Wellington Water

MEMO

TO	South Wairarapa District Council
COPIED TO	Jeremy McKibbin, Group Manager Network Management
FROM	Laurence Edwards, Chief Advisor Drinking Water
DATE	December 2021

FOR YOUR INFORMATION

Update on South Wairarapa District Council Water Supply Matters

Summary
As expected and previously advised to council, all of South Wairarapa's drinking water supplies were assessed as non-compliant with the Drinking Water Standards for New Zealand 2005 (Revised 2018) as per Wai Comply's *Report on compliance with the drinking-water standards for New Zealand 2005 (Revised 2018), Period 1st July 2020 – 30th June 2021.* Wai Comply are acting as the Drinking Water Assessor (DWA) on behalf of Regional Public Health.

Since SWDC joined Wellington Water in October 2019 significant progress has been made towards achieving compliance with the Drinking Water Standards (DWSNZ), though there is still much work to do before full technical compliance is achieved.

Full technical compliance will require:

- Installation of filtration equipment at Memorial Park (Greytown)
- Controls and data system upgrades to adequately and reliably capture treatment plant performance data in all foreseeable conditions including power outages/storm conditions (all treatment plants).
- Completion and approval of a water safety plan for all water supplies (for all supplies including Pirinoa)

Once the treated water reservoir at the Waiohine treatment is commissioned and is operating reliably, our intention is to avoid using the Memorial Park treatment plant until it is upgraded to achieve compliance, though it continues to be an important asset for the operational resilience of both the Featherston and Greytown drinking water supplies and therefore it is important that its upgrade proceeds.

In addition to work above to achieve compliance, we continue to identify operational and safe drinking water improvements required to the water supplies that will be captured in the water safety plan for prioritisation, and will inform investment needs in the next three years and beyond. Improvements identified will prioritised against existing activities and some of the higher priority improvements may result in reprioritisation in the annual plan process.

We are also assessing what further work is required to meet new operational rules/standards to meet the requirements of the new drinking water regulator, Taumata Arowai. Taumata Arowai's operational rules are expected to be issued formally for consultation in early 2022, though early exposure drafts give us an indication on what to expect from the new rules.

Compliance Status FY20/21

Wai Comply, drinking water assessors acting on behalf of Regional Public Health, has assessed the water supplies for Featherston, Greytown, Martinborough, and Pirinoa as non-compliant with the drinking water standards (DWSNZ) for FY20/21. The reasons for non-compliance are summarised in the table below:

Treatment plant	Determinand	Reason for non-compliance
Waiohine	Bacteriological	Data loss/reliability issues in demonstrating compliance – continuous monitoring/data capture for chlorine efficacy through provision of Free Available Chlorine, pH, and turbidity results is required
	Protozoa	Data loss/reliability issues in demonstrating compliance – continuous monitoring/data capture for UV efficacy i.e. Flow, Turbidity, UVI, UVT, Lamp outage is required
Memorial Park	Bacteriological	Change of elected compliance criterion mid-year. Prior to criteria change a recorded turbidity issue spike issue impacted compliance status.
	Protozoa	4 log treatment required (additional filtration)
Martinborough	Bacteriological	Data loss/reliability issues in demonstrating compliance – continuous monitoring/data capture for chlorine efficacy i.e. FAC, pH, turbidity is required. In addition, a change of compliance data monitoring point is now required following completion of the Manganese Reduction Plant.
	Protozoa	Data loss/reliability issues in demonstrating compliance – continuous monitoring/data capture for UV efficacy i.e. Flow, Turbidity, UVI, UVT, Lamp outage is required
Pirinoa	Protozoa	As a water safety plan for Pirinoa WTP is yet to be submitted & approved by RPH, the plant is assessed against section 5 of the DWSNZ and would require additional monitoring equipment to comply. Once the Water Safety Plan is

Treatment plant	Determinand	Reason for non-compliance
		approved, it complies with section 10 requirements for small water supplies.

As noted in the above table, data loss and data capture/reliability issues are a common and problematic factor impacting compliance status. Operational resilience is also an important factor that puts compliance with the drinking water standards at risk, as was experienced in Q1 of FY21/22 when high winds and power surges impacted plant performance, required intensive and ongoing manual intervention from operators to maintain supply, and ultimately resulted in a probable non-compliance event at the Waiohine treatment plant.

Planned installation of filtration equipment at Memorial Park and completion of the water safety plan for Pirinoa, together with electrical, controls, data capture and resilience improvements will ultimately achieve full technical compliance with the standards.

Work planned/in progress

Work underway and/or planned includes:

Project	**Description**	**Comments**
Waiohine WTP treated water reservoir (TWR)	Commissioning of 8 million litre storage bladder installed by SWDC within containment bunds	Completion of TWR is required to allow Memorial Park WTP (Greytown) to be taken offline for an extended period. Allows Waiohine WTP to be taken offline for short periods if required (storm events/power outages/electrical storms etc) Quality assurance/testing during commissioning has identified a leakage issue – work is in progress to address this.
Waiohine WTP post TWR chlorination	New chlorination equipment required downstream of treated water reservoir	Modification/relocation of compliance monitoring equipment is required.
Water Safety Plan (WSP)	Update/refresh and combining water safety plans into a single plan for South Wairarapa supplies	Including Pirinoa in WSP will allow compliance assessment against Section 10 of drinking water standards (for small supplies) and achieve compliance for Pirinoa. Water safety plans for Greytown (Memorial Park), Greytown/Featherston (Waiohine), Martinborough and Pirinoa to be combined into a single document.

Project	Description	Comments
		Under existing arrangements WSP is approved by DWA on behalf of Regional Public Health. When Taumata Arowai commences its role Water Safety Plans will be reviewed but not approved.
Memorial Park Stages 2 and 3	Includes replacement of existing bore pump, additional filtration equipment and new chemical storage facilities in a permanent arrangement	Sewer lateral location relative to existing supply bore and condition inspection using CCTV confirmed need for urgent relocation to mitigate risk to safe drinking water. This work is being completed as soon as possible. Risk is partially mitigated by UV installation.
Waiohine WTP soda ash dosing system	Upgrade to existing soda ash dosing system	Temporary caustic dosing plant installed is operationally efficient for pH control, but comes with additional operational cost compared to soda ash dosing.
Powerlink server relocation	Moving AR Riley Powerlink server to the Waterloo treatment plant (Lower Hutt)	Relocation of the server improves data resilience by enabling connection to the data historian. Includes cyber security improvements
SCADA system conversion	Conversion to 'system platform'	Consolidates SCADA platforms and improves reliability/resilience of compliance data capture. Includes cyber security improvements
WTP data storage upgrades	Increased data storage capability onsite	Provides additional resilience to extended period of communications loss (power outages/electrical storms etc.)
Digital radios	Digital connections from treatment plants	Provides more reliable communications link than cellular networks. Allows remote access to treatment plants for better oversight/controls/system diagnosis
Surge protection	Installation of surge protection at all treatment plants	Power surge and/or lightning strikes damage systems and risk causing non-compliance
Remote access units	E-WON remote access units for all treatment plants and bores.	Allows remote programming and manual download of compliance data.

Project	Description	Comments
Martinborough future source study	Review of options for supply of Martinborough	Existing Manganese Reduction Plant lease agreement is due to expire on 13 November 2024. Water take consent for Martinborough expires 27 November 2037. Study is largely complete. Paper summarising the results of the study and recommended approach to be provided to council
Tauherenikau river crossing	Replacement of exposed pipeline across the Tauherinkau river	Pipeline is a very high critical asset. Damage to the pipeline will cause loss of supply to Featherston for an extended period of time. Contingency plan prepared, and design for replacement of the pipeline is in progress.
Boar Bush reservoir risk mitigation	Short term improvements to reduce water quality risks. Investigation and assessments for longer term replacement of the Boar Bush reservoir	Existing chlorine contact tank is in poor condition posing contamination risk. Existing Boar Bush site is vulnerable to natural hazards including earthquake and washout of connecting pipelines
Martinborough reservoirs	Replacement of 2xconcrete and 2xtimber tanks serving Martinborough	Very High Criticality Assets work has confirmed reservoirs are in poor condition, posing contamination risk. Potential contributing factor to 2019 contamination incidents.

Due to the interconnected and interdependent nature to the Greytown and Featherston water supplies and lack of operational resilience from treatment plant outage, our immediate focus continues to be on commissioning the treated water storage reservoir at the Waiohine water treatment plant. Once commissioned, this will provide flexibility to turn of the Waiohine water treatment plant in adverse conditions, provide more storage to better cope with drought conditions, and will allow the Memorial Park bore to be taken offline for upgrade and maintenance without significant risk of loss of supply to Greytown.

Given that the Memorial Park treatment plant requires additional filtration to achieve compliance, following commissioning of the treated water reservoir our intention is to supply Greytown from the Waiohine treatment plant and avoid using the Memorial Park bore and treatment plant unless absolutely necessary until it is upgraded to achieve compliance. However, in the meantime the bore will still be available if required due to unforeseen circumstances. The treatment plant continues to be an important source of drinking water for Greytown and an important asset for the operational resilience of both the Featherston and Greytown drinking water supplies long term.

Risks

Key risks include:

- New operational rules/standards requiring further work/upgrades not currently funded.
- Increased capital and operational costs to meet the new rules and standards
- Pending expiry of the lease agreement for the Manganese Reduction Plant site in 2024, significant costs and uncertainty risk of not being able to locate and implement an alternative supply source before then.
- Reliance on commissioning of the treated water reservoir at the Waiohine treatment plant prior to carrying out other important upgrade work (unforeseen leakage/quality assurance/other issues with knock on impacts)
- Failure of aging infrastructure (bore pump) at Memorial Park prior to upgrade
- Failure of exposed pipe crossing of Tauherenikau river resulting in loss of supply to Featherston.
- Ensuring adequate level of mains renewals and leak detection/repairs to keep leakage to acceptable levels.

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Wellington Water

MEMO

TO	South Wairarapa District Council
COPIED TO	Jeremy McKibbin, Gary O'Meara, Adam Mattsen, Gillian Woodward
FROM	Amy Smith / Phil Garrity
DATE	December 2021

FOR YOUR INFORMATION

SWDC Wastewater Treatment Plant – Resource Consent Compliance Risk Review

Purpose

The purpose of this memo is to:

- Provide a review of the current resource consent compliance status for the wastewater treatment plants (WWTPs) owned by South Wairarapa District Council (SWDC).
- Identify key risks to achieving resource consent compliance.
- Provide information on an initial assessment of projects that are required to establish and maintain resource consent compliance at the treatment plants for the duration of the resource consents.

Summary of Findings

The Martinborough and Greytown WWTPs will require considerable investment over the duration of their consents. Some of the early commitments of the staged consents stated in the consent hearings appear to have been deferred (for example inlet screening and pond desludging) and these need to be completed. In addition, increased population growth since the plants obtained resource consents and the staging of land irrigation areas and winter storage in the resource consents mean that investment needs to be brought forward to ensure compliance is established and maintained.

Cost estimates have been prepared based on the Wellington Water Cost Estimating Manual, to a level 1 estimate. The scale of investment for Martinborough WWTP is estimated at $3.5M-$8M over the next 1-3 years, $8.5M-$19M over years 4-10, and an estimated total of $21M-$47M over the 1-30 year horizon.

The scale of investment for Greytown WWTP is estimated at $2.2M-$5M over the next 1-3 years, $6.8M-$15M over years 4-10, and an estimated total of $23M-$51M over the 1-30 year horizon.

The Featherston WWTP operates under the 2012 resource consent which has few conditions. It is undergoing a resource consent renewal process through the Major Projects team at Wellington Water. The costs of the possible treatment options are presented elsewhere. The Lake Ferry WWTP had had some operational issues over the past year, resulting in discharge to wetland rather than to land. These issues have been repaired and the WWTP is back to discharging to land. Some minor works improvements continue to be required. An application for consent renewal will need to be lodged by 2025.

Background

SWDC became a shareholder of Wellington Water on October 1st 2019. There are four wastewater treatment plants in the South Wairarapa district. Three of these plants (Greytown, Martinborough and Featherston) are pond-based treatment systems followed by UV disinfection. Greytown and Martinborough have 35-year consents (expire 2051) with a dual disposal route to stream and land irrigation. Featherston operates under an expired 2012 consent which discharges to a creek. The Lake Ferry WWTP treats septic tank waste in a proprietary treatment system and disposes treated effluent to a below ground disposal system. The resource consent expires in 2025.

In June 2020 we briefed SWDC on wastewater treatment plant matters that needed to be addressed to achieve our preliminary findings with regard to resource consent compliance and mitigate significant operational health and safety risks. The South Wairarapa District Council subsequently approved additional funding of $500,000 for the 20-21 financial year for urgent work needed to improve treatment plant site health and safety risks.

Since then, Wellington Water have been working to deliver the improvements, and to better define further improvements needed to lift the performance and reliability of the WWTPs, to provide SWDC with confidencethat their WWTPs meet the obligations outlined in the individual resource consents.

We have been completing a comprehensive assessment of the capacity, performance and compliance risks ofthe Greytown and Martinborough Wastewater Treatment Plants for the duration of the resource consents – these reports will be provided in due course. The preliminary findings of these reports are summarised in the following sections. Our high-level understanding of the Featherston & Lake Ferry WWTPs are also outlined below.

GREYTOWN WASTEWATER TREATMENT PLANT

Resource Consent Compliance for the period 1 July 2020-30 June 2021

The Annual Report for GWRC outlines the full consent compliance status. A high level summary is providedbelow. Discharge to stream contaminant concentrations are used to assess compliance, as discharge to stream was the only disposal route used in the last year.

- **Treated Effluent Quality**

  The treated effluent quality of BOD, TSS and *E.coli* for discharge to stream was compliant.

  The treated effluent quality of nutrients (nitrogen and phosphorus) for discharge to stream wascompliant.

- **Discharge (Irrigation & Stream)**

  The WWTP discharged to the Papawai Stream only, under all stream flow conditions. This is not theexpected disposal route under Stage 1A of the resource consent.

  No discharge to land via irrigation occurred, due to Health and Safety issues identified with the UV Lift Pump Station (screen blocking with no safe access for cleaning) and filter area (excessive bird droppings) during irrigation mode.

  Greater Wellington Regional Council were advised of this operational issue, and that discharge to stream was considered a reasonable solution given the consent is worded such that discharge to stream is to be avoided at stream flows lower than 190l/s, but is not prohibited

- **Environmental Monitoring**

  Ammonia nitrogen limits were exceeded in the stream downstream of the treatment plant. Because the upstream levels are lower than the downstream levels this is a consequence of concentrations in the effluent.

  Ecological assessment of the stream is a routine reporting requirement of the consent. Monitoring results reinforce that reducing the effluent discharge to the stream (by operating the land irrigation system) will improve the ecological outcomes.

- **Management Plans**

  In June 2021, the following management plans were submitted to GWRC for certification:

  - Environmental Monitoring Management Plan
  - Inflow & Infiltration Management Plan
  - Odour Management Plan
  - Riparian Planting Management Plan

  The remaining management plans are underway, with varying degrees of completion due to their nature and requirement for funding:

  - Operations & Maintenance Manual
  - Tangata Whenua Values Monitoring Plan
  - Discharge to Land & Water Management Plan
  - Site Flooding Investigation

- **Reporting & General**

  Various sampling and reporting non-compliances which Wellington Water's Network Management Group and Network Engineering Team are actively working to resolve.

  Community Liaison Group is not operating – Wellington Water is actively working to reestablish this group.

Work Completed in 2020-2021

Work completed at the WWTP to date:

- Health & Safety improvements around site.
- De-sludging survey to understand the scale of sludge stored in the pond.
- Installation of bird laser to reduce bird load on ponds and thus improve their treatment performance.
- Providing short term mitigations to irrigation issues with operators to be ready to operate this coming season.

Wastewater Treatment Plant Capacity and Performance Assessment

WWL has carried out a capacity and performance assessment of the Greytown WWTP which considers the work carried out to date, the issues identified with safely operating the WWTP, and our improved knowledge of the compliance status. The report can be provided in full once additional population and influent data is available. The limitations of this report are as follows:

1. The confirmation of population projections.
2. Capacity assessment of the pond is limited to a small influent sampling data set.

The interim findings identify that the following programme of work is required to deliver a safe operating environment and achieve resource consent compliance now and into the future.

Pond Inlet

- **Influent Sampling**

  Influent sampling has not previously been regularly carried out to understand the influent load to the plant – this data is important to understand the treatment performance of the WWTP now and to inform future treatment requirements due to growth.

  WWL has commenced a monthly influent sampling programme to better understand the load entering the plant. To continue, this needs to be funded. Further data points will be collected and used to refine the findings of the Capacity and Performance Assessment Report.

- **Inlet Pipeline and Flowmeter**

  With the current upgrade of the Papawai trunk main the inlet flowmeter is being relocated. This should provide more reliable plant inflow measurement for assessing compliance and future stage design parameters.

- **Inlet Screen**

  There is no inlet screen despite the resource consent documentation specifying it will be installed under Stage 1A. Installation of inlet screening should occur in conjunction with de-sludging the pond, so once the pond is desludged, it is not re-filled with screenings.

Facultative and Maturation Ponds

- **Sludge in Ponds**

  The ponds have not been de-sludged since construction in the 1970's. A sludge survey was carried out in June 2021. The results indicate that:

  - The current sludge level will start to affect the efficacy of their performance, particularly as influent load increases from population growth in the area.
  - The ponds have been treated with Parklink's AMD product which is designed to increase the sludge degradation rate of the volatile solids in the sludge. It has resulted in a sludge level reduction in the order of 100-150mm; further investment in AMD is expected to deliver diminishing returns in terms of sludge degradation. At the time of the resource consent hearing this was understood to be an option that would delay mechanical desludging by approximately 5-years.

  Best practice is to desludge wastewater treatment ponds when the water depth (from the surface) is 1m or less. The 2021 sludge survey shows the water depth ranges between 0.8 – 1.1m across the ponds' surface with some areas having higher sludge depths.

  De-sludging the ponds has the following benefits:

  - Removes the risk of sludge carryover out of the ponds and into the treated effluent discharge.
  - Reduces the release of nutrients from the sludge back into the liquid stream and into the treated effluent discharge.
  - Increases the hydraulic retention time of the ponds, to optimise treatment performance.
  - Maintains a free water depth of 1m across the pond depth, which optimises treatment performance. The algae (which produce oxygen in the pond treatment system) operate in the top 1m level of a pond where light penetrates. They cannot operate in areas where sludge is within this one metre profile. As the ponds are overloaded on a biological loading basis, it is important to maintain optimal operating conditions for the algae by desludging.

- **Ponds Treatment Process:**

  The pond is overloaded. The primary facultative pond is 1.95ha with a design loading rate of 89kgBOD/ha (winter temperature 9^{o}C). At a design Biochemical Oxygen Demad contribution of 80gBOD/person/day, and an estimated current population of 2700, the primary facultative pond BOD loading rate is 110kgBOD/ha.day which is greater than the design capacity.

  At the time of the resource consent application, no additional population growth was forecast. Due to population growth, the ponds are now overloaded. Although this is not currently resulting in resource consent non-compliance (for affected parameters such as BOD and TSS), as the newly forecast population growth (and therefore influent flow and load) occurs in the Greytown wastewater network, the likelihood of treated effluent quality compliance failure increases.

  WWL recommends that an investigation is carried out to determine what additional treatment capacity may be required over the life of the consent to 2051 to meet population growth. It is important to investigate this now and plan for the future compliance of the WWTP, in conjunction with development of the Stage 2 irrigation zone.

- **UV Pump Station**

  The UV Pump Station requires modification to ensure the screen can be regularly cleaned, and the pumps can be lifted for maintenance. The current facility is not fit for purpose. The investigation into an appropriate solution is underway, but implementation of the solution is not currently funded.

Staged Land Irrigation

- **Stage 1B Irrigation System**

  The UV lift pump station was identified as a confined space in 2020, and the screen in this chamber blocks regularly and quickly under the higher irrigation flow rates (compared to the stream discharge). Due to their being no safe way to access the screen for cleaning, WWL did not operate the irrigation system over the 2020-2021 summer. A number of improvements and temporary mitigation measures to clean the screen have been implemented during the winter of 2021. While we are set up to operate the irrigation system over the summer of 2021-2022, the upcoming operation of the irrigation system will prove whether it is reliable and has adequate hydraulic capacity.

  When WWL did operate the irrigation system over the summer of 2019-2020, it proved to be difficult to reliably operate the irrigation system in accordance with the resource consent conditions at the same time as managing the operational requirements of the gliding club which use the irrigation field as their airstrip during daylight hours.

- **Stage 2 Irrigation & Winter Storage**

  The Stage 2 irrigation area has not been developed in any detail up until this point. The Stage 2 irrigation area must be commissioned by November 2030. WWL understands a series of 'land swaps' is being undertaken to produce a single irrigation block, and would like to understand the status and availability of this land. It would be prudent to commence a cohesive programme of work around developing the Stage 2 irrigation system now.

  As added impetus, if irrigation on the Stage 1B area proves unreliable this summer, or population in the area continues to grow (increased nutrient load), commissioning of the Stage 2A irrigation area and associated winter storage Stage 2B may need to be brought forward from 2030 and 2039 respectively.

Electrical and Controls

- **Surge Protection**

  A programme of work is underway to design and install surge protection at the WWTP, to protect critical equipment during electricity brownouts. Surge protection is required to protect critical equipment (such as UV) from damage and thus maintain their operability for consent compliance.

- **Controls Systems Improvements:**

  The SCADA system for the site will be replaced in 2021-2023. This ensures currency of equipment and delivers remote access to ensure ongoing operation.

Site Works

- **Site Fencing**

  The site is not securely fenced. A recent Worksafe case against the Gore District Council (as a result of a child drowning in their wastewater treatment pond) ordered the council to securely fence their pond.

  WWL recommends that the site is securely fenced to protect against accidental drowning.

- **Riparian Planting**

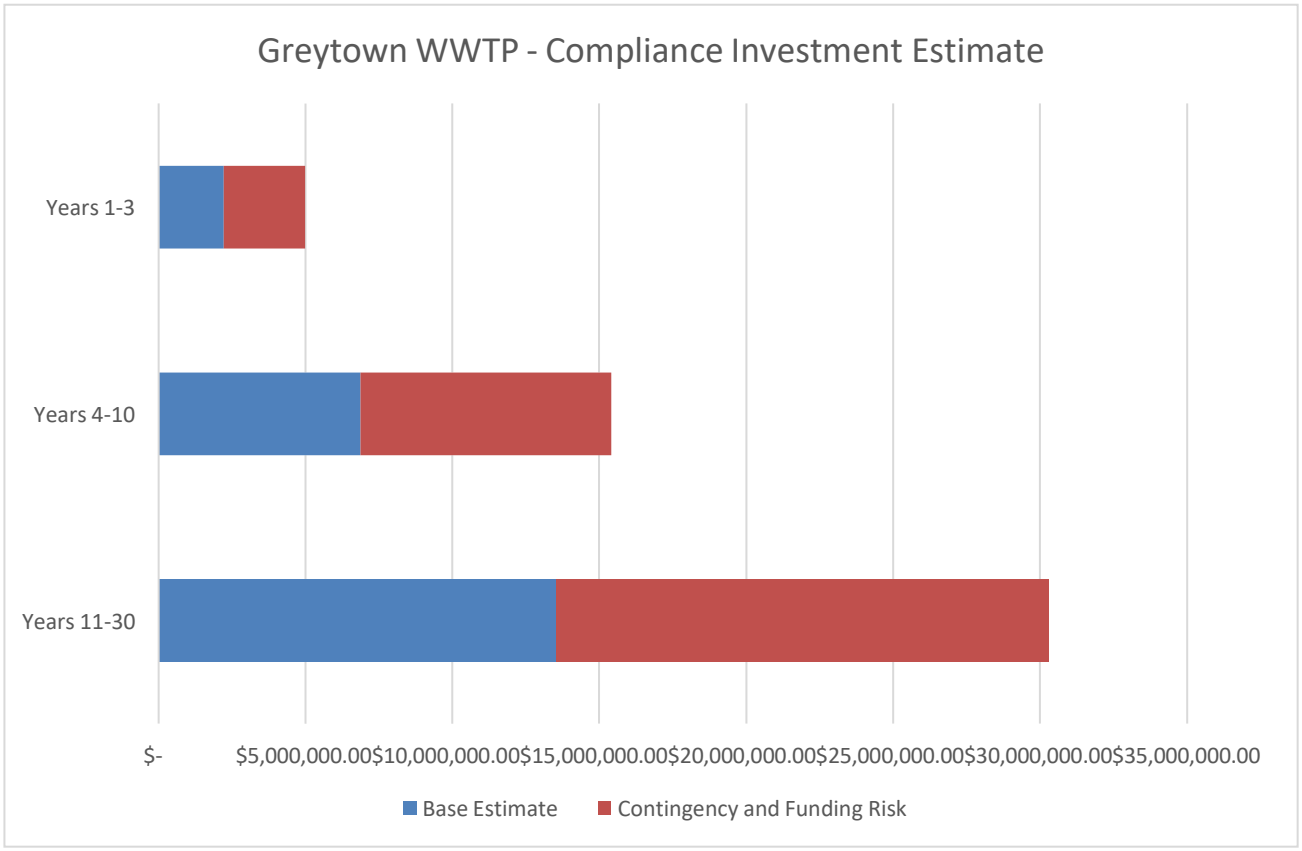
  Riparian planting is outlined in the Riparian Planting Management Plan which is currently undergoing certification with GWRC. The purpose of riparian planting is to protect the surrounding streams from run-off from the irrigation activity as well as stock grazing. Riparian Planting should commence as soon as practicable once the plan is certified, however it is currently unfunded.

- **Site Flooding Investigation**

  A Site Flooding Investigation is required by the associated Management Plan (prepared by WWL). The purpose of this plan is to understand the risk of the site flooding and the integrity of the pond system in a flooding event. The investigation must be undertaken by a suitably qualified consultant; currently the investigation is not funded, but we note that it is a resource consent requirement.

Cost Estimates and Programme

A preliminary capital cost estimate for the Greytown WWTP compliance programme has been prepared as per Wellington Water's Cost Estimating Manual Level 1. The individual project estimates are provided as an Appendix to this memo. A summary of the estimated investment required is presented below, in line with Long Term Planning periods. Further investigations will be required to define scope and risks so that these costs can be refined, and contingency percentages reduced.


Greytown WWTP - Compliance Investment Estimate
Years 1-3
Years 4-10
Years 11-30
$-
$5,000,000.00
$10,000,000.00
$15,000,000.00
$20,000,000.00
$25,000,000.00
$30,000,000.00
$35,000,000.00
Base Estimate
Contingency and Funding Risk

MARTINBOROUGH WASTEWATER TREATMENT PLANT

Resource Consent Compliance for the period 1 July 2020-30 June 2021

The Annual Report for GWRC outlines the full consent compliance status. A high level summary is provided below. Discharge to river contaminant concentrations are used to assess compliance, as in any one month, discharge to river can occur.

- **Treated Effluent Quality**

  The treated effluent quality of BOD, TSS and *E.coli* for discharge to river was compliant.

  The treated effluent quality of nutrients (nitrogen and phosphorus) for discharge to river was not compliant.

  The nitrogen loading rate on the irrigation field was close to its compliance limit.

- **Discharge (Irrigation & River)**

  A control valve was installed to reduce the risk of uncontrolled river discharges as part of the priority works.

  Discharge to river disposal volumes and mixing ratios were compliant.

  Discharge to land was not compliant. Stage 1A irrigation area has a consent limit of 35mm/week and soil moisture capacity limits, which does not provide adequate disposal volume capacity over summer when the river discharge route is not available. GWRC was advised that Wellington Water would carry out a trial of applying 45mm/week to the Stage 1B irrigation area (from January 2021). This higher application rate was still not adequate to dispose of the required volumes of wastewater. Once the pond maximum safe operating level was reached, the land irrigation application limit of 45mm/week was regularly breached, in lieu of discharging to river at low flows.

- **Environmental Monitoring**

  Groundwater monitoring bores were installed as part of the priority works. Results will start to be reviewed.

  The river quality monitoring was compliant.

  Ecological assessment of the river is a routine reporting requirement of the consent. Monitoring results reinforce that reducing the effluent discharge to the river will improve the ecological outcomes.

- **Management Plans**

  In June 2021, the following management plans were submitted to GWRC for certification:

  - Environmental Monitoring Management Plan
  - Inflow & Infiltration Management Plan
  - Odour Management Plan

The remaining management plans are underway, with varying degrees of completion due to their nature and requirement for funding:

- Operations & Maintenance Manual
- Tangata Whenua Values Monitoring Plan
- Discharge to Land & Water Management Plan

- **Reporting & General**

  Various sampling and reporting non-compliances which Wellington Water's Network Management Group and Network Engineering Team are actively working to resolve.

  Community Liaison Group is not operating – Wellington Water is actively working to reestablish this group.

Significant Work Completed in 2020-2021

Work completed at the WWTP to date:

- Pond outlet automated control valve to avoid accidental discharge to river.
- Health & Safety improvements around site.
- De-sludging survey to understand the scale of sludge stored in the pond.
- Flow balance review of discharge to land management strategy for Stage 1B
- Review of irrigator wind limits
- Working through irrigation issues with operators and suppliers to be ready to operate this coming season.

Wastewater Treatment Plant Capacity and Performance Assessment

Wellington Water has carried out a capacity and performance assessment of the Martinborough WWTP which considers the work carried out to date, the issues identified with safely operating the WWTP, and our improved knowledge of the compliance status. The report can be provided in full once additional population and influent data is available. The limitations of this report are as follows:

1. Confirmation of the population projections.
2. Capacity assessment of the pond is limited to a small influent sampling data set.
3. The interim findings identify that following projects that are required to deliver a safe operating environment and achieve resource consent compliance now and into the future.

The interim findings identify the following programme of work is required to deliver a safe operating environment and achieve resource consent compliance now and into the futu

Pond Inlet

- **Influent Sampling**

  Influent sampling has not previously been regularly carried out to understand the influent load to the plant – this data is important to understand the treatment performance of the WWTP now and to inform future treatment requirements due to growth.

  Wellington Water has commenced a monthly influent sampling programme to better understand the load entering the plant. This continue this needs to be funded. Further data points will be collected and used to refine the findings of the Capacity and Performance Assessment Report.

- **Inlet Screen**

  There is no inlet screen despite the resource consent documentation specifying it will be installed under Stage 1A. Installation of inlet screening should occur in conjunction with de-sludging the pond, so that once the pond is desludged, it is not re-filled with screenings.

Facultative and Maturation Ponds

- **Sludge in Ponds**

  The pond has not been de-sludged since construction in the 1970's. A sludge survey was carried out in June 2021. The results indicate that:

  - The current sludge level is affecting the efficacy of the pond treatment process, which will only get worse as influent load increases from population growth in the area. Sludge accumulation has increased considerably since the 2012 survey (as a direct result of growth in the catchment).

  Best practice is to desludge wastewater treatment ponds when the water depth (from the surface) is 1m or less. The 2021 sludge survey shows the water depth ranges between 0.75 – 0.95m across the pond surface with some areas having even less free water depth, i.e. the sludge is visible at the surface.

  De-sludging the ponds has the following benefits:

  - Removes the risk of sludge (BOD and TSS) carryover out of the pond into the maturation pond and ultimately the treated effluent discharge.
  - Reduces the release of nutrients from the sludge back into the liquid stream and into the treated effluent discharge.
  - Increases the hydraulic retention time of the ponds, to optimise treatment performance.
  - Maintains a free water depth of 1m across the pond depth, which optimises treatment performance. The algae (which produce oxygen in the pond treatment system) operate in the top 1m level of a pond where light penetrates. They cannot operate in areas where sludge is within this one metre profile. As the ponds are overloaded on a biological loading basis, it is important to maintain optimal operating conditions for the algae by desludging.

- **Maturation Ponds**

  A collection of improvements is required for the maturation ponds to maintain their treatment efficacy, resolve health and safety issues, and resource consent compliance. Full details are provided in the report. The efficacy and suitability of the maturation ponds should be considered as part of the Pond Treatment Process Investigation. Various performance improvements that may reduce alage and nutrients were proposed in the Consent application. These need to be reviewed and implemented as appropriate as these continue to an issue at the treatment plant.

- **UV Pump Station & UV System**

  The UV lift pumps are located in the fourth maturation cell. They are not readily or safely accessible in the event of failure or scheduled maintenance. Access to the pumps is not safe for operators. The UV system is located inside a container on the bank of the maturation cells.

  A project to upgrade the pumps, upgrade access to the pumps, and generally mitigate health and safety concerns around the installation is required.

  The pumps capacity requires re-design when they are due for replacement, as they are not currently sized for the flow rates allowed under the maximum river discharge volume scenario. This capacity will become more important under Stage 2 of the consent, which seeks to optimise river discharge flow volumes under high river flows, to reduce the size of Winter Storage and irrigation.

  The resilience of the UV equipment location requires review with a possible need for relocation.

- **Ponds Treatment Process & Investigation**

  The facultative treatment pond is overloaded. It is 1.65ha with a design loading rate of 89 kgBOD/ha (winter temperature 9^{o}C). At a design BOD contribution of 80 gBOD/person/day, and an estimated current population of 1950, the facultative pond BOD loading rate is 95 kgBOD/ha.day which is greater than the design capacity.

  At the time of the resource consent application, no additional population growth was forecast. Due to population growth, the ponds are now overloaded. Although this is not currently resulting in resource consent non-compliance (for affected parameters such as BOD and TSS), as the newly forecast population growth (and therefore influent flow and load) occurs in the Martinborough wastewater network, the likelihood of treated effluent quality compliance failure increases.

  WWL recommends that an investigation is carried out to determine what additional treatment capacity may be required over the life of the consent to 2051 to meet population growth. It is important to investigate this now and plan for the compliant future of the WWTP, in conjunction with development of the Stage 2 irrigation zone

Staged Land Irrigation

- **Stage 1B Irrigation System**

  In 2020, Stantec undertook an investigation into the hydraulic capacity constraints of the combined discharge to land and river system. The report, titled "Martinborough WWTP Flow Balance" concludes that over the summer period (when river flows are consistently lower than 24.93m^3/s), the capacity of the Stage 1B irrigation block is not sufficient to accept the required discharge flow rates.

  WWL is working with contractors to deliver a series of improvements to increase the reliability of the irrigator operation, and optimise (but not resolve) the disposal volume with the constraints of the resource consent.

- **Stage 2A Irrigation**

  The Stage 2A irrigation area at the Pain Farm must be commissioned by December 2030. Preliminary design of the Stage 2A site was included in the resource consent application, but detailed design, site access, and equipment procurement will take a considerable period of time.

  Development of the Stage 2A irrigation area will mitigate the nutrient and hydraulic constraints causing resource consent compliance failure. We propose bringing this project forward from its current required commissioning date of December 2030, to commence investigation and design from 1 July 2022.

  Until Stage 2A is developed, hydraulic loading rate compliance failure of the Stage 1B irrigation area will continue, as will nutrient compliance failure in the river discharge.

  Stage 2B Winter Storage

  Winter Storage is designed to further reduce discharges to the river and must be in operation by 31 December 2035.

Electrical and Controls

- **Surge Protection**

  A programme of work is underway to design and install surge protection at the WWTP, to protect critical equipment during electricity brownouts. Surge protection is required to protect critical equipment (such as UV) from damage and thus maintain their operability for consent compliance.

- **Controls Systems Improvements:**

  The SCADA system for the site will be replaced in 2021-2023. This ensures currency of equipment and delivers remote access to ensure ongoing operation.

- **Power Supply**

  The site power supply may need to be upgrade to sustain the Staged land irrigation and treatment plant performance requirements.

Site Works

- **Site Fencing**

  The site is not securely fenced. A recent Worksafe case against the Gore District Council (as a result of a child drowning in their wastewater treatment pond) ordered the council to securely fence their pond.

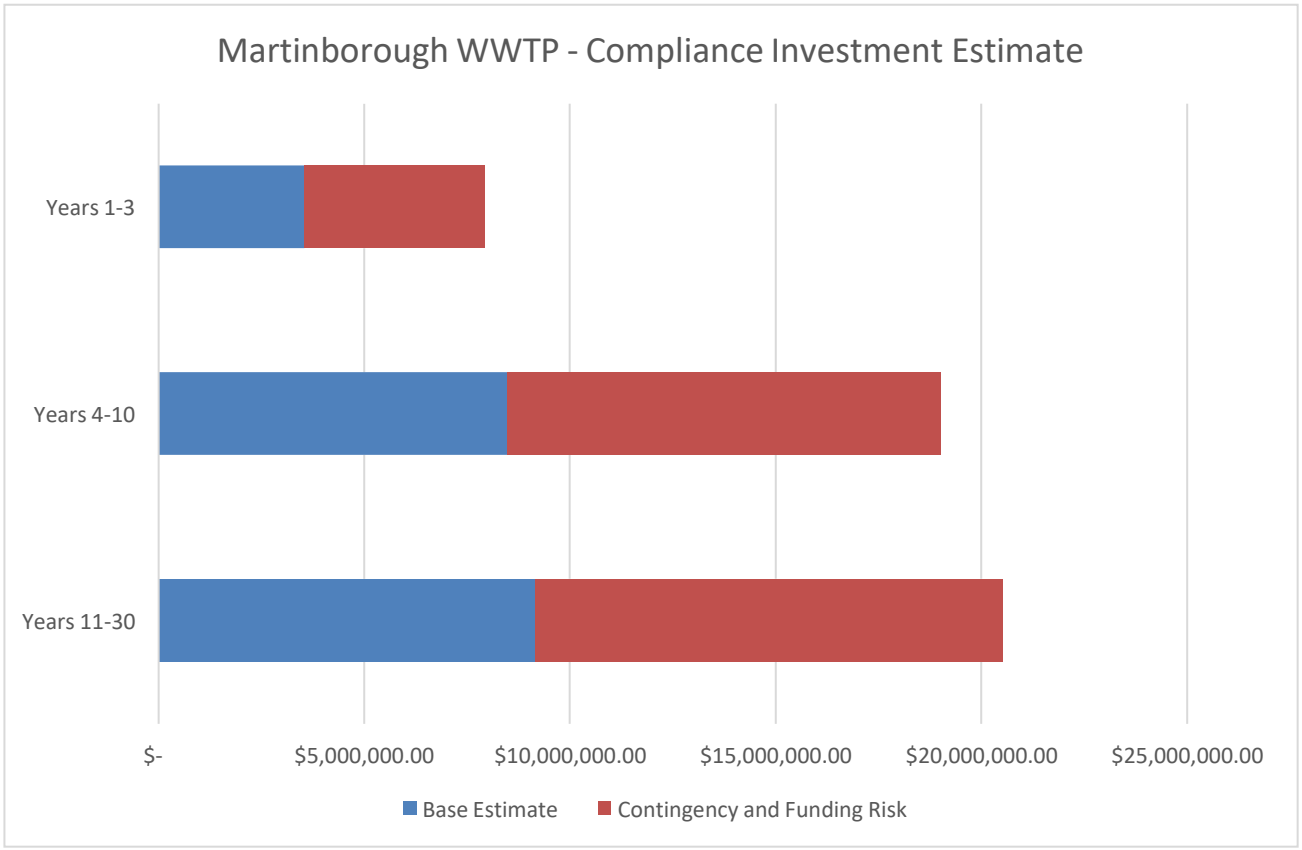
  WWL recommends that the site is securely fenced to protect against accidental drowning.

- **Operator Facilities**

  The site does not provide adequate operator facilities. The need for operator attendance will increase with the Stage irrigation upgrades'

Cost Estimates and Programme

A preliminary capital cost estimate for the Martinborough WWTP compliance programme has been prepared as per Wellington Water's Cost Estimating Manual Level 1. The individual project estimates are provided as an Appendix to this memo. A summary of the estimated investment required is presented below, in line with Long Term Planning periods. Further investigations will be required to define scope and risks so that these costs can be refined, and contingency percentages reduced.


Martinborough WWTP - Compliance Investment Estimate
Years 1-3
Years 4-10
Years 11-30
$-
$5,000,000.00
$10,000,000.00
$15,000,000.00
$20,000,000.00
$25,000,000.00
Base Estimate
Contingency and Funding Risk

FEATHERSTON WASTEWATER TREATMENT PLANT

Resource Consent Compliance for the period 1 June 2020 - 31 May 2021

The Annual Report for GWRC outlines the full consent compliance status. A high-level summary is provided below.

- **Treated Effluent Quality**

  The treated effluent quality was compliant throughout the year apart from BOD_5 and Total Nitrogen in May 2021. This was related to an uncontrolled trade waste dumping in the network, identified by an oily sheen across the surface and low DO levels in the pond during April and May.

- **Discharge Volume**

  The WWTP operated in compliance with the discharge volume limits to Donald's Creek.

- **Environmental Monitoring**

  Nitrogen and phosphorus were elevated in Donald Creek downstream of the discharge.

  There are no requirements for ecological monitoring in the operative consent.

- **Reporting & General**

  Various sampling and reporting non-compliances which Wellington Water's Network Management Group and Network Engineering Team are actively working to resolve

  Community Liaison Group is not operating – Wellington Water is actively working to reestablish this group.

Work Completed in 2020-2021

Work completed at the WWTP to date:

- Sludge survey
- Operator Facilities
- Various health and safety improvements

Wastewater Treatment Plant Capacity and Performance Assessment

- **Resource Consent**

  The primary facultative pond is 2.6ha with a design loading rate of 89kgBOD/ha (winter temperature 9^{o}C). At a design BOD contribution of 80gBOD/person/day, and an estimated current population of 2500, the primary facultative pond BOD loading rate is 77kgBOD/ha.day which is less than the design capacity. Hydraulic capacity related to the high level of inflow and infiltration in the network requires further consideration.

  The treatment plant is undergoing a process to renew the resource consent. This will require an upgrade to the treatment plant. Therefore, the efficacy of the current WWTP process has not been assessed further.

- **Septic Tank Disposal**

  Uncontrolled septic tank trucked waste disposal into the Featherston wastewater network poses a risk to the ongoing consent compliance at the WWTP.

- **Sludge in Ponds**

  The pond has not been de-sludged since construction in the 1970's. A sludge survey was carried out in June 2021. The results indicate that there is at least 1 metre on average of free water. Therefore it is assessed that the current sludge level is not affecting the efficacy of the pond treatment process.

Cost Estimates and Programme

A major project is underway to develop options and costs for upgrading the Featherston WWTP.

LAKE FERRY WASTEWATER TREATMENT PLANT

Resource Consent Compliance for the period 1 July 2020-30 June 2021

The Annual Report for GWRC outlines the full consent compliance status. A high level summary is provided below.

- **Treated Effluent Quality**

  The treated effluent quality and nutrient loadings rates were compliant.

- **Discharge (Irrigation & Stream)**

  The discharge volume was compliant with the resource consent. The WWTP discharged to the wetland area for most of the year since the irrigation disposal system was damaged in July 2020 due to a contractor incident.

- **Reporting & General**

  Various sampling and reporting non-compliances which Wellington Water's Network Management Group and Network Engineering Team are actively working to resolve.

  Development of an updated Management Plan is underway for this site.

Work Completed in 2020-2021

Work completed at the WWTP to date:

- Repair/replacement of dripline irrigation system.
- Some upgrades to pumping systems

Wastewater Treatment Plant Capacity and Performance Assessment

The capacity of the treatment plant will need to be assessed and re-considered if the proposed 60-lot development proceeds. This will require review of the hydraulic and nutrient loading limits to land.

A resource consent renewal is required in 2025.

Cost Estimates and Programme

Costs will need to be allocated to review the system capacity and renew the consent. At this time it is not known if any upgrades will be required.

Reactive renewals budgets are being used to replace the control system and install irrigation field moisture sensors this financial year.

CONCLUSIONS

The Martinborough and Greytown WWTPs require considerable investment over the duration of their consents. Some of the early commitments of the staged consents stated in the consent hearings appear to have been postponed (for example inlet screening and pond desludging) and these need to now be completed. In addition, increased population growth since the plants obtained resource consents and the staged nature of their resource consents regarding land irrigation areas means that investment needs to be brought forward to ensure compliance is established and maintained.

The Featherston WWTP operates under the 2012 resource consent which has minimal conditions. It is undergoing a resource consent renewal process through the Major Projects team at Wellington Water. The costs of the possible treatment options are presented elsewhere.

The Lake Ferry WWTP has had some operational issues over the past year, resulting in discharge to wetland rather than to land. These issues have been repaired and the WWTP is back to discharging to land. Some minor works improvements continue to be required. An application for consent renewal will need to be lodged by 2025.

Amy Smith
Senior Engineer, Network Engineering

Phil Garrity
Principal Engineer, Network Engineering

Attachment: Greytown and Martinborough WWTP Investment Summary by Plant Area

INVESTMENT SUMMARY BY PLANT AREA

Martinborough WWTP Compliance Capex Summary		
Area	**Amount**	**Timing**
Pond Inlet Screening	$1,492,000	2022/24
Facultative Pond Improvements	$1,200,000	2022/23 - Desludging component. Other components TBC
Maturation Pond Improvements	$1,407,000	TBC
Ultraviolet Disinfection Renewal / Upgrade	$675,000	TBC
Stage 1B Land Irrigation	$46,000	2021/23
Stage 2A Land Irrigation	$6,454,000	2022/26
Stage 2B Land Irrigation (Winter Storage)	$3,127,000	2030/34
Electrical and Control	$130,000	2021/26
Site Works	$351,000	2023/24 Some components
Documentation	$140,000	Various
Additional Treatment Capacity (Provisional)	$6,175,000	TBC
Contingency (20%)	$8,479,000	Across programme
Funding Risk (30%)	$17,805,000	Across programme
Total	**$47,481,000**	
Greytown WWTP Compliance Capex Summary		
Area	**Amount**	**Timing**
Pond Inlet Screening	$1,674,000	2023/25
Facultative Pond Improvements	$825,000	2022/23 - Desludging component. Other components TBC
Maturation Pond Improvements	$1,125,000	2022/23 - Desludging and H&S components. Other components TBC
UV Disinfection Renewal / Upgrade	$0.00	Renewal may be required
Stage 1B Land Irrigation	$152,000	2022/24
Stage 2A Land Irrigation	$4,525,000	2022/29
Stage 2B Land Irrigation (Winter Storage)	$4,909,000	2032/38
Electrical and Control	$130,000	2021/26
Site Works	$1,887,000	2022/25 Some components
Documentation	$140,000	Various
Additional Treatment Capacity (Provisional)	$7,280,000	TBC
Contingency (20%)	$9,059,000	Across programme
Funding Risk (30%)	$19,023,000	Across programme
Total	**$50,729,000**	

Wellington Water

MEMO

TO	South Wairarapa District Council
COPIED TO	Jeremy McKibbin, Group Manager Network Management
FROM	Laurence Edwards, Chief Advisor Drinking Water, Martyn Cole, Manager Service Planning,
DATE	22 December 2021

FOR YOUR INFORMATION

South Wairarapa District Council as Wellington Water shareholder – Summary two Years In

Strategic asset management planning and delivery at Wellington Water

Our strategic assessment management planning and delivery framework incorporates a continuous cycle and process of planning, building, acquiring, operating, maintaining and disposing of assets with an outcome focus for our stakeholders – our client councils, and the customers and communities that we serve.

This process provides a framework for continuous improvement, achieved through investigation of asset condition and performance against service goals, and renewal or upgrade of the assets to lift the standard to achieve or exceed these goals. As your trusted advisor, and as we learn more about your assets, their performance, and the risks that the existing networks pose to service delivery, it's important that we regularly convey and update our understanding to you and recommend improvement works necessary to maintain an acceptable level of performance and service to the community.

Our starting point – October 2019

When SWDC joined Wellington Water in October 2019, we immediately set about assessing the performance of the critical drinking water treatment plants and advised council of urgent risk reduction work required to reduce significant risks to delivery of safe and healthy drinking water, together with longer term work needed to bring these assets up to compliant standard. This improvement work is still ongoing following Council providing funding to address these immediate priority issues. Funding to address immediate wastewater overflow issues identified was also provided by Council in early 2020.

Our 2021 Long Term Plan advice was based on these initial assessments, the developing depth of understanding of asset operations and performance, and the funding envelopes presented.

As we learn more about the networks, we continue to identify improvement works required to manage council and community risk to acceptable levels, and it is important that we continue to appraise you of the risks associated with your assets as our knowledge and understanding of them develops through the strategic asset management planning and delivery process.

Our 2020 status updates

In June 2020 we provided updates on status and progress of water and wastewater treatment improvements. Generally good progress was made on the urgent improvements and reducing regulatory risks overall, however we advised the work to achieve compliance was ongoing and several operational challenges were faced that also brought insights for further investment needs. Over this period a greater depth of understanding and knowledge was developed through the operation of plants and following the work undertaken following the initial assessments. COVID also played a part in disrupting operations and programmes of work both locally and nationally.

Specific challenges in operation and maintenance of the Martinborough and Greytown wastewater treatment plants were identified and core themes of improvement areas requiring more detailed assessment included O&M manuals, document management, organizational roles and responsibilities, asset management practices, consent management, suitability of irrigation systems, plant telemetry control and alarms, and management of trade waste.

In late 2020 we provided Long Term Plan investment advice to Council based on the available information and signaled increasing operational reactive maintenance cost pressures that were emerging at the time. These figures were included for Long Term Plan Consultation although the scale of the emerging reactive costs increases weren't quantified until after the Long Term Plan figures had been issued. An operational cost review in 2021 confirmed councils preferred approach to managing these additional costs in 2021-22, and noted similar funding gaps would also be present in years 2 and 3 of the LTP.

The current difference between the 2022/23 operational budget of $3,30M and forecast expenditure of $4.50 million is $1.2million attributable to increased reactive maintenance, planned maintenance and monitoring.

A budget of $5.82 million (including carry overs from 2020/21 ($ 586k) was set for year one of the LTP capital programme, based on the available understanding of identified and costed capital projects from the initial assessments and subsequent works and operational knowledge.

These capital figures fed into Council's long term planning processes in late 2020 and through audit and consultation early 2021, ultimately being adopted at the end of 2020/21. Ongoing investigations, scoping and design proceeded following the submission of the Long Term Plan investment advice and is in the order of an additional $2.9 million of capital investment in 2022/23.

There remain additional growing pressures on both operational and capital budgets to meet drinking water assurance under the new drinking water regulator, asset information and data improvements, cybersecurity, active leak management, COVID-19 cost escalation, capital programme material and labour cost and availability headwinds.

Progress and what we have learned – to end of 2021

We expect to be able to complete commissioning of the additional treated water storage at the Waiohine treatment plant this summer, and this will allow the Memorial Park treatment plant to be taken offline to allow commencement of the upgrade needed to meet the requirements of the current drinking water standards later in 2022 and into the 2022/23 financial year. Completion of this work will represent a significant step forward for achieving compliance with drinking water standards – however, it's important to note that many of the treatment plant systems lack operational resilience and remain vulnerable to disruption, requiring further investment to resolve. New requirements of Taumata Arowai will also require further investment.

Further investigations and information discovery has resulted in more projects being identified for investment prioritisation such as the watermain crossing the Tauherinikau river, and together with price escalation in the industry and increases in project scope and costs specifically with the Waiohine and Memorial Park Water Treatment Plant projects being highlighted, there continues to be pressure on available budgets and a need to communicate clearly to council risks of not proceeding with important work that does not fall within the available budget envelope following prioritisation.

Assessment of wastewater treatment plant performance against consent requirements has also identified a need for significant investment at the Martinborough and Greytown plants over the duration of the consents for these plants. Some of the early commitments of the existing staged consents as stated in the consent hearings appear to have been deferred (for example inlet screening and pond desludging) and these now need to be completed with urgency.

In addition, increased population growth since the plants obtained resource consents and the staging of land irrigation areas and winter storage in the resource consents require investment to ensure compliance is established and maintained.

The scale of additional investment required to resolve these issues is significant. Indicatively, the expected investment required for the Martinborough WWTP is around $3.5M-$8M over the next 1-3 years, $8.5M-$19M over years 4-10, and $21M-$47M over the 11-30 year horizon.

For Greytown WWTP, the indicative scale of additional investment required is $2.2M-$5M over the next 1-3 years, $6.8M-$15M over years 4-10, and an estimated total of $23M-$51M over the 11-30 year horizon. The Featherston WWTP operates under the 2012 resource consent which has few conditions, and the scale of investment needed for the possible treatment options have been presented to council previously.

We also anticipate increased operational costs going forward to meet monitoring costs for implementation of stormwater consents. From 2027 onwards, this may also require works to improve the quality of the stormwater.

<u>Positioning for the future</u>

Work continues on delivering the identified and agreed improvements to the water supply system to continue to increase safe drinking water and achieve compliance and further scoping of wastewater treatment improvements needed with a focus on performance, safety and resource consent compliance of the plants.

However it is clear that there are numerous and significant upcoming investment needs for council consideration in a challenging post-COVID fiscal environment, including key decisions on acceptable timeframes for improvements to achieve compliance for drinking water supplies, wastewater discharges to the environment, and global stormwater consents.

Difficult decisions will need to be made as to what work can be funded. As your trusted advisor we will continue to assist you in your decision making including advising on the risks council carries for those activities that sit outside the available operational and capital works funding envelopes.

We will continue to apply the strategic assessment management planning and delivery framework and update you on the performance of your assets and the additional investment requirements as this work progresses.

MEMO

TO	South Wairarapa District Council
COPIED TO	Jeremy McKibbin, Group Manager Network Management
FROM	Martyn Cole, Manager Service Planning
DATE	December 2021

FOR YOUR INFORMATION

SWDC 2022/23 Annual Plan investment advice

General approach

The LTP year 2 inflated budgets have been used as the basis for investment advice. We have looked at changes in risks, and emerging risks since our LTP investment advice was delivered in late 2020 and are proposing changes to investment levels for 2022/23 accordingly.

This includes need for increased investment in years 2 and 3 of the LTP due to:

- early Emerging operational cost pressures
- Refinement of the capital programme delivery
- Cost escalation pressures in delivering the capital programme.

In relation to the operational costs Government has signalled that Councils would receive a further two tranches of funding to support local government transition through the reforms to New Zealand's drinking water, wastewater and stormwater services. The first is $500 Million to ensure councils are no worse off with around $39 Million allocated to the Wellington region's local authorities (excluding GWRC).

Our advice is that councils explore this funding as an opportunity to address the funding challenges outlined in this memo including mitigating emerging risks.

SWDC Opex budgets

The key issue being addressed by the proposed investment levels is the challenge of the opex investment gap in years 2 and 3. In the current year the increased opex costs were partially offset with stimulus funding, which masked the impact of the increased cost of providing services. The stimulus funding will end on 30 June 2022 and will leave a funding gap for 2022/23 and 2023/24. The proposed investment required is signalled in the table below. Our advice is that council consider the signalled government investment to fund this gap.

The investment gap incorporates the following key investment area.

- Reactive and planned maintenance.
  - Through the LTP process Council adopted an investment level for capital renewals. As advised while an increase from historical levels, it carries an ongoing risk of increased asset failures resulting in higher reactive costs including maintenance, repairs and renewals.
  - We are seeing a continuation of increased reactive costs and have included for this in the advice. The number proposed is only an estimate the actual need could be higher.
  - There is also an increase in critical planned maintenance that is funded through stimulus in 2021/22. Completing critical planned maintenance is considered good asset management practice and can allow for planned work to occur on critical assets.

Proposed OPEX budgets[1]

($ x 1,000)	LTP Year 1 2021/22	Forecast 2021/22 (as at Sept)	LTP Year 2 2022/23	Proposed AP 2022/23	Difference	Commentary
Water supply	$1,641	$2,036	$1,877	$2,234	$357	Increased reactive maintenance expectation and operations costs.
Stormwater	$371	$365	$383	$439	$56	Increased reactive maintenance expectation, Increased planned maintenance
Wastewater	$824	$1,464	$1,023	$1,824	$801	Increased reactive maintenance expectation, Increased planned maintenance, Increased monitoring
Total	**$2,836**	**$3,865**	**$3,283**	**$4,498**	**$1,215**	A more detailed break down is contained in appendix A.

Additional funding to address emerging risks

The context in which we are operating is changing, leading to several emerging cost and risk pressures. Addressing these risks is part of improving our asset management maturity that was highlighted through the LTP process and has started through the use of the current stimulus funding. New risks have emerged making this asset management improvement even more important. With the emerging risks there is still work to do to fully understand the impact, but we recommend that Wellington City Council invest to continue and enhance the asset management improvement programme. Like the opex shortfall our advice is that the government signalled funding could be utilised. The key risks are as follows:

[1] An additional detailed breakdown by operational investment categories is provided in appendix A

- Providing safe water assurance**.** The new drinking water regulator, Taumata Arowai will expect a lift in standards and disclosure. As a result, we need to continue the development and improvement of our data, processes, and systems to ensure we can continue to achieve and demonstrate our performance confidently to customers, councils and Taumata Arowai.
- Asset information and data improvements. Asset information is a fundamental part of an asset management system and improvements were key items identified for investment as part of the LTP advice. These improvements facilitate an increased understanding of assets and their performance, and our ability to collect and analyse data helps better investment decisions. The improvement programme we have initiated has been funded from the stimulus funding, and we are signalling that additional investment needed in 2022/23 and 2023/24 to continue this momentum.
- Cybersecurity. There is an increasing level of cyber security risk in the world of critical infrastructure, which includes the three water networks. It is important that we build up the resilience of our operational and information technology and invest in the ability to detect, protect and respond to cyber attacks.
- Leakage management**.** The government stimulus funding has provided investment in 2020/21 and 2021/22 to proactively find and then repair water leaks. The leak repair programme of work will not be able to be funded from 2022/23 within the proposed budget envelope, funding has been included to find leaks but there is insufficient funding to repair these.

While we are currently working to scope the investment required, initial indications suggest $5 to $7M per annum across the region is needed. In the context of South Wairarapa District Council there will be a proportional contribution for 2022/23. This investment need has not been incorporated into the proposed opex numbers in the previous table.

There is another cost risk that is not included in the budget submission or the risks mentioned above.

- COVID-19 Cost escalation. Materials and resource scarcity continue to be increasing challenges due to the global pandemic. Constraints in the market are resulting in upward pressure on the cost of both capex and opex activities. There are risks that the cost escalation will exceed budget allowances.

SWDC CAPEX Budgets

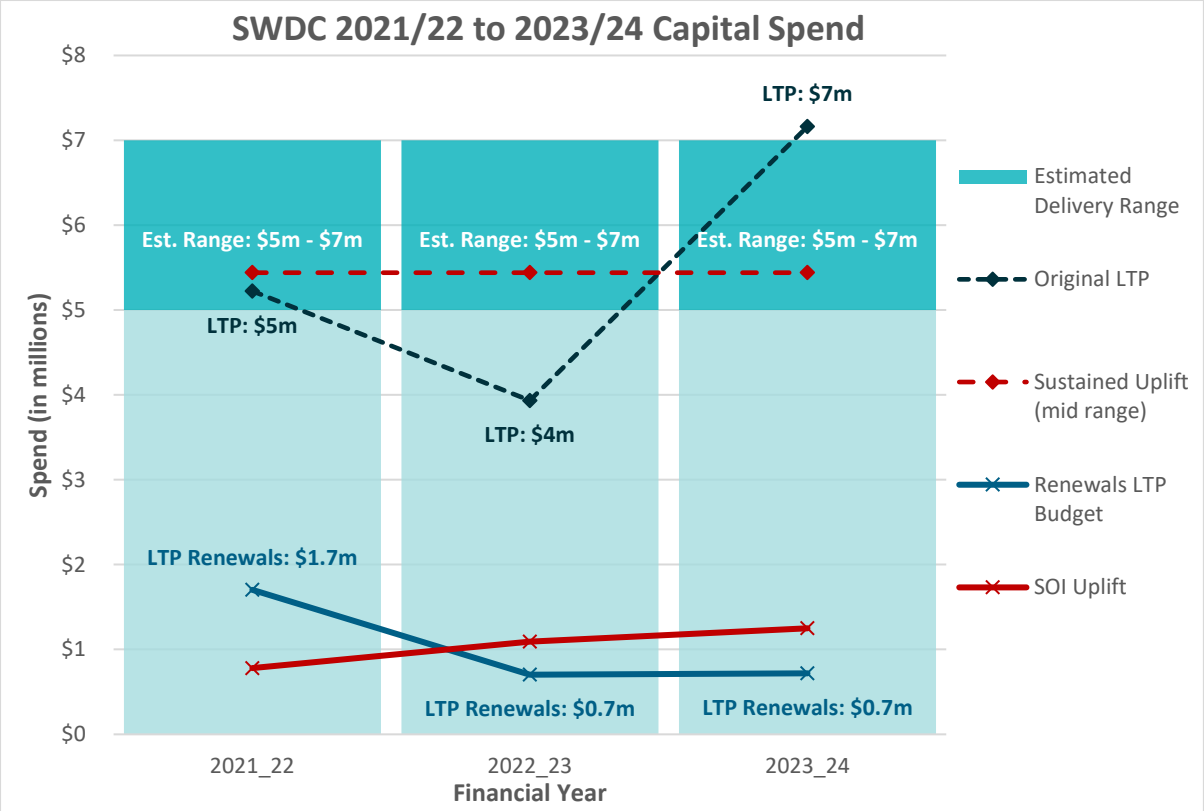
Proposed CAPEX budgets

($ x 1,000)	LTP Year 1 2021/22	LTP Year 2 2022/23	Proposed AP 2022/23	Difference	Commentary
Water supply	2,410	1,950	3,790	1,840	Additional projects identified for delivery in Year 1 rephased into year 2
Stormwater	132	0	130	130	
Wastewater	3,260	1,990	2,910	920	
Total	**5,802**	**3,940**	6,830	**2,890**	

Delivery of the three-year capex programme

As signalled to council in June 2021, there are constraints to delivering the regional capital programme and a strategy is in place to build regional capability and capacity, this includes consultants, contractors and Wellington Water staff.

The approach to addressing this is to work within a range (as shown below) and deliver the total programme over three years. This means that should the budget be underspent there is a need to carry over remaining funding (this is dependent on project stage and may not be needed to all waters).



Capital Delivery Programme Pressures

The following risks, issues and challenges have been identified, and could impact the deliverability of the total three-year programme.

It is still early in the delivery of the first year and we expect to have a better view of any potential impact at the end of quarter 2 of this year. We intend to provide an update to council in February 2022 on the deliverability of the three-year programme, allowing council to make adjustments if needed.

Deliverability Challenges

- Year to date
    - We are currently managing the risks associated with the nationwide lockdown in August/September and the localised lockdowns in Auckland, Waikato and Northland. We still expect to deliver between $145 - $189M of capital works regionally in 2021/22, this forecast will be reviewed regularly.

    - There have been delays in material delivery and these delays are being factored into the delivery plans for each project.
- There are three key headwinds that may impact future deliverability
    - With the unpredictable nature of covid we are operating with the ongoing risk of further restrictions that could result in construction being suspended or with localised restrictions outside of Wellington affecting travel and productivity of workers in these areas when working from home.
    - The ability to source and bring into the country construction materials could be affected if delays in global manufacturing and shipping increase.
    - The infrastructure sector was already signalling a shortage of capacity prior to covid. With the borders closed there is now no ability to bring in overseas resource to fill the resource gap exacerbating the problem. The availability of human resource is an issue for Wellington Water and the supply chain.
- Cost escalation**.** Constraints in the market are resulting in upward pressure on the cost of both capex and opex activities as materials and labour costs are constantly changing based on supply and demand. This will affect the quantity of work that could be delivered for the allocated budgets. In some instances, these costs increases are significant and cannot be managed within the budget envelope. We will work with council on a case by case basis to manage these.
- Replacing critical assets – Assessment of very high criticality assets is ongoing and there is likely to be additional critical assets that require replacement sooner rather than later. The current renewals budget, especially wastewater has minimal flexibility to respond to short term renewal needs of these assets.
- Unexpected events. We have not included any contingency for unexpected events such as major asset failures requiring immediate attention and affecting the planned capital programme. This is on the understanding that Council is aware of this risk and will provide additional funding on a as needed basis.