

AGENDA



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MEMBERSHIP: Shannon Dowsing, Larry Foster, Terry Sheldrake (Chair), Kerry Worsnop and Tangata Whenua members
Pene Brown, Ronald Nepe, Angus Ngarangioue.

WASTEWATER MANAGEMENT Committee

DATE: Thursday 1 September 2022

TIME: 9:00AM

AT: Te Ruma Kaunihera (Council Chambers), Awarua, Fitzherbert Street, Gisborne

AGENDA – OPEN SECTION

1. Apologies.....	3
2. Declarations of Interest.....	3
3. Confirmation of non-confidential Minutes	4
3.1. Confirmation of non-confidential Minutes 7 July 2022.....	4
3.2. Action Sheet.....	8
3.3. Governance Work Plan.....	9
4. Leave of Absence	10
5. Acknowledgements and Tributes.....	10
6. Public Input and Petitions	10
7. Extraordinary Business.....	10
8. Notices of Motion	10
9. Adjourned Business.....	10
10. Reports of the Chief Executive and Staff for INFORMATION	11
10.1. 22-192 Tairāwhiti Resource Management Plan Update	11
10.2. 22-199 Alternative Use and Disposal Update.....	21
10.3. 22-200 DrainWise Programme Update.....	61
10.4. 22-203 Wastewater Treatment Plant Stage 2 Update	66

Wastewater Management

Reports to:	Council
Chairperson:	Terry Sheldrake
Deputy Chairperson:	To be confirmed
Membership:	Four Councillors (including the Chairperson) and four tangata whenua representatives.
Quorum:	Four members. Two to be Councillors and two to be tangata whenua.
Meeting Frequency:	Four times a year.

Purpose

The establishment of this Committee is a requirement of the conditions of the resource consents for the upgrade and discharge of Gisborne's municipal wastewater.

On 21 September 2007 the Minister of Conservation granted the coastal permit for the discharge of treated wastewater to the marine area subject to the same conditions as recommended by the Hearings Committee.

Terms of Reference

1. Ensure implementation, commissioning and monitoring of the Wastewater Treatment Plant is carried out in accordance with the consent conditions.
2. Monitor compliance with permit conditions and separated industry standards.
3. Explore feasible options for alternative use and disposal of domestic and industrial wastewater and recommend implementation.
4. Identify research, monitoring and planning projects to improve the mauri and water quality of Tūranganui a Kiwa. Develop and administer the Tūranganui a Kiwa Water Quality Enhancement Project.
5. Ensure development of educational information to encourage reductions in domestic and industrial wastewater.
6. Recommend membership of and receive reports from independent review panel (IRP).
7. Provide an annual report to the Chief Executive of the Gisborne District Council.
8. Carry out the functions required by the conditions of the resource consents and report them to Council.
9. The Committee has no delegated authority from Council other than the functions expressed in the conditions of the resource consents.

Collaborations

These arrangements are entered into by the Gisborne District Council and tangata whenua representatives of Tūrangānui a Kiwa, supported by other members of the Committee, in a spirit of goodwill and a pledge to act towards each other with the utmost good faith.

Each member to this protocol is committed to progressing and enhancing the overall wellbeing of the district's people, environment and heritage by acknowledging and accommodating each other's values and philosophies, where applicable.

The Committee will develop and maintain effective relations with other Council committees, Government and its departments, NGOs and other stakeholders to achieve its terms of reference, and in particular:

- Gisborne District Council officers
- Hauora Tairāwhiti (District Health Board)
- Department of Conservation
- Industry
- Recreational groups
- Environmental groups
- Federated Farmers.

Special Notes

1. Membership of the Committee comprises four councillors and four tangata whenua representatives and other members that the Committee itself shall determine from time to time.
2. The Committee may appoint, or invite participation in an advisory or consultative capacity, other persons from:
 - Gisborne District Council officers
 - Hauora Tairāwhiti
 - Department of Conservation
 - Industry
 - Recreational Groups
 - Environmental Groups
 - Federated Farmers.
 - Others who may have a particular contribution to make to the workings of the Committee.

The Council agrees to remunerate members that the Committee appoints.

Power to Act

To make all decisions necessary to fulfil the role and scope of the Committee, subject to the limitations imposed.

Power to Recommend

To Council and/or any standing committee as it deems appropriate.

3.1. Confirmation of non-confidential Minutes 7 July 2022

MINUTES

Draft & Unconfirmed



P O Box 747, Gisborne, Ph 867 2049 Fax 867 8076
Email service@gdc.govt.nz Web www.gdc.govt.nz

MEMBERSHIP: Shannon Dowsing, Larry Foster, Terry Sheldrake (Chair), Kerry Worsnop and Tangata Whenua members Pene Brown, Ronald Nepe, and Angus Ngarangioue.

MINUTES of the WASTEWATER MANAGEMENT Committee

Held in Te Ruma Kaunihera (Council Chambers), Awarua, Fitzherbert Street, Gisborne on Thursday 7 July 2022 at 9:00AM.

PRESENT:

Shannon Dowsing, Larry Foster, Terry Sheldrake (Chair), Kerry Worsnop and Tangata Whenua members Ronald Nepe, and Angus Ngarangioue.

IN ATTENDANCE:

Her Worship the Mayor Rehette Stoltz, Councillor Pat Seymour, Chief Executive Nedine Thatcher Swann, 4 Waters Infrastructure Manager Neville West, Senior Project Manager Ben McArthur (Civil Project Solutions), Communications Advisor Sophie Rishworth, Democracy & Governance Advisor Jill Simpson and Committee Secretary Jesse Graham.

The meeting commenced with a karakia.

Secretarial Note: There was no quorum therefore the meeting was adjourned until 9.15am.

1. Apologies

MOVED by Cr Dowsing, seconded by Cr Foster

That the apologies from Pene Brown and David Wilson be sustained.

CARRIED

2. Declarations of Interest

There were no declarations of interest.

3. Confirmation of non-confidential Minutes

3.1 Confirmation of non-confidential Minutes

MOVED by Cr Foster, seconded by Cr Dowsing

That the Minutes of 10 February 2022 be accepted.

CARRIED

3.2 Confirmation of confidential Minutes

MOVED by Ronald Nepe, seconded by Cr Foster
That the Minutes of 10 February 2022 be accepted.

CARRIED

3.3 Action Sheet

Noted.

3.4 Governance Work Plan

Noted.

4. Leave of Absence

There were no leaves of absence.

5. Acknowledgements and Tributes

There were no acknowledgements and tributes.

6. Public Input and Petitions

There were no public input and petitions.

7. Extraordinary Business

There was no extraordinary business.

8. Notices of Motion

There were no notices of motion.

9. Adjourned Business

There was no adjourned business.

10. Reports of the Chief Executive and Staff for INFORMATION

10.1 22-108 Alternative Use and Disposal Update

MOVED by Cr Worsnop, seconded by Cr Foster

That the Wastewater Management Committee:

1. Notes the contents of this report.

CARRIED

10.2 22-109 DrainWise Programme Update

MOVED by Cr Dowsing, seconded by Cr Worsnop

That the Wastewater Management Committee:

1. Notes the contents of this report.

CARRIED

10.3 22-113 Wastewater Treatment Plant Stage 2 Update

Ben McArthur spoke to his report.

Summary of update and discussion points included:

- Project still on track for timelines.
- There is a significant electrical matter that requires in excess of \$50k to remedy, however cost savings in other areas means the project is within budget to accommodate this.
- Site visit later today will demonstrate the work gone into the project to date.
- The committee was assured that the fire at the Christchurch wastewater plant will not likely occur with our local one due to them two being different in structure.

MOVED by Cr Foster, seconded by Cr Worsnop

That the Wastewater Management Committee:

1. Notes the contents of this report.

CARRIED

10.4 22-116 Three Waters Reform Update

An update was given by Nedine Thatcher Swann.

Summary of update and discussion points included:

- The Water Services Bill outlines four entities.
- The entity Tairāwhiti will be part of includes 21 councils and 3 unitary councils.
- There will be regional representative groups established as co-governance groups.
- There may be sub-regional governance groups – yet to be confirmed.
- Regional representative groups are appointed as Boards and will be responsible for the water entities.
- Under the 3 Waters Reform, current assets and staff, will be transferred to the entities.
- There is a national transition unit working together with councils to resolve issues.
- Future outlook is uncertain at this stage.
- Complicating factors are where our regional councils overlap and where there are differing standards. They will eventually look for consistency.
- A lot of work has been put into getting our local/regional standards right and want them captured in the reform.
- Our regulatory arm is still in place and therefore still have enforcement ability and can hold them to account.
- TRMP is potentially a place where issues can be resolved.

MOVED by Cr Dowsing, seconded by Cr Foster

That the Wastewater Management Committee:

1. Notes the contents of this report.

CARRIED

10.5 22-148 Wastewater Management Committee Meeting 26 May 2022

MOVED by Cr Dowsing, seconded by Cr Foster

That the Wastewater Management Committee:

1. Notes the content of the report.

CARRIED

10.6 22-153 Tūranganui a Kiwa Water Quality Enhancement Project Update

MOVED by Cr Dowsing, seconded by Cr Foster

That the Wastewater Management Committee:

1. Notes the content of the report.

CARRIED

11. Close of Meeting

There being no further business, the meeting concluded at 9.55am.

Terry Sheldrake

CHAIR

3.2. Action Sheet

Meeting Date	Item No.	Item	Status	Action Required	Assignee/s	Action Taken	Due Date
11/03/21	10.2	21-22 Wastewater Treatment Plant Stage 2 Delivery Update	Completed	Prepare a report to Council or, if necessary, an Extraordinary Wastewater Management Meeting (public excluded) outlining legal risks and any other information relevant to non-compliance and resource consent.	David Wilson	19/08/2022 David Wilson Discussions between Director Lifelines and Compliance Monitoring and Enforcement Manager resolved the issues and therefore a meeting is no longer required.	18/08/22

3.3. Governance Work Plan

WASTEWATER MANAGEMENT - STANDING COMMITTEE							Meeting Dates				
Group Activity	Activity	Name of agenda item	Purpose	Report type	Owner	26-May	7-Jul	1-Sep	3-Nov	1-Dec	
Community Lifelines	4 Waters Infrastructure	Wastewater Treatment Plant Upgrade - Update	Update on progress of the Wastewater Treatment Plant (WWTP) Stage 2 Upgrade	Information	Ben McArthur (CPS)						
Community Lifelines	4 Waters Infrastructure	Alternative Use and Disposal (AUD) Update	Provide the WMC with an update on the Alternate Use and Disposal Project	Information	Neville West						
Community Lifelines	4 Waters Operations	Turanganui A Kiwa Water Quality Enhancement Project Update	Provide update on the Tūranganui-a-Kiwa Water Quality Enhancement Project as worked on by the KIWA Group and Council.	Information	Ian Ruru						
Community Lifelines	4 Waters Operations	Drainwise Programme Update	Provide an update on the DrainWise programme.	Information	Neville West / Chris Hopman						
Community Lifelines	4 Waters Infrastructure & 4 Waters Operations	WMC Annual Report 2021-22	Provide the Wastewater Management Committee (WMC) with an annual report that summarises the financial year's activities.	Information	Tracey Panton, Neville West, Chris Hopman, Ben McArthur (CPS)						
Community Lifelines	4 Waters Infrastructure	Wastewater Overflow Consent	Update the WMC on the wastewater overflow resource consents for both dry and wet weather overflows	Information	Neville West						
Community Lifelines	4 Waters Infrastructure	Treated Water Effluent Quality Report	Outlines the characteristics of what the treated wastewater will be like post the clarifier and UV what do we know volume wise and quality wise, also a refresh of the list of potential users i.e. if this quality who could use it.	Information	Neville West, Ben McArthur (CPS) & Beca						
Community Lifelines	4 Waters Infrastructure	Wastewater Conveyance Report	Outlines at a high level how far we can pump the wastewater, with proposed routes across the Poverty Bay flats, do radius circles of how far for what cost and what infrastructure is required.	Information	Beca						

WASTEWATER MANAGEMENT - STANDING COMMITTEE

Meeting Dates

Group Activity	Activity	Name of agenda item	Purpose	Report type	Owner	Meeting Dates				
						26-May	7-Jul	1-Sep	3-Nov	1-Dec
Community Lifelines	4 Waters Infrastructure	Three Waters Reform Update	This paper is to update the committee on the 3W reforms to go to every meeting with what is happening, any changes etc.	Information	Yvette Kinsella					
Community Lifelines	4 Waters Infrastructure	Wastewater Treatment Plant Upgrade - Update & site visit	A short presentation on progress of the Wastewater Treatment Plant upgrade followed by a visit to the Wastewater Treatment Plant site at Banks Street	Information	Dave Wilson, Neville West, Ben McArthur					
Strategy & Science	Strategy & Science	Tairāwhiti Resource Management Plan	Report outlining high level of timeframes in the TRMP programme overall and further detail on what is included in each workstream for Phase 1 and stakeholder engagement – when this is occurring and what the WMC might expect from TRMP team in terms of points of input and how.	Information	Charlotte Knight					

10. Reports of the Chief Executive and Staff for INFORMATION



22-192

Title: 22-192 Tairāwhiti Resource Management Plan Update
Section: Strategy
Prepared by: Dr Graeme Card PMP - Senior Programme Manager Strategy & Science
Meeting Date: Thursday 1 September 2022

Legal: No

Financial: No

Significance: **Low**

Report to WASTEWATER MANAGEMENT Committee for information

PURPOSE

The purpose of this report is to introduce the Tairāwhiti Resource Management Plan (TRMP) review programme to members of the Wastewater Management Committee (WMC).

SUMMARY

The Tairāwhiti Resource Management Plan (TRMP) is a single combined planning document that represents all of Gisborne District Council's (GDC) resource management plans. The 2021–2031 Long Term Plan (LTP) included a significant investment of \$25.6m (including \$7m for freshwater) to support a review of the TRMP and deliver Council's freshwater planning programme ([Report 21-120](#)).

The TRMP review is being undertaken in two phases over eight years. The programme has completed its first year and is tracking satisfactorily against key milestones.

The three main workstreams are:

- Development of a new Regional Policy Statement (RPS).
- Implementation of the National Policy Statement on Urban Development 2020 to support urban growth and development planning, including housing outcomes. This includes development of a Fugue development Strategy for Tairāwhiti.
- Updating the regional freshwater planning provisions and developing catchment plans required under the National Policy Statement for Freshwater Management 2020.

Communications and Engagement plans have been developed for the three main workstreams, which are updated monthly.

The freshwater planning workstream has numerous community engagements planned through the catchment planning process. Consultations are also planned to start late in 2022 on the Draft Urban Chapters, as well as the Freshwater Plan changes. Full consultation on a draft RPS is planned for August 2023.

Iwi and hapū engagement is a key part of the TRMP review process. The TRMP Review team is using the principles of Te Tiriti o Waitangi to inform its approach to engaging with Māori.

Planning for iwi and hapū engagement is progressing – including workshops in August 2022 with iwi Chief Executives and key operative staff to identify practical options for technical input into plan-making and wider matters of interest to iwi in the second half of 2022. Parallel to these discussions are the ongoing higher-level Tiriti partnership and co-governance korero taking place between Council and iwi leadership.

We are also launching a 12-month trial with iwi technical leads working alongside Council staff from October 2022 on matters of importance to iwi and procuring technical reports directly from iwi in addition to tangata whenua engagement.

Tangata whenua have had initial briefings on the FDS (Future Development Strategy) and there are several hui arranged during August 2022.

The decisions or matters in this report are considered to be of **Low** significance in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS

That the Wastewater Management Committee:

- 1. Notes the contents of this report, including the intended engagement approach and indicative timeframes.**

Authorised by:

Joanna Noble - Chief of Strategy & Science

Keywords: Tairāwhiti Resource Management Plan, TRMP, infrastructure, Freshwater, Urban growth and development, Regional Policy Statement, mana whenua, catchment planning, partnerships, governance, engagement, wastewater management

BACKGROUND

What is the context of the review?

1. The Tairāwhiti Resource Management Plan (TRMP) is a single combined planning document that represents all of Gisborne District Council's (GDC) resource management plans. The purpose of the TRMP is to assist Council to carry out its resource management functions and to promote the sustainable management of the region's natural and physical resources.
2. The TRMP is a statutory resource management plan prepared under the Resource Management Act 1991 (RMA). It is compulsory that Council has resource management plans to deliver its RMA functions and to make decisions on the natural and built environment.
3. The 2021–2031 Long Term Plan (LTP) included a significant investment of \$25.6m (including \$7m for freshwater) to support a review of the TRMP and deliver Council's freshwater planning programme ([Report 21-120](#)).
4. The development of our region's Spatial Plan (**Tairāwhiti 2050**) provides the vision for Tairāwhiti for the next 30 years. This plan was developed throughout 2019 and has benefitted from extensive consultation and engagement ([Report 20-17](#)). It was approved by the Sustainable Tairāwhiti Committee on 30 January 2020. Staff are using the aspirations in Tairāwhiti 2050 and the feedback we received during its development to inform the TRMP review.

Why are we doing the review?

5. Council is undertaking a full review of the TRMP since most provisions have been in our TRMP for more than 10 years without a review.
6. Our region has changed due to development, population growth and changing demands on resources. National direction has also changed – there is a new National Policy Statement for Freshwater Management 2020 and National Policy Statement on Urban Development 2020, and there is more national direction coming.
7. Reviewing the TRMP will ensure we:
 - a) protect what's important
 - b) provide an aspirational and strategic view and direction that reflects the voice of mana whenua and our communities
 - c) enable activities that contribute positively to Tairāwhiti and helps achieve our community outcomes
 - d) respond to future change.

8. The TRMP has a significant impact on Tairāwhiti, and all whanau who live here and call our region home. It influences and can help address:
 - a) Housing supply issues and removing barriers to develop affordable housing for Māori (including papakāinga).
 - b) Water allocation and giving effect to Te Mana o Te Wai.
 - c) Sustainable land use, including enabling productive use of whenua Māori.
 - d) Protecting what we value – ecosystems, freshwater, air quality, biodiversity, the coastal environment and our historic heritage.
 - e) Building resilience, by addressing impacts of climate change and natural hazards.

What are the review timeframes?

9. The TRMP review is being undertaken in two phases over eight years. The programme has completed its first year and is tracking satisfactorily against key milestones.
10. The three main workstreams are:
 - a) Development of a new **Regional Policy Statement (RPS)**.
 - b) Implementation of the National Policy Statement on Urban Development 2020 to support **urban growth and development planning, including housing outcomes**.
 - c) Updating the **regional freshwater planning** provisions and developing catchment plans required under the National Policy Statement for Freshwater Management 2020.
11. The workstreams are running concurrently and alignment is key to successful delivery. Public notification of these three workstreams in phase 1 is expected in 2023/24. This is when we'll be asking for formal submissions on the proposed changes.
12. Phase 2 will include the coastal plan, the remainder of regional plan provisions, and the rest of the District Plan. This phase will start in early 2024, with public notification of proposed changes in 2028.

DISCUSSION and OPTIONS

Regional Policy Statement (RPS) / Te Kaupapa Tauāki ā-Rohe

13. The RPS workstream covers the development of a new RPS, which provides an overview of the significant resource management issues of the region, and policies and methods to achieve integrated management of the natural and physical resources of the region.
14. The RPS will provide the overarching structure and policy direction for the rest of the TRMP. It must give effect to national policy statements and national planning standards and be consistent with water conservation orders. Iwi authority planning documents must also be considered when the RPS is prepared or changed.

15. Staff are currently preparing nine preliminary issue and option reports for the following topics:
 - a) Hazards and risks
 - b) Ecosystems and indigenous biodiversity
 - c) Land and freshwater
 - d) Coastal environment
 - e) Air
 - f) Natural features and landscapes
 - g) Historical and cultural values
 - h) Urban form and development
 - i) Energy, infrastructure, transport and waste
16. Two additional topic areas will also be developed in accordance with the National Planning Standards. These topics are:
 - tāngata whenua/mana whenua and
 - Integrated Management.These topics will be progressed once the iwi engagement approach is confirmed.
17. These reports will identify for each topic the key drivers for change that mean our current TRMP provisions are not adequate. For example, issues could be changes to legislation or national direction, problems with interpretation identified by users of the plan, research or environmental trends that show the plan is not working as expected or changes such as an increasing population that alter the demand for resources.
18. Following the preliminary investigations of issues and options, we will engage with our key stakeholders, including the WMC, to ensure we have captured all the issues and to identify options for future management. These discussions will start from October 2022.

Freshwater Planning / Te Whakamahere Wai Māori

19. The Freshwater Planning workstream covers the preparation of catchment plans and an updated Regional Freshwater Plan to give effect to the National Policy Statement for Freshwater Management 2020 (NPS-FM), including implementation of Te Mana o te Wai.
20. The catchment plans are:
 - a) Mōtū Catchment Plan (under way)
 - b) Waiapu Catchment Plan (under way)
 - c) Waimatā – Pakarae Catchment Plan (under way)
 - d) Ūawa Catchment Plan (planned early 2023)
 - e) Waipaoa Catchment Plan (planned late 2022)
 - f) Wharekahika – Waikura Catchment Plan (planned early 2023)
 - g) Hangaroa – Ruakituri Catchment Plan (planned early 2023).

Urban Growth and Development (UGD) / Te Whakawhanake me te Whakarahi Taone

21. This workstream covers the implementation of the National Policy Statement on Urban Development 2020 (NPS-UD) and the update of key policies and provisions of the District Plan to enable urban development and housing. It also includes the preparation of a Future Development Strategy. This workstream will involve a full review of all urban zones – including all the residential, commercial and industrial zones in the Gisborne urban area and rural settlements – and zoning for the periphery of these areas.
22. The projected demand for approximately 5000 new dwellings by 2052, and the direction provided by the NPS-UD 2020, will very likely see new district plan provisions that allow for much higher densities of development in the existing urban area of Gisborne city, and some new “greenfield” residential areas on the edges of the city. This will have implication for the provision of all infrastructure, including wastewater services and will likely require consideration of upgraded or new wastewater infrastructure. This will have implications for the existing consents held by Council.
23. The development of the FDS will fully consider what infrastructure is required to provide services to the areas of the city that will be available for intensification, and where services extensions will be planned for new greenfield areas. Feedback from councillors on the WMC on the implications for existing consenting conditions, can be made at councillor workshops or, if requested, through a specific item to that Committee.

TRMP high-level overview of the key milestones for the programme

24. High level milestones include the following:



25. Progress made in the first year 2021/22:

- a) The TRMP Review Programme moved from initiation into the planning stage of programme management.
- b) The three main workstreams are all progressing well.
- c) A significant procurement milestone was reached in December 2021 with the Panel of Suppliers in place. Technical expertise requirements have been collated across all hubs, prioritised and phased to ensure work/research can be commissioned early in 2022.
- d) Completed a Housing and Business Capacity Assessment in February 2022. This report identified the projected demand for housing, industry and commerce and whether there is sufficient plan-enabled and infrastructure-ready land to provide for the demand in the short, medium and long term.
- e) Preparing the Tairāwhiti Future Development Strategy.
- f) Confirmed and procured science-based technical reports and inputs for the three workstreams.
- g) On 4 November 2021, Council agreed ([Report 21-234](#)) to establish a new co-governance committee with mana whenua to oversee the review of the TRMP, subject to further discussion and confirmation from mana whenua.
- h) Several Treaty partnership wānanga between elected members and iwi were held since 2021 to explore the status of our relationships, as part of moving toward better partnerships and to inform how iwi and Council jointly design co-governance arrangements of the TRMP review.
- i) At an operational level, Council staff have been working with iwi leadership to develop an Iwi Technical Trial (ITT), which are planned to start on 1 October 2022. The trial stretches over twelve months, is of high value, and is looking at technically experienced people coming onboard representing their iwi and being able to put in place advice for the RPS, FDS and some regional freshwater and climate change mahi that is being undertaken.
- j) Ongoing community engagement is fundamental to all three workstreams. A Communications and Engagement Plan has been developed for each workstream to outline what, when and how information will be shared at key intervals and with whom of our identified stakeholders, inclusive of both rural and urban communities.
- k) Prepared collateral for wider engagement on the three main workstreams to raise awareness of the different kaupapa and support preliminary analyses.

ASSESSMENT of SIGNIFICANCE

Consideration of consistency with and impact on the Regional Land Transport Plan and its implementation

Overall Process: **Low** Significance

This Report: **Low** Significance

Impacts on Council's delivery of its Financial Strategy and Long Term Plan

Overall Process: **Low** Significance

This Report: **Low** Significance

Inconsistency with Council's current strategy and policy

Overall Process: Low Significance

This Report: Low Significance

The effects on all or a large part of the Gisborne district

Overall Process: Medium Significance

This Report: Low Significance

The effects on individuals or specific communities

Overall Process: Medium Significance

This Report: Low Significance

The level or history of public interest in the matter or issue

Overall Process: High Significance

This Report: Low Significance

26. The decisions or matters in this report are considered to be of **Low** significance in accordance with Council's Significance and Engagement Policy.

TANGATA WHENUA/MĀORI ENGAGEMENT

27. Iwi and hapū engagement is a key part of the overall TRMP review process. The TRMP Review programme team is using the principles of Te Tiriti o Waitangi to inform its approach to engaging tangata whenua, and other Māori living in the region.
28. Planning for iwi and hapū engagement at an operational level is progressing – including workshops in August 2022 with iwi CEs and key operative staff to identify practical options for technical input into plan-making and wider matters of interest to iwi in the second half of 2022. Parallel to these discussions are the ongoing higher-level Tiriti partnership korero taking place between Council and iwi leadership.
29. We're also launching a 12-month trial with iwi technical leads working alongside Council staff from October 2022 on matters of importance to iwi and procuring technical reports directly from iwi in addition to tangata whenua engagement.
30. Tangata whenua have had initial briefings on the FDS and there are several hui arranged during August 2022.

COMMUNITY ENGAGEMENT

31. The TRMP is a multi-layered programme that will require a wide range of tactics to reach all audiences. Community groups and industry representatives have a keen interest in the development of the TRMP. Our engagement approach will reflect that interest and their various roles within the region.
32. Ongoing community engagement is fundamental to all three workstreams: development of the next generation RPS, catchment and regional freshwater plans, and how we grow and develop our urban areas and townships.
33. Our rural, urban and coastal communities all have a key role to play in helping us develop a resource management framework that is fit-for-purpose.

34. Communications and Engagement plans have been developed for the three main workstreams and are updated on a monthly basis.
35. The freshwater planning workstream has numerous community engagements through the catchment planning process.
36. Consultations are also planned to start late in 2022 on the Draft Urban Chapters, as well as the Freshwater Plan changes. Full consultation on a Draft RPS is planned for August 2023.

CLIMATE CHANGE – Impacts / Implications

37. There are no climate change impacts or implications arising from the matters in this report. However, climate change is a priority issue within the RPS and is integrated within the TRMP work programme. Councillors also identified climate change as a regionally significant issue during the councillor workshop held in August 2021 (see [Report 21-216](#) to 28 October 2021 Sustainable Tairāwhiti Committee meeting).
38. Climate change will affect the availability and reliability of freshwater resources. The combination of existing over-allocated water resources, an expected increased future demand and impacts of climate change mean that managing water quantity within limits is a significant issue for freshwater management in the region and will only become more important in the future.
39. Climate change will be a central consideration in all parts of the Growth and Development workstream. Planning for an urban form, that is compact and well connected, will likely reduce greenhouse gas emissions by reducing the reliance on private motor vehicles. Growth and development planning will also incorporate climate change adaptation by ensuring that existing urban areas, subject to hazards affected by climate change, are subject to appropriate risk assessment requirements, and other areas are avoided entirely.

CONSIDERATIONS

Financial/Budget

40. There are no financial implications from the progress updates in this report.
41. A budget of \$25.6m (including \$7m for freshwater) was approved to support the TRMP review.

Legal

42. There are no legal implications due to the progress updates in this report.
43. Keeping the TRMP current is a legislative requirement. Under the Resource Management Act 1991 (RMA), councils must commence a review of any RPS, regional plan, and district plan provision if they have not done so for 10 years.
44. We are also aligning the TRMP review with the RMA Reform programme to the extent this is possible.
45. The 3-waters reform programme will have implications relating to the ownership, upgrading and redevelopment of key 3-waters infrastructure. This matter is being progressed on the basis that whoever owns the infrastructure, the best outcome is achieved when land use and infrastructure planning is integrated.

46. Under Section 81 of the Local Government Act 2002, Council is required to establish and maintain processes to provide opportunities for Māori to contribute to the decision-making processes of Council and to consider ways in which Council may foster the development of Māori capacity to contribute to the decision-making processes of Council. This is articulated in Council's 'Tairāwhiti Piritahi – Fostering Māori Participation in Council Decision-making' Policy. This policy provides a framework for Council to ensure effective Māori participation in the Council's planning and decision-making processes.

POLICY and PLANNING IMPLICATIONS

47. Although the entire Resource Management Framework in New Zealand is about to be reformed, direction from Central Government is for local authorities to continue with their current policy work programmes under the RMA. This is because the new Resource Management system is not yet finalised, and the transition will take some time to occur. The TRMP work programme has been developed in such a way that it aligns with future legislation to the extent this is possible with the information we know to date.
48. **Integrated catchment planning:** Council owns and operates infrastructure to convey and discharge stormwater away from roads, houses and buildings in both Gisborne city and rural settlements across Tairāwhiti. These discharges are subject to rules and requirements under the current TRMP. Staff will develop an Integrated Catchment Management Plan (ICMP) by 2025 to achieve compliance with the TRMP.
49. The Stormwater ICMP will address stormwater discharges from Gisborne city, rural townships, and associated growth areas that form, or will form, part of the reticulated stormwater network. The ICMP will result in improvements to the receiving environment over time, focusing effort where it is most needed.

RISKS

50. There are no new major risks associated with the contents raised in this report.
51. Extreme and high risks are, however, identified in the TRMP Programme Register and are being reported through the internal Major Project Steering Group monthly reporting process to Central Organising Roopu (COR).

Title: 22-199 Alternative Use and Disposal Update
Section: 4 Waters Infrastructure
Prepared by: Neville West - 4 Waters Infrastructure Manager
Meeting Date: Thursday 1 September 2022

Legal: Yes

Financial: Yes

Significance: **Low**

Report to WASTEWATER MANAGEMENT Committee for information

PURPOSE

The purpose of this report is to provide the Wastewater Management Committee (WMC) with an update on the Alternate Use and Disposal Project (AUD).

SUMMARY

Treated Water Effluent Quality and Wastewater Conveyance Report

- The WMC requested a report on treated water quality and one on wastewater conveyance. They have been combined into one report "Gisborne WWTP Effluent Reuse – Stocktake" **Attachment 1**. The report highlights that a 100% irrigation reuse of the effluent would not be feasible if only considering the crops in the study area. Further next steps are provided in the report for consideration. Costing for conveyance was not completed given the outcome of irrigation to land.

Mortuary Wastewater Management

- Before deciding on a location for the Wisconsin Mound the KIWA Group has requested additional information to inform their decision-making. This information has been compiled with a further hui to be arranged to discuss.

The decisions or matters in this report are considered to be of **Low** significance in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS

That the Wastewater Management Committee:

- Notes the contents of this report.**

Authorised by:

David Wilson - Director Lifelines

Keywords: Alternate Use, Disposal, water quality effluent, wastewater conveyance, Gisborne wwtp

BACKGROUND

1. The AUD work to date has focused on engagement and investigations that support funding applications, material used to educate and inform interested and affected parties on AUD and mortuary wastewater management.
2. Separation of mortuary wastewater from the conventional wastewater system forms part of AUD investigations/activities. Tangata whenua consider it critical that treated wastewater does not contain any mortuary wastewater for it to be acceptable for AUD.
3. Council has provided a budget of \$725k for AUD investigations over the term of the 2021–2031 Long Term Plan (LTP) which is considered as 'seed funding'. This budget will enable partnership and co-operation with industry and other stakeholders/partners to identify opportunities for collaboration and progress sourcing additional funding.
4. Gisborne WWTP Effluent Reuse – Stocktake report not only considered quality but investigated applying partially treated wastewater to land in an 8km radius around the WWTP. 8km was chosen to ring fence a study area considering the likely cost of piping/pumping and the amount of land. The results would determine if further expansion of the study area is recommended.

DISCUSSION and OPTIONS

Gisborne WWTP Effluent Reuse – Stocktake

5. In scoping this work, it became apparent that crop type and soil type are important to determine pumping costs due to variability of application rates and distance to different crops. Council has data on crop types and their location, as well as soil types. The approach taken is to assess the water balance between application to land and need for storage.
6. The Australian guidelines for water recycling will be used to determine the quality of the effluent required to apply to which crops (if further treatment is required). We will also be able to group land use to allow meaningful discussions on use of recycled water. This will then allow costs for pumping, storage, and additional treatment to be developed.
7. In defining the scope of work, the following has been agreed:
 - Study area
 - 8km radius from the WWTP extending out to the Poverty Bay flats
 - does not extend beyond the Waipaoa River
 - does not extend into the hills – apply a percentage slope rule in GIS
 - apply a waterway exclusion zone/buffer in GIS.
 - Use GIS to profile crop types by season (summer/winter), soil type, land parcel, and topography.
 - Group crops to align with Australian standards, i.e., Class A, B, C. This will be used as a proxy for whether further treatment is required.

- Determine agronomic need
 - based on literature (summer/winter)
 - get total daily volume that could be used by season (summer/winter)
 - exclude review of climate/rainfall to determine agronomic need.
- Water Balance
 - compare daily potential water use with average daily treated at WWTP
 - create a summer/winter water balance
 - look at the location of the crops/high demand water uses for logical clusters of common users/common water quality
 - identify next steps to progress viability review.
- Exclusions/Out of Scope
 - Cost estimates. Potential to spend a lot of fees for not much benefit due to amount of uncertainty.
 - Focus on the technical first to confirm scope of what may be required for costing as the next step.
 - Commentary on cultural, social, or industry acceptability – stick to technical.
 - Commentary on New Zealand statutory landscape – i.e., rules and regulations, consents, nutrient load limits – would be considered as part of subsequent steps.
 - Commentary on farm storage/irrigation infrastructure.

8. The report states that a combined system where some of the water is used for irrigation and the rest is discharged via ocean outfall or an alternative method would be possible. It appears that complete removal from the outfall is unlikely unless aquifer recharge can sustain a significant continuous amount of recharge. Therefore, their promoted next steps should bare this in mind.

9. The report promotes the following steps to progress the viability review:

- Explore the possibility of including industrial reuse of treated effluent. This would require identification of the main industries in the area, their water consumption profile and quality requirements.
- Investigate the feasibility of other uses for the treated effluent, for example aquifer recharge.
- Evaluate the advantages and disadvantages of adopting a combined disposal scheme that partially supplies water for irrigating crops and also discharges via ocean outfall. Are the expected benefits greater than the costs and risks associated with installing a treated effluent reticulation scheme?

10. If a decision is made to investigate more details of the feasibility of a recycled water irrigation scheme, then the following steps are suggested:
- Identify the sites that could potentially be irrigated and develop more detailed models of water demand requirements based on the specific site information, crops potentially grown, etc.
 - Develop hydrogeological assessments to determine possible impacts on groundwater, considering the effects of the plant/crop production system and the effects of recycled water on groundwater quality.
 - Identify the environmental hazards and the potential impact of the reuse of treated effluent for irrigation. This will allow to understand further treatment requirements for the Gisborne WWTP.
 - Utilise the Victorian guidelines or other relevant documents to understand in more details the technical requirements and risk management measures associated with the implementation of a recycled water scheme for the Gisborne area.

Mortuary Wastewater Management

11. At the last KIWA Group Hui the group requested that further information be provided as to why the crematorium site is unsuitable and what other alternative sites are available.
12. The review did not identify any additional information than what has already been provided. A further Hui to discuss this issue has been promoted and the matter rests with the chair for direction.

ASSESSMENT of SIGNIFICANCE

Consideration of consistency with and impact on the Regional Land Transport Plan and its implementation

Overall Process: **Low** Significance

Impacts on Council's delivery of its Financial Strategy and Long Term Plan

Overall Process: **Low** Significance

This Report: **Low** Significance

Inconsistency with Council's current strategy and policy

Overall Process: **Low** Significance

This Report: **Low** Significance

The effects on all or a large part of the Gisborne district

Overall Process: **Medium** Significance

This Report: **Low** Significance

The effects on individuals or specific communities

Overall Process: **Medium** Significance

This Report: **Low** Significance

The level or history of public interest in the matter or issue

Overall Process: **Medium** Significance

This Report: **Low** Significance

13. The decisions or matters in this report are considered to be of **Low** significance in accordance with Council's Significance and Engagement Policy.

TANGATA WHENUA/MĀORI ENGAGEMENT

14. The WMC includes iwi representatives from Te Rūnanga o Tūrangānui a Kiwa (TROTAK), Te Aitanga a Māhaki, Rongowhakaata, and Ngai Tamanuhiri. The WMC has been kept informed for the duration of the wastewater consent, including on AUD matters.
15. Extensive consultation has taken place as a result of engagement with the KIWA Group and work on the Mauri Compass.

COMMUNITY ENGAGEMENT

16. Apart from extensive historical consultation on wastewater issues, AUD was included as part of the wastewater management options in the consultation process for the 2021–2031 LTP.

CLIMATE CHANGE – Impacts / Implications

17. The progression of treated wastewater for reuse has the potential to provide additional water and reduce the environmental effects and demand for water taken both from the Waipaoa River and aquifers by providing an alternative water source.
18. There is also the potential to reduce salt intrusion to aquifers as sea levels rise.

CONSIDERATIONS

Financial/Budget

19. A budget of \$725k for AUD investigations is included over the term of the 2021–2031 LTP. This budget will be spent on the following tasks:
- supporting WMC/KIWA Group
 - project management
 - funding applications, engagement with iwi, industry, other key stakeholders, and the farming community
 - research and investigations required to provide the necessary information for the above to be meaningful; and
 - identification of successful business and governance models for the use of recycled wastewater.
20. Applying for potential external sources of funding remains a priority for Council staff. In the event of receiving external grants, budget requirements will be reviewed, and the work plan could then be accelerated.

Legal

21. As part of Council bundled resource consents for the Wastewater Treatment Plant, Clause 8 of the consent is particularly relevant:

“The permit holder shall use its best endeavours to adopt those AUD options that are identified as feasible and which will enable the progressive removal of the treated human sewage from the discharge, via the marine outfall, with the objective of complete removal by 2020.”

22. Council is continuing to investigate AUD with the aim of identifying feasible options that enable progressive removal of treated human sewage from the discharge via the marine outfall.

POLICY and PLANNING IMPLICATIONS

23. Investigations for AUD are included in existing plans.
24. The outcomes of AUD investigations and engagement may influence the LTP and spatial planning.

RISKS

25. Legal risks apply if AUD investigations are not progressed as envisaged in the wastewater consent. If this cannot be resolved, it is unlikely to be able to achieve the tangata whenua objective of reducing and ultimately stopping the discharge of treated wastewater from the marine outfall.
26. Additional funding for AUD work has not been secured. Obtaining external funding remains a high priority for the Project Team as work on AUD cannot be accelerated until additional funding has been secured.
27. Currently Council remains non-compliant with its resource consent by not providing UV treatment and solids removal by 30 December 2020.

NEXT STEPS

Date	Action/Milestone	Comments
1 September 2022	Identify any further steps.	Review BECA report.
Ongoing	Continue to seek external funding.	
Ongoing	KIWA Group consultation.	Engage with the KIWA Group and work on integrating mātauranga Māori knowledge and western science aspects.

ATTACHMENTS

1. Attachment 1 - Gisborne WWTP Effluent Reuse - Stocktake [22-199.1 - 34 pages]



Gisborne WWTP Effluent Reuse - Stocktake

Final Report

Prepared for Gisborne District Council

Prepared by Beca Limited

4 July 2022



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Contents

Executive Summary	3
1 Introduction.....	4
1.1 Scope.....	4
1.2 Structure	4
2 Background and Previous Reports	5
2.1 Opus 2004 Report	5
2.2 Gisborne Chamber of Commerce ‘Wastewater Report’	5
2.3 Nga Mahi Te Taiao Report	6
3 Water Demand Estimation	7
3.1 Study Area	7
3.2 Crop Water Demand Model.....	7
3.3 Survey Crop and Soil Type.....	8
3.4 Model Outputs	11
3.5 Existing Water Use	14
4 WWTP Effluent Characterisation.....	16
4.1 WWTP Flows	16
4.2 WWTP Expected Effluent Quality Following Stage 2 Upgrade	17
5 Effluent Quality Requirements	19
5.1 Background.....	19
5.2 Effluent Classes.....	19
5.3 Existing Crops and Quality Requirements.....	20
5.4 Possible Treatment Options	21
6 Water Balance	22
6.1 Seasonal Water Balance	22
6.2 Storage Requirements.....	23
6.3 Effluent Class Mapping.....	23
6.4 Pipeline Options.....	25
7 Discussion and Next Steps.....	27
8 References	30

Appendices

Appendix A – Model Outputs

Revision History

Revision N°	Prepared By	Description	Date
A	Diego Valenzuela	Draft Interim Report for May 2022 WMC update	02/05/2022
B	Diego Valenzuela	Draft Interim Report – WWTP Effluent Flows Update	20/05/2022
C	Diego Valenzuela	Final Report	04/07/2022

Document Acceptance

Action	Name	Signed	Date
Prepared by	Diego Valenzuela		04/07/2022
Reviewed by	Rachael Shaw		04/07/2022
Approved by	Garry Macdonald		04/07/2022
on behalf of	Beca Limited		

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Executive Summary

Beca has been engaged by Gisborne District Council (GDC) to undertake a study to look at the potential reuse options for the treated effluent from the Gisborne Wastewater Treatment Plant (WWTP). The focus of the study is to develop a stocktake of potential irrigation users within an 8 km radius from the WWTP location, and subsequently develop a water balance by comparing the estimated water requirements to the outflows from the WWTP.

A spreadsheet model developed by Aqualinc for Gisborne District Council was used to estimate the potential irrigation water demand for the study area in this assessment. The inputs for the model are the type of crop grown and the soil type, which were obtained from the last crop survey and Council's GIS. The outputs from the model were reviewed with GDC and further refined to exclude crops that are not typically irrigated in the region. In addition, the outputs from the model were compared against the actual irrigation water use in the study zone as per GDC records.

Once the potential irrigation water demand was estimated, it was compared against the WWTP domestic treated effluent flows to determine a monthly and annual water balance. The results from the assessment are summarised in table below.

	Water Demand of All Crops	Water Demand of Typically Irrigated Crops	Irrigation Annual Consented Limit	Actual Irrigation Water Use	WWTP Domestic Effluent
Annual Volume (m ³)	15,950,000	2,269,000	2,776,000	448,000	5,287,000
% of WWTP Effluent	302%	43%	53%	8%	-

The balance shows that the modelled water demand of the crops typically irrigated only represents 43% of the effluent flows. The actual irrigation water use is only a minor fraction (8%) of the available flows from the WWTP. This indicates that a 100% irrigation reuse of the effluent would not be feasible if only considering the crops in the study area. A combined system where some of the water is used for irrigation and the rest is discharged via ocean outfall or an alternative method would be possible.

In order to explore options for the irrigation reuse, water quality requirements of different crops were classified in accordance with the Victorian guidelines for water recycling, which distinguishes three classes (A, B & C) based on biological requirements and pathogen reduction. Crops were mapped by their most likely acceptable effluent class, and a pipeline route was outlined as a high level option for a reticulation system. As the highest irrigation demand is in the summer months, a storage pond is likely to be required to supplement the demand during these months.

The mitigation of environmental risks such as nutrient loads is not covered in this report. This may impose more restrictive conditions for the effluent reuse. To mitigate these risks, upgrades to the WWTP would be required to improve the quality of the effluent in terms of nutrients, heavy metals, chlorine residual, sodium, boron, etc.

Suggested next steps are outlined in the report, including looking at alternative reuse options like industrial reuse or aquifer recharge. It is recommended to evaluate the advantages and disadvantages of adopting a combined disposal scheme that only partially supplies water for irrigating crops, and where the rest is discharged via ocean outfall or other disposal methods.

1 Introduction

Beca has been engaged by Gisborne District Council (GDC) to undertake a study to look at the potential reuse options for the treated effluent from the Gisborne Wastewater Treatment Plant (WWTP). The focus of the study is to develop a stocktake of potential users within an 8 km radius from the WWTP location, and subsequently develop a water balance by comparing the estimated water requirements to the outflows from the WWTP.

1.1 Scope

- The scope of the study is limited to the 8 km radius zone from the WWTP. The area does not extend beyond the Waipaoa river.
- The potential water use is to be obtained from the estimated irrigation needs of the crops grown in the study area.
- The study excludes the review of climate/rainfall to determine irrigation demand.
- The report focuses on technical aspects of the effluent reuse, and excludes commentary on cultural, social or industry acceptability.
- At this stage, the study does not include a review of NZ statutory landscape – i.e., rules, regulations, consents, etc, related to effluent reuse, application to land or limits to nutrient loadings.
- Commentary on farm storage and irrigation infrastructure is excluded.
- Cost estimates for the potential reuse scheme are excluded.

1.2 Structure

The report is structured in separate sections that address different aspects of the viability of reusing the WWTP effluent:

- **Section 2** summarises the main findings from previous studies commissioned by GDC in relation to effluent reuse and disposal of treated effluent from the WWTP.
- **Section 3** describes the assumptions and processes followed to estimate the potential water demand for irrigation in the study area.
- **Section 4** summarises the WWTP domestic wastewater flows and future projections that will inform the water balance.
- **Section 5** describes the expected quality requirements of the treated effluent for irrigation of different crops grown in the Gisborne region, based on the Victorian guidelines for water recycling, and presents possible treatment options to achieve the required quality.
- **Section 6** compares the daily potential water use with the average daily volume treated at the WWTP.
- **Section 7** provides recommendations and next steps based on the results of the study.

2 Background and Previous Reports

There is a history of previous work done in the Gisborne Tairāwhiti region looking at possible options for reuse/land disposal of the Gisborne WWTP treated effluent. This study reviewed three key reports that were considered to be relevant, which are summarised below:

- Options for Land Disposal of Gisborne City Wastewater (Opus International Consultants Limited, 2004)
- We are pumping our wealth into the ocean: 'Wastewater Report' (Gisborne Chamber of Commerce, 2019)
- Options for alternative uses of Gisborne Turanganui a Kiwa treated municipal wastewater (Nga Mahi Te Taiao, 2015)

2.1 Opus 2004 Report

The report 'Options for Land Disposal of Gisborne City Wastewater' was prepared by Opus International Consultants Ltd for the Gisborne District Council in October 2004. The focus of the report was to scope a full disposal to land scheme for the Gisborne City wastewater as alternative to the current discharge to the Bay via an ocean outfall.

The key points the report defined were the quantities of wastewater, the issues of peak flows and storage, indicative loading rates for irrigation and a review of the soil types of the Poverty Bay area. The base assumption was that all human sewage wastewater would be disposed of to land under all but extreme circumstances like earthquakes or major floods.

Flows and loads for the report were obtained from the companion report "Gisborne Wastewater System: Flows and Loads", Opus 2005. The flow data used was collected over the five-year period prior to the report. It was assumed that the wastewater would be treated to at least a secondary standard and disinfected by UV-light. The soil data was obtained from Pullar (Soils and Agriculture of the Gisborne Plains, 1962).

The findings from the study were that only the well-drained sands and soils in the Waipaoa flats would be suitable for long-term wastewater disposal. In addition, large open storage lagoons would be required to allow for the times when wet weather produced higher flows and the ground was unsuitable for wastewater application. Based on this, the report described two possible schemes based on different soil type availability and storage assumptions.

Both schemes would require extensive areas of prime soil to be purchased and dedicated to wastewater disposal. The conclusion was therefore that a year-round total land irrigation scheme for Gisborne wastewater would not be feasible. However, it did not rule out the use of treated effluent for irrigation and beneficial use on a smaller scale and on a seasonal basis.

2.2 Gisborne Chamber of Commerce 'Wastewater Report'

The Gisborne Chambers of Commerce 'Wastewater Report: We are pumping our wealth into the ocean' published in March 2019 was prepared to investigate the beneficial use of treated wastewater for horticultural crop irrigation. This report was not prepared by technical or scientific experts and was not intended to be a detailed feasibility report. Rather it captured the local needs and views of Gisborne's business, scientific and regulatory communities.

Information used for this report was gathered by interviewing a broad range of people in the sector such as Gisborne District Council staff, representatives from the horticulture sector, researchers (Waikato University), consultants and bank personnel. Other information was obtained by reviewing related articles, previous case studies from NZ and overseas and documents provided by Gisborne District Council.

The report noted the increasing demand for freshwater in the growing horticulture sector and the decrease of natural freshwater resources in the region. It also discussed particular crop considerations, irrigation methods, national standards and exporter and grower requirements, as well as different case studies for the use of treated wastewater in agriculture. The report presented two possible options for the use of wastewater for irrigation in Gisborne and emphasized the economic, environmental and social benefits associated. The report looked at costs, risks, possible funding and commercial viability of reuse of wastewater for irrigation in the region.

One of the main conclusions was that while wastewater used to irrigate horticultural crops may require additional treatment, costs may be offset by private investment and water sales, which must also be viewed in the context of broader economic, socio-cultural and environmental benefits. Another conclusion was that although there is a high potential for the use of reclaimed water for the irrigation of horticulture crops, there is a significant barrier in the perception of the users and the resistance of exporters to purchase such produce.

2.3 Nga Mahi Te Taiao Report

The report 'Options for alternative uses of Gisborne Turanganui a Kiwa treated municipal wastewater' was prepared by Nga Mahi Te Taiao in June 2015. The aim of the report was to discuss alternative use options for the City's treated wastewater and develop a set of suitable options for such use.

The development of the options in the report evolved from discussions with the Alternative Use Working Group in preliminary consultation with a small number of key landowners, industry and community representatives. The report referenced several reports from New Zealand research institutes, New Zealand councils (including six from Gisborne DC), independent consultants as well as regulatory guidelines.

A key factor considered for alternatives to the discharge of Gisborne city's treated wastewater was the great cultural and social significance of the waters of the Bay. Another important factor was the need for the conservation of water resources and important mineral nutrients. The report also highlighted that the availability of potential reusable wastewater provides opportunities for combining the values around the cultural, social and environmental restoration of water in the Bay, with those associated with water, nutrient and carbon conservation.

The report developed different options for alternative wastewater discharge. The following criteria was considered for all the options proposed: logistic consideration, geophysical and social analysis, tangata whenua, aquatic ecosystem health, human health and wellbeing, as well as irrigation and livestock water. The options described were:

- Treated wastewater for industrial and commercial use and/or non-portable domestic water supply
- Treated wastewater for irrigation (municipal (recreational and landscape) irrigation, pastoral agriculture irrigation ('cut and carry'),
- Treated wastewater irrigation for other purposes: afforestation and fibre crops (timber, energy, biodiversity, fibre))
- Treated wastewater for energy production: biogas and microalgae
- Treated wastewater for wetland biodiversity development and water storage (constructed wetland reservoir options, abandoned river oxbows)
- Treated wastewater subsurface irrigation to dune lands
- Treated wastewater flow to surface (river, wetlands and estuaries) and ground water

The report did not draw any conclusions, rather it was a documentation of the reasoning behind finding new use options for Gisborne's wastewater. It also represented a first step in the consultative and discursive process to develop a sustainable set of options for wastewater reuse.

3 Water Demand Estimation

This section describes the assumptions and methodology used to estimate the potential irrigation water demand for the study area.

3.1 Study Area

The area considered for this study includes existing agricultural land in an 8km radius from the location of the Gisborne WWTP, extending out to the Poverty Bay flats. It does not extend beyond the Waipaoa River.



Figure 3-1: Study area radius

Land with slopes greater than 15° were excluded from the review, as these are considered unsuitable for irrigation, in line with the Process Design Manual: Land Treatment of Municipal Wastewater Effluents (USEPA, 2006).

In addition, a buffer zone of 20m from water courses has been applied as a no-irrigation zone. This has been adopted for a preliminary assessment only, but larger distances may be required depending on the irrigation method used.

3.2 Crop Water Demand Model

In 2012, Aqualinc Research Limited (Aqualinc) developed for Gisborne District Council the Guidelines for Irrigation Water Requirements in the Poverty Bay Flats (Aqualinc Research Limited, 2012), which provided a detailed methodology to estimate water demand for different crops grown in the region. In 2017, the guidelines were updated, and a spreadsheet-model was developed, using a daily time step water balance model. The model takes into account different factors including:

- Crop type and typical rooting depth
- Soil type and water storage capacity
- Rainfall and evapotranspiration in the area
- Irrigation system used

It is understood that the model is based on deficit irrigation, which assumes the soil moisture content is kept below free draining levels, and water use is optimised for the crop needs not to produce water stress.

Gisborne District Council has been using this tool to estimate the potential water requirements for the crops grown in the Poverty Bay Flats and for water allocation purposes. The spreadsheet has been adjusted over the years to better match the irrigation water use requirements in the region and the new crops grown. In 2021, NIWA undertook a peer review of the model (NIWA, 2021) as the water requirements from the model were perceived as larger than what is likely used, and recommendations were provided to optimise the model.

The GDC spreadsheet model has been used to estimate the potential irrigation water demand for the study area in this assessment. The inputs needed for the model are the type of crop grown and the soil type.

3.3 Survey Crop and Soil Type

Gisborne District Council conducts an annual crop survey to detail the type, location and area of different crops in the Gisborne district. A summer crop survey and a winter crop survey are made depending on the time of the year the information is collected. The crop survey reports include a geographical representation of the different crops throughout the region, indicating the predominant crop grown on each parcel.

The information from the last crop survey (2020/2021) (Gisborne District Council, 2021) was used for the purposes of this study, which was provided in a geodatabase format. This information was overlaid against the soil type layer provided by Council to determine the total area occupied by a particular crop for each soil type within the study area.

The winter survey crop was compared against the summer winter crop, and it showed that most of the land parcels from the winter crop survey are contained in the summer crop survey parcels (refer Figure 3-2 below). As the spreadsheet model can estimate the water demand for a crop for the whole year, the winter crop survey data was disregarded for this study.

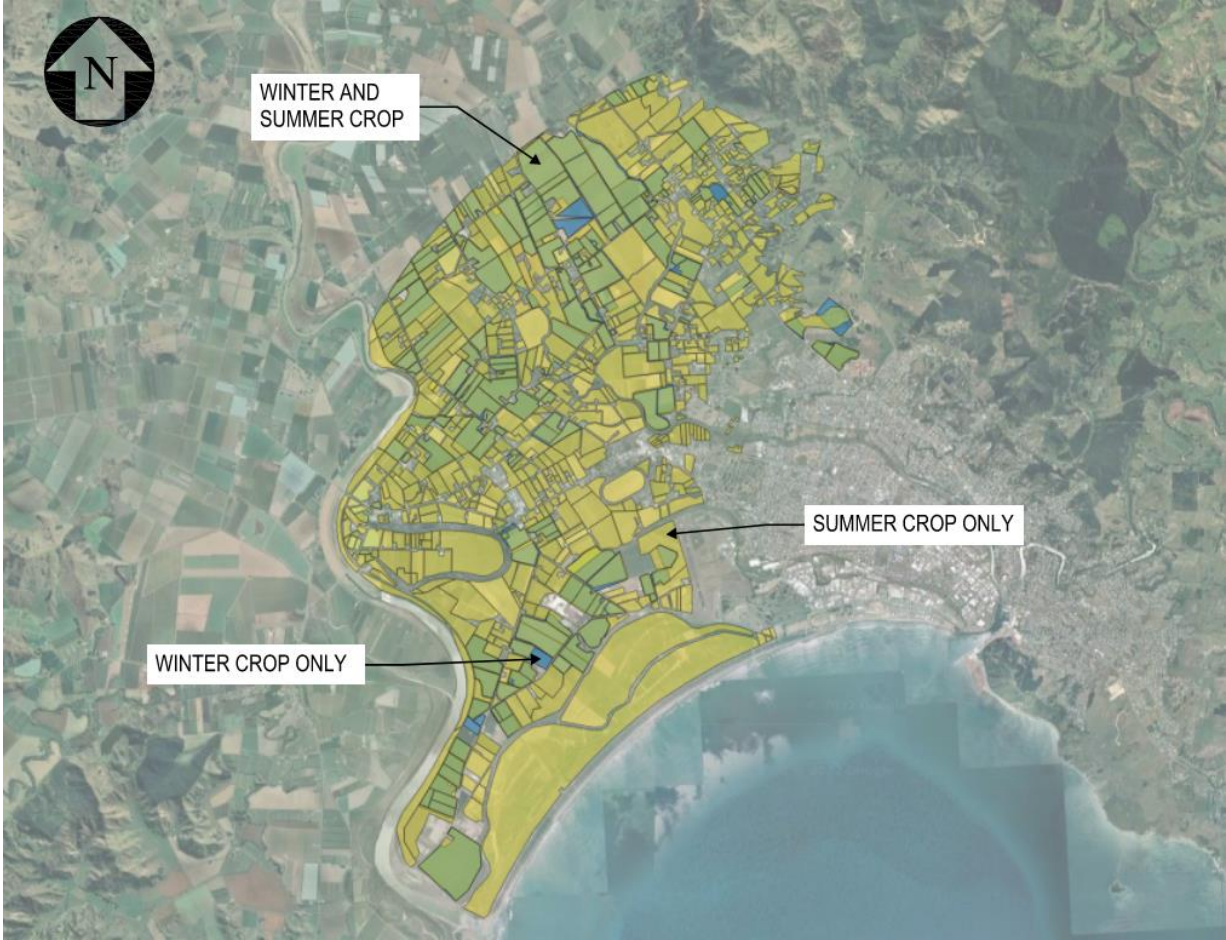


Figure 3-2: Summer crop survey vs. winter crop survey

Figure 3-3 below shows a summary of the summer crops within the study area that meet the slope requirements and excludes the buffer zones around watercourses. The spatial analysis showed that a total of 3,619 ha from the summer crop survey meet these criteria.

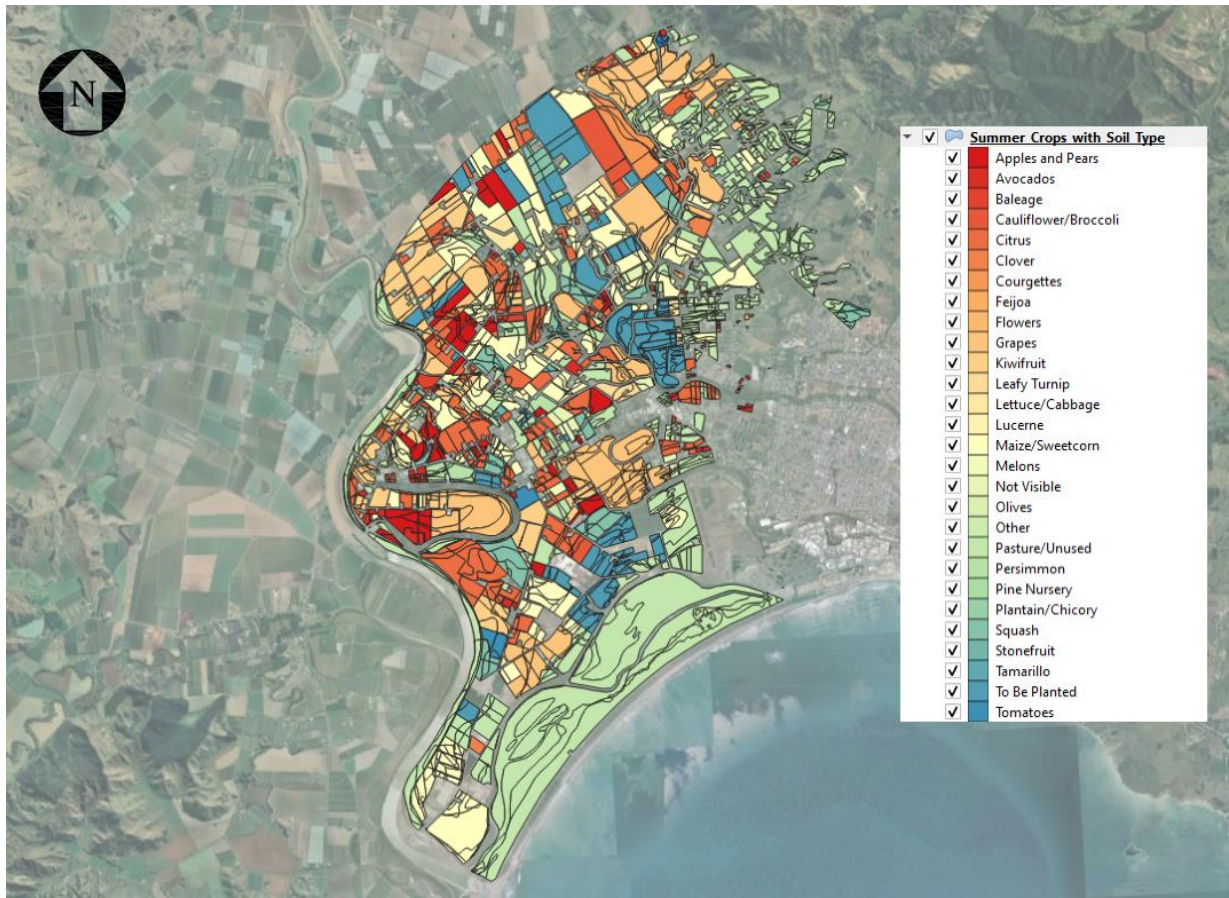


Figure 3-3: Summer crops within the study area considered potentially suitable for irrigation

Figure 3-4 shows a summary of the total hectares per crop type that are situated within the study area, based on the information from the summer crop survey.

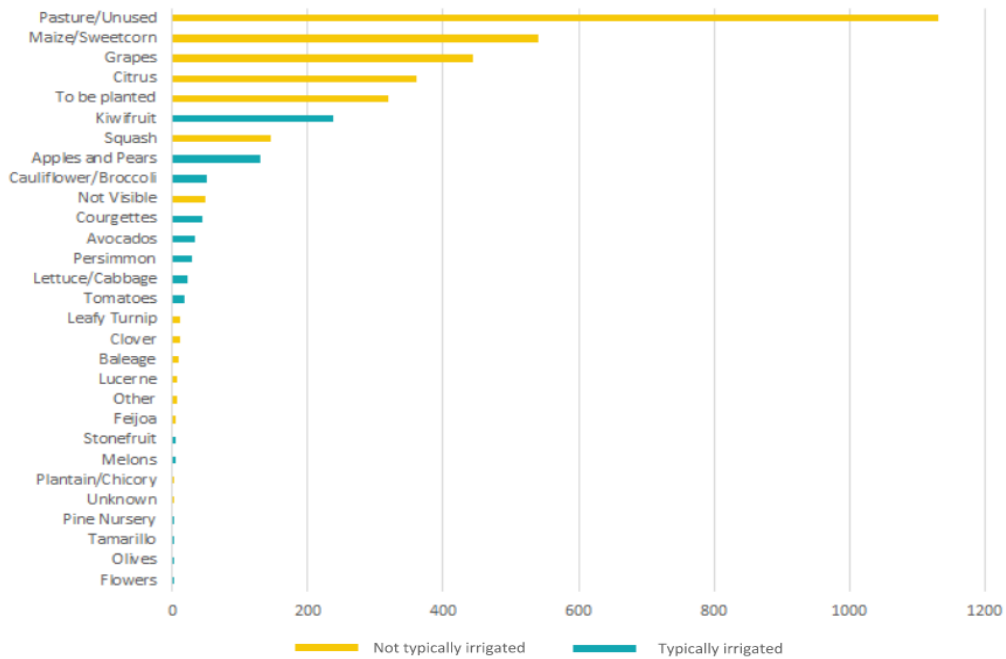


Figure 3-4: Summary of total hectares per crop type

The crops have been divided into two categories, those that are not typically irrigated in the Gisborne region (yellow), and those that typically require irrigation (teal). This categorisation follows information provided by Gisborne District Council for the crops grown in the area.

The figure shows that the top five crops by land area, which account for 77% of the total study land area, are not typically irrigated.

3.4 Model Outputs

The data for the different crops and their corresponding soil types was entered into the spreadsheet model. Not all types of crops identified in the crop survey are listed in the model, so a similar crop from the available list was selected in those cases. Some of the assumptions used are listed below:

- There were 49.4 ha of crops categorised as 'Not Visible'. These were modelled as pasture crops.
- There were 6 ha of crops categorised as "Other". These were modelled as pasture crops.
- There were 317.8 ha of crops categorised as "To Be Planted". These were modelled as pasture crops.
- There were 3.2 ha of crops with no category. These were modelled as pasture crops.
- There was a total of 76 ha of crops in the crop survey with no associated soil types. These crops were excluded from the analysis.

The outputs from the model for each month are shown in Table 3-1 and Figure 3-5 below.

Table 3-1: Monthly irrigation water requirements from spreadsheet model

Month	Irrigation Requirement (m ³)
Jul	6,070
Aug	35,483
Sep	526,541
Oct	1,646,303
Nov	2,768,215
Dec	3,542,006
Jan	3,381,885
Feb	2,212,781
Mar	1,383,119
Apr	410,442
May	26,323
Jun	11,127
TOTAL ANNUAL	15,950,292 (m³/year)

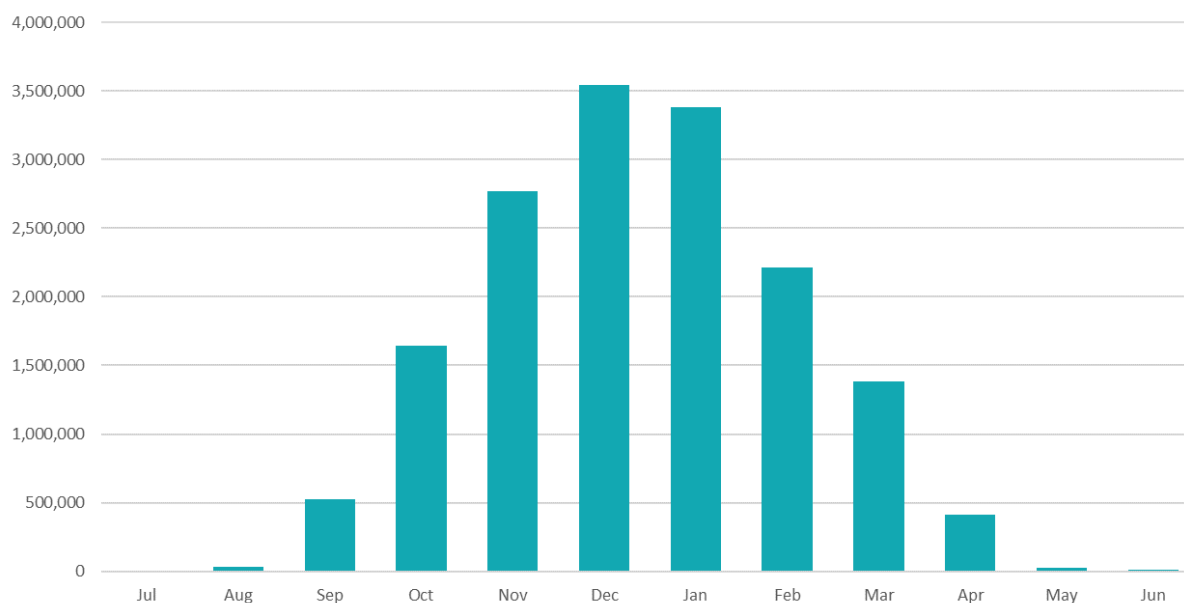


Figure 3-5: Potential irrigation water demand in the study area (m³/month)

The theoretical water demand from the scenario described above was further refined following a review from Olive Steven and Paul Murphy from Gisborne District Council on 28 April 2022, where the following crops were considered not to be typically irrigated in the Gisborne region, and therefore were removed from the irrigation requirements calculations:

- Baleage
- Clover
- Citrus (only occasionally irrigated)
- Feijoas (only occasionally irrigated)
- Grapes
- Leafy turnip
- Lucerne
- Maize/sweetcorn (not often irrigated – possibly only once to get established if planting time is badly timed)
- Not visible (likely to be a not irrigated crop rather than irrigated pasture)
- Pasture
- Plantain / Chicory
- Squash (not often irrigated – possibly only once to get established if planting time is badly timed)

The results from the adjusted scenario are shown in Table 3-2 and Figure 3-6 below.

Table 3-2: Monthly irrigation water requirements from spreadsheet model excluding not commonly irrigated crops

Month	Irrigation Requirement (m ³)
Jul	5,189
Aug	16,762
Sep	44,763
Oct	149,134
Nov	280,129
Dec	455,505
Jan	583,777
Feb	404,237

Month	Irrigation Requirement (m ³)
Mar	236,055
Apr	71,063
May	14,943
Jun	7,521
TOTAL ANNUAL	2,269,079 (m³/year)

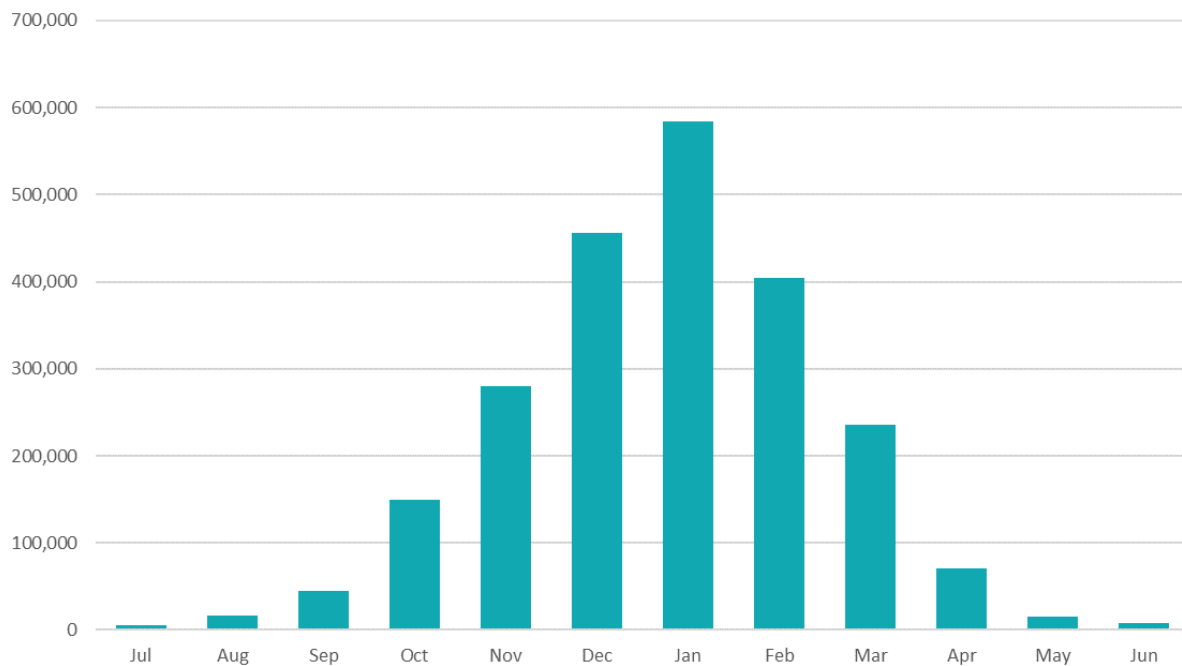


Figure 3-6: Potential irrigation water demand in the study area (m³/month) excluding not commonly irrigated crops

The three most significant crops in terms of water demand are kiwifruit (37% of the total), apples and pears (21%) and cauliflower/broccoli (14%). Figure 3-7 summarises the calculated water demand for the crops that are typically irrigated in the Gisborne region.

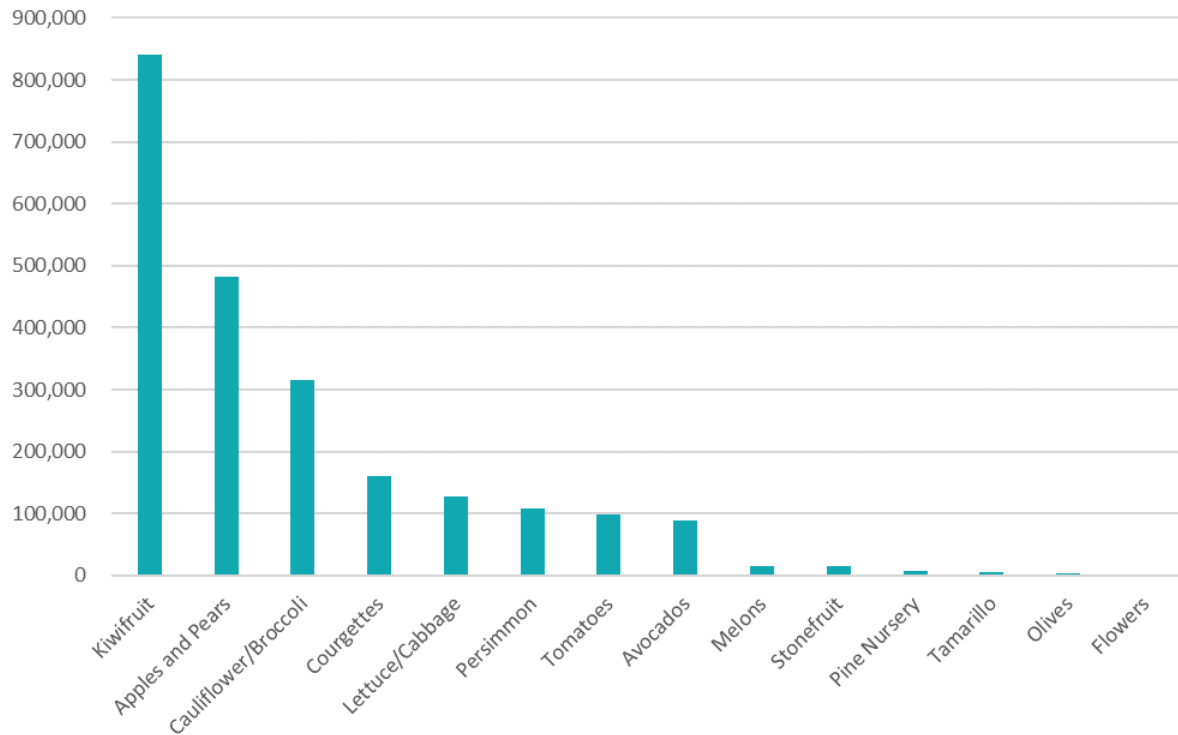


Figure 3-7: Estimated annual water demand (m³/year) of crops typically irrigated in the Gisborne region

3.5 Existing Water Use

Gisborne District Council provided a database with the water use records in the whole district for the past two seasons. The information in this database is submitted to Council by the consent holders in the region. The database contained the total annual water use and maximum water allocation for each consent. These were filtered to include only those consents that fall within the study area, and this information was used to compare the current water use as recorded against the potential water use predicted by the model.

It was assumed that if the geographic coordinates of the consent fall within the study area, all the water usage was utilised in the study area (no translocation of water out of the zone). Likewise, if a consent is located outside of the study area, it was assumed no water from this source was used to irrigate crops within the study area.

Figure 3-8 shows the location of the water consents that meet the criteria. There are four water consents that are located in the city, and one consent to the east that takes water from the Waimata river. These are likely not used to irrigate crops in the Poverty Flats, however they were not excluded as these are consents that could potentially be replaced by treated effluent.



Figure 3-8: Water consents within the study area

Table 3-3 below shows a summary of the total water use for the past two seasons of the water consents within the study area. There is a slight decrease in water consumption from the 2019/20 season to the 2020/21. The current water use is between 15 - 17% of the total annual water allocated for these consents, indicating that only a minor fraction of the consented water is being used.

Table 3-3: Actual water use and consented water take allocation summary

Item	Annual Volume (m ³ /year)
Water Consumption 2019-2020	477,745
Water Consumption 2020-2021	418,735
Annual Consented Limit	2,776,022

It is noticeable that whilst the consented annual water take is a similar order of magnitude to the modelled annual water take presented in Table 3-2, the actual water consumption as reported by the consent holders is a factor of six lower.

4 WWTP Effluent Characterisation

4.1 WWTP Flows

The WWTP domestic flows follows an annual daily flow profile as shown in the figures below. Industrial wastewater flows are separated and bypass the biological and tertiary treatment processes. As such, they are excluded from this analysis. **Error! Reference source not found.** shows the long term daily flow profile, whereas **Error! Reference source not found.** presents the average daily flow by month for the period 2011 to 2018.

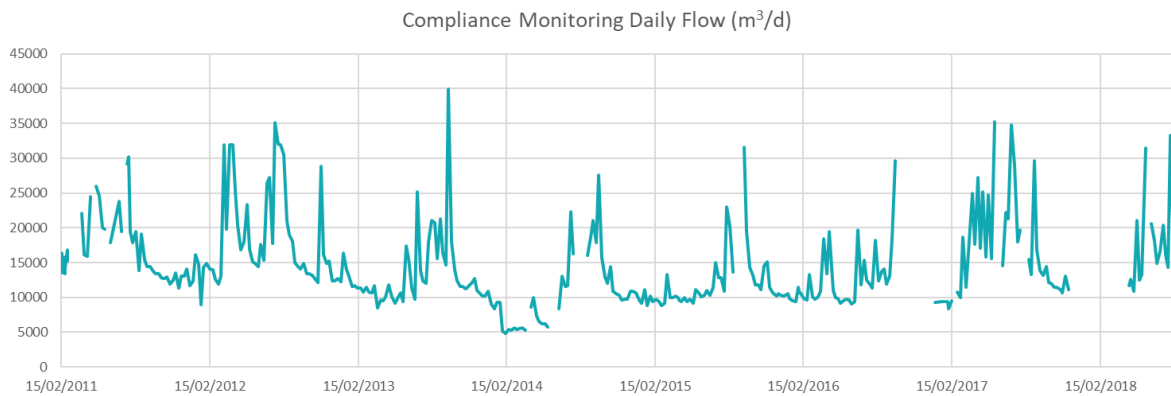


Figure 4-1: Long term flow profile – Domestic wastewater

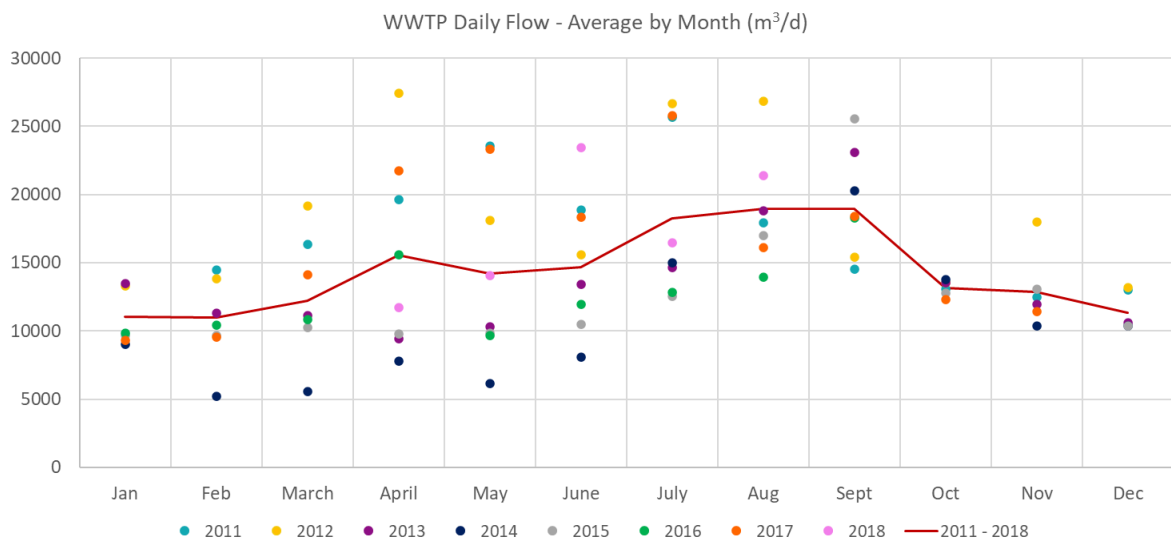


Figure 4-2: Treated domestic wastewater average daily flow (m³/d) by month

The average daily flows drop to approximately 11,000m³/d in January and peak at approximately 19,000m³/d through August to September.

Table 4-1: Average daily flow treated at WWTP (m³/d) by month

Month	Average Daily Volume (m³/d)	Average Monthly Volume (m³/month)
Jan	11,036	342,104
Feb	10,994	307,846
March	12,215	378,661

Month	Average Daily Volume (m ³ /d)	Average Monthly Volume (m ³ /month)
April	15,570	467,109
May	14,217	440,731
June	14,673	440,193
July	18,253	565,855
Aug	18,944	587,259
Sept	18,931	567,937
Oct	13,154	407,779
Nov	12,853	385,589
Dec	11,362	352,218
Annual	14,486	5,287,348 (m³/year)

The analysis indicates that there is more treated domestic wastewater discharged annually from the WWTP and potentially available for reuse than the actual annual consented water takes recorded in the study region. The quality of the wastewater relative to the specific crop will become the determining factor on the feasibility of replacing irrigation water with treated wastewater.

4.2 WWTP Expected Effluent Quality Following Stage 2 Upgrade

The plant is designed to meet the requirements of the resource consent for discharge to the marine environment. The consent places discharge limits on Total Suspended Solids (TSS), Total Oil and Grease (TOG) and Enterococci.

The Stage 2 WWTP upgrade will consist of inlet screening followed by biological treatment in the trickling filters, clarification to remove suspended solids, and tertiary filtration using disc filters to polish the effluent suitable for UV disinfection. The expected effluent quality following tertiary filtration and disinfection is summarised in Table 4-2.

Table 4-2: High level performance requirements of the liquid stream treatment processes (Ref: Beca Preliminary Design)

Process Unit	Outlet/Effluent		
	Median	95 th %ile	99 th %ile
Tertiary filtration TSS (mg/l)	<10	<15	50
UV disinfection	1000cfu/100ml at 95 th %ile		

It is noted that the Victorian standards for reuse water, which have been used as a reference for this study, define additional quality requirements in terms of BOD, Turbidity, Bacterial (*E.coli*) and Pathogen load.

- **BOD**

The Stage 2 upgrade is not designed to improve the BOD performance of the existing plant. Removal of the sludge and TSS in the effluent will improve the BOD concentration, however the degree of improvement will be confirmed following commissioning.

- **Turbidity**

Turbidity and TSS are closely correlated. The disc filters will reduce the TSS of the effluent to a level suitable for disinfection.

- **Bacterial Loads - *E.coli***

The UV disinfection plant has been specified based on achieving a 3 log reduction of Enterococci. Enterococci is typically used as the microbial indicator organism for discharges to marine environments. *E.coli* is typically used for freshwater or land discharges. The WWTP does not currently have an *E.coli* bacterial limit and as such does not specifically collect data for *E.coli*. For the purpose of this assessment,

Enterococci will be considered as a proxy for *E.coli*. It is recommended that following commissioning of the WWTP upgrade, *E.coli* performance data is collected as this will be required for any future alternative use and disposal assessments.

- **Pathogens**

The WWTP is not specifically designed for pathogen reduction. Typically, higher UV doses, chlorination or additional barriers such as membranes are required in order to reduce viral concentrations.

The mitigation of environmental risks associated with the use of treated effluent for irrigation, such as nutrient removal, salinity, pharmaceutical, heavy metals or hydraulic loading is covered in more detail in the Technical Information for the Victorian Guideline for Water Recycling (Environment Protection Authority Victoria, 2021). This would impose further treatment requirements to the reuse of treated effluent for irrigation, however the review of these requirements is not part of the scope of the study at this stage.

5 Effluent Quality Requirements

5.1 Background

With the introduction of the RMA in 1991, there has been an increase of consideration towards land-based discharges for treated effluent from WWTP, as an alternative to the typical discharges to freshwater and marine environments such as the current discharge method at the Gisborne WWTP. In New Zealand, these discharges are constrained through resource consents to ensure there are no adverse effects to the receiving environments. However, there are no standards or guidelines to govern these discharges if they are to be irrigated to crops for human consumption.

In the absence of any New Zealand standards or guidelines, the Victorian Guidelines for Water Recycling (Victorian guidelines for water recycling, 2021) (Australian) are used in this study to provide guidance on the requirements to discharge wastewater to crops. These standards have been recently released so they represent recent thinking and a proactive approach in reducing the risk of harm from the re-use of recycled water. The standards are in line with the new Victorian Environmental Protection Act, which moves from a compliance stance to a proactive prevention stance. The Victorian standards follow a risk based approach by putting in place controls that are proportionate to the risk posed by pollution and waste, and they address the requirements to understand and minimise the risk of harm to human health and the environment from pollution and waste. The standards present technical information on risks of recycled water for irrigation use, and references other standards such as ANZECC & ARM CANZ (2000), the Australian National Guidelines for Water Recycling (2006), the State Environment Protection Policy and the previous Environment Protection Authority publication 168, which is specific for the disposal of wastewater to land via irrigation.

5.2 Effluent Classes

The Victorian guidelines for water recycling define three classes of recycled water (A, B and C) that represent the minimum standards of biological treatment and pathogen reduction. These classes have been adopted based on the effluent quality and pathogen reduction requirements that must be met prior to its reuse. The required level of treatment increases with the potential for higher levels of exposure. These requirements have been summarised in Table 5-1 below.

Table 5-1: Effluent classification based on quality requirements

Parameter	A	B	C
Microbiological	Varies ⁱ	< 100 <i>E.coli</i> / 100 ml	< 1,000 <i>E.coli</i> / 100 ml
Turbidity (NTU)	< 2	-	-
BOD (mg/L)	< 10	< 20	< 20
SS (mg/L)	< 5	< 30	< 30
pH	6 - 9	6 - 9	6 - 9
Treatment processes required	Designed to achieve log reduction targets	Secondary and pathogen reduction ⁱⁱ	Secondary and pathogen reduction ⁱⁱ
Typical uses	Irrigation of public open spaces, agricultural food production (consumed raw), domestic garden watering, toilet flushing, washing machine, etc.	Dairy cattle grazing, industrial washdown water	Human food crops cooked/processed, grazing/fodder for livestock, industrial water with no potential worker exposure

Notes:

i. Microbiological objectives expressed as microbial log reduction target based on Australian Guidelines for Water Recycling. Water quality objectives depends on the intended use, treatment processes and on-site preventive measures. For commercial food crops, typically a log reduction of 6, 5, 5 (Virus, Protozoa, Bacteria) is required.

ii. Helminth reduction required for cattle grazing.

It is expected that the Gisborne treated domestic wastewater most closely aligns with Class C water, with the exception of the Pathogen reduction level.

The Use of Reclaimed Water Guidelines (EPA Victoria, 2002), which have now been superseded by the Victorian guidelines, included an additional Class D recycled water classification, which was used primarily for agricultural non-food crops including instant turf, woodlots, flowers, etc. The microbiological targets for this class are < 10,000 *E.coli* / 100 ml. Although Class D is not referenced in the new guidelines, its use is not precluded. However, any application to EPA Victoria must demonstrate that the water is fit for the proposed purpose and has a risk management plan in place to mitigate any risks due to the quality.

The effluent classes A, B and C are only used to describe the pathogen reduction and biological treatment requirements. In addition, further treatment to ensure the protection of public health, agriculture and the environment are specified in the Technical Information for the Victorian Guideline for Water Recycling (Environment Protection Authority Victoria, 2021). These include actions to identify and mitigate key environmental hazards such as nutrient loading, salinity, sodium and chloride toxicity, pharmaceuticals, heavy metals, chlorine disinfection residuals, hydraulic loading of soils, etc. The review of these requirements is not covered in the scope of this study.

5.3 Existing Crops and Quality Requirements

The 2020/21 summer crop survey in the Gisborne region identified 25 different crop types available for potential irrigation, covering a potential area greater than 3300 ha for the reuse of recycled wastewater. Each crop having different requirements of effluent treatment to meet the standards for further use and sale. The crops from the survey and their likely required level of treatment were classified in accordance with the Victorian guidelines, and the results are summarised in Table 5-2 & Table 5-3.

Most of the crops in the Gisborne region may accept different effluent classes based on the irrigation method used. When using methods such as furrows, drips and subsurface irrigation, the potential contact of wastewater with produce is significantly reduced, lowering the risk of harm to human health.

Table 5-2: Gisborne's crops and likely required effluent classes for irrigation

Class	Crop	Notes
A	Cauliflower/Broccoli Courgettes Lettuce/Cabbage Melons Squash Tomatoes	Assumed these crops are consumed raw. If processed, a lower effluent class may be acceptable. Helminth controls are required for raw human food crops exposed to recycled water.
B	Baleage Clover Leafy Turnip Lucerne Maize/Sweetcorn Plantain/Chicory Pasture	Assumed these crops are grown for dairy livestock, which is the most restrictive case, although not allowed in NZ by Fonterra. Refer Table 5-3 for more details on cattle consumption requirements.
C	Apples and Pears Avocados Citrus Feijoa Grapes	No food contact with recycled water via irrigation method, dropped product not to be harvested. Not to be wet with recycled water when harvested. If these conditions are met, no helminth controls are required.

Class	Crop	Notes
	Kiwifruit Olives Persimmon Stonefruit Tamarillo	
D	Flowers Pine Nursery	Although not referenced in Victorian guidelines, a lower effluent Class D may be acceptable for these crops with an appropriate risk management plan.

Table 5-3: Gisborne's available crops for cattle consumption and required effluent classes for irrigation

Crop	Cattle Type	Acceptable Effluent Classes	Additional Requirements
Baleage Clover Leafy Turnip Lucerne Maize/Sweetcorn Plantain/Chicory Pasture	Dairy Animals	A & B	Requires helminth reduction targets met. Withholding period of 4 hours before collection
		C	Requires helminth reduction targets met. Withholding period of 5 days before collection
	Beef Cattle	A , B , C	Requires helminth reduction targets met. Withholding period of 4 hours before collection
	Sheep, Goats, Horses	A , B , C	No helminth reduction required. No withholding period required
	Pigs	None	

5.4 Possible Treatment Options

Published alongside the Victorian guidelines is a set of technical information which provides some suggestions on best practice for water recycling (Technical information for the Victorian guideline for water recycling, 2021). These best practise guides provide a list of treatment processes that can be used to achieve the required effluent quality grades for irrigation use. These processes have been summarised for each effluent class in Table 5-4 below.

Table 5-4: Summary of typical treatment technologies used to achieve effluent classes

Effluent Class	Treatment Stages
A	Primary Treatment: Screens & grit removal, followed by sedimentation tanks
	Secondary Treatment: Activated sludge or trickling filters, followed by further sedimentation tanks/lagoons
	Tertiary Treatment: Coagulation, flocculation & sedimentation followed by a form of filtration, or membrane/standard filtration or RO
	Disinfection: UV, chlorination or ozonation
B & C	Primary Treatment: Screens & grit removal, followed by sedimentation tanks
	Secondary Treatment: Activated sludge or trickling filters, followed by further sedimentation tanks/lagoons
	Disinfection: UV, chlorination or ozonation
	If used for animal feed, then additional sand/membrane filtration, or 30 days retention time in non-aerated lagoons prior to disinfection (this can be from primary, secondary or tertiary lagoons)

6 Water Balance

6.1 Seasonal Water Balance

The WWTP effluent flow profile was compared against the crop water demand estimations detailed in Section 3. A comparison was made for both scenarios modelled, one assuming that all crops are irrigated and one which only considers the crops typically irrigated in the region.

Table 6-1: Potential irrigation water demand and WWTP effluent flows

Month	Irrigation Demand (All Crops) (m ³ /month)	Irrigation Demand (Typically Irrigated Only) (m ³ /month)	WWTP Effluent (m ³ /month)
Jul	6,070	5,189	565,855
Aug	35,483	16,762	587,259
Sep	526,541	44,763	567,937
Oct	1,646,303	149,134	407,779
Nov	2,768,215	280,129	385,589
Dec	3,542,006	455,505	352,218
Jan	3,381,885	583,777	342,104
Feb	2,212,781	404,237	307,846
Mar	1,383,119	236,055	378,661
Apr	410,442	71,063	467,109
May	26,323	14,943	440,731
Jun	11,127	7,521	440,193
TOTAL	15,950,292	2,269,079	5,287,348

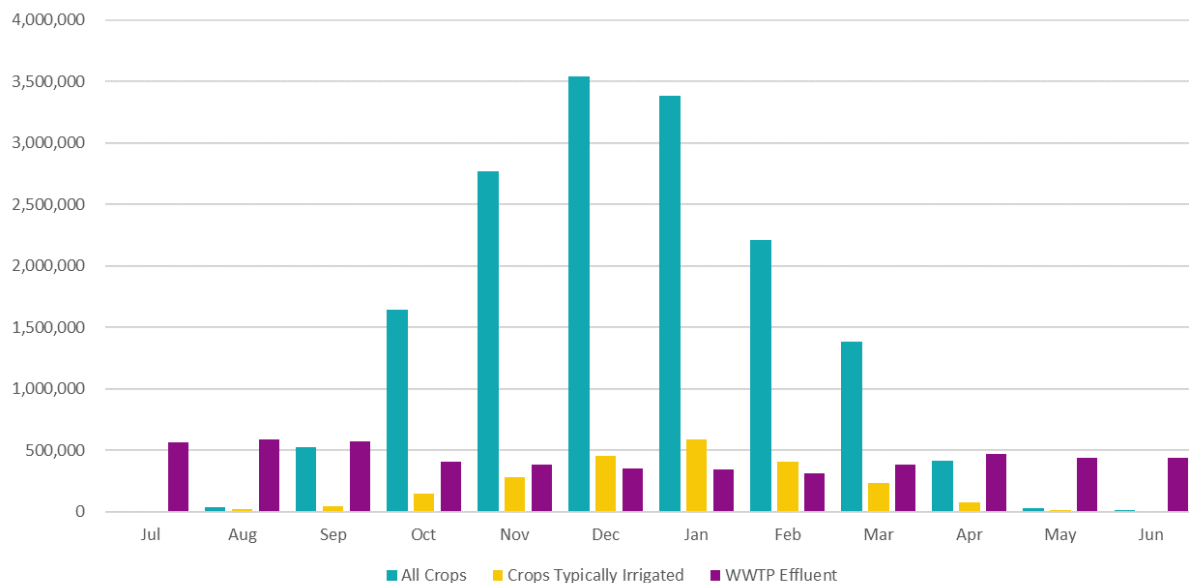


Figure 6-1: Potential irrigation water demand and WWTP effluent flows in m³/month

When looking at the irrigation demand for all crops, the water demand could be up to 10 times higher than the available flows from the WWTP in the summer months, and it is three times higher than the annual volume discharged from the WWTP. From May to September, the flows from the treatment plant are higher than the crop water

requirements, therefore storage may be required or an alternative disposal during these months for the effluent surplus.

A more realistic comparison against the typically irrigated crops shows that the flows from the WWTP are more than twice the volume of water required by the crops in a year. Only between December and February is the crop water demand higher than the effluent flows. From March to November, there would be a surplus of treated effluent that could be partially stored for the summer months, but an alternative disposal for the excess water option would be required regardless.

Table 6-2: Water balance between treated effluent flows and typically irrigated crops water demand¹

Month	WWTP Effluent Flows minus Typically Irrigated Crops Demand (m ³)	% of WWTP Effluent Flows not Reused
Jul	560,666	99%
Aug	570,497	97%
Sep	523,173	92%
Oct	258,645	63%
Nov	105,459	27%
Dec	-103,288	-29%
Jan	-241,673	-71%
Feb	-96,391	-31%
Mar	142,606	38%
Apr	396,046	85%
May	425,787	97%
Jun	432,673	98%
TOTAL	3,018,270	57%

The balance presented above is based on the theoretical water demand for crops estimated using the GDC spreadsheet model. When comparing the treated effluent annual volumes against the actual water use as detailed in Table 3-3, the difference between the available effluent flows and the existing water use for irrigation is increased even further. The estimated actual water use is in the order of 450,000-500,000 m³/year, which represents about 8-10% of the effluent annual volume.

6.2 Storage Requirements

In order to supply irrigated crops with recycled water during the summer months, where a potential deficit has been identified in Table 6-2 above, an estimated volume of 450,000 m³ would be needed. For a storage of this magnitude, an artificial lagoon would be most likely required. Assuming an operating depth of 3m, the total surface area required would be 15 ha. This area does not include a margin for bunds, buffers for flows or additional security during dry years. The volume could be reduced if a combination of irrigation water using recycled water and other sources is adopted.

6.3 Effluent Class Mapping

Based on the classification of effluent quality requirements described in Table 5-2, the summer crops were mapped to identify logical clusters of crops that could be reticulated with the same water quality. Figure 6-2 shows all summer crops and their most likely effluent class requirements.

¹ Red indicates the irrigation demand exceeds the effluent flows, and green indicates the opposite

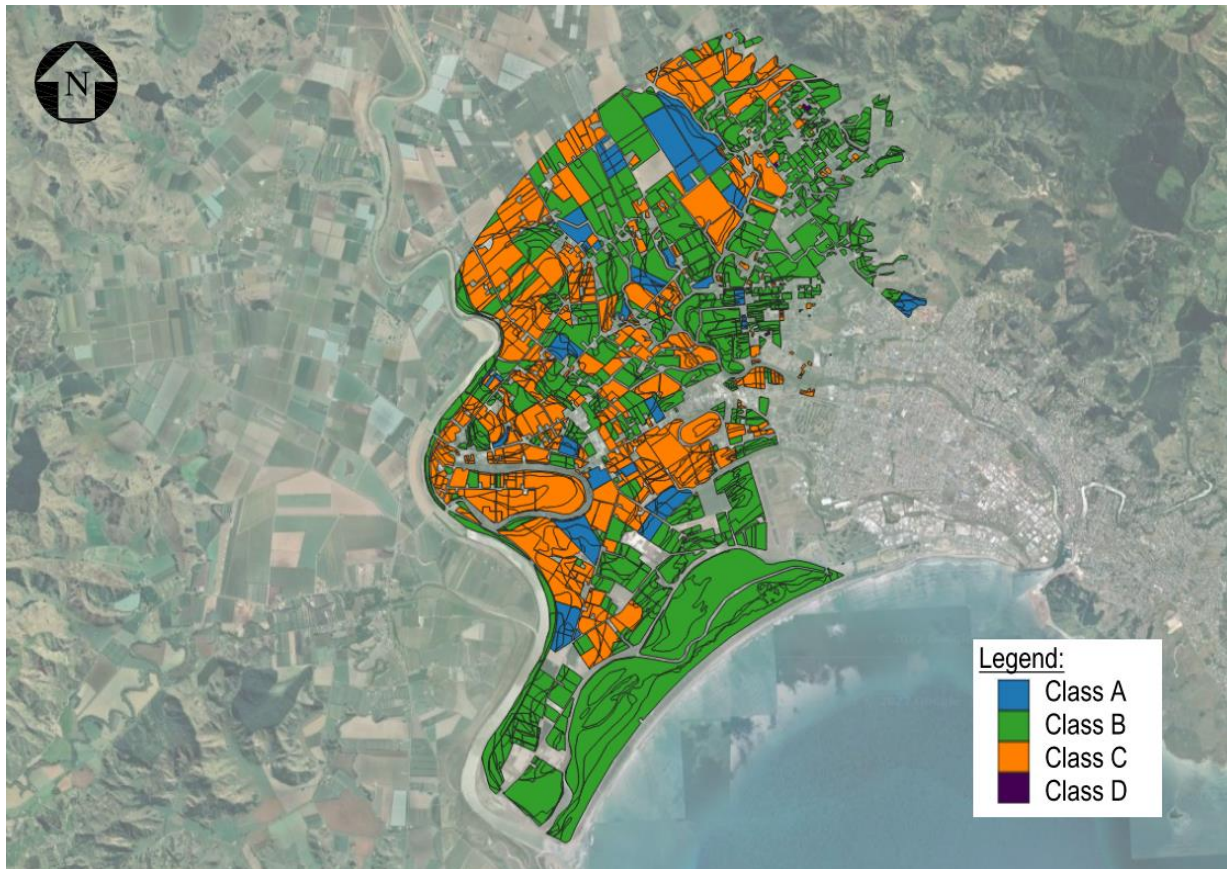


Figure 6-2: Summer crops classified by most likely effluent class

The figure above shows that there are no evident clusters of crops that require a common effluent class. Some high level patterns are identified, for example the coastal areas are mostly used for cattle grazing (Class B), and near the Waipaoa river there are a number of orchards that grow fruits likely to require a Class C effluent.

A similar exercise was undertaken considering only the crops that are typically irrigated in the area. Pasture and other crops grown for cattle are not typically irrigated, therefore all Class B parcels were excluded. Fruit crops like citrus, feijoas and grapes that would use Class C effluent, but are not irrigated in Gisborne are also excluded. Squash is the only crop requiring Class A effluent that is not irrigated in the area. Figure 6-3 below summarises the results of this exercise.

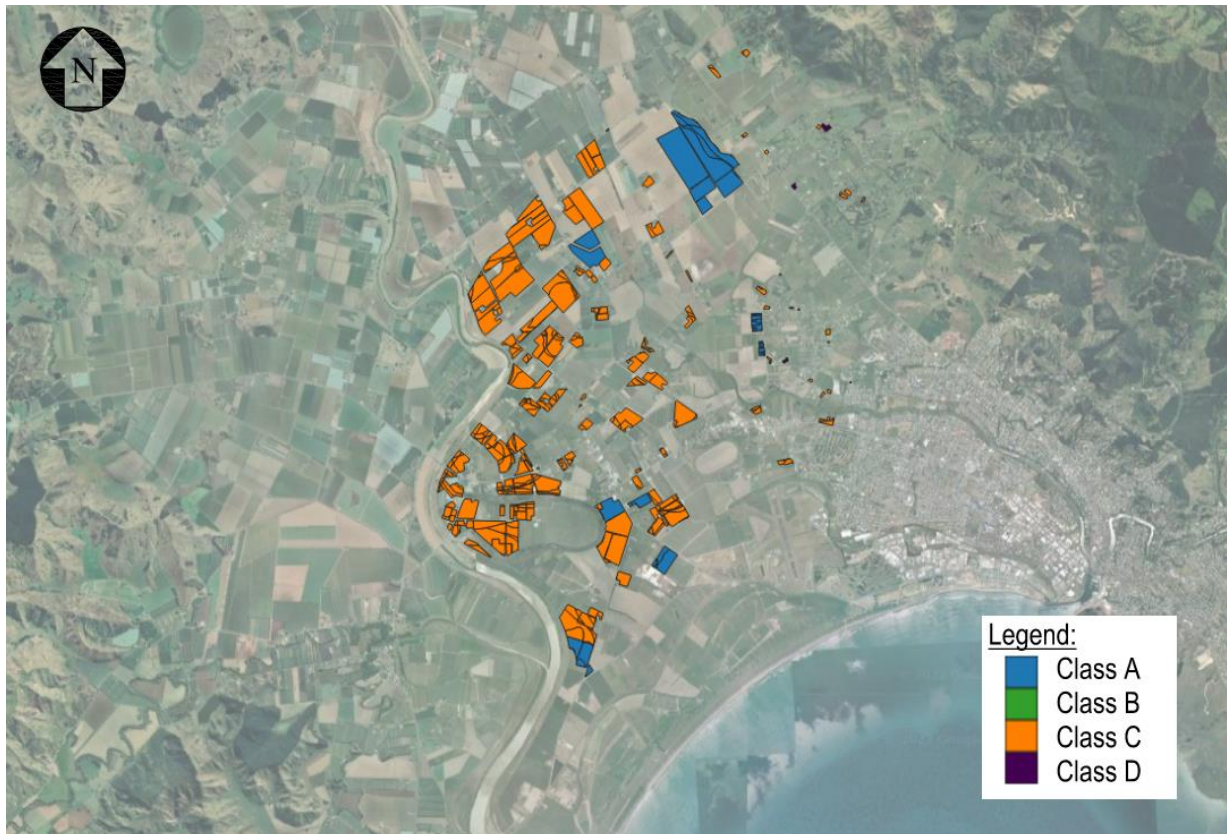


Figure 6-3: Typically irrigated crops classified by most likely effluent class

It is noticeable that crops requiring Class A effluent are scattered around the area, with no evident clusters. There is a big property at the north end of the study area that produces vegetables, however the southernmost property in Figure 6-3 above would also require Class A effluent. This poses a challenge when looking at some efficiency in the possible distribution routes. Class D (flowers, pine nursery) crops are only minor, making it unfeasible to install a reticulation network only to supply these properties, instead they could be supplied with a higher effluent class. The largest proportion of orchards requiring Class C are located towards the west side of the study area, however, to supply all the properties identified above it would require an extensive reticulation network covering most of the area to the west of the city up to the Waipaoa river.

6.4 Pipeline Options

A high level pipeline route to service the parcels that are typically irrigated is shown in Figure 6-4. The main pipe route follows Awapuni Rd, Bushmere Rd, Matawai Rd and King Rd, with several branches to supply individual properties. Some parcels towards the east and north would require additional pipeline extensions as they are located far from the main pipe route. The indicative scheme assumes that Class A recycled water is used, as it is the most restrictive case in terms of quality requirements. Elevated reservoirs and/or booster pump stations could be installed at different locations to provide the supply pressure needed. If storage is required to supplement the summer months, a lagoon could be built near Awapuni Road before the connection to the first property.

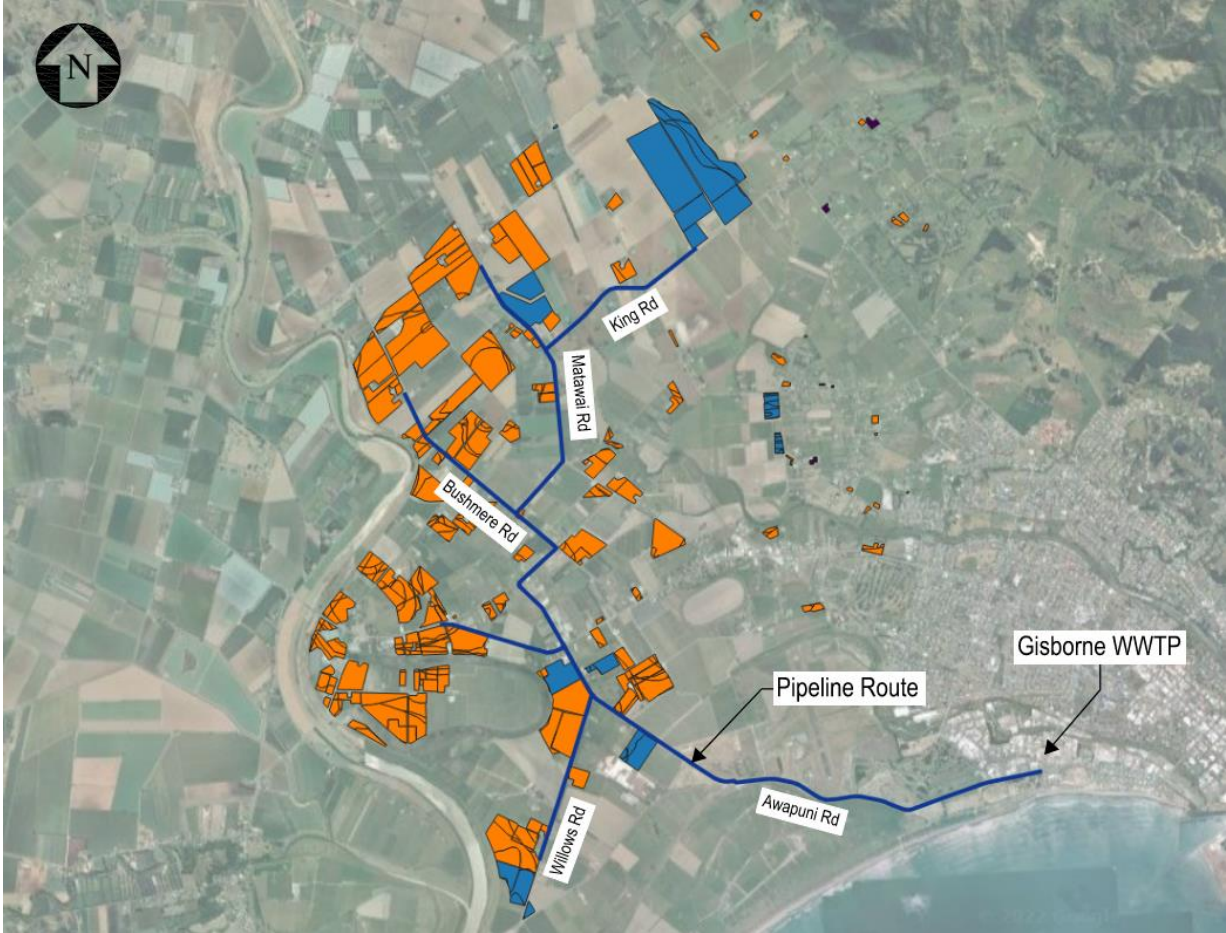


Figure 6-4: Indicative pipeline routes

Another alternative would be to exclude from the irrigation scheme the properties that require Class A effluent. In that scenario, a pipeline conveying Class C effluent could be used to irrigate the properties shown in orange in Figure 6-4 above.

7 Discussion and Next Steps

This section summarises the main findings from the study and recommends next steps to progress the viability review.

Crop Water Demand Model

The main tool used to estimate the potential water demand for the different crops grown in the Gisborne region was the GDC spreadsheet model. There are some limitations identified with the use of the tool, which are detailed below:

- As confirmed by GDC staff, the spreadsheet is understood to overestimate the water demand for crops. In some cases, the spreadsheet can overestimate by about four times the real water usage for certain crops. A peer review of the model was undertaken by NIWA in 2021, but it is not clear if amendments have been made to the model based on NIWA's recommendations. Our understanding is that these have not yet been implemented.
- The model does not take into account the crop stages for estimating the irrigation needs, which will typically vary through the growing season. We note this point was also identified by NIWA (NIWA, 2021).
- The model does not consider that after rainfall events irrigation may not be needed (NIWA, 2021). Fallow days are also not included in the water demand estimations, and this may further reduce the water demand, as there will be days when no irrigation is needed (e.g., during harvest, between crop rotations, etc.).
- It is not clear how the model takes into account percolation and rainfall runoff to estimate water needs.
- No data on current irrigation methods being used is available from the crop survey. This could have a significant impact on the water demand estimations, and also on the effluent treatment requirements. It is understood the model somehow incorporates the most common irrigation method for different crops, but this is not detailed enough to confirm the adequacy of these assumptions.
- The crop survey includes nurseries (although only a few), where the irrigation scheduling may be quite different to crops directly planted onto soil.
- The water demand of a crop depends on the soil type where it is grown. In many cases, the model returns no values for specific combinations of crops and soil types. As instructed by GDC, in those cases, the next available soil type is selected to represent the water demand for that particular crop. This may not accurately represent the water demand for that crop as it assumes it is grown in a different soil type.
- No irrigation buffer from adjacent properties was used in this study. A 20m buffer was applied from water courses as no-irrigation zones. It was assumed that the polygons in the crop survey represent the effective canopy area, but it may not be the case. This may overestimate the calculated irrigation water demand.
- Only summer crops were considered for this study. This may overestimate the irrigation water needs as winter crops mostly include crops for cattle grazing, which are not typically irrigated in Gisborne.

The limitations described above may partially explain why the model overestimates the water demand for crops. When comparing the results from the model with the actual water use records (refer Table 3-3), it became clear that only a fraction (around 15-20%) of the predicted water use is currently being used (or at least recorded). For the purposes of this study, the model was a useful tool to provide a first indication of the likely water demand requirements for the balance, however we recommend developing more detailed assessments to better understand the water demand of crops that could be irrigated with treated effluent.

Water Balance

- The actual water use is significantly less than the model projections. This confirms the model overestimates the crop water demand. It is understood that the scenario where all crops are irrigated is not realistic. The

scenario that only considers the crops typically irrigated provides a better estimation of the potential water needs for crops, however the results are still significantly higher than the recorded water usage.

- When comparing the outputs from the model with the WWTP effluent flow profile, for the crops that are typically irrigated, the crop water demand is about 43% of the annual WWTP effluent flows. Only during the summer months, is the water demand higher than the treated effluent. To fully meet the irrigation requirements, storage would be required to supplement water during these months. For the rest of the year, continued ocean outfall discharge or alternative disposal methods would be required. The difference between treated effluent flows and water demand is further increased when comparing against the recorded water use, which represents only about 10% of the annual WWTP effluent flows.
- **A 100% reuse of the treated effluent for irrigating crops within the study area is not considered to be feasible**, as the effluent volume is larger than the crop needs. A combined system where some of the water is used for irrigation and the rest is discharged via ocean outfall or an alternative method would be possible. This is aligned with the main conclusion from the Opus 2004 Report, where it was concluded that a year round total land irrigation scheme is not feasible, but some treated effluent could be eventually reused on a smaller scale and on a seasonal basis (Opus International Consultants Limited, 2004).
- A comment extracted from the Victorian guidelines further supports the idea of the unfeasibility of a 100% reuse scheme: *“The average annual evapotranspiration rates should substantially exceed rainfall to maximise recycled water reuse. Drier climates, such as those in the northwest of Victoria, are the most suitable. In areas with high rainfall, irrigation with recycled water is possible provided there is a distinct prolonged dry season, together with adequate available land for storage and irrigation.”* (Environment Protection Authority Victoria, 2021) (p.39)
- The feasibility of a 100% irrigation reuse scheme would be even further challenged by the future growth of the city, as new developments could occupy the Poverty Flats in the future. If agricultural land is re-zoned as residential/industrial, the irrigation needs will be reduced and therefore the effluent surplus will be larger. In addition, as the city population grows, the treated effluent flows are also expected to increase.
- Currently many crops that have consented water do not use all the allocated water. A possible reason is that it may not be worth pumping from a bore for low cost crops such as pasture. If treated effluent becomes available, a shift from lower value crops such as maize or pasture to higher value crops like kiwifruit or feijoa could occur. Under this scenario, it is expected that irrigation water demand would increase. It is expected that irrigation needs and crops will naturally adjust based on water availability and its cost.
- A quite large area (about 15ha) would be required to provide treated effluent storage for the summer months. The benefits between providing irrigation water during summer versus the costs and constraints associated with such a large infrastructure needs to be assessed in more details if that option is further considered. Only limited area may be available to build a large storage pond.
- Climate change is also expected to have an impact on future irrigation water needs. It is not clear at this stage how the model incorporates climate change into the estimations, and if there will be a higher water demand in the future due to reduced rainfall.

Environmental Risks

- The mitigation of environmental risks such as nutrient loads is not covered in this report. We note that this may impose more restrictive conditions for the effluent reuse, reducing even further the amount of water that can be reused. To mitigate these risks, upgrades to the WWTP would be required to improve the quality of the effluent in terms of nutrients, heavy metals, chlorine residual, sodium, boron, etc.

Produce Safety – Quality Assurance Systems

- Several agricultural industries have quality assurance systems to manage produce safety. This includes controlling microbiological, chemical and physical risks associated with food safety. Industry specific requirements may

impose restrictions on the acceptability of treated effluent for agricultural uses, for example Fonterra currently prohibits the use of treated effluent for dairy cattle grazing in New Zealand.

Next Steps

We recommend the following steps to progress the viability review:

- Explore the possibility of including industrial reuse of treated effluent. This would require identification of the main industries in the area, their water consumption profile and quality requirements.
- Investigate the feasibility of other uses for the treated effluent, for example aquifer recharge.
- Evaluate the advantages and disadvantages of adopting a combined disposal scheme that partially supplies water for irrigating crops and also discharges via ocean outfall. Are the expected benefits greater than the costs and risks associated with installing a treated effluent reticulation scheme?

If a decision is made to look into more details at the feasibility of a recycled water irrigation scheme, then the following steps are suggested:

- Identify the sites that could potentially be irrigated and develop more detailed models of water demand requirements based on the specific site information, crops potentially grown, etc.
- Develop hydrogeological assessments to determine possible impacts on groundwater, considering the effects of the plant/crop production system and the effects of recycled water on groundwater quality.
- Identify the environmental hazards and the potential impact of the reuse of treated effluent for irrigation. This will allow to understand further treatment requirements for the Gisborne WWTP.
- Utilise the Victorian guidelines or other relevant documents to understand in more details the technical requirements and risk management measures associated with the implementation of a recycled water scheme for the Gisborne area.

8 References

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A large, white, sans-serif capital letter 'A' is centered on a teal rectangular background. The letter is bold and occupies a significant portion of the teal area.

Appendix A – Model Outputs

Table 8-1: Calculated water demand for all crops within the study area

Crop Grown	Water Demand (m ³ /month)												TOTAL
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Apples and Pears	0	0	0	36707	89628	117967	130911	85615	18116	2989	0	0	481933
Avocados	0	0	618	5781	13901	19782	22544	14465	8382	1965	367	87	87892
Baleage	0	0	1071	5466	9318	10824	11983	8927	5627	1330	0	0	54545
Cauliflower/Broccoli	4173	8601	16880	39922	48936	42284	50477	35578	33176	19513	9516	6294	315350
Citrus	0	0	4426	52116	138568	207138	238152	153097	88124	20475	3403	997	906496
Clover	0	0	2660	6868	10493	11883	12712	9659	6282	1886	0	0	62442
Courgettes	0	5235	11970	22625	33950	41379	45664	0	0	0	0	0	160824
Feijoa	0	0	98	752	1791	2495	2862	1835	1065	256	49	11	11214
Flowers	40	85	174	222	250	281	286	209	205	136	113	49	2051
Grapes	0	0	12550	91499	202153	271141	308738	198175	114461	26789	5287	1183	1231976
Kiwifruit	0	0	0	2932	35748	161446	254540	211099	142439	33171	0	0	841375
Leafy Turnip	743	1618	3157	8437	10354	8450	10821	7241	7124	4004	2023	1236	65210
Lettuce/Cabbage	927	2691	7531	16897	15993	20182	21228	15086	14027	6844	4726	1015	127147
Lucerne	0	0	2133	5076	7819	8978	9607	7269	4639	1413	0	0	46933
Maize/Sweetcorn	0	0	0	236933	448900	672457	175557	0	0	0	0	0	1533847
Melons	0	0	688	1498	2192	2790	3354	2688	1936	624	0	0	15770
Not Visible	0	0	13650	33525	50743	57423	61033	46535	30136	9381	0	0	302428
Olives	0	0	26	179	449	640	742	476	276	67	13	3	2870
Other	0	0	1656	4029	6136	6977	7447	5656	3658	1120	0	0	36679
Pasture/Unused	0	0	315346	762380	1159191	1318007	1406529	1067323	689174	213078	0	0	6931027
Persimmon	0	0	0	8547	20105	26099	28947	18816	3977	661	0	0	107153
Pine Nursery	49	149	480	1047	1012	1273	1335	1002	799	417	209	73	7845
Plantain/Chicory	138	414	1167	2644	2466	3132	3253	2432	2060	1039	617	178	19537
Squash	0	16689	40448	74553	114350	137742	153664	0	0	0	0	0	537446
Stonefruit	0	0	0	1440	2934	3585	3966	2507	527	91	0	0	15049

Crop Grown	Water Demand (m ³ /month)												TOTAL
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Tamarillo	0	0	0	302	847	1167	1297	865	184	30	0	0	4690
To be planted	0	0	82854	211383	323477	367214	392917	298247	193319	58198	0	0	1927609
Tomatoes	0	0	6396	11036	14185	16628	18486	15830	12013	4555	0	0	99129
Unknown	0	0	562	1509	2326	2641	2833	2149	1394	411	0	0	13824
TOTAL	6070	35483	526541	1646303	2768215	3542006	3381885	2212781	1383119	410442	26323	11127	15950292

Table 8-2: Calculated water demand for crops that typically require irrigation in the Gisborne region

Crop Grown	Water Demand (m ³ /month)												TOTAL
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Apples and Pears	0	0	0	36707	89628	117967	130911	85615	18116	2989	0	0	481933
Avocados	0	0	618	5781	13901	19782	22544	14465	8382	1965	367	87	87892
Cauliflower/Broccoli	4173	8601	16880	39922	48936	42284	50477	35578	33176	19513	9516	6294	315350
Courgettes	0	5235	11970	22625	33950	41379	45664	0	0	0	0	0	160824
Flowers	40	85	174	222	250	281	286	209	205	136	113	49	2051
Kiwifruit	0	0	0	2932	35748	161446	254540	211099	142439	33171	0	0	841375
Lettuce/Cabbage	927	2691	7531	16897	15993	20182	21228	15086	14027	6844	4726	1015	127147
Melons	0	0	688	1498	2192	2790	3354	2688	1936	624	0	0	15770
Olives	0	0	26	179	449	640	742	476	276	67	13	3	2870
Persimmon	0	0	0	8547	20105	26099	28947	18816	3977	661	0	0	107153
Pine Nursery	49	149	480	1047	1012	1273	1335	1002	799	417	209	73	7845
Stonefruit	0	0	0	1440	2934	3585	3966	2507	527	91	0	0	15049
Tamarillo	0	0	0	302	847	1167	1297	865	184	30	0	0	4690
Tomatoes	0	0	6396	11036	14185	16628	18486	15830	12013	4555	0	0	99129
TOTAL	5189	16762	44763	149134	280129	455505	583777	404237	236055	71063	14943	7521	2269079

Title: DrainWise Programme Update
Section: Community Lifelines
Prepared by: Neville West – 4 Waters Infrastructure Manager
Chris Hopman – 4 Waters Operations Manager
Meeting Date: Thursday 1 September 2022

Legal: Yes

Financial: Yes

Significance: **Low**

Report to WASTEWATER MANAGEMENT Committee for information.

PURPOSE

The purpose of this quarterly report is to provide the Wastewater Management Committee (WMC) with an update on the DrainWise programme for the last three months (1 April – 30 June 2022).

SUMMARY

In this reporting period there was one wet weather overflow on 13 April for 19 hours.

Rapid inflow assessment of private property is ongoing – 443 properties have been inspected, 312 gully traps have been repaired and 10 downpipes into gully traps have been removed and connected to an approved outlet.

Public drains on private property: 42% of the budget was spent with remaining budget carried over. Rutene Road/Maki Street upgrade is complete. Two contracts are under construction, three are ready for tender.

Gisborne District Council Dry/Wet Weather Consent: Deliverables required within six months of commencement of the consent were delivered by 16 May. These include appointing a Tangata Whenua Reference Group, Operating Maintenance Plan (OM Plan), Response Plan, and shellfish virus study methodology.

Stormwater and Wastewater Renewals: Stormwater renewal programme was completed. Wastewater renewals spent 50% of the budget and remaining budget carried over. The contractor was severely affected by COVID-19, wet weather and supply chain issues of their specialised liner.

The decisions or matters in this report are considered to be of **Low** significance in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS

That the Wastewater Management Committee:

1. Notes the contents of this report

Authorised by:

David Wilson - Director Lifelines

Keywords: DrainWise, Wastewater Management Committee, WMC

BACKGROUND

1. The DrainWise programme is made up of the following work streams:

Property Inspections

- minor public-funded works on properties (fixing gully traps and broken downpipes)
- compliance and enforcement; removing stormwater from downpipes and property flooding that enters or tops gully traps or wastewater pipes.

Stormwater Network Upgrades and Renewals

- stormwater public network extensions into private property.

Wastewater Network Upgrades and Renewals

- focus projects.

Education and Awareness

Engagement

- Tangata Whenua Reference Group.

2. The above workstreams aim to prevent wastewater overflows by reducing the amount of rainwater getting into the wastewater network. Rainwater can get into the wastewater network either by:
 - direct inflow, eg. through gully traps or downpipes into gully traps
 - flooding on private property topping gully traps, or
 - ground water infiltration seeping through the soil and into broken private pipes or Council's pipes that are underground.
3. When too much rainwater gets into the wastewater network, our wastewater pipes become full and struggle to transport wastewater to the treatment plant. When this occurs Council opens the scour valves to allow wastewater to discharge into the rivers in order to prevent wastewater overflows onto private property and out of manholes.
4. With 50% of the wastewater network on private property and privately owned, it has become apparent that a greater focus on this portion of the network is required if further reduction in overflows is to be achieved. A key success factor will therefore be property owners fixing problems on their privately owned wastewater and stormwater infrastructure. The Project Team is working to inspect and assist homeowners and educate residents about fixing issues with gully traps, downpipes and laterals on their properties.
5. At the same time Council is making sure that public infrastructure has adequate capacity and is in an acceptable condition, and it is looking for solutions that help with reducing the problems on private property (eg. public stormwater network extensions).
6. Council also manages a focused education and awareness programme that includes a revamped DrainWise website, videos, posters, billboards, infographics, news stories and a DrainWise Art Competition in schools. It also uses social media when appropriate.

DISCUSSION and OPTIONS

DrainWise Activity

7. In this reporting period there was one wet weather overflow on the 13 April for 19 hours.

Activity	Number
Properties inspected (rapid assessment)	443
Properties full inspection including smoke testing, CCTV	1
Gully traps repaired	312
Number of downpipes into gully traps identified	5
Downpipes into gully traps removed (last three months)	10
Number of stormwater RfS received for Gisborne City / (Resolved)	132 / (120)
Number of wastewater RfS received for Gisborne City / (Resolved)	83 / (71)

Public Drains on Private Property

8. 42% of the budget was spent this year. Projects were constrained due to COVID-19, staff departures, property access agreements and ongoing wet weather. A carryover of unspent budget was approved.
9. Current status of On Property projects is:

Activity	Status
Rutene Road/Maki Street	Completed
De Lautour Road	Under construction
Ida Road/Coldstream Road	Tendered
Craig Road	Under construction
Montrose Street/Oman Road	Investigations under way
Heath Johnson	Survey complete, design feasibility under way

Dry and Wet Weather Discharge Consent

10. As a requirement of Council's resource consent for dry and wet weather discharges, a number of documents and actions needed to be provided/undertaken by 16 May (six months following the consent being granted). These included appointing a Tangata Whenua Reference Group, OM Plan, Response Plan, shellfish virus study methodology. These were provided on time.
11. As part of the consent WMC has appointed the KIWA Group to the role of Tangata Whenua Reference Group (TWRG). A Memorandum of Understanding (MoU) has been developed and provided to the TWRG for review. Once agreed a copy will be tabled for this committee's information.

12. Council is looking to increase its wastewater network performance monitoring equipment with the deployment of additional flowmeters and level sensing devices. This will provide greater granularity for identifying if the problem is inflow and/or infiltration and allow more focused investigations leading to further reduction of stormwater into the wastewater network. Consultants were engaged to assist with this, and their recommendations have been provided for future implementation.
13. Stormwater renewal programme was completed, Wastewater renewals spent 50% of the budget and remaining budget carried over. The contractor was severely affected by COVID-19, wet weather, and supply chain issues of their specialised liner.

ASSESSMENT of SIGNIFICANCE

Consideration of consistency with and impact on the Regional Land Transport Plan and its implementation

Overall Process: Low Significance

This Report: Low Significance

Impacts on Council's delivery of its Financial Strategy and Long Term Plan

Overall Process: Low Significance

This Report: Low Significance

Inconsistency with Council's current strategy and policy

Overall Process: Low Significance

This Report: Low Significance

The effects on all or a large part of the Gisborne district

Overall Process: Low Significance

This Report: Low Significance

The effects on individuals or specific communities

Overall Process: Medium Significance

This Report: Low Significance

The level or history of public interest in the matter or issue

Overall Process: Medium Significance

This Report: Low Significance

14. The decisions or matters in this report are considered to be of Low significance in accordance with Council's Significance and Engagement Policy.

TANGATA WHENUA/MĀORI ENGAGEMENT

15. The WMC includes iwi representatives from Te Rūnanga o Tūrangānui a Kiwa (TROTAK), Te Aitanga a Māhaki, Rongowhakaata, and Ngai Tamanuhiri. The WMC has been kept informed for the duration of the wastewater consent, including DrainWise matters.
16. Further engagement is achieved through WMC appointed technical working groups – being the KIWA Group and the Tangata Whenua Reference Group.

COMMUNITY ENGAGEMENT

17. The community has been consulted as part of the Long Term Plan 2021–2031 (LTP) process and gives a high priority to the DrainWise Programme.

CLIMATE CHANGE – Impacts / Implications

18. Rising sea levels and higher intensity rainfalls will impact the performance of the stormwater network. Any new or renewal works have adopted 2090 climate change levels.

CONSIDERATIONS

Financial/Budget

19. Budgets have been approved as part of the 2021–2031 LTP. The outcomes of the dry and wet weather discharge consent will require a review of existing budgets to meet the 10-year improvements. These will be promoted for the next LTP.

Legal

20. Council has a challenging Dry/Wet weather discharge consent, requiring regular interaction and a number of procedural processes that need to be managed to ensure compliance.

POLICY and PLANNING IMPLICATIONS

21. The requirements of the DrainWise Programme are likely to influence the LTP and spatial planning given the current constraints on the wastewater and stormwater capacity in places, until such a time as inflow and infiltration is reduced sufficiently to not cause wastewater overflows.

RISKS

22. There are legal risks associated with not complying with Council's resource consent.
23. Not meeting community expectations of having no overflows can impact adversely on Council's reputation.
24. On property overflows will continue to pose health risks for property owners.
25. Overflows to our rivers will continue to present health and environmental risks.

NEXT STEPS

Date	Action/Milestone	Comments
18 August 2022	TWRG Hui to review MoU	
Early September 2022	DrainWise Workshop (TWRG)	
Mid-September	Review DrainWise Annual Report	TWRG also to provide their own report
16 November 2022	Meet 12-month consent requirements	

Title: 22-203 Wastewater Treatment Stage 2 Update
Section: Community Lifelines 4 Waters Infrastructure - Capital Works
Prepared by: Ben McArthur – Civil Project Solutions
Meeting Date: 1 September 2022

Legal: Yes

Financial: Yes

Significance: **Medium**

Report to WASTEWATER MANAGEMENT Committee for information

PURPOSE

The purpose of this report is to provide the Wastewater Management Committee (WMC) with an update on progress of the Wastewater Treatment Plant (WWTP) Stage 2 Upgrade.

SUMMARY

Of note within the attached report is:

- Contract is progressing within budget. Currently there are no variations altering the tendered price. The Contractor has indicated that they will be requesting some variations.
- Milestone dates are provided with the plant starting to process the wastewater in April 2023, which is the start of hot commissioning. This includes a 25-day contingency allowance for programme slippage.
- Construction is programmed for completion in December 2022. We are expecting a request for a time extension due to weather delays which may extend construction into January.

The decisions or matters in this report are considered to be of **Medium** significance in accordance with the Council's Significance and Engagement Policy.

RECOMMENDATIONS

That the Wastewater Management Committee:

- 1. Notes the contents of this report.**

Authorised by:

David Wilson - Director Lifelines

Keywords: Wastewater management, treatment plant, upgrade

ASSESSMENT of SIGNIFICANCE

Inconsistency with Council's current strategy and policy

Overall Process: Low Significance

This Report: Low Significance

The effects on all or a large part of the Gisborne district

Overall Process: Medium Significance

This Report: Low Significance

The effects on individuals or specific communities

Overall Process: Medium Significance

This Report: Low Significance

The level or history of public interest in the matter or issue

Overall Process: High Significance

This Report: Low Significance

1. The decisions or matters in this report are considered to be of **Medium** significance in accordance with Council's Significance and Engagement Policy.

ATTACHMENTS

1. Attachment 1 - GWWTP WMC Update Report 20220809 [**22-203.1** - 8 pages]

Wastewater Management Committee Update Report

Project: Gisborne Wastewater Treatment Plant Upgrade Stage 2

Committee: Wastewater Management Committee 1 September 2022

Project Manager: Ben McArthur

Report Date: 9 August 2022

Health and Safety

Sign in and out protocols are in place for the site, including covid-specific registers and QR codes. Various areas of the site are delineated for the different work activities and appropriate measures are in place.

MCD new active approach to safety is holding a weekly See Say Do's toolbox meeting on every Thursday. Here we see each and every site member needing to present on of their 2x weekly See Say Do reports to the group. I went along to the last of these and was very impressed with the engagement from the crews with the engineers and managers.

General Update

We are up to RFI #184 with the majority of the latest of these still related to electrical and structural, up from #172 last report.

There has been a single Notices from the Contractor to the Engineer to Contract, detailing a zero-cost extension of time claim. This has been approved in principle and will be formalised over the next week. There were no Notices to the Contractor within the last period.

There have again been no further non-conformances on the project since last report.

Pre concrete pour inspections have been being carried out with Beca involvement both over Teams video calls, and for significant points they have been present on site. Within the last period Beca have been present on site for all pre concrete pours relating to water retaining structures to ensure the PS4 is able to be obtained at completion.

The effect of Covid on site is being overshadowed by personnel and companies within the supply chain being struck with the flu/cold in recent times. MCD are pressing on well but the resultant supply chain issues from freight and other companies not able to meet delivery timeframes proves to continue to be a factor.

Civil works are progressing with the arrival of the GRP pipes for the pumped line that connects between the pump station and clarifier inlet. Dewatering and excavation works have begun on this line which will be done in stages as to maintain access into the existing plant. Most major slabs and foundations are now in place, with infill pads to complete.

Water testing has now been completed and passed for the clarifier pump station and lamella clarifier tanks. Lamella packs have been installed within the first of the two tanks and the supplier has had a representative on site to sign off the work completed to date.

The electrical building and pump shed structures are under construction with Kiwispan.

Overleaf is the updated *Project Milestones Forecasted Dates* which takes into account the most recent changes in the procurement, construction and commissioning programmes.

Wastewater Management Committee Update Report

Construction Progress

June - July 2022

Complete and pour sludge tank storage slab plinths.
 Complete and pour dewatering and tertiary filtration slabs.
 Construction of UV clarification channel floor and walls.
 Complete clarifier pump station manhole works.
 Complete assembly of lamella clarifier hoppers and upper wall tank sections.
 Construct HDPE outlet pipework and bends from lamella clarifier.
 Complete hydrostatic testing of lamella clarifier pump station and lamella clarifier chambers.
 Begin installation of clarifier packs into lamella hoppers.
 Electrical building and pump shed construction started.
 Transport from Waipaoa Water Treatment Plant and landing of tertiary filters onto site.
 Pre-casting of tertiary flow splitter panel walls.
 Procurement of MCC cabinets, drives and other electrical equipment.
 Receive first of GRP pipe ex. Turkey.
 Stormwater upgrade works around existing plant.
 Fabrication of lamella pump station manifold.

Forward Programme

August - September 2022

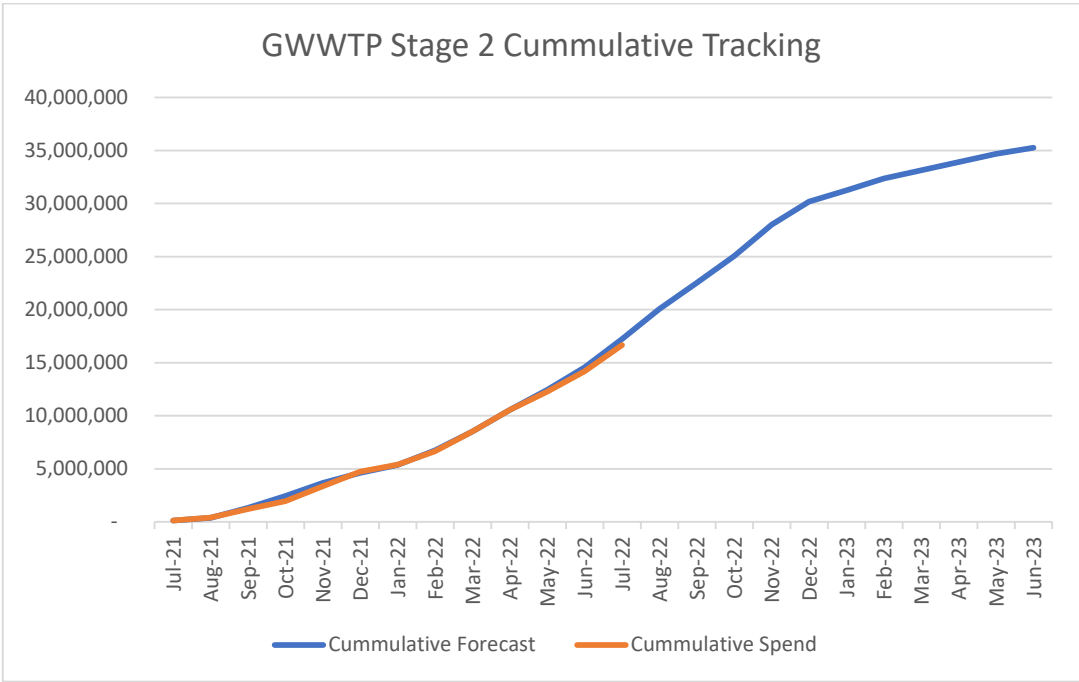
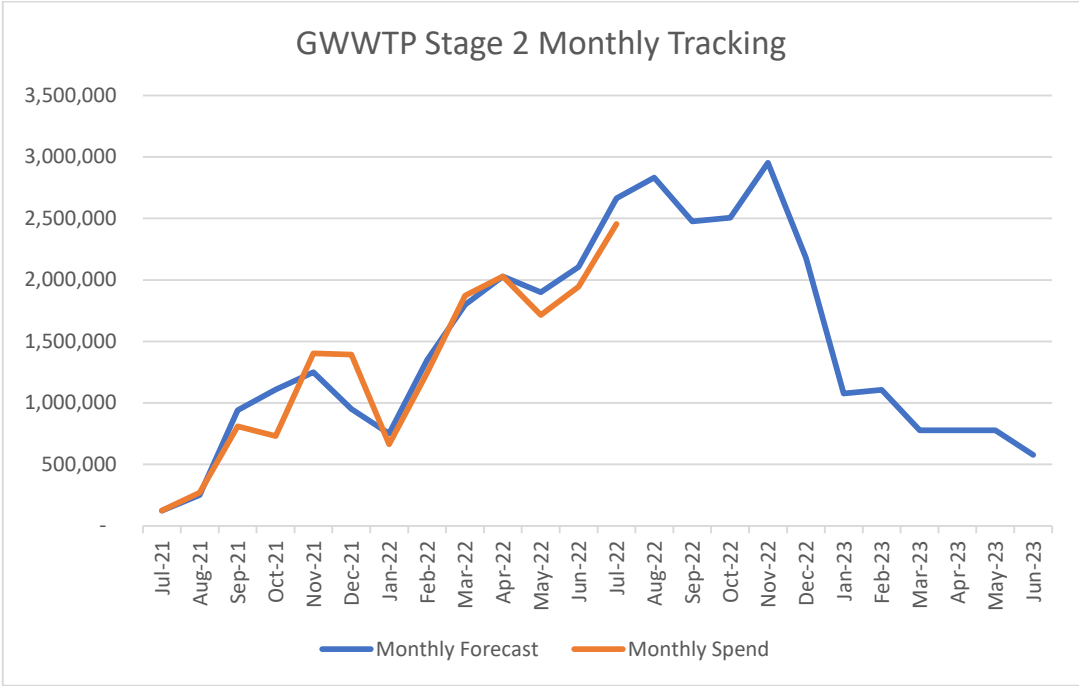
Installation continues of lamella clarifier packs into hoppers and weirs overtop.
 Begin pumped line from clarifier pump station to lamella clarifier structure.
 Procurement of MCC cabinets, drives and other electrical equipment.
 Receive first deliveries from Spirac.
 Installation of pumped GRP line between pump station and lamella.
 Stormwater upgrade works around existing plant.
 Electrical building and pump shed construction and fitout.
 Standing of precast panels and construction of tertiary flow splitter.
 Fabrication of lamella pump station manifold.

Project Milestones Forecasted Dates

Construction period	Aug 2021 – Jan 2023
Cold commissioning	Feb 2023
Contingency allowance (mandatory 25 days)	Mar 2023
Hot commissioning	Apr 2023
Trial operating period (25 days allowed)	May 2023

Wastewater Management Committee Update Report

Financial Update (to end of July 2022 *note July costs are as accrued and are TBC)



Wastewater Management Committee Update Report

Progress Photos



Electrical building construction.



Pump shed building construction.

Wastewater Management Committee Update Report



Progress of the tertiary filtration slab construction.



Wastewater Management Committee Update Report



Precast panels ready for lifting into place for the tertiary flow splitter.



Penstock installation in clarifier pump station inlet chamber.

Wastewater Management Committee Update Report



First delivery of GRP pipes, ex. Turkey.



Wastewater Management Committee Update Report



Arrival and unboxing of tertiary filters on site.



Tertiary filters in place on site.

