



2024 Asset Management Plan
Wastewater Network



Version History

Version	Date	Description
1.0	May 9, 2024	InnServices' Board Approved
1.0	June 5, 2024	Council Approved

InnServices is committed to public transparency and open communication. In this spirit, and in compliance with Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure (O. Reg 588/17), Asset Management Plans are accessible through the InnServices' website. If an alternate format is required, please contact communications@innisfil.ca



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Executive Summary

InnServices owns and manages a large range of waste assets on the behalf of our community. These assets must be managed efficiently and effectively to ensure that they continue to meet the current and future needs of the community.

The **Wastewater Network** Asset Management Plan (AMP) focuses on InnServices' wastewater assets (core and non-core assets). Wastewater core assets include gravity mains, force mains, maintenance holes, sanitary laterals, sanitary fittings, pumping stations, and waste treatment plants. Non-Core assets primarily include fleet and land improvements.

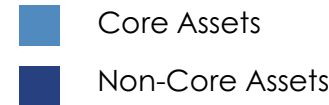
The wastewater network support the collection, treatment and disposal of the waste by InnServices across the Town of Innisfil.

AMPs will be updated periodically to meet legislative requirements as outlined in Figure 1 and to ensure the information remains current. The information and figures within this plan have been developed based on the best available data at the time of the plan's development. The AMPs will guide decision making for Levels of Service (LOS) and lifecycle management activities including the acquisition, operation, maintenance, renewal, and disposal of InnServices' assets.

2024 State of Infrastructure



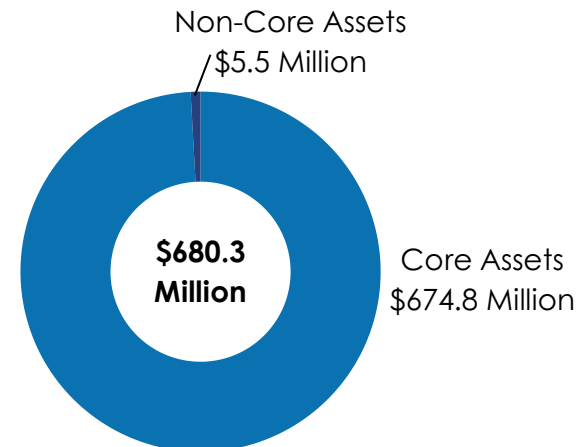
Asset Inventory:



60% of Wastewater Network assets are in good or better condition.



Total Replacement Value



Introduction

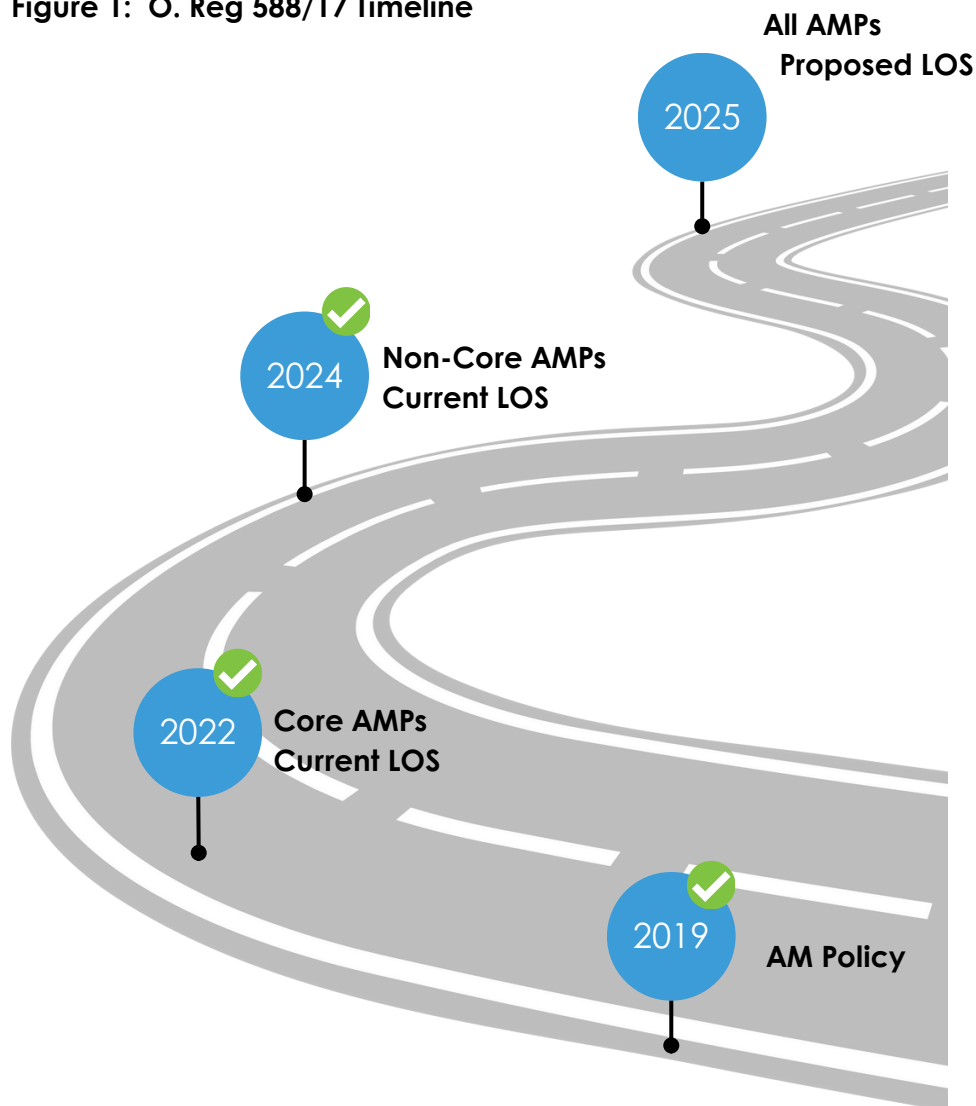
In 2015, the Ontario government, introduced the Infrastructure for Jobs and Prosperity Act. The purpose of this Act is to establish mechanisms to encourage principled, evidence-based and strategic long-term infrastructure planning that supports job creation and training opportunities, economic growth and protection of the environment, and incorporates design excellence into infrastructure planning.

Under this Act, the Ontario government also introduced O. Reg. 588/17 which requires that every municipality shall prepare an Asset Management Plan (AMP) in respect of its core and non-core municipal infrastructure assets. Although the regulation has not defined which non-core assets to include, InnServices has chosen Fleet and Land Improvement assets as the non core assets for the July 1, 2024 reporting year.

The AMP has, in part, been prepared to meet the 2024 regulatory requirements of O. Reg. 588/17. Any gaps or weaknesses in compliance are addressed in the Monitoring & Improvement section of the AMP.

InnServices owns and manages a large range of core and non-core assets. These assets provide valuable services to the public, such as safe waste treatment and disposal, and to assist in maintaining the health of the environment. Effective maintenance and renewal of these assets is critical to ensuring that they continue to deliver adequate levels of service and provide expected benefits.

Figure 1: O. Reg 588/17 Timeline



Strategic Plan 2030

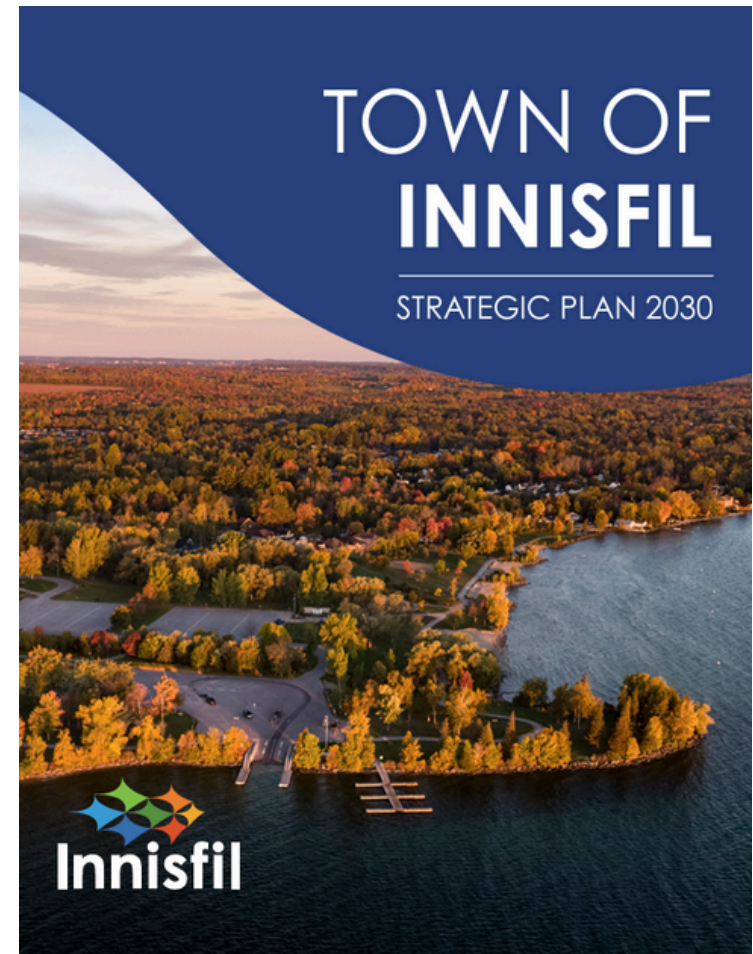
InnServices was established on January 1, 2016 as municipal service corporation, wholly-owned by the Town of Innisfil, charged with the responsibility to operate, maintain and expand the water and wastewater services that service the Town of Innisfil. InnServices is closely tied to the Town of Innisfil's Strategic Plan. The Town of Innisfil's Strategic Plan 2030 is organized around four pillars - Grow, Sustain, Connect, and Serve. These pillars guide the actions, priorities and outcomes the Town is working to achieve while balancing the needs of the community now and in the future. Asset management planning incorporates the long-term goals and objectives of the Town's Strategic Plan by documenting the current state of our assets and identifying the resources required to manage these through their lifecycles to achieve the current levels of service.

This AMP demonstrates InnServices' systematic approach to asset management, compliance with regulatory requirements and commitment to fulfilling the following goals of the Town's Strategic Plan 2030:

- Proactively plan and manage growth
- Protect and preserve Innisfil's natural heritage and Lake Simcoe
- Advance climate change mitigation and adaption initiatives
- Ensure continued financial sustainability
- Focus on continuous improvement in service delivery

The reader will further benefit by consulting the following documentation:

- Approved Budgets
- Master Servicing Plan
- Water & Wastewater Rates Study



Frequently Asked Questions

What is an asset?

An asset is an item of property owned and maintained by InnServices that is deemed to have a value over a specified threshold. InnServices' assets include a variety of wastewater network assets alongside most assets that are housed in facilities operated & maintained by InnServices.

What is an asset category?

An asset category refers to a set of assets that have similar characteristics or functionality. For example, "wastewater network" asset types include gravity mains, force mains, maintenance holes, sanitary laterals, facility assets and fleet.

What are the objectives of asset management?

The objectives of asset management are to intervene at strategic points in an asset's lifecycle to extend the expected service life, and thereby maintaining its performance. When maintenance activities are scheduled strategically it helps to decrease costs, rather than the increased costs of unplanned maintenance or excessive planned maintenance.

What is an Asset Management Plan?

An Asset Management Plan (AMP) is a strategic document that provides summary level information about the quantity, quality, average age, and replacement value for a particular asset category. It identifies the level of service delivered by the assets and the lifecycle activities required to maintain the assets in a condition that will adequately support this deliverable. Finally, the plan provides a summary of the required investment over the next 10 years.

Why does InnServices need an AMP?

Under the Infrastructure for Jobs and Prosperity Act, 2015, and Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure, each municipality in Ontario has a legislative requirement to develop and maintain AMP's. In addition to the legislative requirement, InnServices benefits from maintaining an effective AMP to help ensure that limited resources are being invested effectively in the assets that need it the most to ensure the ongoing delivery of services.

How does InnServices include community feedback into the Plan?

InnServices would provide opportunities for community engagement in asset management planning. InnServices will provide information on the corporate website to facilitate transparency in asset management planning.



Definitions & Acronyms

Asset Performance: The manner in which or the efficiency with which an asset fulfills its intended purpose.

Average Asset Age: The age of the asset since the construction date. As each asset class has various components, the average asset age is used.

Combined Sewers: A type of gravity sewer with a system of pipes, tunnels, and pump stations to transport sewage and stormwater together to a sewage treatment plant or outfall.

Connection-days: The number of properties connected to a municipal system that are affected by a service issue, multiplied by the number of days on which those properties are affected by the service issue.

Core Asset: As per O. Reg. 588/17, Water Assets, Wastewater Assets, Stormwater Management Assets, Roads and Bridges/ Culverts are considered as core assets.

Expected Useful Life: The length of time that assets are designed to provide safe, reliable, and useful service.

Lifecycle Activity: Activities undertaken with respect to a municipal infrastructure asset over its service life, including constructing, maintaining, renewing, operating and decommissioning, and all engineering and design work associated with those activities.

Lifecycle Cost: The cost of activities undertaken with respect to a municipal asset over its service life including reconstructing, maintaining, renewing, operating and decommissioning including associated design and engineering fees.

New Acquisitions: The planned construction of new assets that are not to replace the existing infrastructure.

Non-Core Assets: O. Reg 588/17 regulation has not defined which non-core assets to include. InnServices has chosen Fleet and Land Improvement assets for the July 1, 2024 reporting year.

Renewal: The asset to be replaced or restored to a excellent state as if had become new again.

Replacement Value: The cost in 2023 dollars to rebuild the entire asset regardless of maintenance/rehabilitation strategies. It is assumed as a complete new build of the asset, not including the land acquisition cost.

Sewer Relining: Technique of inserting a liner into a sewer; used to restore sewers nearing the end of their useful life to like-new condition.

Wastewater Network: Wastewater assets that relate to the collection, transmission, treatment or disposal of wastewater, including any wastewater asset that from time to time manages stormwater.

Acronyms:

AMP = Asset Management Plan

CCTV = Closed Circuit Television Video

CI = Continuous Improvement

CPI = Construction Price Index

CVOR = Commercial Vehicle Operators Registration

ECA = Environmental Compliance Approval

LOS = Levels of Service

MCR = Municipal Comprehensive Review

MSP = Master Servicing Plan

NASSCO = National Association of Sewer Service Companies

O. Reg = Ontario Regulation

PACP = Pipeline Assessment Certification Program

PDCA = Plan-Do-Check-Act

Asset Hierarchy

InnServices has adopted an asset hierarchy approach to develop the framework for categorizing the asset portfolio into the appropriate linkages between the assets. The asset hierarchy in the AMP is illustrated as parent-child type relationship, with 4 levels:

- **Level 1:** Service
- **Level 2:** Major Group
- **Level 3:** Segment
- **Level 4:** Data

Below is the detailed asset hierarchy of Wastewater Network assets:

Table 1: Wastewater Network Asset Hierarchy

Level 1	Level 2	Level 3	Level 4
Wastewater Network	Core Assets	Gravity Mains	Type, Size, Material, Shape
		Sanitary Laterals	Type, Size, Material
		Maintenance Holes	Type, Size
		Forcemains	Type, Size, Material
		Wastewater Treatment Plants	Process Area, Component
		Pumping Stations	Component
		Sanitary Fittings	Type, Size
		Sanitary Valves	Component
	Non-Core Assets	Fleet	Type
		Land Improvements	Component

State of Infrastructure

The State of Infrastructure section provides summary level information about InnServices' wastewater network assets. This information provides the foundation of InnServices' asset management plans, as having a complete and current understanding of InnServices' state of infrastructure is critical to efficient and effective lifecycle management and financial planning.

Background information and reports used in the preparation of the Asset Management Plans will also be made available publicly through InnServices' website or upon request.

In keeping with O. Reg 588/17 requirements, the following information is provided for each of the core and non-core asset types currently in scope of InnServices' asset management program:



Inventory (quantity)



Estimated useful life



Replacement value



Remaining useful life



Average age



Average condition



Wastewater Network Inventory

Asset inventory was determined through the review of data in the 2023 Tangible Capital Assets (TCA) File and cross referenced through data within the County of Simcoe's Geographic Information System (GIS) database. InnServices' TCA and GIS database are updated frequently to ensure all assets are kept current and information is available to staff. Table 1 summarizes InnServices' Wastewater Network asset hierarchy, with asset sub-types and data available.

Wastewater Core assets are classified into eight (8) sub-types:

- **Gravity Mains** - Pipeline laid typically under the centre line of the road, used to transport wastewater to a pumping station.
- **Sanitary Laterals** - The sewage service line that drains wastewater from a property into a gravity main.
- **Maintenance Holes** - Vertical concrete shafts used for inspection and maintenance, and to vent gasses out of gravity mains.
- **Force Mains** - Pressurized pipelines that transport wastewater uphill from lower elevation pumping stations to wastewater treatment plants.
- **Wastewater Treatment Plants** - A plant designed to remove enough contaminants and impurities from wastewater so that it is suitable to be released into the environment.

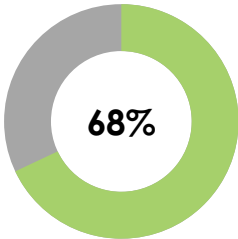
- **Pumping Stations** - It is typically designed to handle wastewater that is fed from underground gravity pipelines and pumped to a wastewater plant.
- **Sanitary Fittings** - Cleanable tubing connections installed in systems of process piping to ensure sterility.
- **Sanitary Valves** - An element in the wastewater treatment plants to control the flow and pressure of wastewater related liquids.

► How many wastewater facilities are managed by InnServices?



There are 10 pumping stations and 2 wastewater treatment plants are managed by InnServices.

Table 2: Wastewater Core Assets Summary

Asset Sub Type	Quantity	Replacement Value	Average Age	Condition
Gravity Mains	153 km	\$674.8 million	23.7 years	 Good
Sanitary Laterals	124 km			
Maintenance Holes	2091			
Forcemains	18 km			
Wastewater Treatment Plants	2			
Pumping Stations	10			
Sanitary Fittings*	11419			
Sanitary Valves	225			

*The replacement value of the sanitary fittings is accounted with the replacement value of gravity mains

Wastewater Non-Core assets are classified into two (2) sub-types:

- **Fleet** - Assets used to transport people or goods related to manage wastewater activities and operations.
- **Land Improvements** - Land Improvements Include assets such as fences, walkways, parking lots, and outdoor lighting.

► How many wastewater fleet assets are owned by InnServices?



There are **8** wastewater fleet units owned by InnServices.

Table 3: Wastewater Non-Core Assets Summary

Asset Sub Type	Quantity	Replacement Value	Average Age	Condition
Fleet	8	\$5.5 million	16.6 years	<div><div><div>Fair</div><div>41%</div></div></div>
Land Improvements	146			

Replacement Value

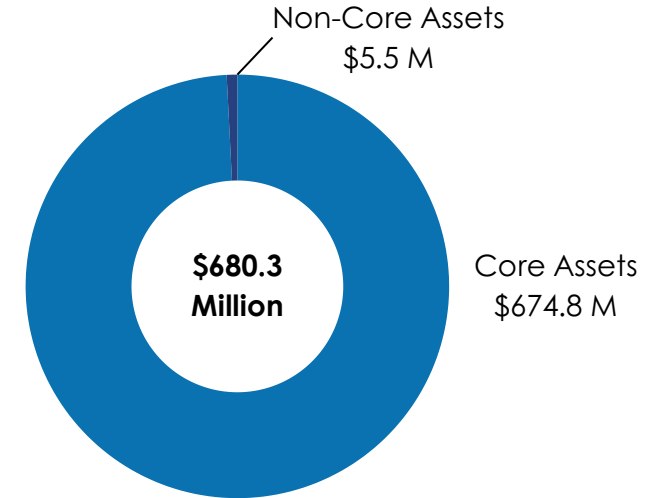
Replacement value is the estimated total cost to replace an asset to the same/current functional standard and varies depending on current market costs. Asset replacement value is determined by estimating the total replacement value of the assets within each asset class.

All Wastewater network assets analyzed in the AMP have a total replacement value of \$680.3 million. The replacement value of the majority (73%) of the assets is estimated using "Cost/Unit" method. However, Construction Price Index (CPI) Method is used to estimate the replacement value of the remaining (27%) assets.

- **Cost/Unit:** Based on the current capital projects, the cost/unit is estimated for the infrastructure including the asset removal costs, site work, material costs, and engineering contingencies.
- **CPI (Construction Price Index) Method:** Replacement cost of the assets is estimated by inflating the historical costs using Non-Residential Building Construction Price Indices (NRBCPI) to reflect an assets replacement value in today's dollar (2023).

The Current Replacement Value (CRV) detailed in the AMP has become more important as a result of the Ministry of Infrastructure now using this data to determine Ontario Community Infrastructure Funding (OCIF).

Replacement Value Summary



► When are assets replaced?



Assets are replaced when they no longer add value or serve their initial/intended purpose.

Replacement Value - Wastewater Core Assets

The distribution of the Wastewater Core replacement value is predominantly in gravity mains. Total replacement value of Wastewater Core Assets analyzed in the AMP is \$680.3 million. As per the asset hierarchy approach, the Wastewater Core assets are broken down to seven asset classes displaying replacement values in Table 4

Replacement Value - Wastewater Non-Core Assets

Wastewater Non-Core Assets analyzed in the AMP have a total replacement value of \$5.5 million. As per the asset hierarchy approach, the Wastewater Non-Core assets are broken down to two asset classes displaying replacement values in Table 5



Table 4: Replacement Value of Wastewater Core Assets:

Asset Sub-Type	Replacement Value
Gravity Mains	\$338,225,314
Sanitary Laterals	\$88,686,404
Maintenance Holes	\$34,074,210
Forcemains	\$33,689,266
Wastewater Treatment Plants	\$112,179,123
Pumping Stations	\$64,968,754
Sanitary Valves	\$2,928,244

Table 5: Replacement Value of Wastewater Non-Core Assets:

Asset Sub-Type	Replacement Value
Fleet	\$506,954
Land Improvements	\$5,079,373

Average Age

The average age of InnServices assets is determined by analyzing the expected useful life and year built data detailed in the 2023 Tangible Capital Asset (TCA) file. Wastewater Core and Non-Core assets are analyzed to inform and enable effective lifecycle management activities, such as rehabilitation or replacement.

Expected and Remaining Useful Life

The Expected Useful Life (EUL) is the length of time that assets are expected to provide safe, reliable, and useful service. This value is obtained from the TCA Policy and helps inform the timing of replacement activities. The Remaining Useful Life (RUL) represents the actual length of time an asset has left before requiring replacement. The Average Remaining Useful Life (ARUL) is obtained by subtracting the Average Age from the EUL for each asset sub-type.

In many cases, the service life of an asset can be extended well beyond the original expected life with proactive lifecycle management, however the cost of ownership generally increases as condition worsens and the frequency and cost of repairs increases. Figure 2 outlines average age, and ARUL of wastewater network assets.

Age, EUL & ARUL Summary of Wastewater Assets



Average Age: 24 Years

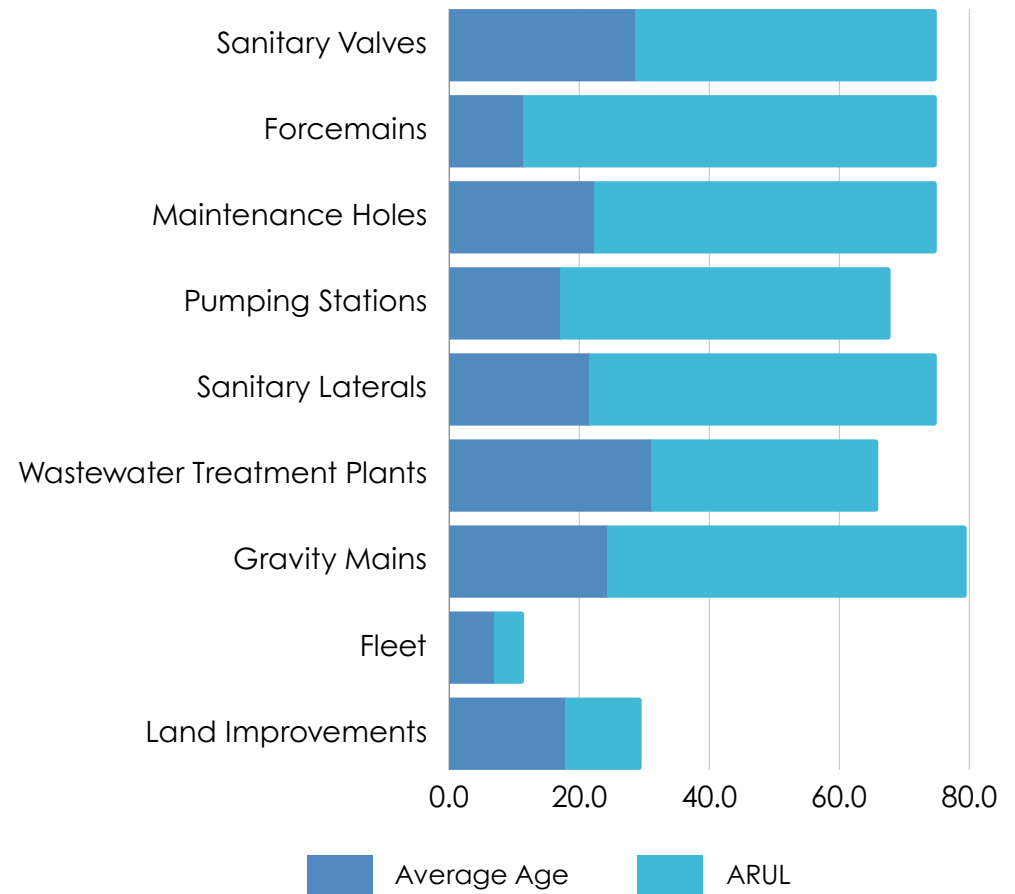


EUL: 4- 80 years



ARUL: 51 Years

Figure 2: Average Age & ARUL - Wastewater Assets



Condition

Asset condition can be determined through modeling or direct measurement. The modeling approach uses standardized deterioration curves and assigns condition based on the percentage of the expected life remaining. Direct measurement involves inspection of the assets against technical standards to directly determine the current condition.

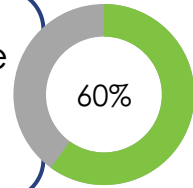
InnServices has a condition assessment program to investigate current condition of the gravity mains by conducting CCTV inspections. These CCTV inspections are based on Pipeline Assessment Certification Program (PACP) in compliance with NASSCO Standards. Based on the current condition of the gravity main a PACP score is given to a gravity mains ranging between 1 and 5 as shown in Table 6.

InnServices conducts condition assessments as needed for critical assets. Due to the unavailability of the assessed condition of the infrastructure, age-based estimates are used to project the current condition of the remaining assets through lifecycle modeling. The modeling approach uses standardized deterioration curves and assigns a condition, based on the percentage of remaining life.

Assessed condition data is invaluable in asset management planning as it reflects the true condition of an asset. Due to the unavailability of assessed condition data for some asset types, age-based estimates are used to determine the condition. The average condition of the wastewater network assets is 67.

Condition Summary

60% of Wastewater Core assets are in good or better condition.



30% of Wastewater Non-Core assets are in good or better condition.

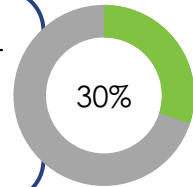
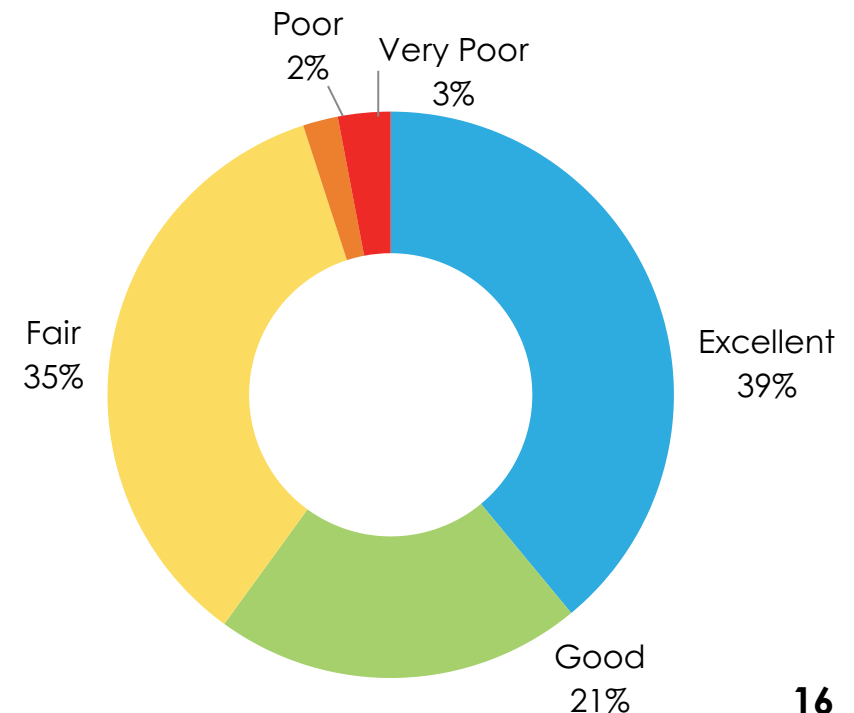


Figure 3: Wastewater Network Assets Condition



Building Condition Assessment

Condition data of Facilities Assets was obtained from the 2021 Building Condition Assessment (BCA) Report completed by a third-party consultant. BCA's are completed in accordance with the American Society for Testing and Materials (ASTM) Standards for Property Condition Assessments: Baseline Property Condition Assessment Process (E2018-15).

The BCA's inspect facility assets for physical deficiencies through a visual review of building components/systems based on the Uniformat II building nomenclature system including substructure, shell, interiors, services, and building sitework. A condition rating is provided for each asset component from Excellent (1), Good (2), Fair (3) Poor (4) or Immediate (5). These values roll-up to provide an overall condition rating. A Condition Index was established by the third-party consultant and to evaluate and prioritize maintenance and renewal activities identified within the BCA.

In addition to the BCA's, Facilities staff complete regular inspections of facility assets to ensure staff and community spaces are maintained, safe, and accessible.

Innservices has 12 wastewater facilities including 10 Pumping Stations and 2 Wastewater Treatment Plants. Out of the 12 facilities, 5 facilities were inspected in 2021. Pumping Station 1 and Pumping Station 3 are in good condition. However, Pumping Station 2, Pumping Station 5 and the Cookstown Wastewater Treatment Plant are in Fair Condition. The BCA for Pumping Station 5 is scheduled to be completed by the end of 2024. Figure 4 & 5 below, outlines the condition summary of core and non-core assets based on the current condition of assets within each asset type.

Condition Summary

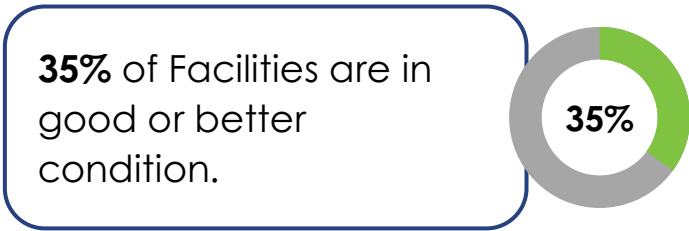


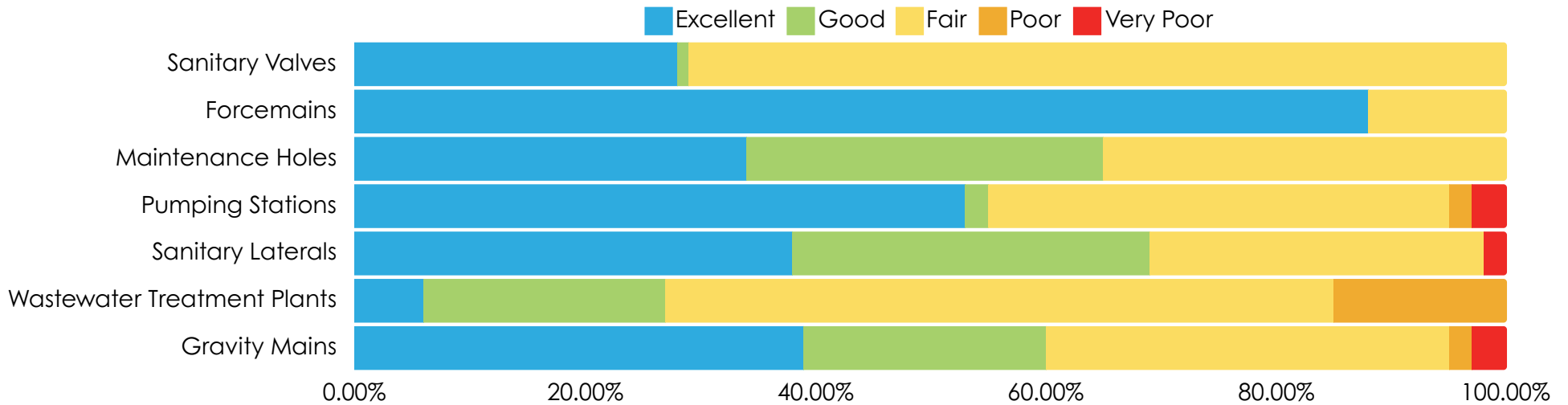
Table 6 : Condition Index

Condition	BCA & PACP Rating	Age-Based Rating	Definition
Excellent	1	80-100	Functioning as intended. No repairs anticipated within 10 years.
Good	2	60-79	Functioning as intended. No repairs anticipated within 5 years.
Fair	3	40-59	Functioning as intended with some deterioration consistent with age of asset. Repairs and/or replacements required within 2 to 5 years.
Poor	4	20-39	Not functioning as intended. Significant repair or replacement required within 0 to 1 years.
Very poor	5	0-19	It is near or beyond its expected service life and shows widespread signs of advanced deterioration.

Wastewater Core Assets Condition

Figure 4 shows the asset class condition ratings determined through the building condition assessments, PACP Scores, and age-based estimates of each asset type. Overall, 60% of wastewater core assets are in good or excellent condition, whereas 4% of assets are in poor or very poor condition. The percentage of assets in a particular condition are weighted with respect to their replacement value.

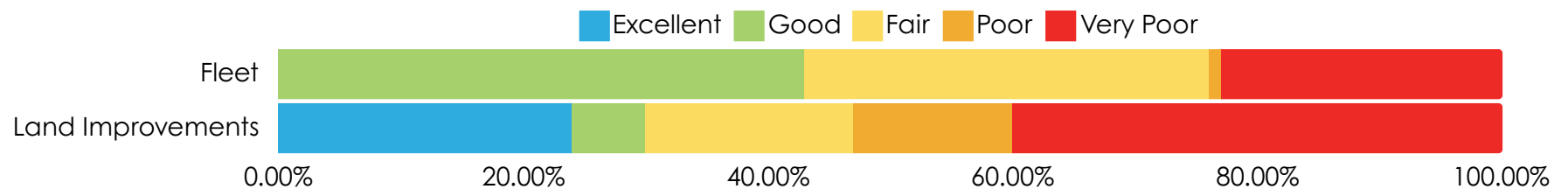
Figure 4: Wastewater Core Assets - Condition Summary



Wastewater Non-Core Assets Condition

Figure 5 shows the asset class condition ratings determined through the age-based estimates as well as building condition assessments. Overall, 35% of wastewater non-core assets are in good or excellent condition, whereas 50% of assets are in poor or very poor condition. The percentage of assets in a particular condition are weighted with respect to their replacement value.

Figure 5: Wastewater Non-Core Assets - Condition Summary



Wastewater Network Assets Condition Summary

Table 7 shows the asset class condition ratings determined through age-based as well as building condition assessments (BCA) of each asset type.

Table 7: Wastewater Assets - Condition

Asset Sub-Type	Average Condition	Average Condition Rating	Condition Assessment Method
Sanitary Valves	62	Good	100% Age-Based
Forcemains	85	Excellent	100% Age-Based
Maintenance Holes	70	Good	100% Age-Based
Pumping Stations	72	Good	75 % Age-Based & 25% BCA
Sanitary Laterals	71	Good	100% Age-Based
Wastewater Treatment Plants	49	Fair	94% Age-Based & 6% BCA
Gravity Mains	70	Good	63% Age-Based & 37% PACP
Fleet	55	Fair	100% Age-Based
Land Improvements	40	Poor	81% Age-Based & 19% BCA

Levels of Service

Levels of Service (LOS) describe the quantity and performance of services that assets should support during their service life. They provide a direct link between InnServices' strategic objectives, the public's service expectations and the measured performance of the delivered service.

LOS also facilitate a greater understanding of the cost-benefit implications of adjusting the services provided. To be effective, LOS must be documented in ways that are meaningful to both the customers using the service and to the municipal staff that are delivering the services and managing the infrastructure that underlies the service.

To ensure effectiveness, two types of LOS have been defined below:



Community - simple qualitative descriptions, in non-technical terms, or images, that describe the public's perception or understanding of a service.



Technical - quantitative metrics that enable staff to measure, track and report on various service attributes such as scope, quality and reliability.

Community and Technical LOS defined by InnServices are summarized in the following tables. These will be used to:

- Identify LOS that service recipients can expect to receive and InnServices' current performance in meeting these.
- Identify assets that require attention to ensure that LOS can be delivered and maintained.
- Enable Staff, the Board and Council to discuss and assess the suitability, affordability and equality of the existing service levels and to determine the effect of increasing or decreasing these levels over time.

It should be noted that LOS listed here exceed the current LOS requirements of O. Reg. 588/17.

► How often are Levels of Service (LOS) updated?



LOS are updated **yearly** and documented every 5 years in revisions to asset management plans.

Community Levels of Service

Community Levels of Service (LOS) are performance measures designed to help the community better understand the services they are receiving and how varying LOS will impact their service experience. Where possible, images are used to further enhance this understanding.

Table 8: Community LOS

Service Attribute	Community LOS (Qualitative Descriptions)	Current LOS
Scope	Description, which may include maps, of the user groups or areas of the municipality that are connected to the municipal wastewater system.	Appendix A - Levels of Service; Servicing Map
Reliability	Description of how stormwater can get into sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or backup into homes.	Stormwater can enter sanitary system in the following ways: 1) Through holes and cracks in maintenance holes and often caused due to wear & tear 2) Through un-accounted connections of household plumbing items; down spouts, roof leaders and yard drains to the sanitary system. 3) Through floor drains in the flooded basement, or via top of the maintenance holes in a flooded road, etc. Such situations happen only when the storm water management system is overwhelmed and is not capable to handle the rainwater or river flow. 4) At low lying streets/roads during heavy rainfall, overwhelmed water accumulates creating pool which eventually enters through the manhole covers if they are not water tight.
	Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above.	InnServices follows a series of the best engineering design standards that integrate both current & future servicing requirements and land use considerations, when constructing or replacing sanitary sewers. These standards have been determined with consideration of the minimization of sewage overflows, backups, and to reduce the inflow and infiltration.
	Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system.	Not applicable, there is no individual separate community or ICI (Industrial, commercial and Institutional) based wastewater treatment system discharging their effluents in InnServices' wastewater network. InnServices' wastewater system includes two treatment plants and associated collection network with no intermediate wastewater treatment plants.
Performance	Description of Inspection, maintenance and rehabilitation activities performed to provide the existing LOS	InnServices actively carry out both scheduled and un-scheduled maintenance and inspection on its system that includes CCTV inspection, flushing, station cleanouts, smoke testing, and I and I monitoring, and rehabilitation and renewal strategies based on the asset type.
Quality	Description or images of the condition of wastewater facilities and gravity mains and how this would affect their use.	Wastewater facilities are evaluated through the Building Condition Assessments, and through regular inspections by InnServices' staff. Majority of the facilities are in fair good condition require no planned repair or replacement activities within the life of the BCA, whereas Fair or Poor condition will require repairs or replacements within 0 to 10 years. For underground infrastructure such as gravity mains, InnServices has started a three year condition assessment program in 2022, to investigate the condition by conducting CCTV inspections as per NASSCO Standards. Almost 56 km (37%) of gravity mains have been inspected.

Technical Levels of Service

Technical Levels of Service (LOS) are designed to translate Community LOS into quantitative performance measures, and results that can assist staff responsible for delivering the services and supporting the assets that fulfill the Community LOS. For this version of the Wastewater Network Asset Management Plan, performance and quality measures were obtained through Key Performance Indicators and metrics data obtained from staff.

Table 9: Technical LOS

Service Attribute	Performance Measure	Current Performance
Scope	Percentage of properties connected to the municipal wastewater system.	66%
Reliability	The number of events per year where combined sewer flow in the municipal wastewater system exceeds system capacity compared to the total number of properties connected to the municipal wastewater system.	Not Applicable*
	The number of connection-days per year due to wastewater backups compared to the total number of properties connected to the municipal wastewater system.	0
	The number of effluent violations per year due to wastewater discharge compared to the total number of properties connected to the municipal wastewater system.	0
Performance	Actual Reinvestment Rate.	0.39%
	% of Core assets in good & excellent condition	60%
	% of Core assets in poor & very poor condition	4%
	Average condition of facilities inspected through BCA only	2.1 (Fair)
	% of Non-Core assets in good & excellent condition	35%
	% of Non-Core assets in poor & very poor condition	50%
Quality	% of gravity mains flushed (annually)	33.3%
	% of facilities inspected or planned for inspections as per Building Condition Assessments	50%
	% of gravity inspected as per NASSCO Standards	37%
	Number of complaints received related to odour annually	4

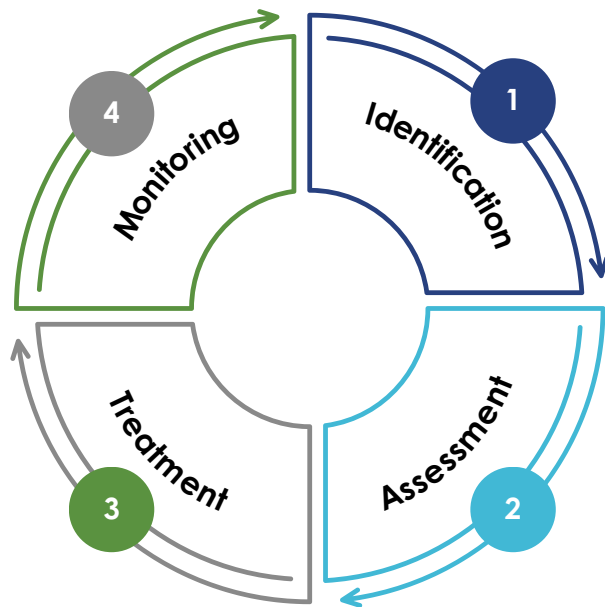
*InnServices does not have any combined sewers.

Risk Management

In the context of municipal asset management, a **Risk** is an event that, if it occurred, would have an undesirable effect on the delivery of service. Understanding what risks exist for InnServices' each asset category is critical in determining how best to treat them.

Risk is managed through a four-step iterative process of identification, assessment, treatment, and monitoring to ensure that InnServices is adequately prepared for what events may happen and have plans in place to react to events appropriately. This process is outlined in Figure 6, with each step described in further detail.

Figure 6: Risk Management Process



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Identification - Write down all the threats and risks you can think of and ask for ones from other stakeholders. Risks are identified through a number of data sources, including:

- Routine inspections
- Reports and complaints from the public
- Information obtained from past incidents
- Advice from professional bodies
- Past experience of InnServices staff

2

Assessment - Evaluate each risk by determining the likelihood and severity of it happening and the level of impact it would have. Each controllable event is evaluated and provided a risk rating (1-5) for each of the following categories:

- **Likelihood (A):** if the possibility of an identified event is remote, the score will be low (closer to 1)
- **Severity (B):** greater the implication of the occurrence of an identified event causing harm to persons or property, higher the score will be (closer to 5)
- **Detectability (C):** If an identified event is highly detectable, the score will be low (close to 1)



Risk = Likelihood + Severity + Detectability

Likelihood and Severity are scored based on lower the value, lower the risk. Detectability scores, however, are based on, more detectable an event, lower the score will be. Appendix D includes three tables in reference to likelihood, severity and detectability and these tables provide context and guidance on the rating of risk.

► What is InnServices risk management procedure?



InnServices has a risk management procedure for identifying potential hazards, conducting hazard analysis, and identifying critical control points within InnServices Utilities wastewater treatment and collection activities, in a manner consistent with industry standards.

Based on a review of the Total Risk Values and the associated events, a threshold number is chosen such that all events associated with Total Risk Values which are equivalent to or greater than the threshold number are considered critical.

- Total Risk Values less than or equal to 6 are considered low risk.
- Total Risk Values between 7 and 10, inclusive, are considered as moderate risk
- Total Risk Values equal or greater than or equal to 11 are considered high risk

3

Treatment - Implement process changes to reduce the impact of each risk and a response plan for if it happens. The choice of treatment depends on the level of risk that can be reasonably managed and accepted by InnServices(i.e. the risk tolerance).

Risk tolerance is informed not just by the likelihood, detectability and impact of the risk event, but also the cost of treatment and the urgency of the risk in comparison to other priorities. Depending on the nature of the risk event and the level of risk tolerance, treatment can include:

- **Elimination** - process of removing the risk event entirely
- **Mitigation** - process of reducing the likelihood and/or impact of the risk event
- **Acceptance** - process of retaining the risk as controlling or monitoring it

4

Monitoring - InnServices review the progress of the plan and ensure assessment and treatments are adequately addressing the identified risks on annual basis. Continuous monitoring enables InnServices to stay ahead of any potential hazards and ensures that the risk management process and techniques used are current and effective.

InnServices have identified some potential risks mentioned in Appendix D along with outcome strategies to reduce the likelihood and impact.



Future Demand

InnServices is the municipal service corporation of the Town of Innisfil and rely on Town's Official Plan for growth within the Community. As we look towards the future, it is important that we align asset management planning with local land-use planning and provincial policies. Ontario's Place to Grow Plan sets minimum targets for growth and the Municipal Comprehensive Review (MCR) currently underway by the County of Simcoe will establish the minimum growth (residents and jobs) for Innisfil. Innisfil is expecting its current population to double over the next 30 years. Innisfil's Official Plan "Our Place" guides where Innisfil will direct growth to achieve complete and sustainable communities and will be updated to align with the outcome of the County MCR process.

Growth generates both challenges and opportunities as we navigate and balance the ongoing needs of existing residents while addressing the pressures associated with growth and the incremental increases in costs for operational needs. As we look to the future in addressing the longer term financial requirements related to asset renewal and replacement, careful and prudent planning is necessary to ensure the community remains stable, sustainable and affordable.

InnServices Master Servicing Plan is a comprehensive, long-term master plan that outlines recommendations for building the new infrastructure and expanding the existing infrastructure to meet the future demand. This plan takes into consideration the anticipated growth of the Town of Innisfil and identifies the future locations of wastewater facilities and linear infrastructure. It also provides projections for when these assets will be required based on population forecasts.

DEMAND FORECAST



Current Population: 43,326 (2021 Census)
Projected Population: 54,971 (by 2031)



Housing: 6300 new homes by 2031

► *How many customers connected to Wastewater System?*



InnServices is responsible for providing safe and reliable wastewater services to over **13,000** customers.

Climate Demand

InnServices is working with the Town of Innisfil to develop an Integrated Sustainability Master Plan which will identify the vulnerabilities of its infrastructure towards policy formulation and program implementation for projected future climate change impact. Changes to our climate can create challenges for municipalities to maintain the levels of service and can decrease the service life and functionality of these assets. To ensure InnServices' wastewater assets are safe and reliable, climate change and the consideration of sustainable materials must be incorporated into the decisions and long-term planning.

We are committed to delivering services in a way that are sustainable and that protect the existing natural environment. InnServices' wastewater infrastructure is designed and constructed to resist the impacts of such extreme climate events. Based on past experience, InnServices has implemented corporate processes such as additional staff on call, more training, inclusion of an emergency contingency plan and program, better communication, and adding capacity to the systems to help manage extreme climate events. InnServices inspects and monitors its wastewater assets to ensure the safety of the public and staff.

During the acquisition or renewal lifecycle stages, InnServices' staff will prioritize sustainable practices where possible. Staff will explore energy efficiency options to reduce emissions, such as retrofitting existing facilities to reduce emissions, such as retrofitting existing facilities.

Conserving & Enhancing Natural Assets



Planting trees in our community helps by absorbing carbon dioxide and providing shade for cooling.



Decrease watering and grass cutting activities during periods of extreme heat.



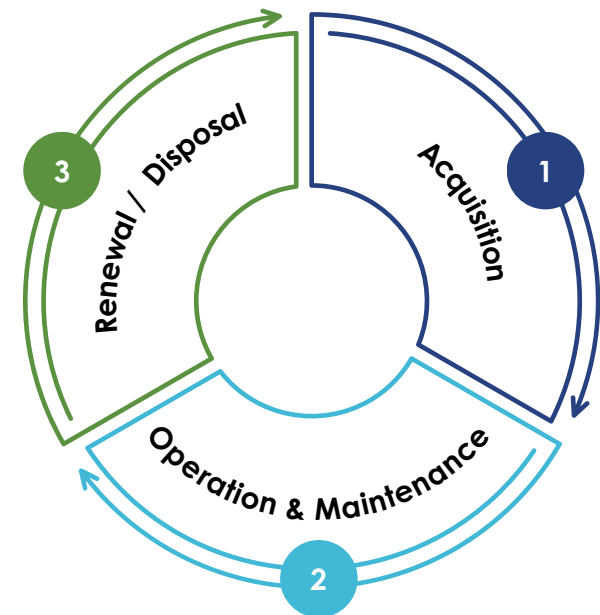
Lifecycle Management

All municipal infrastructure assets progress through a series of stages referred to as the asset lifecycle. Management of this lifecycle is critical for delivering consistent and reliable service and achieving the lowest possible cost over the expected life of the assets. A fundamental principle of lifecycle management is that maintaining an asset in good condition costs significantly less than reconstructing an asset in poor condition. For Municipal Wastewater Network assets, the overall goal is to extend the expected life of the assets while managing risks and minimizing the total lifecycle costs.

As shown in Figure 7, municipal assets follow an iterative 3-step cycle including acquisition, operations, maintenance, renewal and disposal. As assets progress through each lifecycle stage, different activities or tasks are required to ensure assets are delivering the expected levels of service.

- 1 Acquisition** - Municipal infrastructure assets are acquired primarily through assumption of ownership from developers but can also be constructed directly by InnServices through approved capital projects.
- 2 Operations and Maintenance (O&M)** - Planned and unplanned routine activities such as inspection, assessment, cleaning, and servicing to fulfill level of service commitments and detect defects before failures occur. Operations and Maintenance activities help resolve minor defects and delay future defects.
- 3 Renewal and Disposal** - Capital activities that are beyond the scope of routine maintenance including reconstruction and rehabilitation of assets to enhance their condition and extend the expected life of an asset. Asset disposal occurs when the asset has reached the end of their effective service life.

Figure 7: Asset Lifecycle



Lifecycle Activities

Building on the state of infrastructure and levels of service content, lifecycle activities are the actions utilized by InnServices to operate, maintain, and renew wastewater assets in the manner most appropriate to ensure the long-term performance of assets.

Determination of the specific action to be taken in the Maintenance and Renewal stages is based on careful consideration of the asset condition, remaining life, and available budget. The timing of the activity also considers competing priorities and related project activities to minimize the risk of having to redo work that is disturbed by a related project. All this helps to ensure that InnServices is performing the most appropriate and cost effective activity to optimize the lifecycle for each asset.

Table 10: Lifecycle Activities - Wastewater Network

Activity	Description of Activities Performed by InnServices
Assessment	<ul style="list-style-type: none"> • There is no formal condition assessment program in place. However, InnServices is starting a condition assessment program to investigate the condition of sanitary sewers as per NASSCO Standards. • New or larger assets are identified through technical analysis as part of Master Servicing Plans completed every 5 years to service new development. InnServices conducts regular inspections to ensure all pumping stations operate in a manner that is free from failure and meets the accepted operational standards and efficiencies. • Pumps & motors are inspected, externally as well as internally as specified in the operations manual to identify the asset performance and remedial measures. • Generators are inspected on monthly basis as per the operational schedules. • Vehicles are inspected as on annual basis and follow CVOR (Commercial Vehicle Operators Registration) Regulations. • Health & Safety inspections are conducted every 6 months
Operations & Maintenance	<ul style="list-style-type: none"> • InnServices performs the ongoing maintenance activities as necessary, such as emergency repairs, maintenance hole repairs, exercising valves. • A detailed breakdown of applicable maintenance activities is provided in Appendix B.
Renewal	<ul style="list-style-type: none"> • Sanitary sewers in very poor or poor conditions are replaced around their expected useful life. • Vehicles and facility assets are rehabilitated and upgraded based on the condition, breakage, growth, and compliance as per Ministry Standards. • Wastewater assets are either removed during renewal or disconnected and abandoned in place depending on the construction circumstances. Abandoned assets are capped and/or grouted to protect other infrastructure. • Undersized sanitary sewers that don't meet the capacity requirements are replaced with larger mains . • Sanitary maintenance holes & laterals are typically replaced with sanitary sewers.

Financial Summary

InnServices' financial summary includes the full consideration of the lifecycle costs of the existing and new wastewater infrastructure assets. This summary along with financial policies provide guidance to InnServices while building operating and capital budgets. This financial summary guides InnServices when and where the financial resources will be needed, recognizing the immediate and future needs for the asset renewal, maintenance and growth to meet the infrastructure demands.

The Budget Process

InnServices prepares a budget on an annual basis. The budget is informed by development charges background study, various master plans, water and sewer rate studies, and infrastructure needs studies, and asset lifecycle requirements.

Operating Budget

InnServices' operating budgets quantify the expenditures needed to provide services, governance and administration, maintain financial funding for the current & future projects, and to perform the operational and maintenance activities required to maintain current service levels.

Funding for operating expenditures is provided from water and sewer rates and various non-rates revenue sources including:

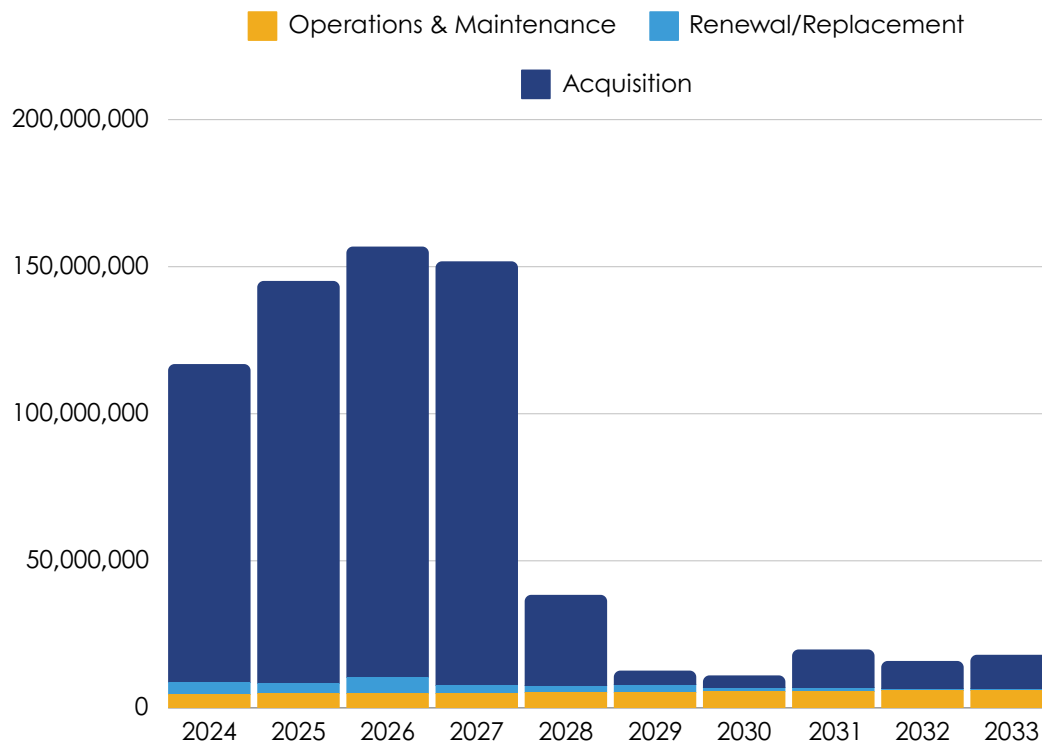
- Development charges
- Other user fees
- Interest



10-Year Lifecycle Activities Forecast

O. Reg. 588/17 requires municipalities to provide a 10-year forecast that estimates the annual costs of lifecycle activities that will need to be undertaken to maintain the current LOS and accommodate expected growth.

Figure 8: 10-Year Lifecycle Activities Forecast



Asset renewal/replacement includes the capital costs of the existing wastewater infrastructure to be replaced /rehabilitated in the next 10 years. Acquisition costs includes the new infrastructure scheduled to be built as per master servicing plan over the period of next 10 years.

For the Operations & Maintenance costs, the 2023 operational & maintenance budget costs are extrapolated to 2033 with an annual of increase of 3%.

Figure 8 and table 11 below identifies 10 year lifecycle activities forecast scheduled to be completed by 2033.

Table 11: 10-Year Lifecycle Costs

Lifecycle Phase	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Operations & Maintenance	\$4.6M	\$4.7M	\$4.9M	\$5M	\$5.2M	\$5.3M	\$5.5M	\$5.6M	\$5.8M	\$6M
Renewal/Replacement	\$4.2M	\$3.6M	\$5.6M	\$2.6M	\$2.4M	\$2.7M	\$1.6M	\$1.3M	\$0.9M	\$0.6M
Acquisition*	\$108.1M	\$136.8M	\$146.4M	\$144.2M	\$30.9M	\$4.7M	\$3.9M	\$13M	\$9.2M	\$11.4
Total	\$116.9M	\$145.1M	\$156.9M	\$151.8M	\$38.5M	\$12.7M	\$11.0M	\$19.9M	\$15.9M	\$18.0M

*Acquisition and Renewal costs are estimated w.r.t 2023 costs

Monitoring and Improvement

In this final section, opportunities for improvement of InnServices asset management program, including AMP content, are identified along with planned activities to strengthen both. These planned activities will ensure that InnServices continues to comply with O. Reg. 588/17 and that the utility of the AMP and the level of data confidence continuously improves over the short to medium term.

Continuous Improvement

The overall approach to monitoring and improving the asset management program and AMP will be consistent with the Plan-Do-Check-Act (PDCA) model. Following this model, staff will monitor the performance of the asset management program and continue to plan and implement corrective actions to ensure that the program and AMP continue to improve and mature over time.

Improvement Plan

Table 12 on the following page, summarizes the improvement opportunities currently identified for the Wastewater Network AMP and the corrective actions planned for the next three years. A term of three years has been selected to align with the AMP deliverables detailed in O. Reg. 588/17 and summarized in Figure 1 of the AMP.

► What is the Plan-Do-Check-Act (PDCA)?



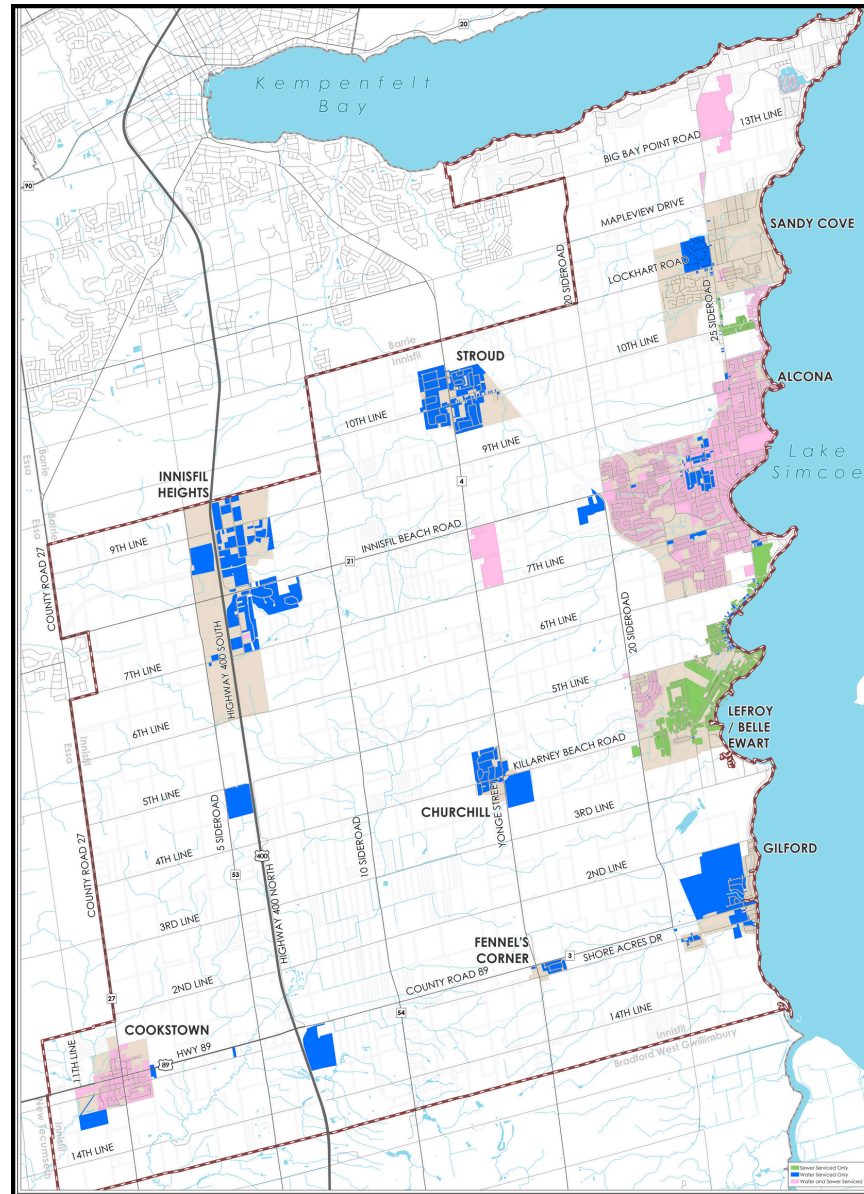
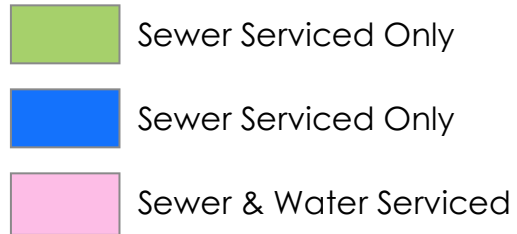
The PDCA model is a four step continuous improvement cycle that helps InnServices' staff monitor performance and make incremental changes to improve the Asset Management Program.

Table 12: Improvement Plan

Opportunity	Actions	Priority
Improve completeness and accuracy of state of infrastructure data for core and non-core assets.	Complete and consolidate wastewater facility assets inventory.	High
	Complete condition assessments of all assets.	High
	Implement a Computerized Maintenance Management system	High
Improve asset management processes for creation, maintenance, and disposal of asset records throughout the asset lifecycle.	Complete mapping of processes.	High
	Prepare standard operating procedure documentation for assets and integrate with year end.	Medium
Improve maturity of level of service reporting for core and non-core assets.	Expand LOS definitions for core and non-core assets.	Medium
	Establish level of service targets.	High
	Formalize data gathering and reporting procedures for each LOS	Medium
Enhance long term financial planning for asset lifecycle.	Identify costs associated with target levels of service and scenarios to achieve same.	High
	Develop long-term financial plan for the wastewater network assets.	High
	Complete wastewater rates study for the infrastructure needs.	High
Enhance strategic asset management policy.	Complete review and release of the updated policy.	Low
Enhance public reporting of asset management information.	Enhance asset management content on InnServices' website.	Low
Enhance asset management links to climate change planning.	Expand climate change coverage in future updates on AMPs.	Medium

Appendix A - Levels of Service Maps

Levels of Service - Servicing Map



Appendix B - Maintenance Activities

Maintenance	Summary of Activity
Cleanouts	Carried out regularly to keep machinery, equipment, and work areas clear of dirt, materials, and foreign objects. The preventative measures ensure the asset is running at ideal performance and is easy to access, inspect, and repair when required.
Facility Assets	Pumping station cleaning is done internally as well as externally on an as needed basis.
	Facility equipment is tested and calibrated to its original standard based on regulatory requirements and the owner's manual. If the asset is determined to be outside of the allowable tolerance even after recalibration then be repaired or replaced.
	Lubricating involves the periodic application of a lubricant (oil, grease, solid) to contact and wear surfaces to prevent wear, corrosion, and friction. Lubrication schedules typically follow manufacturer's recommendations.
	Wet well screen cleaning, pumping down and blockage removal is done as identified through the regular inspection of pumping stations.
Hazardous Waste Disposal	Hazardous wastes generated due to spill response activities are to be hauled & disposed of by contractors at Ministry approved locations.
Odour Complaints	For odour complaints, an inspection of the area will be conducted to determine the remedial measures.
Sewer Cleaning & Flushing	Flushing is to occur on a 3 year cycle where pressurized water is used to flush out individual sections of sewer to reduce build-up of material and decrease the risk of blockages.
	Maintenance plans such as emergency flushing are in place for potential sewer gases and sewer blockages.
Sewer Service Lateral Repair & Hard Surface Restoration	InnServices repairs the portion of a sanitary service line, from the sewer to the property line on an as needed basis. InnServices also restores the hard surfaces within the road allowance for the repairs on an as needed basis.
Spills & Clean Up	Identify the nature/source of the spill, containment, and clean-up by InnServices' operation and maintenance staff, if a spill occurs InnServices follow all regulatory procedures to aid in clean up, collection of which would be in hazardous waste bins.
	Bypass installed between maintenance holes to prevent flooding, sewage overflows, and further spills.
Fleet	Vehicle oil changes between 5000 - 7000 km as per the owner's manual.
	Tire changes every winter and summer season and breakdown maintenance on an as needed basis.

Appendix C - Risk Rating Description Table

Risk Rating Description Table - Likelihood (A)

Risk Rating	Descriptor	Example description
1	Unlikely	May occur only in exceptional circumstances
2	Rare	Could occur at some point
3	Possible	Might occur at some time/the event should occur at some time
4	Likely	Will probably occur in most circumstances
5	Almost Certain	Is expected to occur in most circumstances

Risk Rating Description Table - Severity (B)

Risk Rating	Descriptor	Example description
1	Insignificant	Insignificant impact, little disruption to normal operation, low increase in normal operations costs
2	Minor	Minor impact for small geographical area, some manageable operation disruption, some increase in operating costs
3	Moderate	Minor impact for large geographical area, significant modification to normal operation but manageable, operation costs increased, increased monitoring
4	Major	Major impact for small geographical area, systems significantly compromised and abnormal operation if at all, high level of monitoring required
5	Catastrophic	Major impact for large geographical area, complete failure of all systems

Appendix C - Risk Rating Description Table

Risk Rating Description Table - Detectability (C)

Risk Rating	Descriptor	Example description
1	High Detectability	SCADA alarms with auto-dialer programmed alarm
2	Moderate Detectability	Monitored but not alarmed, may require operator to walk by and notice alarm; A problem is indicated by lab test results
3	Detectable	Visually detectable on operator's rounds; Regular maintenance would discover the problem
4	Poor Detectability	Visually detectable, but not inspected on a regular basis; Would not be detected before a problem was evident; Lab tests that are not done on a regular basis (eg. quarterly)
5	Undetectable	Cannot detect

Appendix D - Risk Management

Tables below shows the hazards accounted for the Lakeshore Wastewater Treatment Plant and collection system

Risk Management Area: Collection System

Description of Hazard	Risk	Control/Monitoring in Place	Outcome (Strategy to reduce likelihood or impact of risk)
Faulty lateral connection causing surcharge	M	Residential notification	Public education i.e. grease, non-flushable wipes etc
Failure of gravity main (break or leak)	M	Scheduled inspections	Flushing program in place
Gravity main blockage causing surcharge	M	Scheduled inspections	Flushing program in place
Maintenance Holes- structural issues	M	I & I inspection, CCTV, flushing	Routine inspections
Pumping Stations - equipment failure	M	SCADA, operational checks	On-going maintenance, rounds
Flooding of the stations (overland)	M	Visual checks, customer input, landscaping & weeping tiles, berms	Continued evaluation and monitor for improvement
Premature failure of facility equipment assets	L	Accept and resolved as reported	Regular/preventative maintenance
Risk of sewage bypass	L	Mitigate through frequent inspection and maintenance	I & I

Appendix D - Risk Management

Risk Management Area: Septic Receiving

Description of Hazard	Risk	Control/Monitoring In Place	Outcome (Strategy to reduce likelihood or impact of risk)
Septic structural issues- storage chamber	L	Scheduled chamber cleaning as needed	Structural assessment when cleaned
Submersible pump (2) fault	L	Redundancy - not critical to operations	Routine maintenance & cleaning of chamber
Dumping of heavy materials such as rags	M	SCADA alarms, operational checks	Modification of design (screening) after upgrade
Septage spills from trucks around inlet area	M	Visual checks, notification from septic hauler	CCTV camera in place,

Risk Management Area: Inlet

Description of Hazard	Risk	Control/Monitoring In Place	Outcome (Strategy to reduce likelihood or impact of risk)
Bar Screen failure	L	Redundancy, Operator Checks	Manually Clear Bar Screen
Dewater belt conveyer-failure	L	Break down maintenance	Manually clean off rags
Aerated grit tanks- airline break	L	Redundancy	Routine maintenance, Change tanks
Grit screw classifier- failure	L	Break down maintenance	Routine maintenance
Alum pumps & tank-pump failure	M	Redundancy, increase delivery status	Routine maintenance
Flowmeter- failure	L	Break down maintenance	Flow would need to be estimated by another method

Appendix D - Risk Management

Risk Management Area: Aeration

Description of Hazard	Risk	Control/Monitoring In Place	Outcome (Strategy to reduce likelihood or impact of risk)
Structure - Aeration tank -wall/floor cracks	M	Redundancy- multiple tanks	Daily rounds
Blowers	M	3 blowers, running 1 at a time	SCADA alarms
Broken bubblers supporting system	M	Redundancy- multiple tanks	Daily rounds
Bulking/foaming	M	Visual Inspection	Daily rounds
Blower failure due to communications failure	H	Visual Inspection	TBD: Isolate Plant communications, heartbeat Alarm for SCADA failure

Risk Management Area: Clarifiers & Outfall

Description of Hazard	Risk	Control/Monitoring in Place	Outcome (Strategy to reduce likelihood or impact of risk)
Structure - Clarifier tanks (4)-cracks on the floor/wall	M	Redundancy	Daily rounds, routine maintenance
Sludge and scum removal mechanisms	M	Maintenance & Inspections	Daily rounds, routine maintenance
Scum skimmer torque	M	Maintenance & Inspections	Daily rounds
Flow meter failure	L	SCADA monitoring	Annual calibration, daily rounds
Potential collapse of 800 mm diameter X 265 m long effluent pipe	M	Maintenance	Cleaning & inspection
Diffuser ports (18) - zebra mussels colonizing the openings	M	Maintenance	Cleaning & inspection

Appendix D - Risk Management

Tables below shows the hazards accounted for the Cookstown Wastewater Treatment Plant and collection system

Risk Management Area: Collection System

Description of Hazard	Risk	Control/Monitoring in Place	Outcome (Strategy to reduce likelihood or impact of risk)
Faulty lateral connection causing surcharge	M	Customer Service complaint/inquiry	Evaluate and repair as necessary
Failure of gravity main	M	Inspect as per maintenance schedule	Evaluate and repair as necessary
Forcemain break	M	Inspect	Evaluate and repair as necessary
Maintenance Holes	M	Inspections	Evaluate and repair as necessary
Excessive I & I	M	Scada high alarms or operator inspections	I and I, repair as necessary
Inflow other than municipal	M	Lab testing/sampling, operator inspection	Bylaw enforcement, Education

Risk Management Area: Raw Wet Wells

Description of Hazard	Risk	Control/Monitoring in Place	Outcome (Strategy to reduce likelihood or impact of risk)
Raw pumps	L	Redundancy, Scada	Evaluate and repair as necessary
Raw feed pipe to grit tank	M	Inspect	Develop strategy- contingency plan
Excess I & I	M	Scada alarms	I & I, Repair
Floats	M	Scada alarms	Inspect, repair as necessary
Inflow with high solids	L	Lab testing/sampling	Maintenance, training for users

Appendix D - Risk Management

Risk Management Area: Lagoons

Description of Hazard	Risk	Control/Monitoring in Place	Outcome (Strategy to reduce likelihood or impact of risk)
Valve(s) failure	M	Exercise as per maintenance schedule	Evaluate and repair as necessary
Berms	M	Visual inspection, pest control (muskrats)	Frequent inspection, berm maintenance
Effluent pump failure	M	Redundancy	Preventive/Breakdown maintenance
Spreading invasive weeds- milfoil	M	Visual inspection	Dredge and weed control (external party)
Failure to discharge effluent	M	Visual inspection, lab results	Contingency plan; obtain permission for alternative discharge (extend season, alter parameters)

Risk Management Area: Outfall

Description of Hazard	Risk	Control/Monitoring in Place	Outcome (Strategy to reduce likelihood or impact of risk)
Piping integrity compromised	M	Inspections, customer service complaint	Halt discharge, evaluate and repair as necessary
Damaged Maintenance holes	L	Inspections	Evaluate and repair as necessary
Outfall location	M	Inspections	Evaluate and repair as necessary