



# WASTEWATER PROFILE STATEMENT

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## **1 Introduction**

### **1.1 Purpose and Scope**

The intent of this profile statement is to define the existing wastewater infrastructure and ongoing projects to extend the infrastructure. Recent growth profiles are considered and any limitations or opportunities imposed by the infrastructure identified.

### **1.2 Definitions**

AMP Asset Management Plan

WDC Waipa District Council

WWTP Wastewater Treatment Plant

LTCCP Long Term Council Community Plan

WUGS Waipa Urban Growth Strategy

### **1.3 Limitations**

The source information used to develop this profile statement is limited to the documents provided by Waipa District Council and detailed in Appendix A.

## **2 Current Profile**

### **2.1 Current Wastewater Infrastructure**

WDC currently owns and is responsible for operating and maintaining two wastewater treatment plants located in Cambridge and Te Awamutu. According to the Wastewater AMP 2006 the networks feeding the plants have a total of 10,591 connections. WDC also own, operate and maintain reticulated sewerage schemes in Cambridge, Karapiro, Te Awamutu and Kihikihi. An overview of this network is shown in Appendix C. Furthermore, there are a number of communities within Waipa District which have privately owned facilities for wastewater treatment.

#### **2.1.1 Cambridge / Karapiro**

The Cambridge and Karapiro networks, which convey wastewater to Cambridge WWTP, currently have approximately 5500 connections. There are 16 pump stations lifting the wastewater into a gravity trunk main. Recent reports state there are no major hydraulic problems in the system although there is potential for sewer flooding at Alpha St in wet weather flow conditions.

The wastewater originating north of the Waikato River crosses the river on a pipe bridge before entering the works through a trunk main. A recent investigation has indicated that the sewer bridge has sufficient capacity for current flows and increased flows for Stage 1 and Stage 2 of the Cambridge North residential development. Provision has been made in the LTCCP to upgrade the pipe bridge for future growth.

Modelling studies (OPUS, 2007) of the network indicated a number of pinch points and recommended solutions for staged upgrades for a 30 year period to allow for the growth identified which included the Cambridge North Deferred Residential Zone, St Kilda, Hautapu Industrial and Victoria Rd West. A new sewer main and pump station for growth in Cambridge North has been constructed.

The Cambridge WWTP is located to the west of Cambridge Township, on the southern side of Waikato River. A map of the network and treatment plant is shown in Appendix C. The plant receives flow from the community of Cambridge including septic waste from the surrounding district. Major contributors to wastewater flow in Cambridge include Karapiro Water Treatment Plant, Cambridge Landfill, St Peters School, and Inghams Poultry Processing Plant. The biosolids produced at the wastewater treatment plant are dewatered and stored in an old pond area on site. Cambridge WWTP does not comply with the conditions of its resource consent,

nitrogen removal being the main issue. A study has been commissioned (OPUS, on-going) to look at options available to upgrade the plant to meet its consent conditions but the output from this study is not yet available.

### 2.1.2 Te Awamutu / Kihikihi

The Te Awamutu and Kihikihi networks convey wastewater to Te Awamutu WWTP. There are 15 pump stations in Te Awamutu and 11 pump stations in Kihikihi. The Kihikihi system discharges into the Albert Park pump station in Te Awamutu. Ultimately the flow is lifted into a gravity trunk sewer to the WWTP.

Recent modelling studies (OPUS, 2007) of the network indicated a number of pinch points and recommended solutions in order to provide sufficient capacity in the network, for the current flows and for the growth identified in the Waipa Urban Growth Strategy. There is also a need for more emergency storage at pump stations as not all pump stations have it.

The Te Awamutu WWTP is located on the north side of Mangapiko Stream on the western edge of Te Awamutu. A map of the network and treatment plant is shown in Appendix C. The treatment plant is predominantly fed from the Te Awamutu reticulation network, however, the township of Kihikihi was also reticulated in 2006 and wastewater flows from there are now treated at the Te Awamutu WWTP. The WWTP was recently upgraded and complies with its consented discharge limits. There is a current study in progress (OPUS, June 2008) to re-assess the capacity at Te Awamutu WWTP and plan upgrades to meet the future demand. The biosolids produced at the wastewater treatment plant are dewatered and stored in an old pond area on site whilst a re-use/disposal route is developed.

### 2.1.3 Private Wastewater Schemes

Hamilton Airport currently uses septic tanks for wastewater treatment however, a planned re-zoning will create approximately 120 ha of industrial zone. The Airport is currently negotiating for services to the industrial zone with wastewater likely to be transferred to Cambridge WWTP for treatment.

Mystery Creek is a large contributor to septage waste particularly during large events such as Parachute Music Festival and the National Fieldays. Mystery Creek has its own septic tank system however this needs to be emptied daily during these large events.

The communities of Pirongia, Ngahinapouri, Ohaupo and Rukuhui are unreticulated and wastewater treatment is through individual septic tanks. Previous reports have noted that the majority of septic tanks in Ohaupo and Rukuhui are of an age where there is potential for significant numbers of failures in the near future which could lead to contamination of shallow groundwater and streams.

Tokanui has two privately owned and operated wastewater treatment plants that are approaching 50 years old and operate under capacity. These plants are not the responsibility of WDC and connection to Kihikihi is considered too expensive for the small community.

## 2.2 Issues for Wastewater

### 2.2.1 WDC Owned Schemes

- n Cambridge WWTP
  - Meeting Resource Consent requirements at the Cambridge WWTP
  - Operation and condition of the wetlands at Cambridge WWTP
  - Solids accumulation in anaerobic pond, aeration lagoon, and settlement basin at Cambridge WWTP
  - Stability of river bank
  - Biosolids re-use/disposal
  - Sensitive nature of discharges to Waikato River
- n Cambridge/Karapiro Network
  - Capacity of trunk main to WWTP, Cambridge
  - Capacity of pipe bridge across Waikato River
  - Infiltration and inflow
- n Te Awamutu WWTP

- Capacity for future growth
- Biosolids re-use/disposal
- n Te Awamutu/Kihikihi Network
  - Trunk main on Factory Road
  - Surcharging in places
  - Capacity for future growth
  - Infiltration and inflow compromising capacity of wastewater treatment plant

#### 2.2.2 Individual Schemes – Septic Tanks

- n Cambridge WWTP is the only location in the district at which septic tank waste can be emptied.
- n Large events at Mystery Creek put extra pressure on the Cambridge WWTP as septic tankers have to make regular trips.
- n Areas of poor soakage have been identified in some communities, e.g. Pirongia. Council have to be pro-active in restricting development in such areas and identifying other areas of poor soakage.
- n Aging septic tanks in Ohaupo and Rukuhui.

#### 2.2.3 Development

- n The development of the industrial zone in Hautapu will lead to additional reticulation being required to convey the wastewater to Cambridge WWTP. The additional load from this development will add to the issues of the plant not complying with its resource consent.
- n There is an existing residential growth cell in Cambridge North and the implications of this on the network and WWTP have been assessed. As part of a 30 year upgrading strategy for the network the flows for the Cambridge North Deferred Residential Zone were modelled and upgrades to the system recommended.
- n A potential future residential expansion has been identified to the south of the Hautapu industrial area. The network model would have to be updated in order to identify the upgrades required to convey wastewater from any development to the WWTP.
- n If wastewater from the industrial development at Hamilton Airport is to be treated at Cambridge WWTP reticulation will have to be installed.
- n Recent network modelling indicates the wastewater flows will exceed the consented flow limit at Cambridge WWTP, in dry weather conditions, within the timeframe being considered. In addition to upgrading the plant performance of the WWTP, the flows will have to be re-consented as part of any long term planning.

### 3 Trends and Growth

Most of the existing information available for trends and growth is for the main settlement areas of Cambridge, Te Awamutu and Kihikihi. Information on these areas shows that growth has been significantly higher than predicted by Statistics New Zealand. Predominantly, growth in the Waipa district has been through migration.

#### 3.1 Cambridge / Karapiro

Cambridge has been identified as having the highest population growth rate of the Waipa District. The Cambridge WWTP is currently constrained by resource consent limits on nitrogen discharge and this can only be expected to worsen as the population grows. WDC have recognised that currently the Cambridge WWTP is incapable of meeting its resource consent limits and there have been a number of studies commissioned to address the situation (WSL, 2003) and a project to replace the existing treatment plant has been identified in the draft LTCCP.

A network upgrade strategy was developed for the growth estimates identified in the Waipa Urban Growth Strategy which included the Cambridge North Deferred Residential Zone and was recently updated to include additional growth zones. Some of the potential residential growth zone south of Hautapu (Victoria Rd West) was included in the most recent modelling exercise. If the rest of this zone is likely to be developed within the timeframe of the Growth Strategy, the model will have to be updated further to reflect this.

Other provisions in the draft LTCCP include:

- n Upgrading the sewer bridge at Cambridge to increase the load capacity.
- n Miscellaneous sewer reticulation and pump station upgrades.
- n Planned maintenance and renewals of infrastructure to ensure a high level of reliability.
- n Ongoing developments in telemetry and control systems to assist operators to monitor and control wastewater collection, delivery and treatment and to identify problems quickly.

### **3.2 Te Awamutu / Kihikihi**

The Te Awamutu reticulation network has known capacity issues in a number of areas. These capacity constraints are likely to be highlighted in the near future as Te Awamutu continues to grow. Kihikihi has recently received a reticulated sewerage network which also pumps flow to the Te Awamutu WWTP. WDC has been proactive in identifying capacity constraints and implementing solutions. There has also been funding set aside in the LTCCP for upgrades to the Te Awamutu sewerage reticulation network. The Te Awamutu WWTP currently operates at a high level of compliance to its resource consents. There are no significant industrial loads expected at the Te Awamutu WWTP within the foreseeable future thus it is expected that the WWTP should be able to handle a significant population increase.

The draft LTCCP provides for:

- n Planned renewals for the Te Awamutu wastewater treatment plant.
- n Bond Road and Picket Hill plan changes.
- n Miscellaneous sewer reticulation and pump station upgrades.
- n Planned maintenance and renewals of infrastructure to ensure a high level of reliability.
- n Ongoing developments in telemetry and control systems to assist operators to monitor and control wastewater collection, delivery and treatment and to identify problems quickly.

### **3.3 Private Wastewater Schemes**

For other settlement areas (including Pirongia, Ohaupo, Maungatautari, Kakepuku, and Te Pahu) there is little information available on growth trends or levels of infrastructure. These areas are predominately serviced by private septic tank systems. Septic tankers collect waste from all round the Waipa District and discharge to the Cambridge WWTP. Information on the operational state of these septic tanks is limited. Historical evidence from Kihikihi shows that approximately one third of all septic tanks used before the reticulation scheme came were operating poorly. If this trend is continued over the entire Waipa District then there is potential for areas of land contamination. It is appropriate to not supply significant infrastructure to these areas as the expense is not cost effective. However there are still issues with this approach in regard to:

- n Responsibility of the education on use and maintenance of septic tanks.
- n Responsibility to ensure there is no inappropriate run off or discharge to land and water bodies.
- n Responsibility to work towards WDC's plan for sustainability and public health.

## **4 Management Considerations**

Wastewater Resource Consents for the treatment plants are listed in Table 1. It is noted that the consents for both treatment plants are due to expire within nine years. Also Cambridge WWTP does not meet its current resource consent limits and EW has the right to formally review their current consent. Allowance has been made in the LTCCP for a new WWTP in Cambridge.

There is a possibility of more stringent discharge conditions being applied during any review or consent renewal which should be taken into account during planned development and upgrading of the sites.

It is also noted that the consented flow for discharge to the infiltration beds at Cambridge WWTP will be exceeded if the growth scenarios recently modelled are fully implemented. If the flow does increase, the effluent concentrations (particularly for nitrogen and phosphorus) may have to be reduced to maintain the same loads in the discharge.

Table 1

WDC Resource Consents for wastewater treatment

Location	Consent No.	Description	Consented Discharge	Expiry
Cambridge	960697	Emergency to Waikato River	7,200 m <sup>3</sup> /day	1/12/2016
Cambridge	960698	Discharge to rapid infiltration beds	7,200 m <sup>3</sup> /day	1/12/2016
Cambridge	960699	Discharge to air		1/12/2016
Te Awamutu	103373	Discharge to Mangapiko Stream	10,000 m <sup>3</sup> /day + rainfall on 12.5 ha pond	31/10/2015
Te Awamutu	103377	Conduct works in Mangapiko Stream		31/10/2015
Te Awamutu	106607 (application)	Discharge of sludge to land		-
Te Awamutu	940335 (application)	Discharge to Mangapiko Stream	20,400 m <sup>3</sup> /day	-

According to the WDC Community Outcomes Review 2007 it was noted under the heading 'Economically Secure Waipa' that "Planning ensures infrastructure matches development requirements and meets the needs of a growing population". From this statement it is obvious that the district expects wastewater facilities to meet growth requirements and that towns will not be limited by their ability to provide such services.

It was also noted under the 'Environmentally Sustainable Waipa' section that "Water quality in our rivers and lakes is maintained and improved and water is used efficiently". In order to achieve this outcome, wastewater treatment plants must be able remove water contaminants that would cause a decline in receiving water quality. This level of treatment is specified by discharge consents set by EW.

## 5 Strategic Opportunities and Constraints

### 5.1 Levels of Service/Quality Standard Requirements

The table in Appendix B shows the current levels of service and target levels of service for WDC. The main gaps between the current and target levels of service are:

- n Compliance with resource consent for Cambridge WWTP
- n Number of sewer blockages
- n Response time for emergency events and minor works
- n A number of target measures are not currently recorded

There is currently no level of service for emptying or inspection of septic tanks. However WDC restricts development in areas of poor soakage and actively seeks to mitigate harmful discharges.

### 5.2 Implications and Constraints

Issues that either constrain development or are an implication of growth are as follows:

- n Compliance with the Resource Management Act and consent requirements at the Cambridge WWTP.
- n Capacity of the existing networks and treatment plants for future growth requirements.
- n Funding to undertake wastewater improvement projects.
- n Town growth plans for beyond 2021.
- n The amount of storm water infiltration into the sewerage network.
- n As the load to the WWTPs increases there will be additional generation of biosolids. Currently the biosolids from both sites are stored on site. A long term re-use or disposal route needs to be developed.
- n Resource consents for Cambridge and Te Awamutu wastewater treatment plants expire in 2016 and 2015 respectively – new consents may require more stringent discharge limits.

- n Conveying sewage across the Waikato River in Cambridge. (It is noted that there is a project identified in the draft LTCCP to upgrade the existing sewer bridge for future loads.)
- n Aging septic tanks and overloaded seepage areas creating pollution in shallow groundwater or streams.
- n Infiltration in the Te Awamutu catchment compromises the capacity of the WWTP in extreme rainfall events.

### **5.3 Strategic Opportunities**

- n Infill development can assist in creating a more dense reticulation network and reduced capital, operating and maintenance expenditure.
- n Beneficial re-use of biosolids providing a valuable resource and reducing disposal costs.
- n Selection of treatment plant processes to enable energy generation from biosolids.
- n Potential for working with third parties (e.g. Hamilton CC who already operate a biosolids treatment train that generates electricity), on biosolids schemes to offset cost of developing a new disposal/re-use route.
- n Replacement of older septic tanks with modern onsite systems on a district wide basis to get economy of scale.
- n New developments in on-site package treatment plants have the potential to allow development of smaller lots but such plants would need to be effectively operated and managed.
- n Develop an education and maintenance programme for individual wastewater system (for both existing and new septic tank units).
- n If reticulation is put in place for the Airport development, there may potential for connecting other communities if there is a driver such as public health concerns through multiple failures of aging septic tanks.
- n Minimise water use through low water use fixtures.
- n If water supply is an issue, water recycling for non-potable uses such as irrigation could be investigated.
- n If a significant amount of work is required to upgrade Cambridge WWTP, is there an opportunity to develop a better site closer to new growth areas, either residential or industrial?



## 6 Base Case Conclusions

- n WDC appears committed to providing a quality wastewater service to the people of Cambridge, Te Awamutu and Kihikihi. This is shown through the work that has been done to identify capacity constraints and future upgrade options for both reticulation systems and treatment plants.
- n There is a significant need to upgrade and expand the Cambridge WWTP in order to meet resource consent requirements. A project has been identified in the draft LTCCP to replace the WWTP as required to meet the consent conditions and cater for growth that is already identified within the catchment.
- n Recent growth in Waipa is higher than previous predictions and is predicted to continue – this could mean that previous upgrade strategies need to be brought forward to bring them in line with actual growth.
- n There appears to be only a limited amount of information available on the state of private wastewater treatment systems. This could impact on WDC's ability to attain their identified Community Outcomes, especially relating to sustainability and health.

## 7 Recommendations

The following are recommendations identified by this Profile Statement for wastewater managers in the Waipa District:

- n Identify growth prediction scenarios through to the year 2050 in order to estimate future flows and loads for the reticulation and WWTPs.
- n Update the network models to add in any new growth scenarios, identify areas with spare capacity and identify any pinch points.
- n Continue work to identify and reduce infiltration and inflow.
- n In conjunction with model updates, review the upgrade strategies for the reticulation networks.
- n Develop an upgrading strategy for the Cambridge WWTP in order to meet the resource consent requirements and treat additional flows and loads due to growth. (It is noted that a project to achieve this has been identified in the draft LTCCP)
- n Develop an upgrading strategy for Te Awamutu WWTP. (A study is underway to address this)
- n Develop an education and maintenance programme for individual wastewater system users.
- n Develop a strategy by which the condition of private wastewater systems can be assessed as well as their impact on the environment.
- n Look in to the feasibility of discharging septic tank waste to the Te Awamutu WWTP or the Hamilton WWTP.
- n Develop a biosolids strategy for Cambridge and Te Awamutu – this could include discussions with Hamilton CC or other third parties.

List of References

## Appendix A

AWT NZ Ltd (2003). *Stormwater Infiltration Reduction in Te Awamutu, Cambridge and Temple View. Action Plan.*

Environment Waikato (2007). *Consent Compliance Audit Report – Waipa District Council: Cambridge Sewage.*

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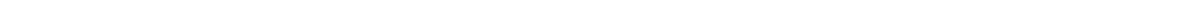
Waste Solutions Ltd (2003). *Cambridge WWTP Status Review.*

Waste Solutions Ltd (2003). *Design Load Study to 2025 for Cambridge Wastewater Treatment Plant.*

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Current and Future Levels of Service

## Appendix B



**Table 1**  
**Levels of Service**

Core Value	Customer Level of Service	Technical Level of Service	Measurement Procedure	Current Level of Service	Target Level of Service
Environmental Standards  Clean air, water and land High standards of public and environmental health	No river or stream pollution resulting from treatment plant discharges	Discharges from treatment plants meet standards set by Environment Waikato	Wastewater testing carried out as per EW requirements	Full compliance with Resource Consent conditions in TA  Significant non-compliance in Cambridge	Full compliance at both treatment plants
	Wastewater assets are operated in such a way that odour events are minimised	Customer complaints of odour events	Quarterly audit of odour events (EW and INFRA)	9 complaints per annum	<= 5 odour events* per Year
Reliability  Efficient and effective utility services	Ensure continuity of wastewater service	Frequency of system blockages	Quarterly review of data	< =1 blockages per 6.2 km of pipe per year	<= 1 blockage per 10 kilometre of pipe (19 blockages per year)
Sustainable, safe and healthy infrastructure	Wastewater pump stations are operated in such a way that overflow events are minimised	Number of Pump station overflow	Review Failure information sheets	Not currently measured	No more than x dry weather overflows from pump stations per year**  No more than y overflows from pump stations per rainfall event**
Responsiveness  Efficient and effective utility services	Timely response to service requests and system failures is provided	Performance with regard to service requests: Emergencies Minor works General enquires	Quarterly review of failure information sheets and INFRA	Emergency response <= 1 hr  Minor works and general enquires: 5 working days	Emergency response <= 30 mins and service restored with 8 hours  Minor works response <= 2 working days  General enquires response <= 5 working days
	Timely response to customer requests for new connections	Performance in approval of new connections	Analyse service connections data	X% of new connections approved within Y days	X% of new connections approved within Y days
Customer satisfaction  A District people can take pride in	Overall satisfaction of residents with wastewater services	% Of satisfied residents	Annual NRB survey	Overall, 62% of customers satisfied with service	>= 62% of customers satisfied with service

\* Event: one fault or problem which can attract a number of complaints; \*\* Targets to be determined when data collected

Maps of Waipa District

## Appendix C

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Scale: 1:100,000 at A3

Waipa District Council GIS Department

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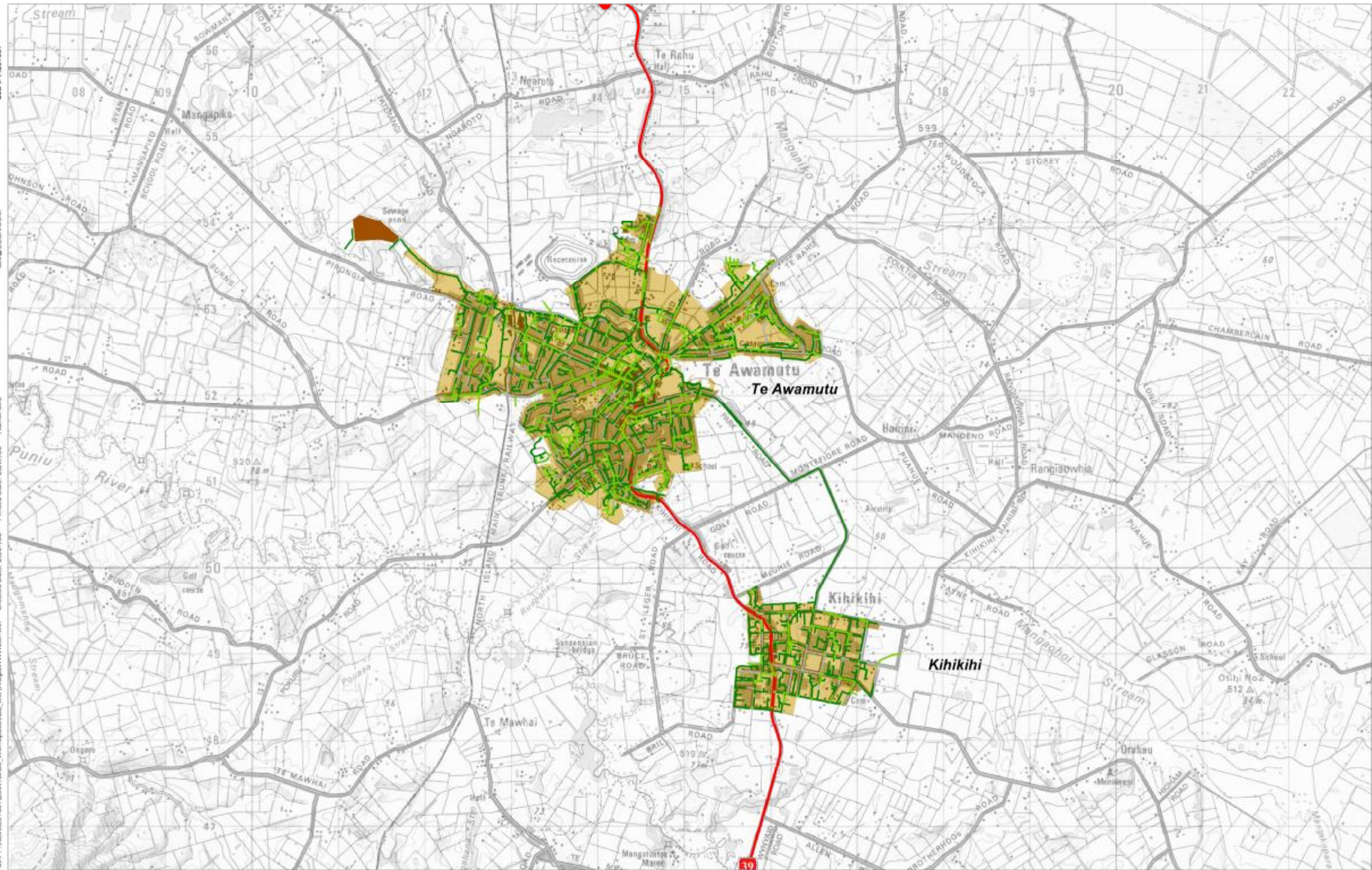
**FOR INTERNAL PURPOSES ONLY.**  
**Waipa District Utility Network**  
**Stormwater and Wastewater Network**  
**NOT TO BE VERIFIED.**

- Stormwater Pipe
- Sewer Rising
- Sewer Pipe
- Sewer Treatment Pond
- Sewer Catchment





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- Stormwater Pipe
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