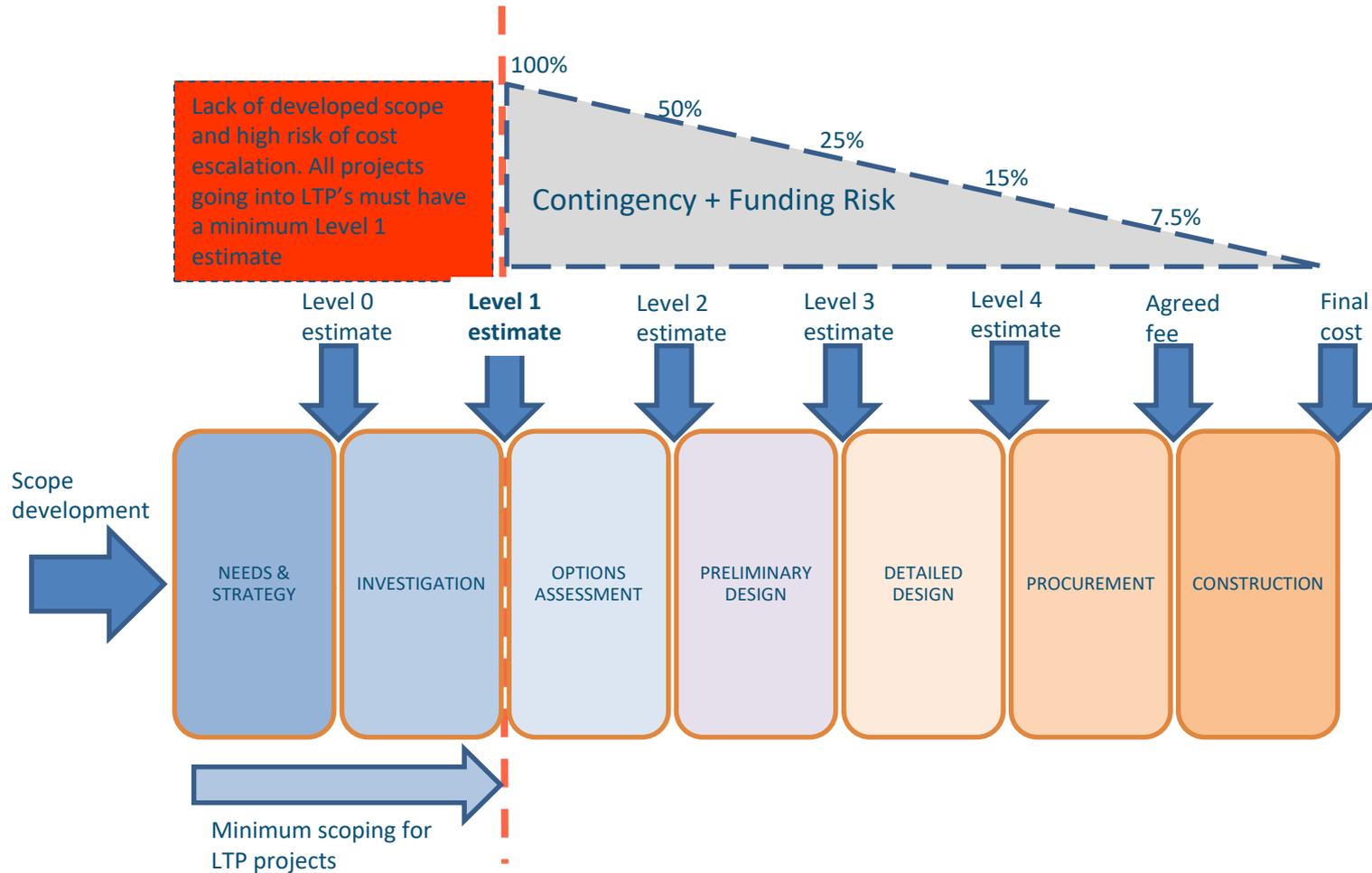
2. Pirinoa Supply:

No reliable multi-barrier approach

Inadequate/unreliable Chlorine dosing system

There are also a number of lesser risks that need attention at comparatively modest cost to improve system performance, such as replacing the undersized pH control dosing system at Waiohine and improvement of control systems.

Cost Estimating



Estimate Definitions

Outside of estimating manual

Multiple options -100% contingency

Single option – 50% contingency

Level 0

Sometimes estimates are requested prior to any investigation or feasibility work being carried out, and without any defined scope of works. These estimates fall outside any recommended procedures.

Level 1

Under the WWL procedures, these estimates apply to the Definition Phase. These estimates are based on:

- Risk Register outputs,
- No site investigations,
- Estimate land requirements,
- Estimated consent conditions,
- Possibility of scope change,
- A range of options that may be developed and delivered.

Level 2

Under the WWL procedures, these estimates are prepared during the Development Phase. These estimates are based on:

- Risk Register outputs,
 - Limited site investigations,
 - Estimate land requirements,
 - Estimated consent conditions,
 - Possibility of scope change,
- Outline design drawings with schedule of quantities

Next Steps



Urgent work (Memorial Park and Pirinoa):

- Obtain SWDC approval to fast track design of upgrade of the Memorial Park and Pirinoa treatment plants
- Confirm costs following more detailed assessment/preliminary design
- Seek approval for budget
- Complete detailed design and construction
- Commission new treatment equipment

Summer Water Demand



Your public water company

Why are we being asked to conserve water so early?

We are conserving water earlier this summer because of limited treated water supply from one operational bore.

When the manganese extraction plant is operational in the autumn of 2020, we'll be able to use our other bores and water supply will be back to normal.

Why is the manganese extraction plant not operational by the summer?

A couple of things:

- We are finalising the short-term lease agreement for the land where the manganese extraction plant will be set up; after this is done the Resource Consent process will get under way.
- A local contractor has joined the project team and contractual details are being finalised

What about using my own private bore, do the water restrictions apply to me?

No, the current water restrictions do not impact those with private bores.

What will happen if people don't follow the water restriction requirements?

If the Martinborough township uses more water than can be supplied from the low manganese bore, we will have to use the other bores as well. This is a problem because, although safe to drink, the water could become discoloured due to the reaction between manganese and chlorine.

The discolouration could range from looking like weak tea to at worst black – which is why everyone needs to do their part in conserving water this summer. Information on how to conserve water will be shared throughout the community. Enjoying safe, clean, clear and healthy water over the next few months means that we all have to work together. Failure to reduce demand means that more formal enforcement measures would be employed.

The Wairarapa Consolidated Bylaw 2019

Collateral examples



FROM 30 NOVEMBER 2019 HAND HELD WATERING ONLY



Find out more: wellingtonwater.co.nz/SWDC



Our water, our future.

BAN ON RESIDENTIAL SPRINKLERS

AND IRRIGATION SYSTEMS



APPLIES TO MARTINBOROUGH

BAN ON RESIDENTIAL SPRINKLERS AND IRRIGATION SYSTEMS



APPLIES TO FEATHERSTON & GREYTOWN

Collateral examples

TOTAL OUTDOOR WATER BAN

Including hand held watering



APPLIES TO MARTINBOROUGH