Chatham-Kent

DETAILED ASSET MANAGEMENT PLAN

2025

Wastewater

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Chatham-Kent Wastewater Report Card

540 KM of sewer pipes

60 sewage pumping stations

9 wastewater treatment plants & lagoons

3000+ service requests annually

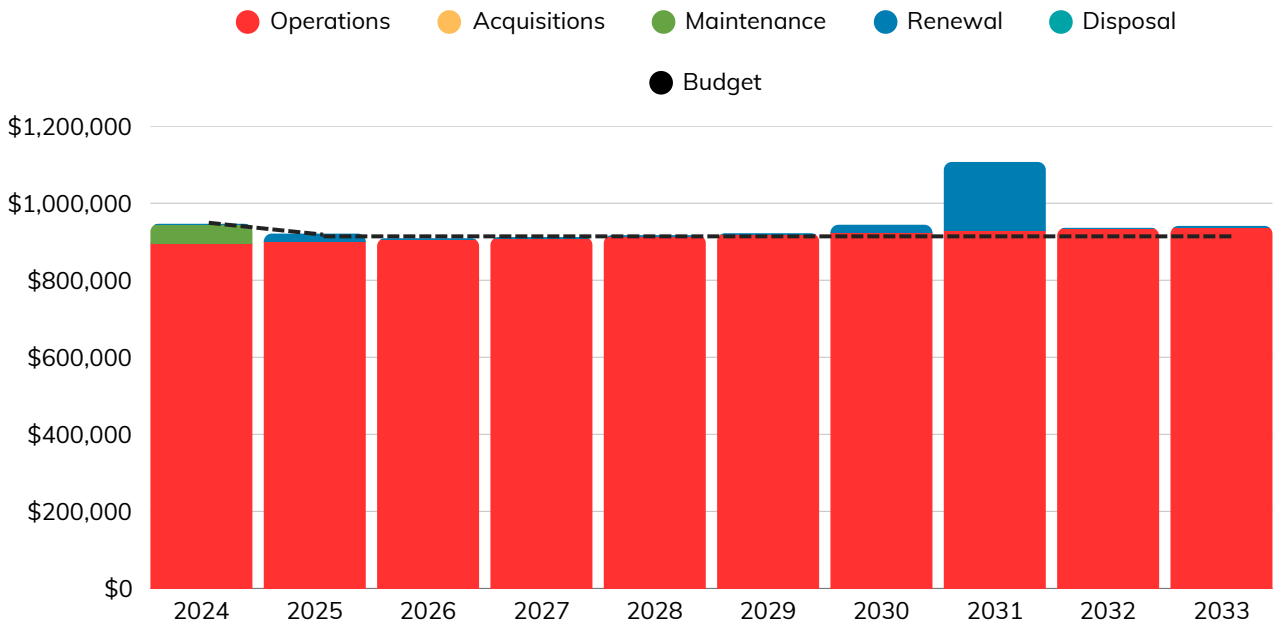
Annual Funding Gap	Asset Renewal Ratio	% of 10-Year Plan Funded
$38,094,596	86%	56%

Asset Summary

Assets	Items	Replacement
	wastewater treatment plants	$460.4 million
	sewage lagoons	$22.0 million
	gravity mains	$836.7 million
	maintenance holes	$166 million
	sewer pump stations	$123.6 million
	force mains	$31.3 millon
	combined sewers	$121.8 million

$1.76 Billon Total Replacement Cost

10 Year Life Cycle Forecast



Data Confidence	Low	Medium	High

2.0 INTRODUCTION

2.1 Background / Purpose of Service

The Municipality of Chatham-Kent (MCK) was formed in 1998 through the amalgamation of 23 municipalities that previously comprised the former County of Kent. At this time, the Chatham-Kent Public Utilities Commission (hereinafter referred to as "CK PUC") was established with a mandate to provide water and wastewater services to the Municipality. The CK PUC is a local board of Chatham-Kent functioning as a regional water and wastewater utility. The responsibilities of the CK PUC include the treatment and distribution of safe drinking water, as well as the collection and treatment of wastewater. The Municipality's Infrastructure and Engineering Services department oversees the maintenance of wastewater collection and management systems for 13 communities making up the entire Municipality.

Chatham-Kent's wastewater (or sanitary) infrastructure comprises a combination of linear sewers and pumping stations that transport wastewater from homes and businesses to the treatment plants, where it is cleaned and discharged into the environment. Wastewater treatment is crucial for maintaining public health and protecting the environment. These services are regulated and require constant monitoring to ensure provincial limits are met.
Ontario Regulation 588/17: Asset Management Planning for Municipal Infrastructure requires all municipalities to prepare baseline asset management plans for their core municipal infrastructure

> **Wastewater is sanitary water that drains from our homes, businesses, and industries into sewers. It includes all the things that we "wash and flush away" daily. This material then flows through a network of pipes that make up the sanitary sewer system.**

assets, which support the delivery of drinking water, wastewater, stormwater, and transportation.

To meet provincial requirements, MCK has developed this initiation of its Wastewater Detailed Asset Management Plan (Wastewater DAMP).

Future iterations of this document will incorporate data improvements; as asset management knowledge matures across CK PUC, the breadth and scope of the plans will be refined to ensure they capture the full cost of delivering the Wastewater service. The plan is updated annually to ensure that data quality improves, enabling and supporting evidence-based decisions.

The Wastewater DAMP will have a minimum ten-year planning horizon and will be fully integrated with the Long-Term Financial Plan by 2027. This plan outlines the requirements for sustainable delivery of services through asset management, program delivery, compliance with regulatory requirements, and the necessary funding to provide the appropriate levels of service over the entire planning period.

The Wastewater DAMP is to be read in combination with the other Chatham-Kent documents, which should include the *Strategic Asset Management Policy*, along with these other key planning documents:

- Chatham-Kent Wastewater Master Plan
- Municipality of Chatham-Kent – Strategic Plan 2022-2026
- 2024 - 2027 Multi-Year Budget
- Short-term and long-term financial plans

Understanding the Wastewater DAMP within the context of these documents ensures a comprehensive perspective of the CK PUC's management and development for today and into the future.

This DAMP has a minimum planning horizon of **ten years** and will integrate fully with the Long-Term Financial Plan (LTFP) by 2027. It will outline the necessary steps for the sustainable delivery of services, covering asset management, program delivery, regulatory compliance, and required funding to maintain appropriate service levels throughout the planning period.

> **Wastewater treatment facilities are designed to accelerate the natural process of purifying water, as the natural process cannot keep up with the amount of waste society produces. Without wastewater treatment and other recycling processes, everyday life would be considerably more hazardous. The primary goal of wastewater treatment facilities is to protect both people and local ecosystems from toxic elements present in wastewater.**

Chatham-Kent Public Utilities Commission Head Office (McGeorge Building)

The infrastructure assets included in this plan have a total replacement value of **$1.75 billion**. This DAMP addresses infrastructure assets specific to the CK PUC, which are vital for delivering services. For a detailed overview of these assets, please refer to **Table 2.2.**

Key stakeholders in the preparation and implementation of this DAMP are shown in **Table 2.1**.

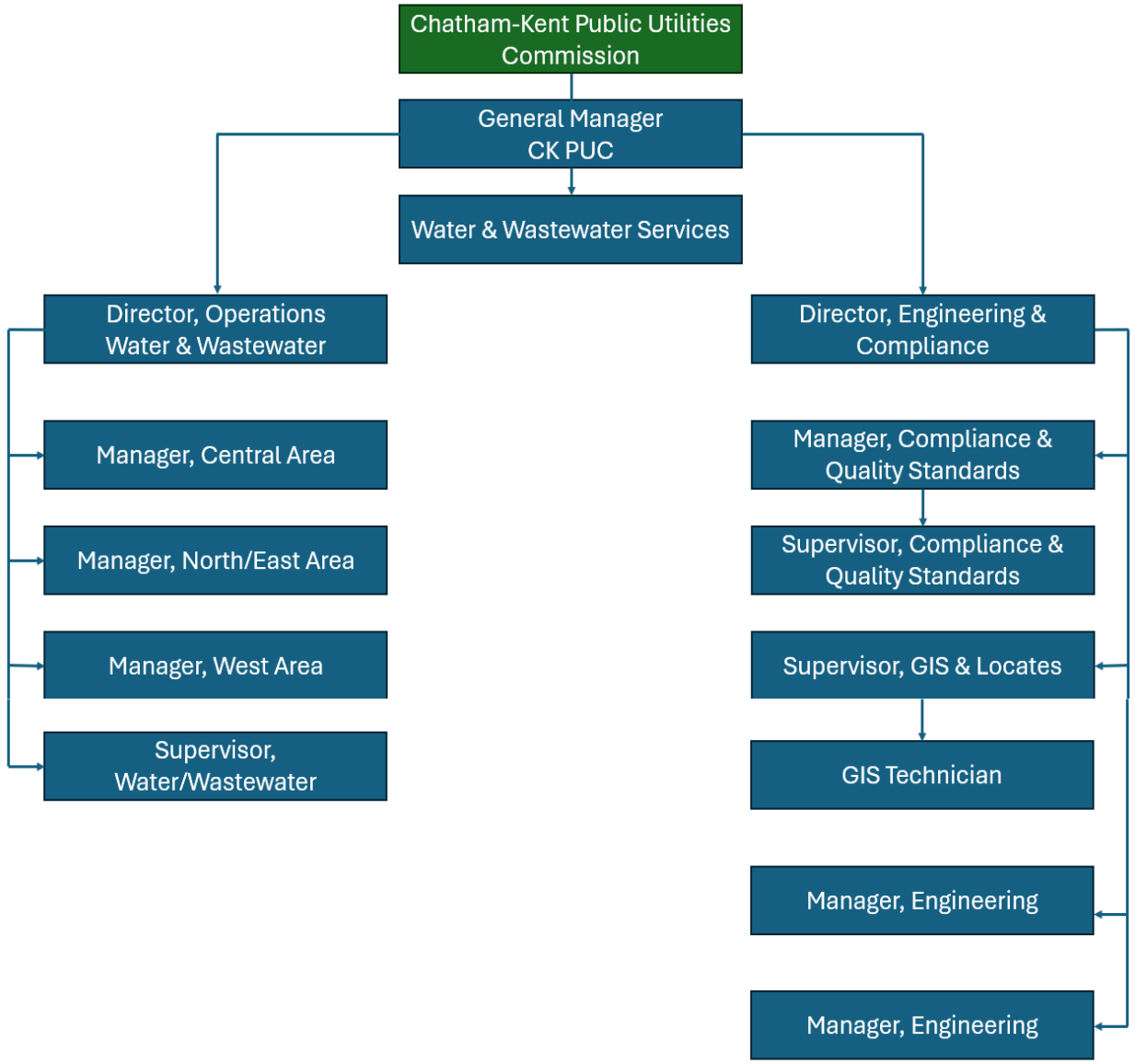
Key Stakeholder	Role in Asset Management Plan
CKPUC Board / Council	• Distribute resources to achieve planning objectives in service provision while effectively mitigating risks. • Support asset management initiatives to enhance understanding and guide decision-making. • Allocate funding to sustain the desired level of service throughout the entire life cycle.
CAO	• Advocate for and champion the adoption of asset management principles within the organization. • Guarantee the availability of sufficient resources to foster the development of staff knowledge and skills, facilitating the implementation and ongoing enhancement of asset management practices.
General Manager, PUC, IES, Public Works	• Allocate resources to meet the organization's objectives in providing services while managing risks. • Overall responsibility for Asset Management provides leadership in influencing decision-making processes related to Asset Management.
Director, PUC, IES, Public Works	• Delivering nominated renewal and upgrade projects. • Review, update, and plan long-term projects and direct overall operational responsibilities etc.

Key Stakeholder	Role in Asset Management Plan
PUC Staff	▪ Manages regulatory requirements, safety management systems, water and wastewater operations, and safety programs. ▪ Reviews, updates, and manages regulatory manuals and risk registers.
Service Operators/ Contractors	▪ Ensuring the facility is safe, secure, and compliant with its certification to remain functional and ensure the safety is a high priority. ▪ Ensure assets are well-maintained.
Asset and Quality Management (AQM)	▪ Establish top-level priorities for the development of asset management and increase awareness of this function among staff and external contractors. ▪ Assist with the Asset Management-driven budget and Long-Term Financial Plan.
CK Community	▪ Engage in facilitated discussions to enable the municipality to comprehend the user's preferred level of service and express support for the Detailed Asset Management Plans.

Wastewater Organizational Chart

The organizational structure for service delivery from infrastructure assets for CK PUC is detailed in **Figure 2.1** below.

Figure 2.1 : Wastewater Organizational Structure



2.2 Asset Hierarchy & Registry

An asset hierarchy provides a framework for structuring data within an information system, facilitating data collection, reporting, and informed decision-making. The hierarchy encompasses the asset class, and its components utilized for asset planning and financial reporting, as well as the service level hierarchy employed for service planning and delivery. Chatham-Kent is currently working towards establishing a functional asset hierarchy, which means that the hierarchy has been established based on what the asset owner needs or wants the asset or system to do. Generally, assets and systems are organized according to their primary function.

An asset registry is a single data source containing an inventory of asset data, including attribute information for each asset. This attribute information includes a record of each asset, including condition, age, replacement cost, and asset-specific information (e.g., length, diameter, material, etc.). The CK PUC wastewater asset registry is currently structured as an asset hierarchy, detailed below in **Table 2.2.1**.

Table 2.2.1. Asset Class Hierarchy

Service Hierarchy	Assets	Service Level Objective	Useful Life in Years	Asset Criticality
Vertical Assets	**Treatment Plants Sewage Lagoons, Pump Stations**	Mechanical and natural treatment of wastewater Mechanical transfer of wastewater	80-100	High
Linear Assets	**Sanitary Mains, Gravity mains, Sanitary service laterals, Sanitary Manholes**	Primary municipal collection of wastewaters, Independent connections of properties to the distribution system Access to the network of hygienic mains	70-75	Medium
Administration, ITT, Fleet, SCADA	**PUC vehicles, IT Hardware, software tools and equipment**	Enable CK PUC asset class to deliver the services	7 - 50	Medium

Generally, assets and systems are organized according to their primary function. The service hierarchy is shown in **Table 2.2.1.**

Asset Registry: Inventory and Valuation

The infrastructure assets covered within this Wastewater DAMP include the primary components required to deliver an effective Wastewater collection and treatment service for the customers. The assets covered in Wastewater DAMP have a replacement value of approximately **$1.76 billion**.

The assets included in this DAMP are shown in **Table 2.2.2.**

Table 2.2.2: Wastewater Service Assets

Asset Category	Description	Estimate Service Life in Years	Average Age	Average Condition	Average Remaining Service Life	Current Replacement Costs
Wastewater Assets	Wastewater Treatment Plants (7)	50- 60	38	Good	22	460 million
	Sewage Lagoons (2)	50	38	Good	12	22 million
	Pump Stations (55)	50	27	Good	23	123.7 million
	Sanitary Force Mains (70 km)	75	23	Good	52	31.3 million
	Gravity Mains (550 km)	75	46	Fair	29	924 million
	Combined Sewers (50 km)	75	75	Poor- Very Poor	--	95 million
	Sanitary Manholes (6600)	75	45	Good	30	86.5 million
Administration	PUC Vehicles	Varies	5	Good	Varies	1.2 million
	Administration Building	50-60	48	Good	12	4.4 million
	IT Hardware	5	Varies	Good	Varies	320,000
	Software	Varies	Varies	Good	Varies	531,000
	Tools and Equipment	Varies	Varies	Good	Varies	602,000
	Total Replacement cost					1.750 billion

All values are shown in 2025-dollar values.

Figure: 2.2.1: Wastewater Assets Based on Total Replacement Value

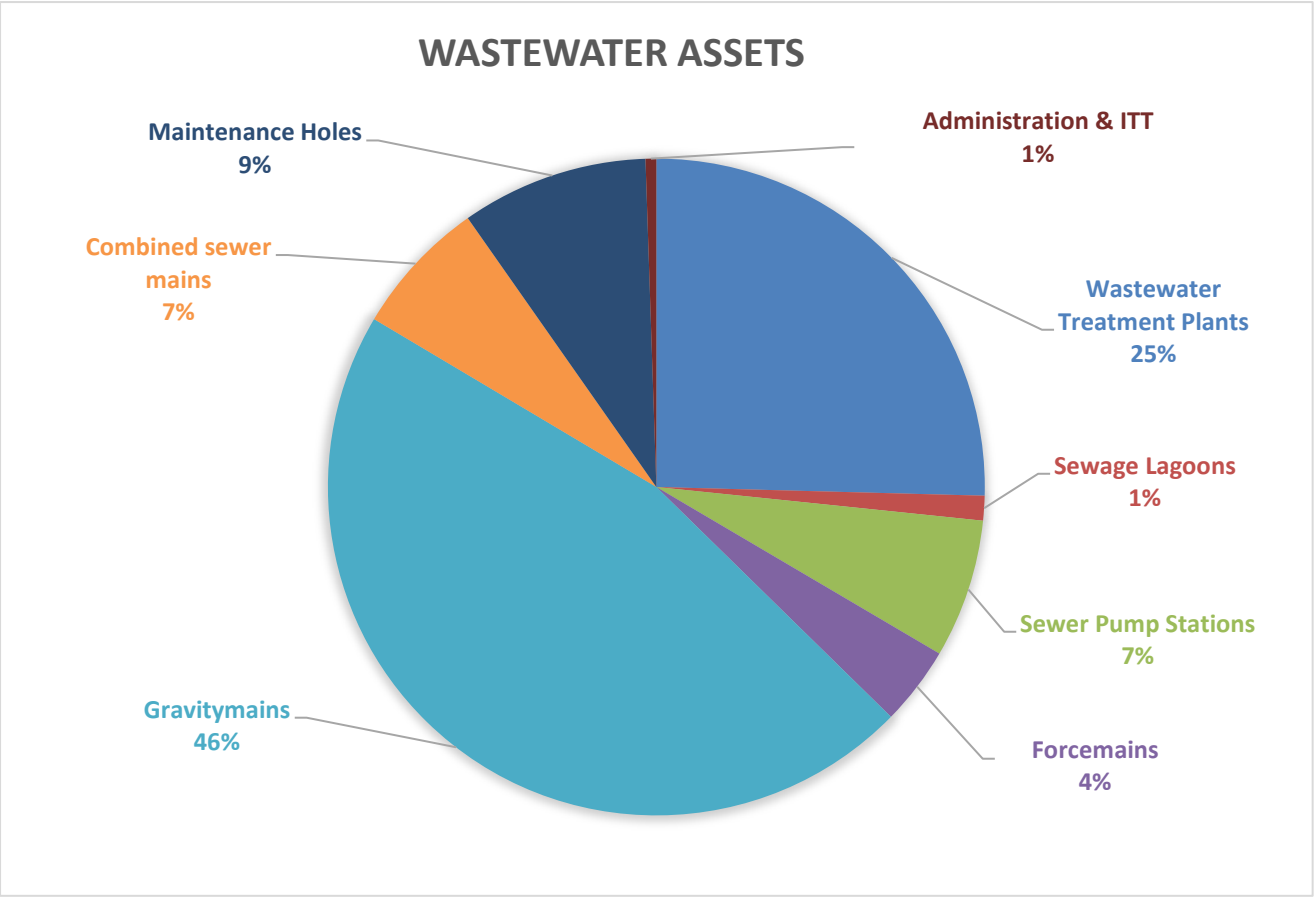


Figure 2.2.1 represents a pictorial representation of Wastewater assets based on the replacement value mentioned in **Table 2.2.2**. A sizable portion of the Wastewater assets in this chart are covered by the linear assets, nearly **66%**. The vertical assets, which include all wastewater treatment facilities, account for a total of 33%. Meanwhile, ITT and Administration, which encompass administrative buildings, PUC Fleets, Hardware, software, and other equipment, account for a total of **1%**.

The initial plan aims to encompass all necessary assets to deliver the wastewater service. However, it is acknowledged that, as this is the first DAMP, additional assets will be included in future iterations. As assets are acquired, disposed of, discovered, or deemed material, they will be included in future plans. Various asset measures such as age, condition, estimated service life and replacement costs will be updated regularly to ensure the data confidence of the plan is sufficient to support evidence-based
Investment decisions.

Wastewater Assets:

The wastewater management system collects and conveys wastewater from private properties, where it can be treated before being returned to the natural watercourse. The service objective is to provide a reliable wastewater network to customers 24 hours a day, 7 days a week.

Wastewater Collection:

Wastewater is a term typically used to describe liquid waste from two types of sources. The first source, sanitary sewage, is generated from homes, businesses, institutions, and industries. The second source, stormwater, is generated from rain or melting snow that drains off rooftops, lawns, parking lots, roads, and other urban surfaces. Wastewater is collected by sewer systems and, in most cases, is treated before being released into the environment. There are two types of wastewater collection systems.

- A combined sewer, and
- A separate sewer system.

Combined sewer systems collect both sanitary sewage and stormwater. During periods of heavy precipitation, overflows caused by overloading the combined sewer collection system may result in a direct discharge of raw sewage into surface waters. On the other hand, separate sewers have isolated the collection of sanitary sewage from that of stormwater.

Wastewater Treatment Plants:

The treatment of wastewater is a crucial process that prevents contamination and protects our waterways, drinking water resources, and natural water sources. There are six stages in the treatment process, involving both mechanical and biological methods, which clean our wastewater before it is released into lakes and rivers. Wastewater plant & collection system locations in Chatham-Kent are as follows:

- **Blenheim Sewage Treatment Plant**
- **Chatham Water Pollution Control Plant**
- **Dresden Water Pollution Control Plant**
- **Ridgetown Water Pollution Control Plant**
- **Tilbury Water Pollution Control Plant**
- **Wallaceburg Water Pollution Control Plant**
- **Wheatley Water Pollution Control Plant**

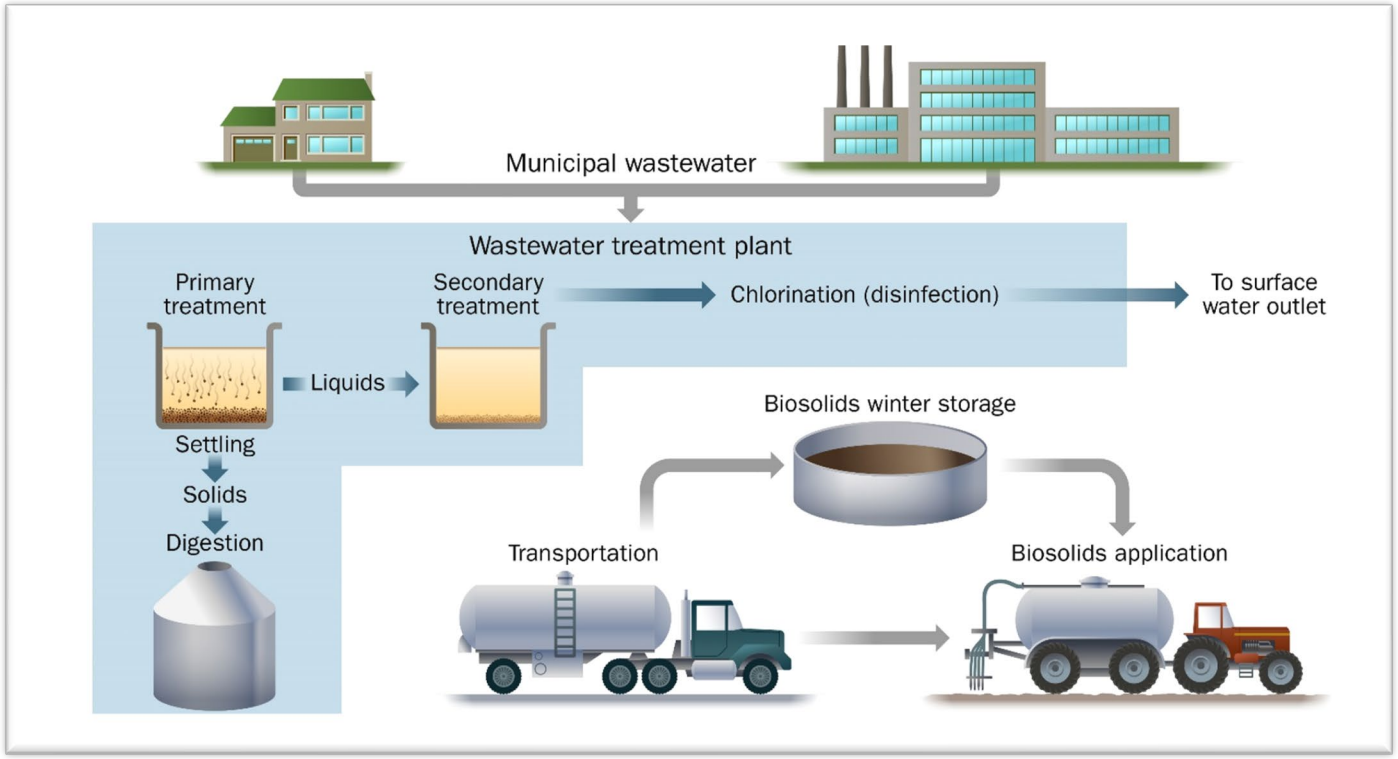
Wastewater Collection Systems:

- **Merlin Sewage Lagoon System**
- **Mitchell's Bay Sewage Lagoon System**

Chatham Water Pollution Control Plant

Chatham Sewer Pump Station

Figure 2.2.2: A diagram of the Municipal wastewater treatment process



Throughout the wastewater treatment process, wastewater samples are constantly monitored and tested. Samples are collected from various locations throughout the process and analyzed for suspended solids, oxygen levels, phosphorus, ammonia, harmful bacteria, oil, grease, solvents, and numerous other chemical compounds. To meet government standards and protect water sources, the concentration of many substances must be measured. The results of these measurements are reported to the Provincial government.

> **Certified CK PUC staff conducts over 22,000 tests a year for sewage, to ensure that CK PUC meets or exceeds all provincial standards.**

2.3. Asset Condition

Condition is the preferred measurement for planning lifecycle activities to ensure assets deliver the agreed-upon levels of service and reach their expected useful life. Conditions are not currently monitored for all assets, and age is the default parameter. Until condition assessments have been completed, age-based data and professional opinions will be utilized.

Table 2.3.1: Wastewater Assets by Age

Wastewater Assets Age						
Type	**Useful Life**	**0-5 Years**	**5-10 Years**	**10-20 Years**	**20-40 Years**	**Above 40 Years**
Maintenance Holes	80	3%	1%	11%	25%	60%
Buildings & Tanks	40	8%	4%	32%	18%	38%
Lagoons	20	0%	0%	13%	63%	24%
Equipment	20	2%	2%	16%	31%	49%
Generators	20	5%	4%	44%	21%	26%

Table 2.3.2: Sanitary Sewers by Material

Sewers by Material		
Material	**Length (m)**	**Percentage**
Concrete/Asbestos. Cement/Brick/Clay	183,498	33%
Iron	2,205	1%
PVC/HDPE*	187,069	33%
Unknown	181,642	33%
Total	**554,414**	**100%**

***PVC- Polyvinyl chloride, HDPE- High-density polyethylene (thermoplastic polymer)**

Although condition rating is the preferred measurement for planning, many assets in the PUC fleet lack a process for determining their condition. For assets where a condition program exists and a condition score was output, those conditions were converted to the scale below in **Table 2.3.1.**

In the future, conditions will be measured using a 1 – 5 grading system, as detailed in **Table 2.3.1**. It is essential to maintain a consistent approach to reporting asset performance, thereby enabling adequate decision-making support. A more refined grading system may be employed at a more specific level. However, for reporting in this DAMP, results are translated into a 1–5 grading scale for ease of communication.

Table 2.3.3: Condition Grading System

Condition Grading	Description of Condition
1	Very Good: free of defects, only planned and/or routine maintenance required.
2	Good: minor defects, increasing maintenance required plus planned maintenance
3	Fair: defects requiring regular and/or significant maintenance to reinstate service
4	Poor: significant defects, higher order cost intervention likely
5	Very Poor: physically unsound and/or beyond rehabilitation, immediate action required

CK PUC manages its existing wastewater treatment plant facilities through a preventive and maintenance inspection program, which includes periodic TV camera inspections and field inspections, implemented to ensure system integrity, minimize disruptions to operations, and maintain reliability.

Currently, conditions are monitored through both formal and informal methodologies. Operational wastewater assets regularly utilize a formalized inspection program, whereas most other assets are monitored informally or through observations and subject matter expert opinion. In addition to this, an ongoing facilities maintenance and improvement program ensures that the wastewater treatment plants, and support structures are continually upgraded and updated through construction improvements, including equipment refurbishment and replacement, the installation of SCADA communications systems, and the introduction of new online instrumentation for enhanced process performance.

For assets without known condition information or inspections that were not output in a way that could be converted, the condition was assumed based on age and remaining service life. In the future, CK PUC will investigate methods for completing condition assessments for assets without a dedicated program. For some assets, condition assessments are not economical; however, for many assets, regular inspections are conducted to ensure they are in working order.

2.4. Asset Capacity and Performance

The CK PUC has ten wastewater service area boundaries within its municipal boundary (CK Wastewater Service Area Boundaries Maps, in **Appendix B**). It owns and operates seven wastewater treatment plants and two lagoon-associated collection systems that serve the various communities in the municipality (CK Wastewater Facility Locations, Appendix B, Map 1).

The Chatham-Kent water and wastewater master plan prepared by AECOM details existing

infrastructure conditions and future needs. The plan projects population growth and increased demand, recommending various short-term, interim, and long-term infrastructure improvements and upgrades. The wastewater treatment capacity performance for all service areas was analyzed using historical flow rates for the period from 2019 to 2022, along with population forecasts. This analysis demonstrated that the treatment capacity for all systems is sufficient to meet growth up to the 2051 planning horizon.

Blenheim Lagoons

3.0 LIFECYCLE MANAGEMENT

The lifecycle management plan will detail how CK PUC plans to operate the wastewater assets at the agreed-upon levels of service by managing its lifecycle costs. These costs are categorized by lifecycle phases: acquisition, operations, maintenance, renewal, and disposal. It is budget-based but will evolve into a whole lifecycle approach by 2027, where appropriate.

From a financial perspective, infrastructure activities are typically classified as either Operating or Capital. The lifecycle activities used in the asset management and financial planning and reporting process cover:

Capital

- **Acquisition** – the activities that provide a higher level of service (e.g., widening a road, sealing an unsealed road, or replacing a pipeline with a larger diameter) or introduce a new service that did not exist previously (e.g., installing a new sewer line).
- **Operations** – Long-term plans and rate studies are identified expenditures within the capital budgets; however, these are operational activities. (E.g. Master plan environmental study)
- **Maintenance** – Large-scale maintenance projects that are required to ensure that assets can reach their expected service life. (e.g. pump maintenance program, intake repairs, etc)
- **Renewal –** the activities that replace or restore assets to their original standard (e.g., pipeline replacement, building components, and fleet replacement).

Operating

- **Operations -** routine activities that maintain accessibility and practicality, striking a balance between efficiency and user expectations (e.g., cleaning, mowing grass, energy management, inspections, etc.)
- **Maintenance is** the preventative and corrective actions to sustain asset functionality and minimize unexpected failures. Maintenance activities enable an asset to provide service for its planned life (e.g., maintenance of plant equipment, pump stations maintenance, and building and structure repairs).
- **Disposal –** the decommissioning, removal, or repurposing of assets that are no longer cost-effective, safe, or necessary (e.g., shutting down an old wastewater treatment plant, demolishing unsafe buildings, or dismantling old equipment or vehicles).

3.1 Acquisition Plan

Acquisitions are lifecycle activities that add new assets or enhance the capability or function of an existing asset. These acquisitions may result from growth, council priorities, donations, demand, or social and environmental needs, as well as those projects identified in the master plan. The costs associated with acquisitions include design, training, consulting, purchase costs, and staff time to ensure the assets are ready for service and can be considered 'fit for use.'

3.1.1 Selection Criteria

Proposed acquisition of new assets and upgrades of existing assets are identified from various sources, such as future capacity requirements, proposals identified by strategic plans, or partnerships with others. Potential upgrades and new works should be reviewed to verify that they are essential to the CK PUC's needs.

> **Over the 10-year planning horizon, CK PUC has budgeted over $240 million for several capital projects, including the expansion of pump station capacity, the upsizing of the forced main, and the expansion of the Chatham Water Pollution Control Plant (WPCP).**

The proposed upgrades and new work analysis will also include developing a preliminary renewal estimate to ensure that the services are sustainable over the long term. Verified proposals can then be ranked by priority and available funds and scheduled for future work programs. The priority ranking criteria are detailed in **Table 3.1.1.**

Table 3.1.1: Acquired Assets Priority Ranking Criteria

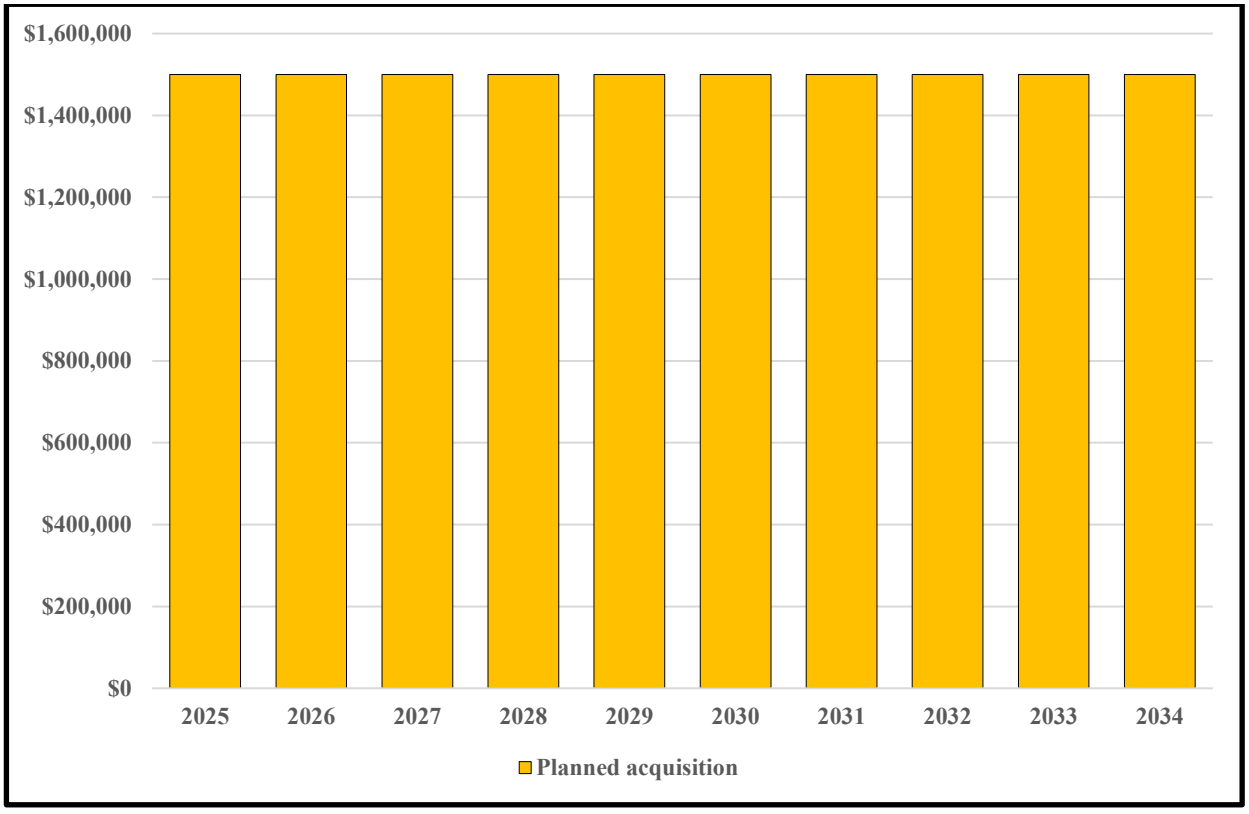
Criteria	Weighting
Development Growth	25%
Asset Life cycle	25%
Risk Mitigation	25%
Legal Compliance	25%
Total	**100%**

Donated Assets

Donated assets are assets built by others and CK becomes the owner of those assets. Generally, for the roads service a donated asset most commonly happens when CK assumes a subdivision which Is built by a developer and becomes the assets of the municipality once the construction is completed. On average, Chatham-Kents Wastewater network grows by 2kms/year or 20kms over the entire 10-year planning period of this DAMP.

When CK takes on assets, it also takes on the responsibility for all expenses related to operating, maintaining, and eventually renewing the Wastewater infrastructure. It is crucial to ensure that CK allocates enough funds in the budget to effectively manage the Wastewater network, including the donated assets, throughout their entire lifecycle. **Figure 3.1.1** shows the anticipated donated assets over the life of the plan

Figure 3.1.1. Summary of Donated Assets



Summary of Future Asset Acquisition Costs

Forecast acquisition asset costs are summarized in Figure 3.1.1 and shown relative to the proposed acquisition budget. **Figure 3.1.2** illustrates the acquisition costs for CK PUC over a 10-year planning period. The budget line falls short of the projected acquisition costs from 2025 to 2034. This suggests the need to consider increasing the allocated budget amount.

Figure 3.1.2: Acquisition (Constructed) Summary

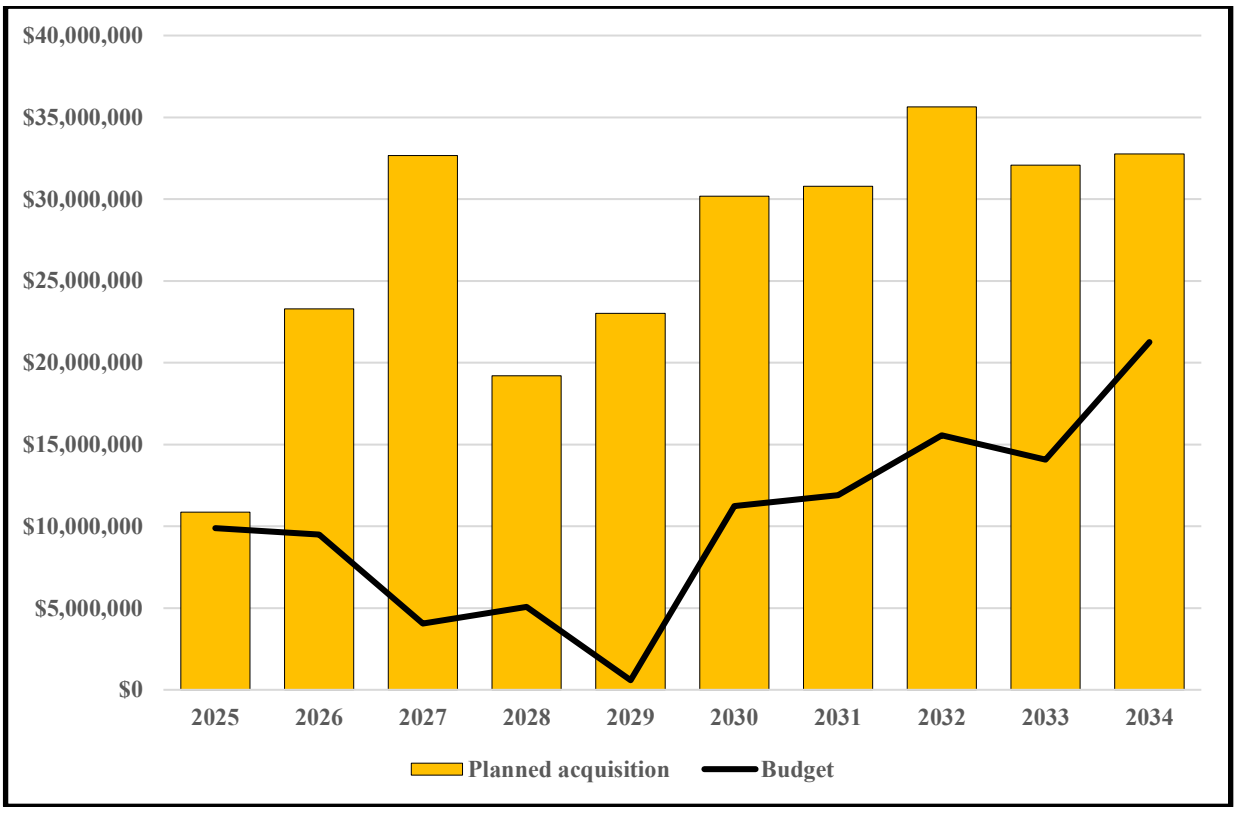


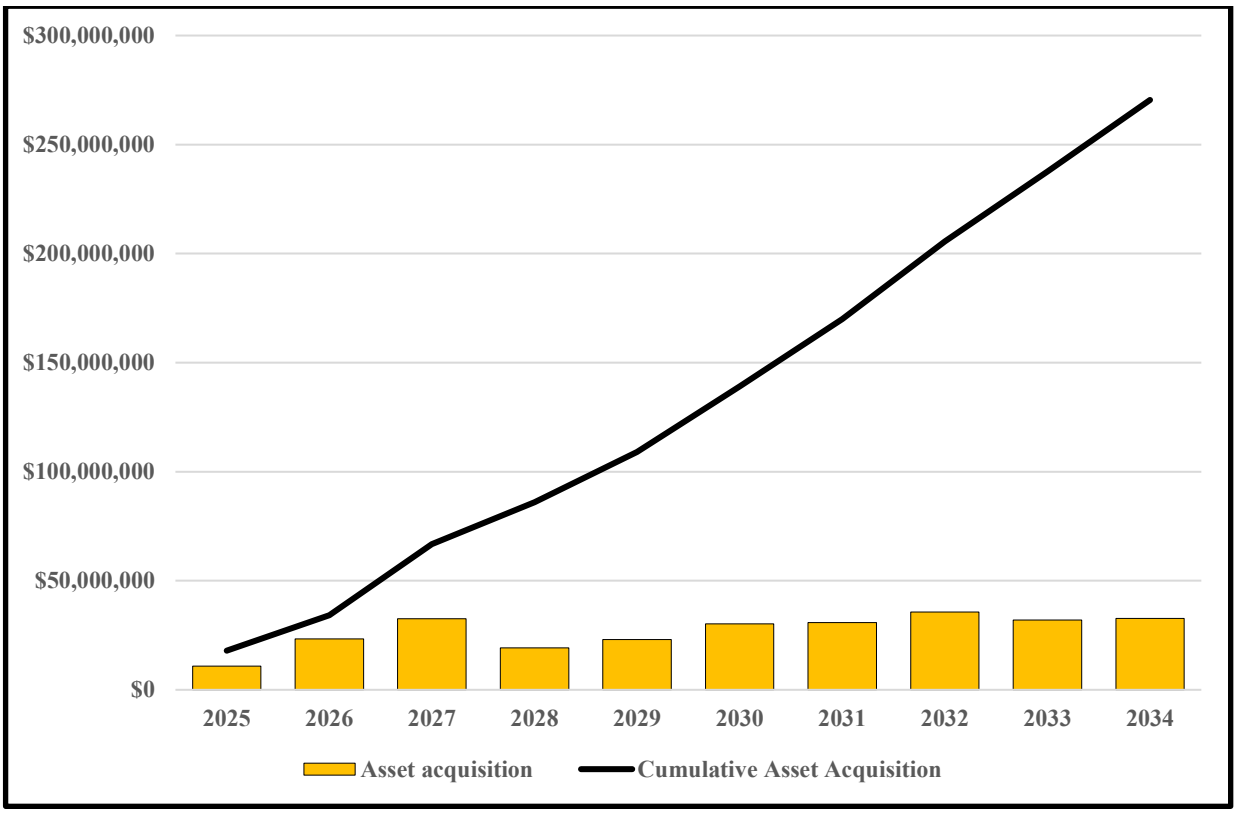
Figure 3.1.2. illustrates all planned acquisitions for the period from 2025 to 2034. The forecasted acquisitions will be financed through wastewater lifecycle reserve funds, wastewater reserves, development charges, reserve funds, and wastewater collection revenues. However, the chart indicates that these funding sources do not fully cover all the forecasted acquisitions. Additional funding will be required for acquisitions in 2029 and from 2026 to 2034 to meet the necessary acquisition needs for those years.

When an entity commits to new assets, it must be prepared to fund future operations, maintenance, and renewal costs. Long-term sustainability must also account for future depreciation. When examining the long-term impacts of asset acquisition, it is helpful to consider the cumulative value of the acquired assets being taken on by the Entity. The cumulative value of all acquisition work, including both contributed and purchased assets, is shown in **Figure 3.1.2.**

Figure 3.1.3: Acquisition Summary

Figure 3.1.2 illustrates asset acquisitions over a 10-year planning period, with the black line indicating the cumulative total of asset acquisitions. Each year's cumulative asset acquisition is the sum of acquisitions from previous years within the planning period.

Figure 3.1.3: Acquisition (Constructed) Summary



The long-term financial plan will accommodate expenditure on new assets and services in the capital works program, provided funding is available.

The planned acquisition projects worth a total of **$240 million** are funded by wastewater reserves, ensuring adequate funding. The DAMP section will be updated annually to report new acquisitions.
Some capital projects CK PUC plans to include in the acquisition budget are:

- **New South Hub Pump Station in Chatham- $38,000,000**
- **Sewer Separation Program for Chatham Targeting largest Downstream Sewers Feeding the Trunk / Interceptor- $50,000,000**
- **Lynwood Subdivision Pump Station #14- $10,000,000**
- **Upsizing Pump Capacity- $14,000,000**
- **Twin Forced main to WPCP- $5,000,000**

3.2 Operations Plan

Operations include regular activities to provide services. These activities are necessary to complete the regular day-to-day operations of the wastewater services. Examples of typical operational costs and activities at the CK PUC include:

- Staffing costs,
- Sample collection and laboratory testing,
- Inspections,
- Grass cutting,
- Utility costs,
- Fuel costs
- Master plans, servicing study
- Contractor costs related to managing wastewater operations and activities required by legislative requirements and
- The necessary staffing resources to perform these activities.

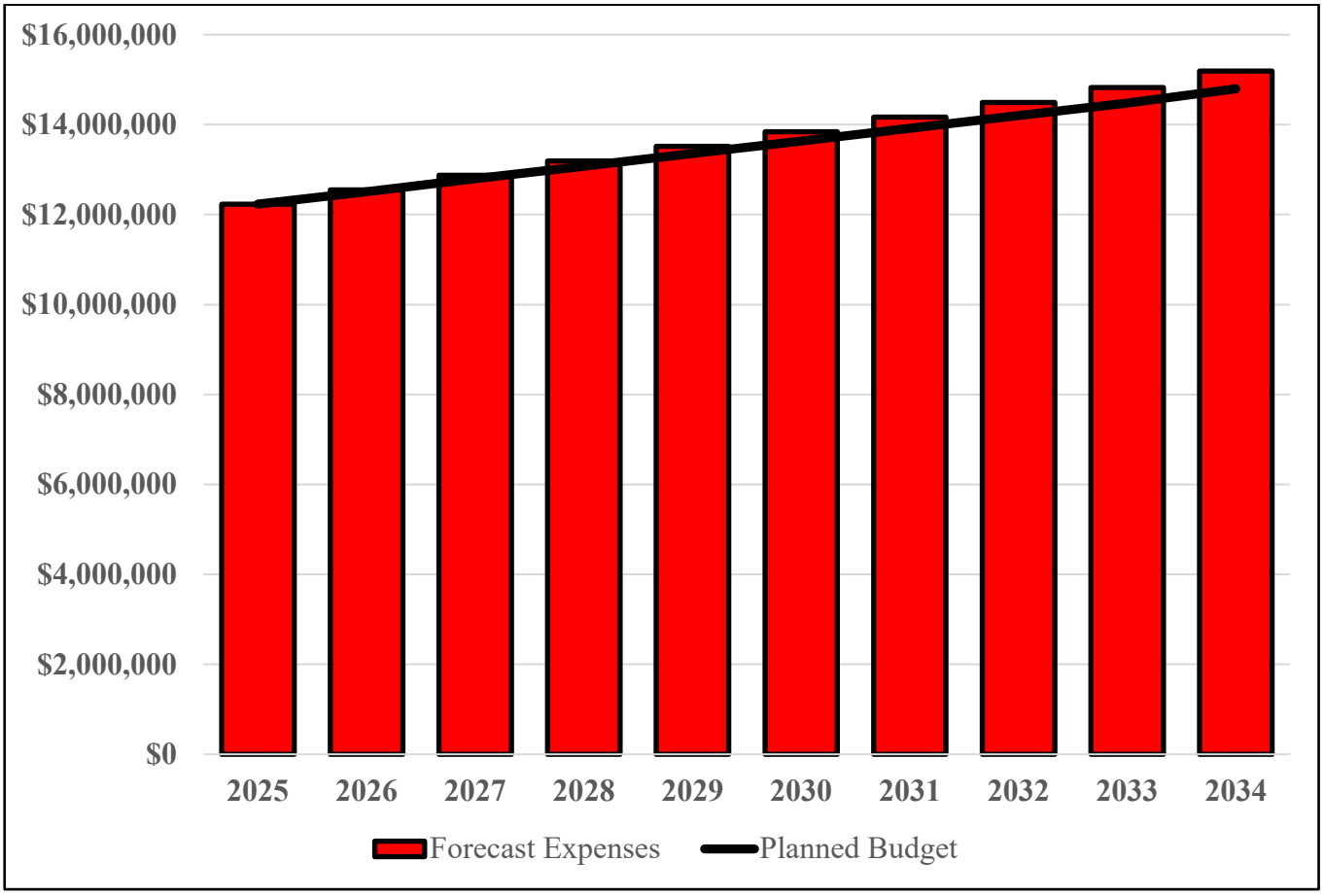
Below mentioned are major Operations lifecycle cost items included in the planned operational budget over ten years:

- **Hydro expense- $22,217,000**
- **Lab Analysis - $3,200,000**
- **Chemical for plants - $5,400,000**
- **Wages and labour expenses -$42,560,000**
- **The Debt payment from CK PUC over the next 10 years is $39,182,000.**

Summary of forecast operations costs

Forecast operations costs are expected to vary in relation to the total value of the asset stock. If additional assets are acquired, the future operations costs are forecast to increase. If assets are disposed of, the forecast operation costs are expected to decrease. **Figure 3.2.1** shows the forecast operations costs relative to the proposed operations planned budget.

Figure 3.2.1: Operations Summary



All figure values are shown in 2025-dollar values.

The forecast costs include all costs from both the capital and operating budget. The forecast for operations costs is increasing steadily over time. Funding for these expenses comes from the planned budget, facilities lifecycle reserve fund, annual lifecycle reserve fund, wastewater reserves, development charges reserve fund, and wastewater revenues. The figures show that the forecasted budget exceeds the planned budget for all years, with a notable increase from 2027 to 2034. While the operational activities in the capital budget are funded through the mentioned revenues and reserves, the higher forecasted operational values are primarily due to operational expenses associated with new acquisitions and inflation. The trend in Operations budgets is shown in **Table 3.2.2** below.

Table 3.2.2: Operations Budget Trends

Year	Operational Budget
2025	12,234,000
2026	12,548,000
2027	12,874,000

> **The Wastewater Asset Management Plan focuses on how ratepayer dollars are invested across lifecycle activities rather than by budget allocation. Since both budgets encompass various lifecycle activities, they must be consolidated for the Asset Management plans.**

Ridgetown WCPC

3.3 Maintenance Plan

Maintenance includes all actions necessary to retain an asset in as near an appropriate service condition as practicable, including regular, ongoing day-to-day work required to keep assets operating. Examples of typical maintenance activities include pipe repairs, equipment repairs, and asphalt patching.

Maintenance should be viewed as the ongoing management of deterioration. The goal of planned maintenance is to proactively apply the appropriate interventions to assets, ensuring they achieve their intended useful life.

> **Maintenance does not substantially prolong the life of an asset; instead, it is the set of actions necessary to enable assets to meet their expected lifespan by restoring them to a preferred, improved condition.**

Planned maintenance significantly reduces the need for reactive maintenance, which is often associated with more significant risks to human safety and higher financial costs. CK PUC is strategically planned and can adequately finance its maintenance activities through its reserve, thereby maintaining the desired service level.

Summary of Forecast Maintenance Costs

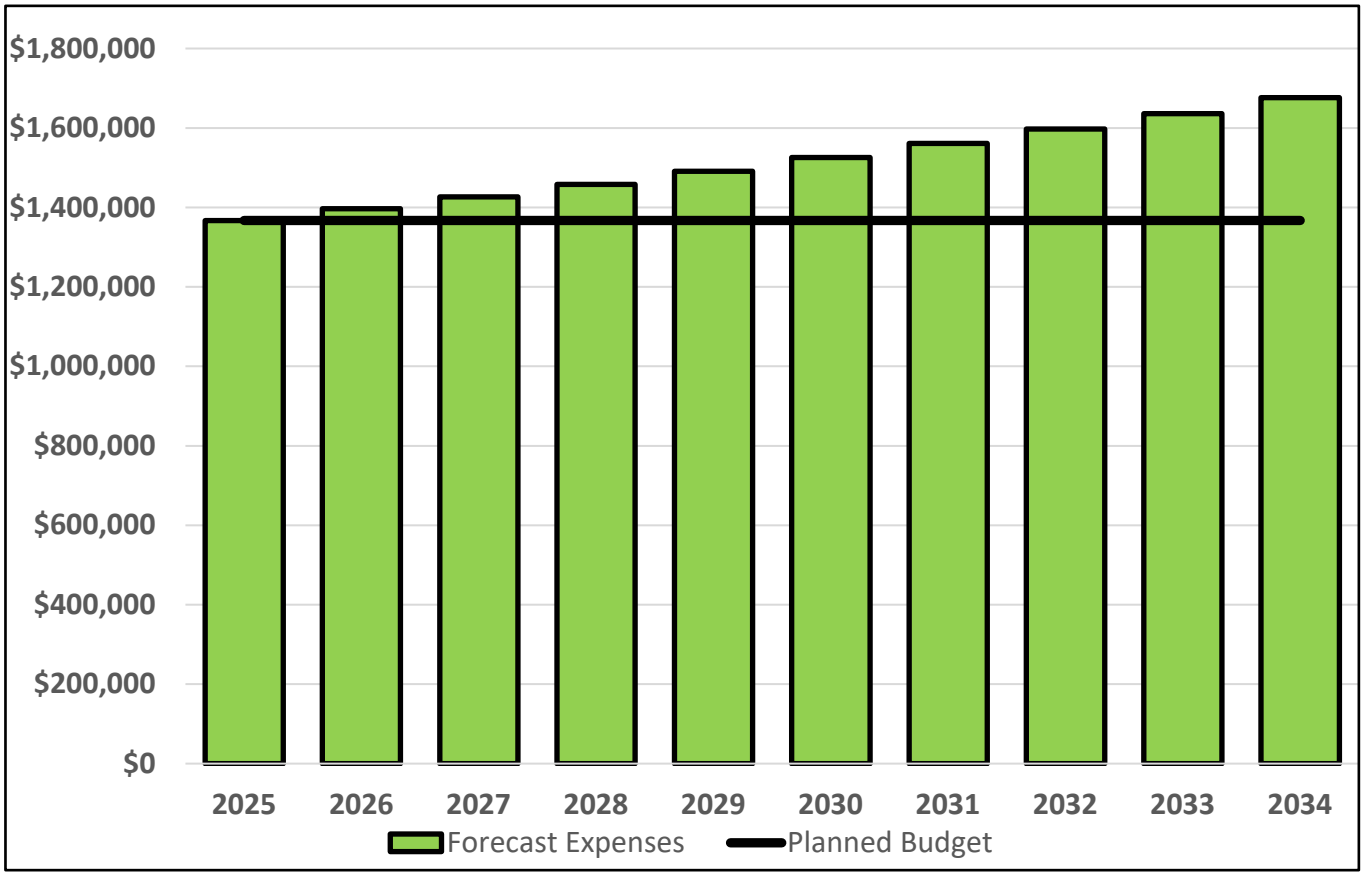
Assessment and prioritization of reactive maintenance are undertaken by staff using their experience and judgment. At this time, most of the maintenance allocations are for the following actions and activities:

- CK Public Works performs Sewer's pipe repairs and maintenance
- Ensuring the wastewater asset is kept at the legislative required condition.
- Facility preventative maintenance program to ensure the wastewater plant equipment functions as expected.

Forecasted maintenance costs are expected to vary in proportion to the total value of the asset stock. If additional assets are acquired, future maintenance costs are predicted to increase. If assets are disposed of, the forecast operation and maintenance costs are expected to decrease.

Figure 3.3.1 below illustrates the forecasted maintenance costs in relation to the proposed maintenance budget.

Figure 3.3.1: Maintenance Summary



The maintenance budget levels are insufficient to meet the projected service levels over the entire 10-year planning period. The increase in forecast expenses is primarily due to inflation and maintenance activities linked to new acquisitions. In the future, the Municipality may not have sufficient budget to maintain all the upcoming acquisitions. The funding gap may result in a delay to some upcoming planned maintenance activities aimed at closing the funding gap. By deferring maintenance, CK PUC is incurring the higher risk and costs associated with reactive maintenance.

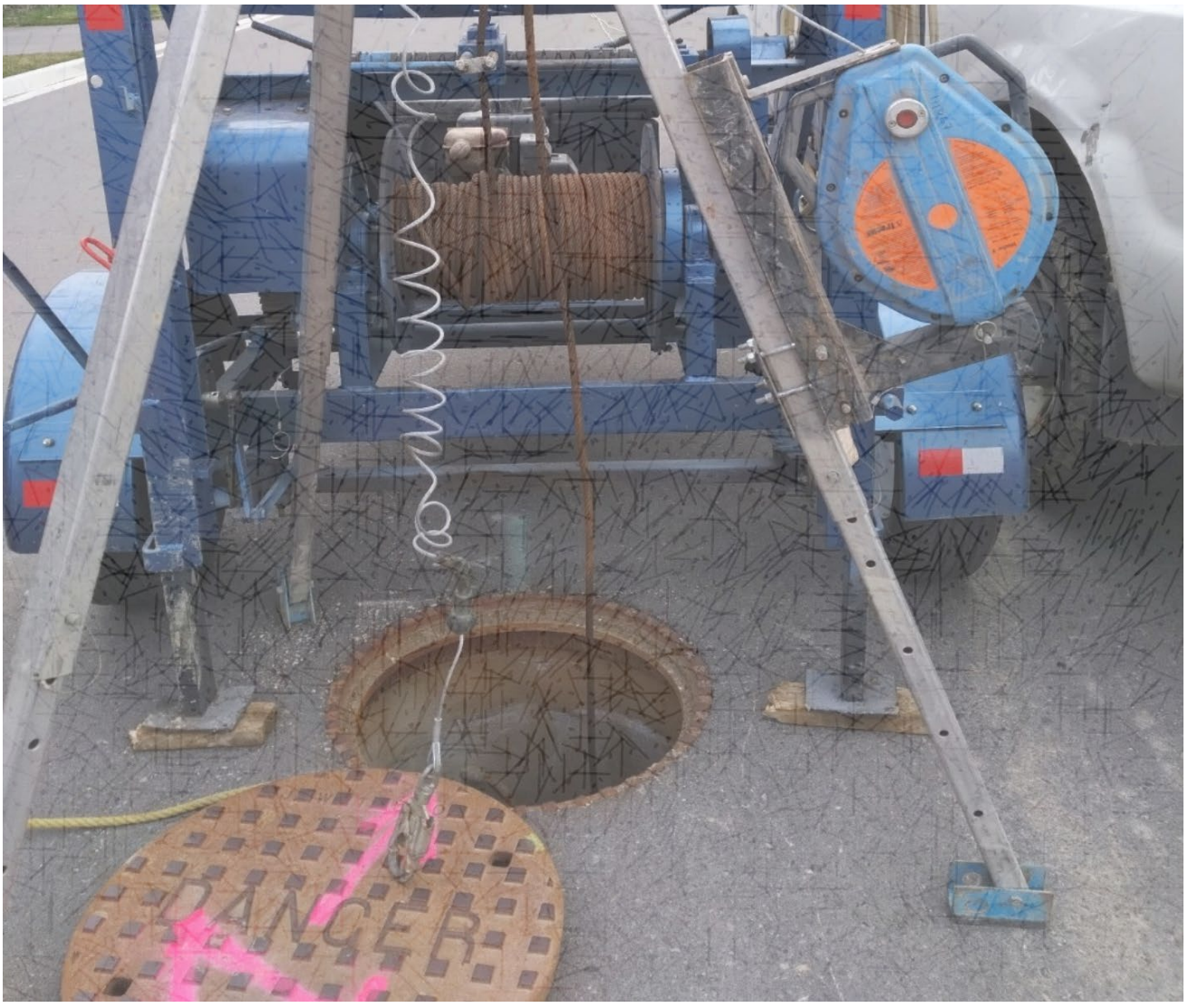
When the CKPUC completes necessary operational and maintenance activities, high-cost, reactive repairs can be prevented, ensuring the assets reach their estimated service life. Currently, the assessment and prioritization of reactive maintenance are conducted by staff using their subject matter expertise and judgment.

Future iterations of the Wastewater DAMP will need to consider obligations to ensure that required safety and regulatory maintenance is prioritized. Where maintenance budget allocations result in a lesser level of service, the service consequences and risks have been identified and are highlighted in this DAMP. Service risks are also considered in the Infrastructure Risk Management Plan. The trend in maintenance budgets is shown in **Table 3.3.2** below.

Table 3.3.2: Maintenance Budget Trends

Year	Maintenance Budget
2025	1,367,000
2026	1,396,000
2027	1,427,000

Maintenance of a sewer system



3.4 Renewal Plan

Renewal is a major capital work that does not significantly alter the original service provided by the asset but restores, rehabilitates, replaces, or renews an existing asset to restore its original service potential. Work that exceeds restoring an asset to its original potential is considered an acquisition, resulting in additional future operations and maintenance costs.

Assets requiring renewal are identified from the asset register data to project the renewal costs (replacement cost) and renewal timing (acquisition year plus updated useful life to determine the renewal year). The typical useful lives of assets used to develop projected asset renewal forecasts are shown in **Table 3.4.1.** Assets with useful lives related to the wastewater service were last reviewed in **March 2025.**

The estimates for renewals in this DAMP are based on the asset register method.

3.4.2 Renewal Ranking Criteria

Asset renewal is typically undertaken to either:

- Ensure the reliability of the existing infrastructure to deliver the service it was constructed to facilitate (e.g., replacing a pump that has lower capacity), or

- To ensure the infrastructure is of sufficient quality to meet the service requirements (e.g., the condition of a sewer).

CK PUC prioritizes its renewals by identifying assets or asset groups that have:

- High consequence of failure
- High use and subsequent impact on users would be significant.
- Higher than expected operational or maintenance costs.
- Potential to reduce life cycle costs by replacing a modern equivalent asset that would provide the equivalent service.

The ranking criteria used to determine the priority of identified renewal proposals is detailed in **Table 3.4.3.**

Table 3.4.3: Renewal Priority Ranking Criteria

Criteria	Weighting
Regulatory / Legal Compliance	25%
Demand Driver (Growth)	25%
Lifecycle Impacts (Operations & Maintenance)	25%
Risk Mitigation	25%
Total	**100%**

3.5 Summary of Future Renewal Costs

Forecasted renewal costs are projected to increase over time as the asset stock expands. The forecast costs associated with renewals are shown relative to the proposed renewal budget in **Figure 3.5.1.**

Figure 3.5.1: Forecast Renewal Costs (2025 - 2034)

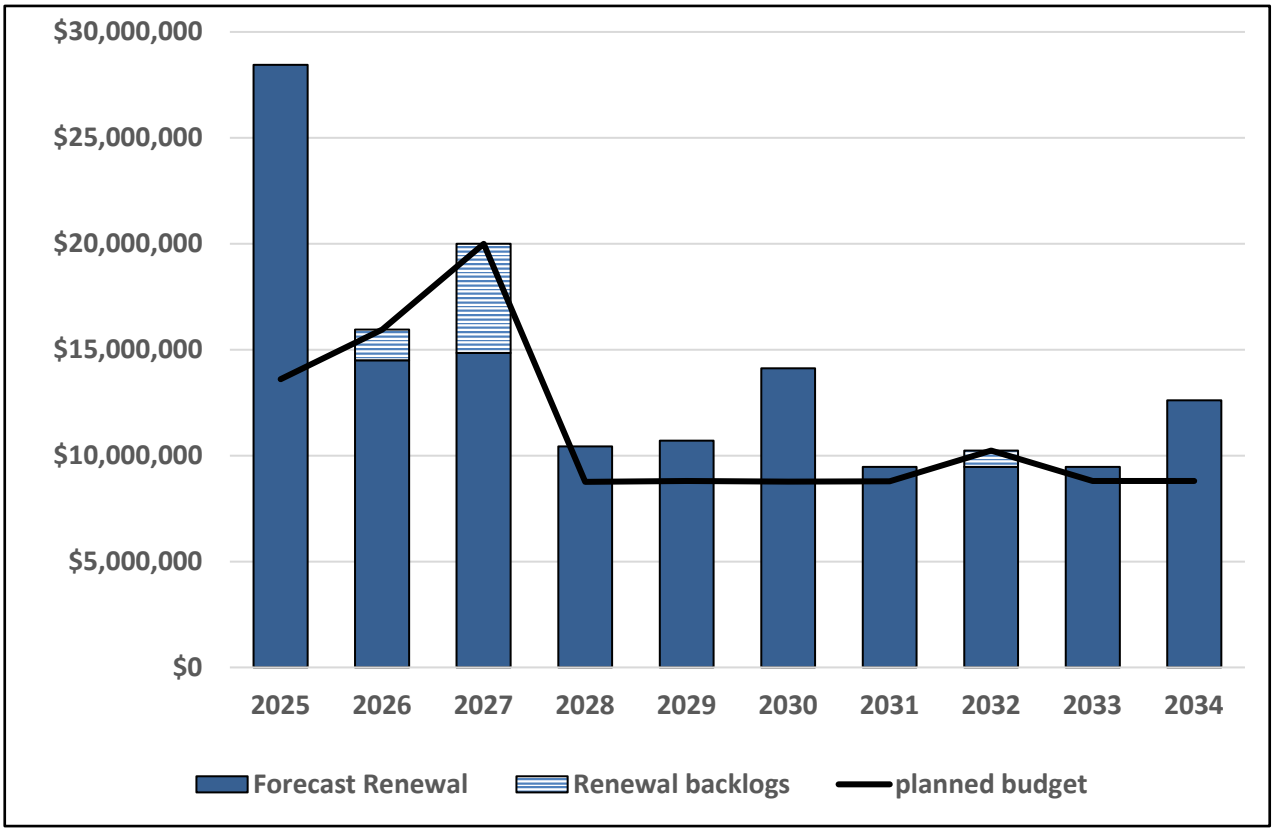


Figure 3.5.1 displays the expenses for renewing CK PUC assets between 2025 and 2034. The significant amount highlighted in 2025 represents the aggregate backlog of deferred work that needs to be completed, which has been either identified through its current estimated condition or age when condition was not available. Deferred renewal (assets identified for renewal and not scheduled in capital works programs) are included and identified within the risk management plan.

Prioritization of these projects will require funding and management over time to ensure renewal occurs at the optimal time. There is only sufficient budget to support the planned projects. Without additional funding, the backlog will remain and continue to grow as future projects outside of the 10-year planning horizon move forward into the 10-year scope. Continued deferrals of projects will result in significantly higher operational and maintenance costs and will impact on the availability of services in the future.

CK PUC funds wastewater renewal projects through the annual Sewer Main Lifecycle project, utilizing the Sewer Main Lifecycle Reserve Fund. Within the 10-year planned period, CK PUC requires renewing the wastewater Pumping Station, upgrading the pumps to higher capacity,

and increasing the sewer main capacity by 2034. Currently, there are insufficient funds in the reserve to renew the wastewater assets at the appropriate time.

3.6 Disposal Plan

Disposal encompasses activities related to the decommissioning of assets that are not slated for renewal. These activities include the sale, demolition, environmental testing and remediation, soil and asbestos remediation, and relocation.

Any costs or revenues from asset disposals will be accounted for in the long-term financial plan. The forecast costs associated with Disposals are shown relative to the proposed disposal budget in **Figure 3.6.**

Figure 3.6: Forecast Disposal Costs (2025 - 2034)

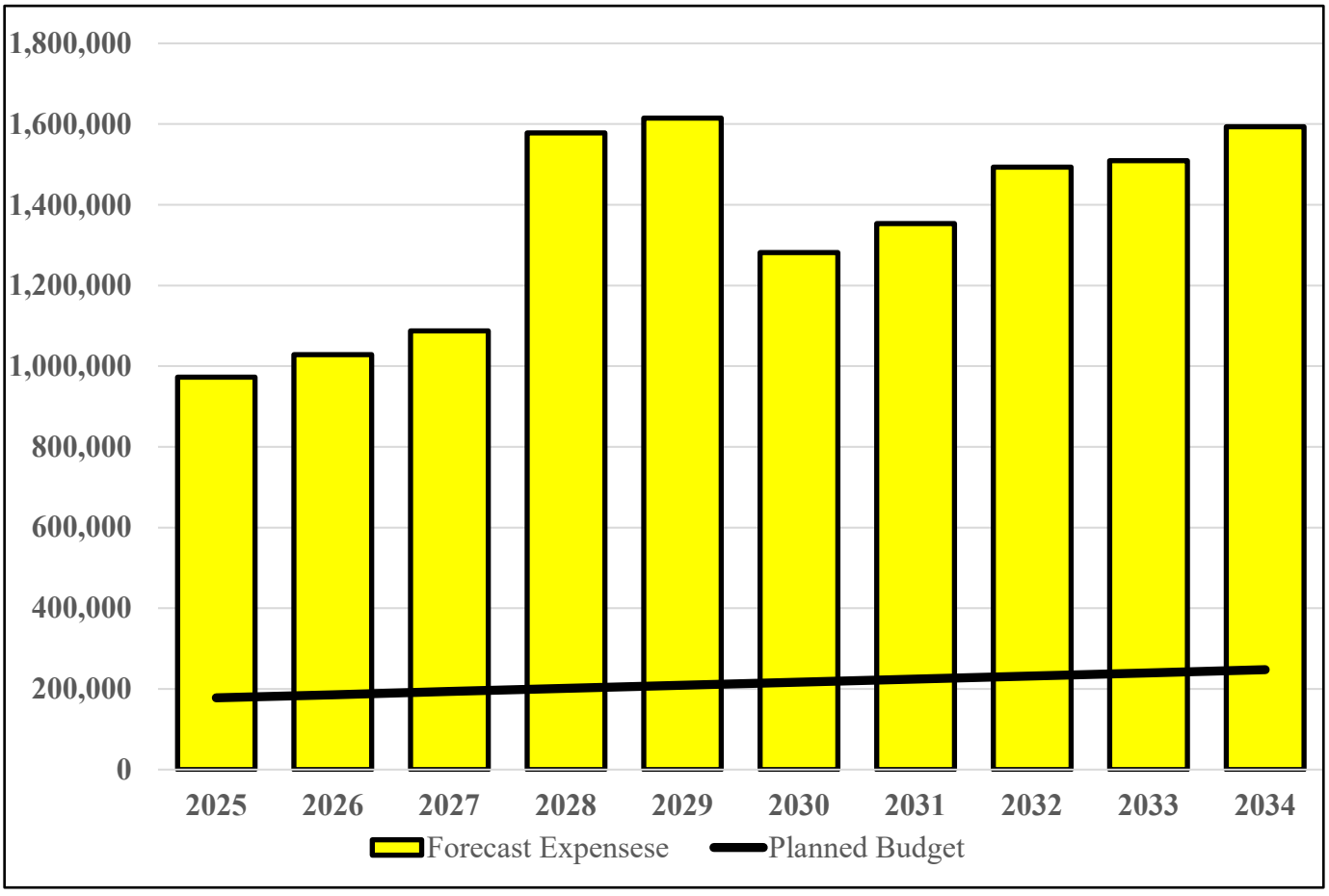


Figure 3.6.1 illustrates the forecast disposal and planned budget from 2025 to 2034. The Disposal cost shown in the above chart is due to the decommissioning and upgrading activities involved in the renewal projects. Below is the disposal projects identified in the planned budget period (2025- 2034).

- **SPS (Sanitary Pump Station) — 602 Pumping upgrade- 2032**
- **Optimizing capacity of the combined sewer trunks / interceptors**
- **Continuing Sewer Separation Program for Chatham Targeting largest Downstream Sewers**
- **Chatham WPCP - Plant#1 Concrete repairs**
- **Sanitary Pump Station #7 -John Street Chatham**

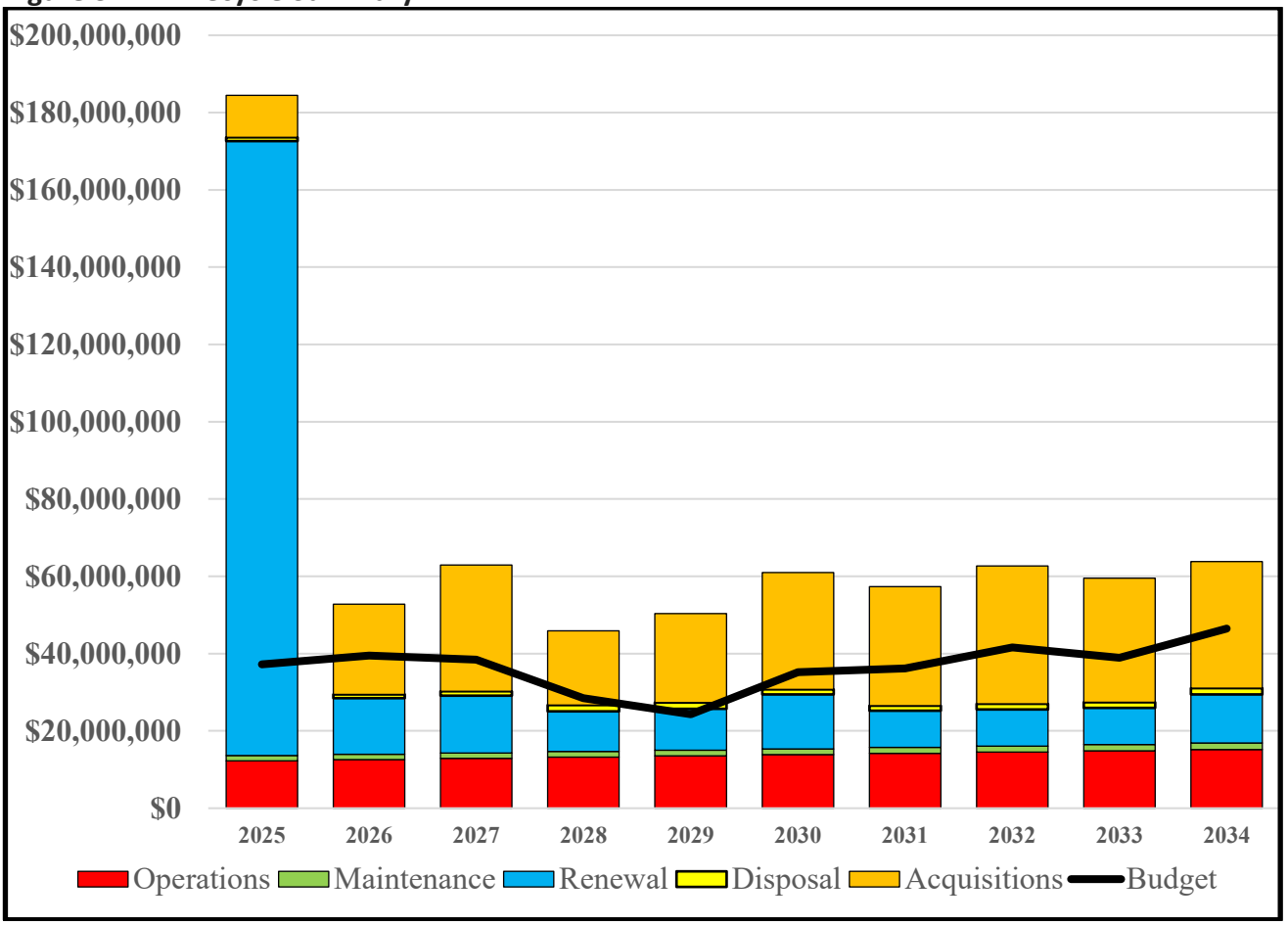
The decommissioning of Mitchell's Bay Lagoon and system has been recommended in Water and Wastewater Master Plan 2024.

3.7 Summary of Asset Forecast Costs

Figure 3.7.1 presents a lifecycle summary for CK PUC over a 10-year planning period, encompassing operation, maintenance, renewal, acquisition, disposal, and budget.

The bars in the graphs represent the forecast costs needed to minimize the life cycle costs associated with the service provision. The proposed budget line indicates the estimate of available funding. The gap between the forecast and the proposed budget serves as the basis for discussing how to achieve a balance between costs, levels of service, and risk to achieve the best value outcome.

Figure 3.7.1: Lifecycle Summary



Currently, there is an insufficient budget to address the large backlog of wastewater renewal work projected by the plan. There is no adequate budget to address most ongoing operational and maintenance needs for most of the planning period; however, with the assumption of assets over time and their associated increased costs, there may be impacts on the service itself, as illustrated in **Figure 3.7.1.**

Allocating adequate resources is crucial for managing wastewater assets throughout their lifecycle. This includes funding for lifecycle activities, adequate staffing, increased asset knowledge, improved planning, contracted services, and additional equipment or vehicles to ensure CK PUC can effectively implement its lifecycle approach. Without some adjustment to available funds or other lifecycle management decisions, CK PUC has limited resources to finance all scheduled lifecycle tasks for the entire 10-year planning period.

The municipality will benefit from allocating adequate resources to develop a long-term financial plan, ensuring it can fully fund necessary lifecycle activities over time. Funding these activities is essential to ensure that assets remain compliant and safe and continue to deliver the services customers need and expect effectively.

The lack of funding for the backlog of renewals and necessary lifecycle activities presents an additional issue: intergenerational equity. Each year, the municipality defers crucial lifecycle activities, shifting the growing financial burden onto future generations. Consistently allocating sufficient funding over time ensures that future generations will enjoy the same service standards that are available today. As the municipality continues to improve its lifecycle data, it will be able to make more informed decisions on how best to mitigate the impacts of the funding gap and address it in the future.

4.0 LEVELS OF SERVICE

Levels of Service (LOS) describe what the MCK intends to deliver to its population, businesses, and other stakeholders. The definition and assessment of LOS are continually completed to improve the service provided by CK PUC stakeholders. LOS are parameters that MCK uses to measure the performance of services. Customer expectations, legislative requirements, and internal policies guide the LOS. Asset management plans require that LOS be formalized and supported through a framework of performance measures and timeframes to achieve targets and that the costs to deliver the documented LOS be understood.

Water and sanitary services are fundamental to the community as they directly impact public health, fire protection, agriculture, industry, and the environment. The Wastewater DAMP establishes a preliminary level of service and the current level of service being provided. The measures align with both municipal strategic goals and provincial requirements and recognize that wastewater assets should:

- Persistently capture, convey, and treat wastewater while minimizing overflows and backups.
- Treat sewage before discharge to the river
- Recycle biosolids into the environment.
- Be maintained in a state of good repair.
- Be periodically inspected to identify need.

> **Water and sanitary services are fundamental to the community as they directly impact public health, fire protection, agriculture, industry, and the environment.**

4.1 Legislative Requirements

Meeting legislative requirements should be the bare minimum level of service that CK PUC provides. These requirements often drive many lifecycle costs and staff tasks to ensure that CK PUC is compliant with all relevant legislation, ranging from Federal to provincial and even Chatham-Kent's bylaws. There are many legislative requirements relating to the management of wastewater assets. Legislative requirements that impact the delivery of the wastewater service are outlined in **Table 4.1.1.**

Table 4.1.1: Legislative Requirements

Legislation	Requirement
Provincial Ontario Water Resources Act	Federal laws and regulations govern the construction, maintenance, and operation of this facility.
Provincial Policy Statement	Prioritization of new development on full urban services
Asset Management Planning Act O. Reg 588/17	Identifies the requirements for municipal asset management planning to assist municipalities to understand their infrastructure needs better and inform infrastructure planning and investment decisions
Wastewater Quality Management System (WWQMS)	Identifies CK PUC summary programs for maintenance, rehabilitation, and renewal of infrastructure and ensures that long-term forecasting of major infrastructure maintenance and renewal activities is. reviewed at least once every calendar year.
Municipal By-laws and CK PUC Policies	Various activities range from daily to monthly, quarterly, seasonal, annual, or as needed.

> **CK PUC has documented and implemented a Wastewater Quality Management System (WWQMS). Staff at the Chatham-Kent PUC are certified with the appropriate certification for each wastewater facility, and receive over 40 hours of training per year in their field, as mandated by the Ministry of the Environment Conservation and Parks (MECP)**

4.2 Customer Research and Expectations

The first DAMP is intended to provide a snapshot of the current level of service provided by CK PUC. Future consultations with the public and the wastewater customers must be undertaken before the MCK can adopt the planned level of service. Future iterations of the wastewater DAMP will involve customer consultation, focusing on service levels and associated costs. This approach aims to assist the Council and stakeholders in aligning the required level of service with potential service risks and consequences for customers' capacity and willingness to support the service financially.

4.3 Customer Values

Service levels are defined in three ways: customer values, customer levels of service and technical levels of service.

Customer Values indicate:

- What aspects of the service are essential to the customer?
- Whether they see value in what is currently provided
- the likely trend over time based on the current budget provision.

The wastewater service will undertake community consultation in 2025-2026 to better Identify customer values and expected trends in the planned budget and outcomes of the consultation. These values will be addressed in future iterations of this plan.

4.4 Customer Levels of Service

The Customer Levels of Service are considered in terms of:

Condition - How good is the service? …What is the condition or quality of the service?

Function - Is it suitable for its intended purpose …. Is it the exemplary service?
Capacity/Use - Is the service over- or underused? Do we need more or less of these assets?

In **Table 4.4.1**, under each of the service measure types (Condition, Function, Capacity/ Use), there is a summary of the performance measure being used, the current performance, and the expected performance based on the current budget allocation.

These measures are based on facts related to the service delivery outcome (e.g., the number of occasions when service is not available or the proportion of replacement value by condition percentages) to provide a balance in comparison to the customer's perception, which may be more subjective.

Further investigation will be necessary to ensure that customer service levels are regularly measured, allowing CK PUC to consider various options to meet the community's evolving needs and expectations. The goal is to consistently develop baseline community measurements and continue the process of creating trend analysis data that will inform future decisions and actions.

Table 4.4.1: Customer Level of Service Measure

Measure Type	Levels of Service	Performance Measure	Current Performance	Expected Trend Based on Planned Budget
Condition	Wastewater Services and infrastructure are expected to be in good condition	▪ Customer complaints per year ▪ Annual Survey feedback	TBD- 2025	TBD- 2025
Function	Wastewater System to function correctly with minimal backups	▪ Annual Survey feedback	8 Events	TBD- 2025
Capacity	Treatment facilities have sufficient capacity for current customers and future growth	▪ Monitoring of storage capacity threshold of treatment facilities	Very Satisfied	Maintain- Very satisfied

4.5 Technical Levels of Service

Technical levels of service describe how a service is performed from the provider's perspective. They are quantified using metrics that directly relate to an asset or service. However, these metrics are related to items that a customer is unlikely to be aware of. Technical measures relate to the activities and allocation of resources to best achieve the desired customer outcomes and demonstrate effective performance.

These represent lifecycle performance measures that gauge how the PUC intends to attain desired customer outcomes, showcasing effective performance, legislative compliance, and management. These metrics should illustrate the alignment of the Wastewater service delivery with customer values and act as potential levers to affect and influence Customer Levels of Service. CK PUC will track specific lifecycle activities to evidence service performance in meeting the desired service level and to shape customer perceptions of the services received from the assets.

Operational and technical performance metrics are essential for delivering customer value and influencing customer service levels. These technical measurements focus on resource allocation and activities optimized to achieve desired customer outcomes and demonstrate effective performance. Technical service measures are tied to activities and annual budgets, encompassing the following areas:

Acquisition – the activities that provide a higher level of service (e.g., installing a new wastewater treatment plant, replacing a 200mm pipe with a 600mm pipe) or introducing a new service that did not exist previously (e.g., installing a new sewer line).

Operation – the regular activities to provide services (e.g., cleaning, mowing grass, utilities, laboratory tests, inspections, etc.)

Maintenance – the activities necessary to maintain an asset in a state as near as practicable to its original service condition. Maintenance activities enable an asset to provide service for its planned life (e.g., repairing pipe breaks, building and structure repairs),

Renewal – the activities that return the service capability of an asset up to that which it had initially been provided (e.g., relining pipes to extend their lives, replacing a truck, and building replacement),

Service and asset management plan, implement, and control technical service levels to influence the service outcomes. **Table 4.5.2** shows the activities expected to be provided under the current 10-year planned budget allocation and the forecast activity requirements being recommended in this DAMP.

Table 4.5.2: Technical Level of Service

Lifecycle Activity	Level of Service Statement	Activity Measure	Current Performance*	Recommended Performance **
Acquisition	Ensure newly acquired assets conform to expected standards for condition, quality, resiliency and function	Staff inspections completed prior to assumption	Fully complied	Same as current
	Extension of new services into existing urban areas with private septic due to customer petition or environmental concerns	# of urban customers on private septic being transitioned to municipal system	TBD	TBD
Operation	Inspecting utility hole condition, conveyance pipe condition and function	Entire system inspected every 5 years (20% annually)	Fully complied	Maintain
	Ensure Wastewater assets are being inspected periodically.	Completed planned inspections	Fully complied	Maintain
		Budget	**$13,501,000**	**$13,690,000**
Maintenance	Facility preventative maintenance program to ensure the plant equipment functions as expected		Fully complied	Maintain
		Budget	**$1,367,000**	**$1,513,000**
Renewal	Update aging infrastructure based on recommendation within the Master Plan	Based on Age/ Repairs cost	Reactive	The Renewal activities we would like to do as per the Lifecycle Forecast
	Significant repairs designed to extend the life of the asset.	Describe the Measure being used for performance monitoring	The Renewal activities that can be done within the current Planned Budget restraints	The Renewal activities we would like to do as per the Lifecycle Forecast
		Budget	**$11,250,000**	**$26,466,000**

It is essential to regularly monitor service levels, as circumstances can and do change. Current performance is based on existing resource provision and work efficiency. It is acknowledged that changing circumstances, such as technological advancements and shifting customer priorities, will continue to evolve.

Proposed Level of Service

O.Reg 588/17 mandates that every municipality define its proposed level of service. The chart below illustrates the existing level of service compared to the proposed level. The planned budget reflects the funds currently available, while the required budget for the proposed level indicates whether an increase in funding is necessary to achieve the desired service level.

Table 4.5.3. Proposed Levels of Service

Level of Service Statement	Current LOS	Current Budget	Proposed LOS	Required to achieve the Proposed LOS
Chatham-Kent on average will maintain its wastewater vertical assets in **Good** conditions over the 10-year planning horizon.	Average conditions is **Good - Fair**	**$32.9 million** on average annually	Average condition is **Good**	**+ $10.3 million** annually on average for the life of the plan **(10 years)**
Chatham-Kent will achieve a Asset Renewal Funding Ratio (ARFR) of **25 %** over a 10-year planning horizon to ensure the stormwater system is sustainable.	**43 % (ARFR)**	**$9.4 million** on average annually (for renewal activities only)	**60 % (ARFR)**	**+ $9.6 million** annually on average for the life of the plan **(10 years)**

5.0 FUTURE DEMAND

5.1 Demand Drivers

Drivers affecting demand include factors such as population changes, regulations, demographic shifts, seasonal factors, vehicle ownership rates, consumer preferences and expectations, technological advancements, economic factors, agricultural practices, and environmental awareness. The MCK's objectives with respect to wastewater service are as follows:

A cost-effective and adequate sewage treatment is provided to support, enhance, and sustain existing and future residents and businesses in the Municipality.

Chatham-Kent's population is expected to grow to 116,848 by 2034 from 112,200 in 2024. PUC services 30,990 wastewater customers. The CKPUC considers the projected growth horizon, improvements to system reliability in response to climate change, operational efficiency, delivery and energy management, consolidation of operating systems to achieve optimization, managing effluent quality in accordance with current and potential future regulatory requirements, and adapting to a changing workforce environment.

5.2 Demand Forecasts

The current position and projections for demand drivers that may impact future service delivery and asset utilization have been identified and documented.

5.3 Demand Impact and Demand Management Plan

The impact of demand drivers that may affect future wastewater service and asset use is shown in **Table 5.3.1.**

Demand for new services will be managed through a combination of managing and upgrading existing assets, as well as providing new assets to meet demand. Demand management practices can include non-asset solutions, insuring against risks and managing failures. Further opportunities will be developed in future revisions of this DAMP.

Table 5.3.1: Demand Management Plan

Demand driver	Current Position	Projection	Impact on Services	Demand Management Plan
Population	112,200 (2024)	116,848 (2034)	Increase the wastewater infrastructure	Revise budgets, long-term financial plans, and Asset Management (AM) plans accordingly. Additional staff may be needed to ensure legislative compliance. Monitor changes and report to the council.
Legislative Demands from the Province	Fully complied	Complete adherence to all legislative demands	Several new demands from the Ministry may require an increase in budget and other	
Chatham Urban collection	WPCP Rated Capacity of 36,000 m3/day for 51,400 population	Population 55,333	Current demand uses 69% ADF Capacity of WPCP	
Ridgetown Urban Collection	WPCP Rated Capacity of 2,347 m3/day for 3,000 population	Population 3,067	Current demand uses 82% ADF Capacity of WPCP	
Wheatley Urban collection	WPCP Rated Capacity of 2,752 m3/day for 8,500 population	Population 9,033	Current demand uses 72% ADF Capacity of WPCP	
Wallaceburg Urban Collection	WPCP Rated Capacity of 10,800 m3/day for 10,600 population	Population 10,933	Current demand uses 67% ADF Capacity of WPCP	
Blenheim Urban collection	WPCP Rated Capacity of 4,045 m3/day for 4,600 population	Population 4,900	Current demand uses 54% ADF Capacity of WPCP	
Dresden Urban collection	WPCP Rated Capacity of 4,546 m3/day for 2,500 population	Population 2,700	Current demand uses 34% ADF Capacity of WPCP	
Tilbury Urban collection	WPCP Rated Capacity of 5,434 m3/day for 4,900 population	Population 5,033	Current demand uses 49% ADF Capacity of WPCP	

Merlin Lagoons	WPCP Rated Capacity of 464 m3/day for 800 population	Population 800	Current demand uses 39% ADF Capacity of WPCP	
Mitchell's Bay Lagoons	WPCP Rated Capacity of 509 m3/day for 400 population	Population 500	Current demand uses 33% ADF Capacity of WPCP	

The Municipality of Chatham-Kent has also initiated a Municipal Class Environmental Assessment Master Plan study to develop a strategy for Sanitary, Stormwater and Water servicing for the southwest area of Chatham (currently outside of the existing Chatham urban boundary) to address servicing requirements and future growth needs.

5.4
Asset Programs to Meet Demand

The new assets required to meet demand may be acquired, donated, or constructed. Acquiring new wastewater assets will commit CK PUC to ongoing operations, maintenance, and renewal costs for the period during which the service provided from the assets is required. These future costs are identified and considered in developing forecasts of future operations, maintenance, and renewal costs for inclusion in the long-term financial plan.

Ridgetown WPCP

6.0 RISK MANAGEMENT PLANNING

Risk Management is defined in ISO 31000:2018 as "coordinated activities to direct and control with regard to risk." The purpose of infrastructure risk management is to document the findings and recommendations resulting from the periodic identification, assessment, and treatment of risks associated with providing services from infrastructure, using the fundamentals of International Standard ISO 31000:2018, Risk Management – Principles and Guidelines.

CK PUC will develop and implement a formalized risk assessment process to identify risks associated with service delivery and to mitigate risks to tolerable levels.

The assessment will identify risks that will result in:

- loss or reduction in service
- personal injury
- environmental impacts
- a 'financial shock'
- reputational impacts
- other consequences

The risk assessment process identifies credible risks, the likelihood of the risk event occurring, and the consequences should the event occur. The risk assessment will also include the development of a risk rating, evaluation of the risks, and development of a risk treatment plan for those risks deemed unacceptable.

6.1 Critical Assets

Critical assets are defined as those that have a high consequence of failure, causing significant loss or reduction in service. Critical assets have been identified, along with their typical failure modes and the impact on service delivery, as summarized in **Table 6.1.1**. Failure modes may include physical failure, collapse, or interruption of essential services.

Table 6.1.1 Critical Assets

Critical Asset(s)	Failure Mode	Impact
Wastewater Treatment Plants	Physical failure	Environmental spill, human safety & Wastewater service network failure, reputational harm, increased costs
Sewer Pump stations	Physical failure	Environmental spill, human safety & Wastewater service network failure
Sewer Mains	Physical failure	Wastewater service network failure Public health & safety, Environmental impact
Gravity pipes	Physical failure	Environmental spill, human safety & Wastewater service network failure

By identifying critical assets and failure modes, an organization can ensure that investigative activities,

condition inspection programs, maintenance, and capital expenditure plans are targeted at these vital assets.

6.2 Risk Assessment

The risk management process used by MCK is an analysis and problem-solving technique designed to provide a logical framework for selecting response plans and management actions to protect the community against unacceptable risks. The process is based on the fundamentals of **International Standard ISO 31000:2018.**

The risk assessment process identifies credible risks, assesses the likelihood of the risk event occurring, determines the consequences should the event occur, develops a risk rating, evaluates the risk, and develops a risk treatment plan for non-acceptable risks.

An assessment of risks associated with service delivery will identify potential risks that may result in loss or reduction of service, personal injury, environmental impacts, financial shock, reputational damage, or other adverse consequences.

Critical risks are those assessed with 'Very High' (requiring immediate corrective action) and 'High' (requiring corrective action) risk ratings identified in the infrastructure risk management plan. **Table 6.2.1.** shows that the initial asset registry risk assessment for the DAMP has been completed. Future iterations of the risk assessment will include the residual risk and treatment costs associated with implementing the selected treatment plan. These critical risks and expenses must be reported to management and the council.

Table 6.2.1: Risks and Treatment Plans

Asset Providing the Service	What can Happen	Risk Rating	Possible Cause	Existing controls
Wastewater Treatment Plant Structures	Structural, mechanical, or electrical failure will lead to disruption in the treatment system. This can come in the form of effluent that does not meet regulatory levels, damages the environment, or causes damage to systems downstream.	H	Age, Severe weather impact, Capacity issue	Condition Assessments of Plants
Sewers	Main break: leading to infiltration of sewage into soil or on streets, backup to customers, overflows	H	Soil failure, excavation, pressure, corrosion	Localized relining program
Pump Stations	Pump station failure causes property damage from sewer backups or environmental damage from overflows.	H	Age, power irregularities that affect mechanical equipment, solids/rags/oil build up, concrete cracking, steel corrosion.	Weekly checks and periodic wet well cleaning
Valves	Damage, failure, locking in position	L	Corrosion of metals or buildup in valve mechanism	Valve exercising program
Mechanical Division Facility (Fleet)	Size and staff limitations - lack of bays. Loss of power.	L	Cooling and heating issues within the building, especially in summer.	Backup generator. Portable hoists are available in case we need to relocate to another building. Having mobile tech going to stations so there

				are fewer apparatuses onsite.
Fleet - Dump Truck	Truck in service and not available.	L	Reg scheduled maintenance (2-3 days on average)	Preventative maintenance and mandated checks.
SCADA	Failure of electrical systems that control treatment and collection systems would lead to mechanical process or chemical treatment failures.	L	Cyber Attack, out of calibration	Preventative maintenance and mandated checks.

6.3 Infrastructure Resilience Approach

The resilience of the CK PUC's critical infrastructure is vital to the ongoing provision of services to customers. To adapt to changing conditions, Chatham-Kent needs to understand its capacity to withstand a given level of stress or demand and respond to possible disruptions to ensure continuity of service.

Resilience recovery planning, financial capacity, climate change risk assessment and crisis leadership. Currently, CK PUC does not measure resilience in service delivery. This will be included in future iterations of the DAMP.

6.4 Service and Risk Trade-Offs

The decisions made in adopting this DAMP are based on the objective of achieving the optimal benefits from the available resources.

6.4.1 What Cannot Be Done

There are some operations and maintenance activities and capital projects that cannot be undertaken within the next 10 years. These include:

- Increase the levels of operation, maintenance, and renewal activities.
- Mitigate all risks.
- Ensure all reactive maintenance projects can be fully funded.
- Ensure that all future renewals outside of the planning period can be completed due to the scope of the plan being limited to a 10-year planning horizon.
- Fully fund capital upgrades and replacements.

6.4.2 Service Trade-Off

If there is forecasted work (operations, maintenance, renewal, acquisition, or disposal) that cannot be undertaken due to limited available resources, then this will result in service consequences for users. These service consequences could include:

- As the condition of buildings and infrastructure continue to deteriorate, it will result in a lower level of service.
- Risk of service interruption
- Increase in customer complaints.
- Limiting future development for future customers

6.4.3 Risk Trade-Off

The operations and maintenance activities, as well as capital projects that cannot be undertaken, may sustain or create risk consequences. These risk consequences include:

- Over the long term, without sufficient funding and as the condition of assets deteriorates, they may become unsafe.
- If buildings and land improvement assets do not meet current standards, the Municipality could be at risk of litigation should an incident occur.
- Financial shock of asset failure

These actions and expenditures are considered and included in the forecast costs and, where developed, the risk management plan.

7.0 Climate Change Adaptation

Climate change will have a significant impact on assets and the services they provide. In the context of the asset management planning process, climate change can be considered both a future demand and a risk. How climate change impacts assets will vary depending on the location and the type of services provided, as will how the CK PUC responds to and manages those impacts.

At a minimum, CK PUC will consider how to manage its existing assets.
Potential Impacts of Climate Change on the Region. The effects of climate change may
Have a significant impact on the assets CK manage and the services it provides. This can include:

- Impacting Asset Lifecycle Costs
- Affect the level of service that can be provided.
- Increase demand for services.
- Impact Risks involved with delivering services.

In the context of the asset management Planning process, climate change can be considered as both a future demand and a risk.

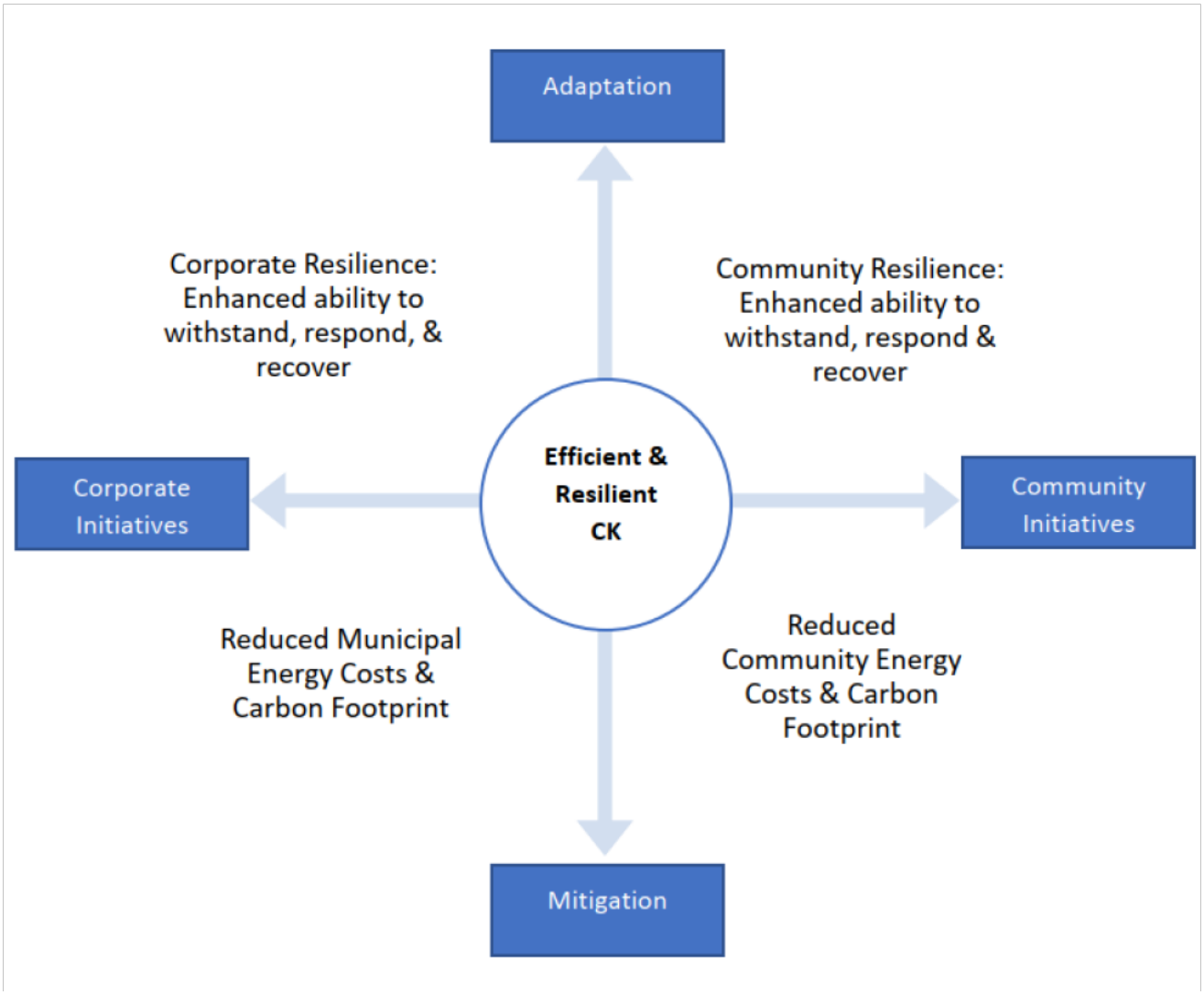
The impact of climate change may have a significant effect on the assets CK manage and the services it provides. In the context of the asset management Planning process, climate change can be considered as both a future demand and a risk.

The impact of climate change on assets will vary depending on location and the type of services provided, as well as the way in which CK PUC responds and manages those impacts. There have been many weather and climate-related impacts on the CK community,
including the following:

- Extended summer heat waves in 2017 and 2018
- Severe rainstorms of 2018 (and related flooding)
- Unseasonably wet spring and fall of 2019, which impacted crop production.
- Record-breaking water levels within river systems and the Great Lakes in 2019 and early 2020 led to significant erosion and flooding issues in the community. This included the closure of Erie Shore Drive, the Talbot Trail, and the Rose Beach Line, among others.

Recognizing these continuing climate change impacts, Council declared a climate emergency in Chatham-Kent on July 15, 2019, and directed municipal staff to develop a climate change action plan (CCAP) to reduce CK's contribution to climate change (known as climate mitigation) and to enhance the community's resiliency to climate change (known as climate adaptation).

The MCK is currently completing its CCAP, which will be presented to the Council and the public by the end of 2025. The CCAP actions given in the CCAP report document will inform the Climate Section of the DAMPs in 2025. The CCAP actions will also be presented within the departments responsible for their completion.



According to the Climate Atlas of Canada, historical climate patterns indicate that CK's climate has become hotter, wetter, and wilder over the past six decades. This trend is expected to continue into the future.

Hotter: Average annual temperatures have risen by 0.5°C and are expected to rise between 3.5 °C and 5.8 °C by the 2080s.

Wetter: Average annual precipitation has increased by 50 mm (2 inches) and is expected to grow by between 78 mm and 127 mm (3 to 5 inches) by the 2080s.

Wilder: Rainstorms have increased in frequency and severity, and seasonal precipitation patterns have undergone significant changes. This trend is expected to continue.

From 1983 to 2008, insurers spent an average of $400 million per year on catastrophic claims; since 2009, the yearly average has risen to almost $2 billion. These 'once in 100 years' events are happening more frequently and are becoming more severe and more costly." (Statistics Canada, 2024)

The risks and opportunities identified to date are shown in **Table 7.0.1.**

Wallaceburg WPCP

Table 7.0.1 Managing the Impact of Climate Change on Assets and Services

Climate Impact (Asset level or Service level)	Projected Position (in 10 years)	Potential Impact on Assets & Services	Climate Management Plan
Increase in extreme weather events, i.e., storms	Increase in flood frequency and severity	Impacts availability of technology at data center and municipal locations. Increased costs to procure data center services with increased power redundancy	Mitigate wastewater infiltration by active maintenance and repairs.
Increase in extreme weather events, i.e., storms	Increase in flood frequency and severity	Inability to use municipal locations due to damage to buildings or lack of essential services at locations	Mitigate wastewater infiltration by active maintenance and repairs.
Annual Precipitation (mm) increase	+45mm annually	An increase in severe storms will lead to higher lake water turbidity, which will reduce treatment capacity.	Mitigate wastewater infiltration by active maintenance and repairs.
Increase in extreme weather events	Increase in frequency and severity	pipe corrosion accelerates in warmer conditions.	Regularly monitor weather conditions and proactive maintenance.

The implications of climate change have a far-reaching impact on planning, design, construction, and management of both capital assets and wastewater sources. Changing weather patterns, increased frequency of extreme events, and fluctuating temperatures can significantly impact the life and efficiency of assets. For the CK PUC, these changes can bring about increased costs, compromised service delivery, and potential risks to public safety.

Therefore, the CK PUC must integrate climate change considerations into their decision-making processes for new capital assets and continue to manage their source water through conservation practices and protection measures to maintain a balanced water supply.

While sustainability has various definitions, from a Municipality's perspective of

> **The excessive flooding can result in unwanted Inflow and Infiltration impacting both the collection treatment systems. Overflows can result in unwanted sewage spills to the water bodies, while washouts at the treatment plants could result in a comprise to the effluent quality. Aside from the effluent quality, this may result in person hours to be diverted to address the issue.**

management of both water resources and protection and wastewater handling, including options for energy conservation and energy recovery, involves balancing today's. resource needs with those of the future to ensure that the objective is met.

Additionally, the way in which CK PUC constructs new assets should recognize the opportunity to build resilience against climate change impacts. Building resilience can have the following benefits:

Assets will withstand the effects of climate change:

- Services can be sustained.
- Assets that can endure may potentially lower the lifecycle cost and reduce their carbon footprint.

The impact of climate change on assets is a new and complex discussion, and further opportunities will be developed in future revisions of this DAMP.

8.0 FINANCIAL SUMMARY

8.1 Financial Sustainability and Projections

This section outlines the financial requirements derived from the data in the preceding sections of this DAMP. The financial forecasts will be refined through ongoing discussions about the desired service levels, as well as the maturation of asset management expertise within Chatham-Kent. It is crucial to align the budgeting process, the Long-Term Financial Plan, and the Detailed Asset Management Plans to ensure that all the CK PUC needs are addressed. At the same time, the municipality establishes a definitive financial strategy with measurable goals and targets.

Effective asset and financial management will enable the CK PUC to ensure that its services provide the appropriate level of support for the community to achieve its goals and objectives. Reporting to stakeholders on service and financial performance ensures the Municipality is transparently fulfilling its stewardship accountabilities. Long-term financial planning (LTFP) is critical for the CK PUC to ensure the network's lifecycle activities, such as renewals, operations, maintenance, and acquisitions, can occur at the optimal time.

Reporting on service and financial performance to stakeholders guarantees that the Municipality is fulfilling its stewardship responsibilities with transparency. Long-term financial planning (LTFP) is crucial for the CK PUC to ensure that asset network lifecycle activities, including renewals, operations, maintenance, and acquisitions, occur at optimal times.

8.1.1 Sustainability of service delivery

Two key indicators of sustainable service delivery are considered in the DAMP for this service area. The two indicators are the:

Asset Renewal Funding Ratio (proposed renewal budget for the next 10 years / proposed renewal outlays for the next 10 years shown in the DAMP)

Lifecycle Funding Ratio (proposed lifecycle budget for the following 10 years / proposed lifecycle outlays for the next 10 years shown in the DAMP)

Table 8.1 Financial Indicators

Type of Financial Indicators	Indicator	Explanation
Asset Renewal Ratio	**43%**	This ratio demonstrates the rate at which CK PUC renews its Wastewater assets.
Lifecycle Funding Ratio	**53%**	The % of funding allocated compared to what needs to be spent
Annual Infrastructure Gap	**$32.3 million**	The difference between what is being spent and what should be spent

Asset Renewal Funding Ratio (ARFR)- 43 %

The Asset Renewal Funding Ratio is an important indicator, illustrating that over the next 10 years, CK PUC has no major renewals planned within the current planning period for CK PUC. As wastewater asset information improves and time passes, future renewal requirements will arise. As the DAMP evolves, the planning horizon will extend from 10 years to 20 years, and at that time, significant renewal activities may be identified.

A high ARFR indicates that service levels are achievable; however, if expenditure is below this level, it suggests that the desired level of service is not feasible. Each year, the wastewater DAMP will be updated to acknowledge the financial realities of the available budget and how those realities will impact the current level of service set by the council.

Lower ARFR typically occurs due to:

- Chronic underinvestment
- A lack of permanent infrastructure funding from senior levels of government
- A freeze on funding allocations from senior levels of government
- Large spikes of growth throughout the years

The ARFR is considered a stewardship measure and serves as an indicator in determining.
Suppose Chatham-Kent is achieving intergenerational equity. Ensuring that sufficient financial resources are allocated to renewing assets is essential for achieving sustainability.
Funding the ARFR over time so the CK PUC can meet its financial target is essential to ensuring the service is considered sustainable.
If assets are not renewed at the appropriate time, it will inevitably require difficult trade-off choices that could include:

- A reduction in the level of service and availability of assets.
- Increased complaints and reduced customer satisfaction.
- Increased reactive maintenance and renewal costs; and,
- Damage to CK PUC's reputation and the risk of fines or legal costs

Future CK PUC DAMPs will align with the planned LTFP. This approach will enable staff
to devise options and strategies for addressing future long-term renewal rates challenges. CK PUC intends to reassess its renewal allocations once the full inventory has been verified and consolidated.

Lifecycle Funding Ratio – 10-year financial planning period - (LFR)

The current 10-year Lifecycle Funding Ratio is 53%.

This DAMP identifies the forecast operations, maintenance and renewal costs required.
To provide an agreed and affordable level of service to the community over 10 years. This includes input into 10-year financial and funding plans that aim to deliver the required services sustainably. This forecast work should be compared to the proposed budget over the first 10 years of the planning period to identify any funding shortfall.

The 10-year Lifecycle Financial Ratio evaluates the Planned Budget against the Lifecycle Forecast to ensure optimal operation, maintenance, and renewal of assets, aiming to deliver a consistent level of service over the 10-year planning period. As with the Asset Renewal Funding Ratio (ARFR), the ideal range for this ratio is between **90- 110%.** A ratio below this range indicates that the funding for assets is insufficient to fulfill the organization's commitments to risk management and service levels.

The forecasted operations, maintenance, and renewal costs over the 10-year planning period are **$68,715,000** on average per year. The proposed budget for operations, maintenance, and renewal funding is **$36,431,000** per year on average, indicating a **shortfall** of **$-32,284,000** per year over the 10-year planning horizon. This shows that **53%** of the forecasted costs required to provide the services documented in this DAMP are accounted for in the proposed budget and available reserves. Note that these calculations exclude acquired assets.

Funding an annual funding shortfall or funding 'gap' cannot be addressed immediately. The overall gap in funding for each of CK PUC's services will require vetting, planning, and resources to begin incorporating gap management into future budgets. This gap will need to be managed over time to reduce it sustainably and limit financial shock to customers.

Options for managing the gap include:

- **Financing strategies** – increased funding, grant opportunities, envelope funding for specific lifecycle activities, long-term debt utilization.
- **Adjustments to lifecycle activities** – increase or decrease maintenance or operations, adjust the frequency of renewals, extend the estimated service life, limit acquisitions, or dispose of underutilized assets. Influence level of service expectations or demand drivers.

These options, along with others, will enable the CK PUC to ensure that any gaps are managed appropriately and to achieve the level of service outcomes that customers desire. Providing sustainable services from infrastructure requires managing service levels, risks, forecasted outlays, and financing to accomplish a financial indicator of 90-110% for the first years of the Asset Management (AM) Plan and ideally over the 10-year life of the Long-Term Financial Plan.

Providing sustainable services from infrastructure requires managing service levels, risks, forecasted outlays, and financing to achieve a financial indicator of approximately 1.0 for the first years of the DAMP and ideally over the 10-year life of the Long-Term Financial Plan (LTFP).

8.2 Forecast Costs (Outlays) for the Long-Term Financial Plan

Table 8.2.1 shows the forecast costs (outlays) required for consideration in the 10-year long-term financial plan (LFTP).
Providing services in a financially sustainable manner requires a balance between the forecasted outlays needed to deliver the agreed-upon service levels and the planned budget allocations in the long-term financial plan.

The gap between the forecasted outlays and the amounts allocated in the financial plan indicates that further work is required to review service levels in the DAMP and/or to update the financial projections in the LTFP. The initial DAMP only attempts to quantify the financial gap for the service; plans will focus on the methods and strategies to manage that gap over time, aiming to achieve sustainable services and intergenerational equity.

PUC will manage any 'gap' by developing this DAMP to guide future service levels and resources required to provide these services in consultation
With the community.

Tilbury WPCP

Table 8.2.1: Forecast Costs (outlays) for the Long-Term Financial Plan 2025 - 2034

Year	Acquisition	Operation	Maintenance	Renewal	Disposal
2025	10,860,000	12,234,000	1,367,000	159,038,000	973,000
2026	23,295,000	12,548,000	1,396,000	14,506,000	1,029,000
2027	32,658,000	12,874,000	1,427,000	14,848,000	1,087,000
2028	19,197,000	13,193,000	1,458,000	10,438,000	1,578,000
2029	23,009,000	13,516,000	1,491,000	10,710,000	1,615,000
2030	30,186,000	13,841,000	1,525,000	14,120,000	1,282,000
2031	30,778,000	14,167,000	1,561,000	9,461,000	1,354,000
2032	35,645,000	14,495,000	1,598,000	9,467,000	1,493,000
2033	32,067,000	14,826,000	1,636,000	9,461,000	1,509,000
2034	32,769,000	15,194,000	1,676,000	12,615,000	1,593,000

8.3 Funding Strategy

The proposed funding for assets is outlined in the operational budget and 10-year
Capital budget. These operational and capital budgets determine how funding will be allocated. In contrast, the DAMP typically outlines how and when this will be spent, along with the associated service and risk implications. Future iterations of the DAMP will provide more detailed service delivery options and alternatives to optimize limited financial resources.

However, there is a lack of designated funds for the wastewater budget, resulting in an annual withdrawal from the reserve for planned lifecycle activities. It is recommended to review the reserve and its contributions once the Council approves the Level of Service to determine the appropriate yearly contributions and allocations for both operational and capital budgets.

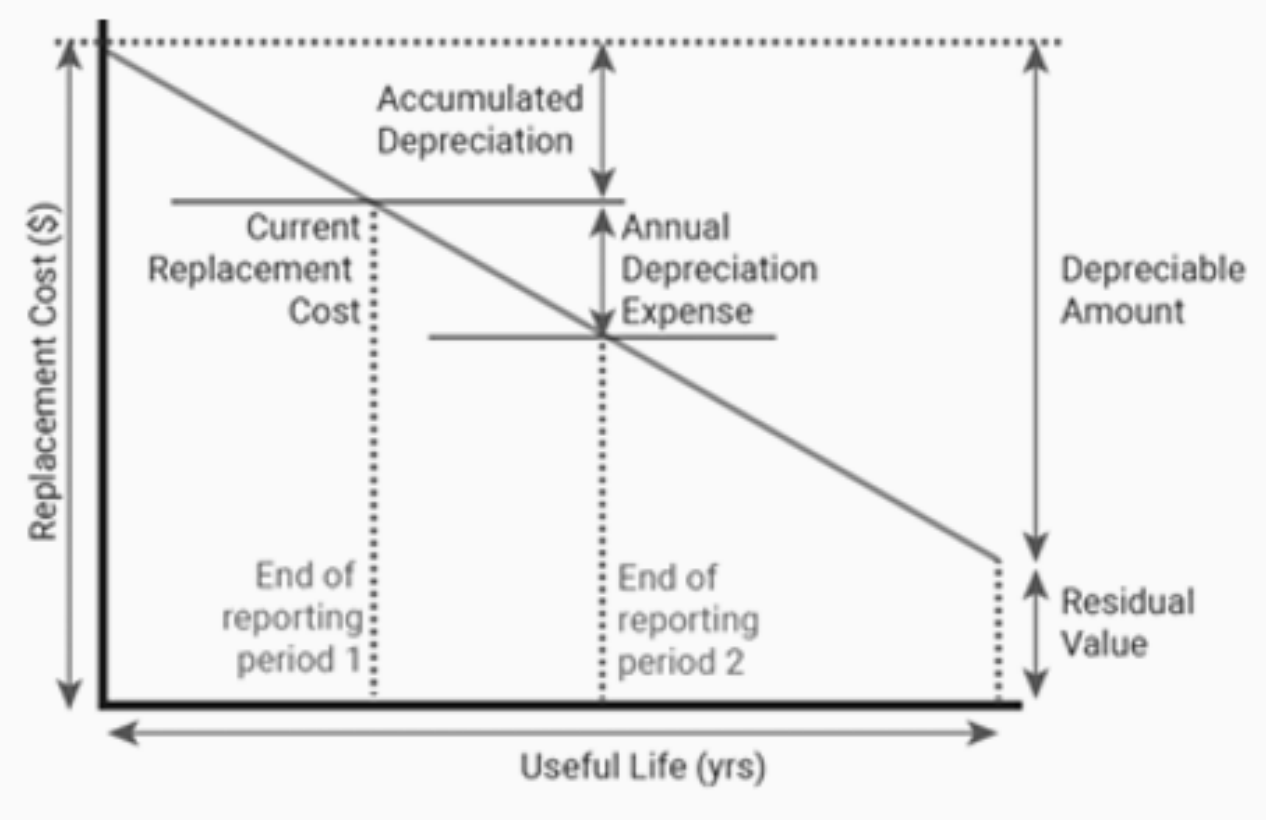
8.4 Valuation Forecasts

Asset values are forecast to increase as additional assets are added into service. As projections improve and can be validated with market pricing, the net values will increase significantly. Additional assets will increase the operations and maintenance needs in the long term. Additional assets will also require additional costs for future renewals. Any additional assets will also be added to future depreciation

forecasts. Any disposal of assets would decrease the operations and maintenance needs in the long term and would eliminate the inflated costs associated with renewal obligations. Currently, it is not possible to separate the disposal costs from the renewal or maintenance costs; however, this will be addressed in the next iteration of the plan.

8.4.1 Asset valuations

The best estimate of the value of assets included in this DAMP is shown below.



The assets are valued using the Current Replacement Cost (Market Price Index). **Table 8.4.2 Asset Valuation Table**

Assets Valuation	Financial Value
Replacement Cost (Gross)	$1,852,032,800
Depreciable Amount	$1,852,032,800
Current Replacement Cost	$728,571,000
Annual Depreciation Expense	$25,994,000

All figure values are shown in 2025-dollar values.

8.5 Key Assumptions Made in Financial Forecasts

In compiling this DAMP, it was necessary to make some assumptions. This section outlines the key assumptions underlying the development of this DAMP and aims to provide readers with an understanding of the level of confidence in the data supporting the financial forecasts.
Key assumptions made in this DAMP are:

- Assumptions were made regarding the existing and planned budget for maintenance, and renewal, using professional judgment.
- Omission of select disposal assets during this budget period; small projects will have a minor impact on disposal projections.
- Budgets have been allocated based on the best available data on assets.
- A **4%** annual inflationary amount has been applied to the operational and maintenance forecast to reflect the projections that costs will increase over time.

8.6 Forecast Reliability and Confidence

The forecast costs, proposed budgets, and valuation projections in this DAMP are based on the most current and reliable data available. For effective asset and fiscal management, the information must be current and accurate. Data confidence is classified on a **scale of A to E,** in accordance with **Table 8.6.1.**

Table 8.6.1: Data Confidence Grading System

Confidence Grade	Description
A. Very High	Data based on sound records, procedures, investigations, and analysis were correctly documented and agreed upon as the best method of assessment. The dataset is complete and estimated to be accurate ± 2%.
B. High	Data based on sound records, procedures, investigations, and analysis is documented correctly, but it has minor shortcomings; for example, some of the data is outdated, some documentation is missing, and/or reliance is placed on unconfirmed reports or some extrapolation. The dataset is complete and estimated to be accurate ± 10%.
C. Medium	Data based on sound records, procedures, investigations, and analysis that is incomplete, unsupported, or extrapolated from a limited sample for which grade A or B data are available. The dataset is substantially complete; however, up to 50% of the data is extrapolated, and the accuracy is estimated to be within ± 25%.
D. Low	The data is based on unconfirmed verbal reports and/or cursory inspections and analyses. The dataset may not be fully complete, and most data is estimated or extrapolated. Accuracy ± 40%.
E. Very Low	None or extraordinarily little data held.

Data Confidence

The estimated confidence level and reliability of the data used in this DAMP are shown in **Table 8.6.2**.

Data	Confidence Assessment	Comment
Demand drivers	Medium	No formal process for driver identification and prioritization.
Growth projections	High	Population-based growth data is extremely high; other drivers require further evelopment.
Acquisition forecast	Medium	Based on population growth projections and master plan.
Operations Forecast	Medium	Future costs are estimated based on existing budget allocations.
Maintenance Forecast	Medium	Future costs are extrapolated from existing budget allocations
Renewal forecast - Asset value	Medium	Market prices are used for asset values and updated annually.
Asset useful lives	Medium	Subject matter expert opinion based on Tangible Capital Assets, Continuous improvement required to ensure data is vetted.
Condition modeling	Low	No current formal method to determine condition
Disposal forecast	Medium	The formal process is to be determined.

Table 8.6.2: Data Confidence Assessment for Data used in DAMP

The estimated confidence level for and reliability of the data used in this DAMP is considered to be low to medium.

9.0 PLAN IMPROVEMENT AND MONITORING

9.1. Accounting and financial data source

This DAMP utilizes accounting and financial data. The sources of the data are:

- Chatham-Kent 2025 - 2027 Multi-Year Budget (Capital & Operating)
- Chatham-Kent PUC rate study
- Chatham-Kent PUC financial plan
- Internal Market Price Valuations
- AM Software Multi-Year Forecasting Models
- Council Reports
- Financial Exports from various systems

9.2. Asset Management Data Sources

This DAMP also utilizes asset management data. The sources of the data are:

- Asset Registers
- Insurance Data
- Tangible Capital Asset Data
- Building Condition Assessment Data
- Fleet Vehicle Data
- Subject Matter Expert Knowledge and Anecdotal Information

9.3. Continuous Improvement Plan

CK PUC must identify areas within the DAMP and within its planning processes that require future improvements to ensure effective asset management and informed decision-making. The tasks listed below are essential to improving the DAMP and the municipality's ability to make evidence-based and informed decisions. These improvements encompass enhanced lifecycle activities, improved financial planning, and plans to physically upgrade assets.

In future iterations of this DAMP, **Table 9.3.1** will highlight proposed improvement items that require further discussion and analysis to determine feasibility, resource requirements, and alignment with current work plans. The costs and resources needed to complete each of these tasks have not been included in the lifecycle models for data, and resource requirements would need to be reviewed for internal resource-driven projects. The improvement plan generated from this DAMP is shown in **Table 9.3.1.**

*ISO 55000 refers to this as the asset management System

Table 9.3.1: Continuous Improvement Plan

Task	Task	Responsibility	Resources Required	Timeline
1	Develop a Long-Term Financial Plan to connect the budgeting process to asset management planning.	Finance and Asset Management	$15,000 p.a., $60,000 Total, Internal Staff Time	2025-2029
2	Investigate Inflow and Infiltration sources in the collection system, identify these sources, and incorporate them into capital projects.	Asset Management, Engineering and Compliance	$100,000	5 Years
3	Conduct condition assessments on Wastewater Treatment Plants (WWTPs) to evaluate infrastructure integrity.	CK PUC, Asset Management	$250,000 Total, Internal Staff, Tender Process, Specialty Assessor	3 Years
4	Develop a plan for condition assessments of pump stations on a recurring cycle (e.g., every 10 years)	CK PUC, Asset Management	$11,000, Internal Staff Time	1 Year
5	Investigate sewer lateral repair and replacement procedures for private residences, clarifying municipal responsibilities.	CK PUC, Asset Management	$4,000 p.a., $8,000 Total, Internal Staff Time	2 Years
6	Enhance wastewater asset replacement cost estimations by aligning with current market prices rather than outdated models.	CK PUC, Asset Management	$30,000 p.a., $90,000 Total, Internal Staff Time	3 Years
7	Improve data quality, GIS accuracy, and inventory completeness.	PUC GIS, IES, Asset Management & Development Services	$5,000 Staff Time	2 Years

The improvements detailed above are designed to ensure that CK PUC can maintain a sustainable service over time. Some initiatives are required to meet legislative requirements, while others aim to improve service or data quality. Although not legislative, these initiatives are intended to find financial efficiencies or are necessary for other operational improvements.

Specific improvements can be made to staffing capacity and should be included in the work plan for the CK PUC upon council approval. Other initiatives necessitate resources beyond those allocated in the current

budget. Should resources be inadequate for the identified items, the strategy is to postpone them. Annually, the DAMP will be revised to align Continuous Improvement items with the budgetary opportunities and constraints.

9.4 Monitoring and Review Procedures

This DAMP will be reviewed during the annual budget planning process and revised to reflect any material changes in service levels, risks, forecast costs, and proposed budgets resulting from budget decisions. The DAMP will be reviewed and updated annually to ensure it accurately represents the current service level, asset values, forecasted operations, maintenance, renewals, acquisition, and asset disposal costs, as well as planned budgets. These forecast costs and proposed budget are incorporated into the LTFP or will be incorporated into the LTFP once completed.

The DAMP has a maximum life of 1 year and will be updated annually. This plan will undergo a comprehensive revision and update in 2027 to ensure the CK PUC is prepared for the 2028 four-year budget process.

9.5 Performance Measures

The effectiveness of this DAMP can be measured in the following ways:

1. The degree to which the required forecast costs are identified in this DAMP are incorporated into the long-term financial plan.
2. The degree to which the 1–5-year detailed works programs, budgets, business plans and corporate structures consider the ‘global’ work program trends provided by the DAMP.
3. The degree to which existing and projected service levels, service consequences, risks, and residual risks are incorporated into the Strategic Planning documents and associated plans.
4. The Asset Renewal Funding Ratio achieves the Organizational target, which is often 90–100%.

10. APPENDICES

Appendix A- Mandatory O.Reg. 588/17 Community Levels of Service

1. **Description of the frequency and volume of overflow in combined sewers in the municipal wastewater system that occur in habitable areas or beaches**

Chatham Pump Station 5 on West end 2nd Street had 4 overflow events

2. **Description of how stormwater can enter sanitary sewers in the municipal wastewater system, causing sewage to overflow into streets or back up into homes.**

During rain events, stormwater can infiltrate the sanitary sewer system through combined sewers and residential connections. Some residents have combined drainage systems that direct storm drains and sump pumps into hygienic drains. When stormwater and sanitary flows exceed the sewer's capacity or when pumps fail or lose power, this can lead to overflowing into streets and backups into homes.

Infiltration and inflow from defects, leaking joints, cracked or compromised sewer mains, root infiltration into the pipes, and compromised maintenance holes and maintenance hole covers. High river levels, high water table levels, and ice over snow are also contributing factors to unwanted infiltration and inflow.

3. **Description of how sanitary sewers in the municipal wastewater system are designed to be resilient to avoid events described above**

Sanitary sewers are designed for resilience by incorporating features that manage peak flows, prevent overflows, and minimize the impact of stormwater and groundwater infiltration.

- **Design for Peak Flows**: Sanitary sewer systems are designed to manage not only average sewage flows but also peak flows, which occur during certain times of the day or heavy rainfall events.
- **Sizing Pipes Appropriately**: Pipe sizes are determined based on these peak flow calculations to ensure the system can effectively transport the wastewater.
- **Infiltration and Inflow (I/I) Management**: Sanitary sewers are designed to minimize the entry of extraneous water, such as groundwater and stormwater, which can increase the overall flow and potentially overwhelm the system.
- **Preventing Overflows and Backups**: Combined sewer systems, which carry both sanitary sewage and stormwater, often have overflow structures designed to release excess flow during heavy rainfall events, thereby preventing backups into homes and businesses.

- **Storage Capacity**: Some systems incorporate storage tanks or tunnels (CK PUC does not utilize these) to temporarily store excess wastewater, allowing for a more gradual release into treatment plants during periods of high flow.

- **Pumping Stations**: Pumping stations are used to lift wastewater to higher elevations, ensuring gravity flow through the system and preventing backups.

- **Backup Power**: Pumping stations and other critical infrastructure should be equipped with emergency stand-by generators and backup power sources to ensure continued operation during power outages.

- **Separate Stormwater Systems**: In some municipalities and systems, stormwater is managed separately from sanitary sewage, thereby reducing the risk of combined sewer overflows and improving water quality.

- **Sustainable Land Use Planning**: Implementing appropriate land use planning and sustainable landscape design can help mitigate stormwater runoff and its impact on sewer systems.

- **Green Infrastructure:** Green infrastructure, such as green roofs, permeable pavements, and rain gardens, can help manage stormwater runoff at the source, reducing the overall volume of water entering sewer systems.

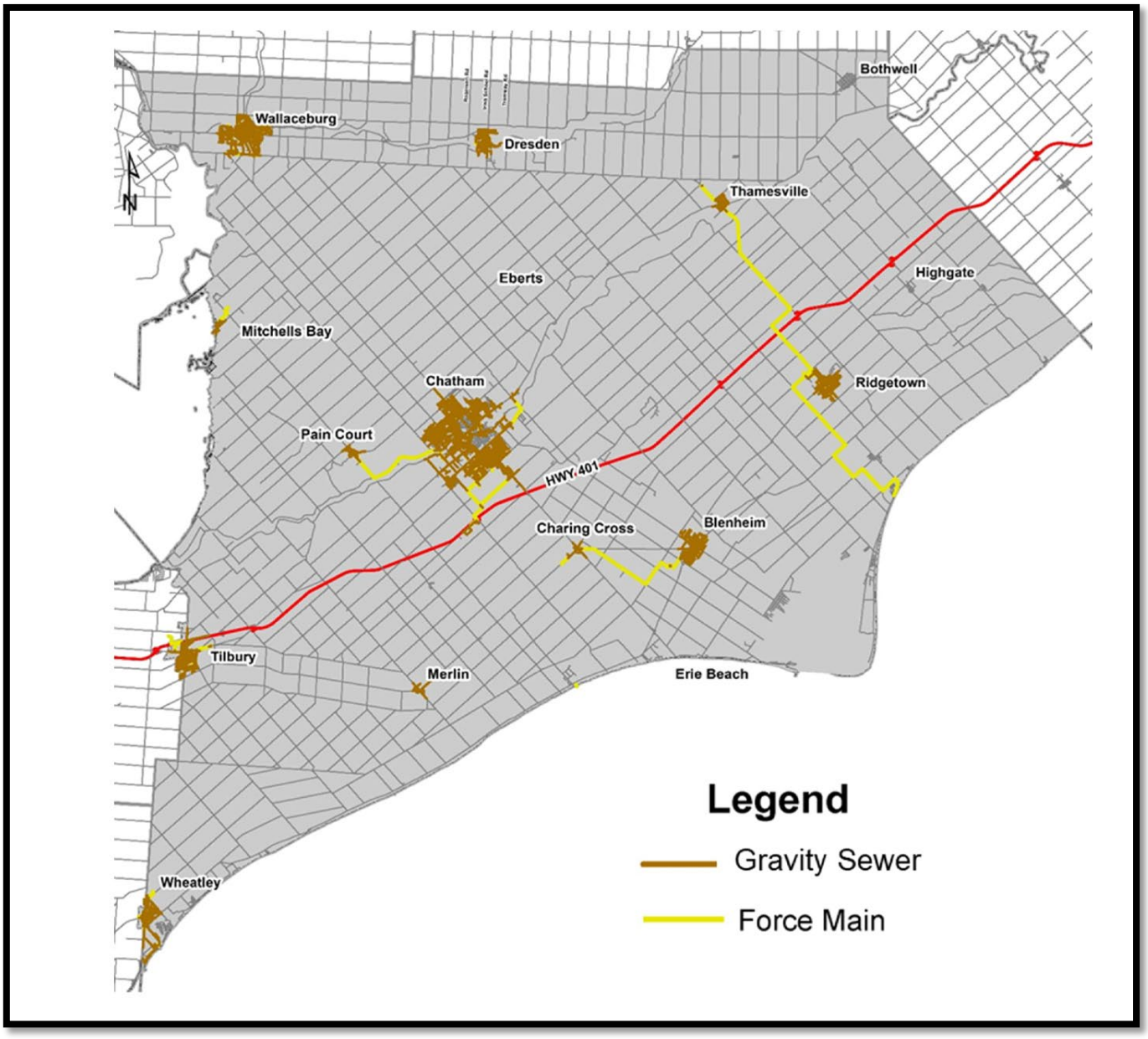
- **Infiltration Reduction Programs:** These programs are designed to address and reduce the leakage of clean water into underground sewers, ensuring that sewers have sufficient capacity to absorb excess water during heavy storms.

4. **Description of the effluent that is discharged from sewage treatment plants in the municipal wastewater system**

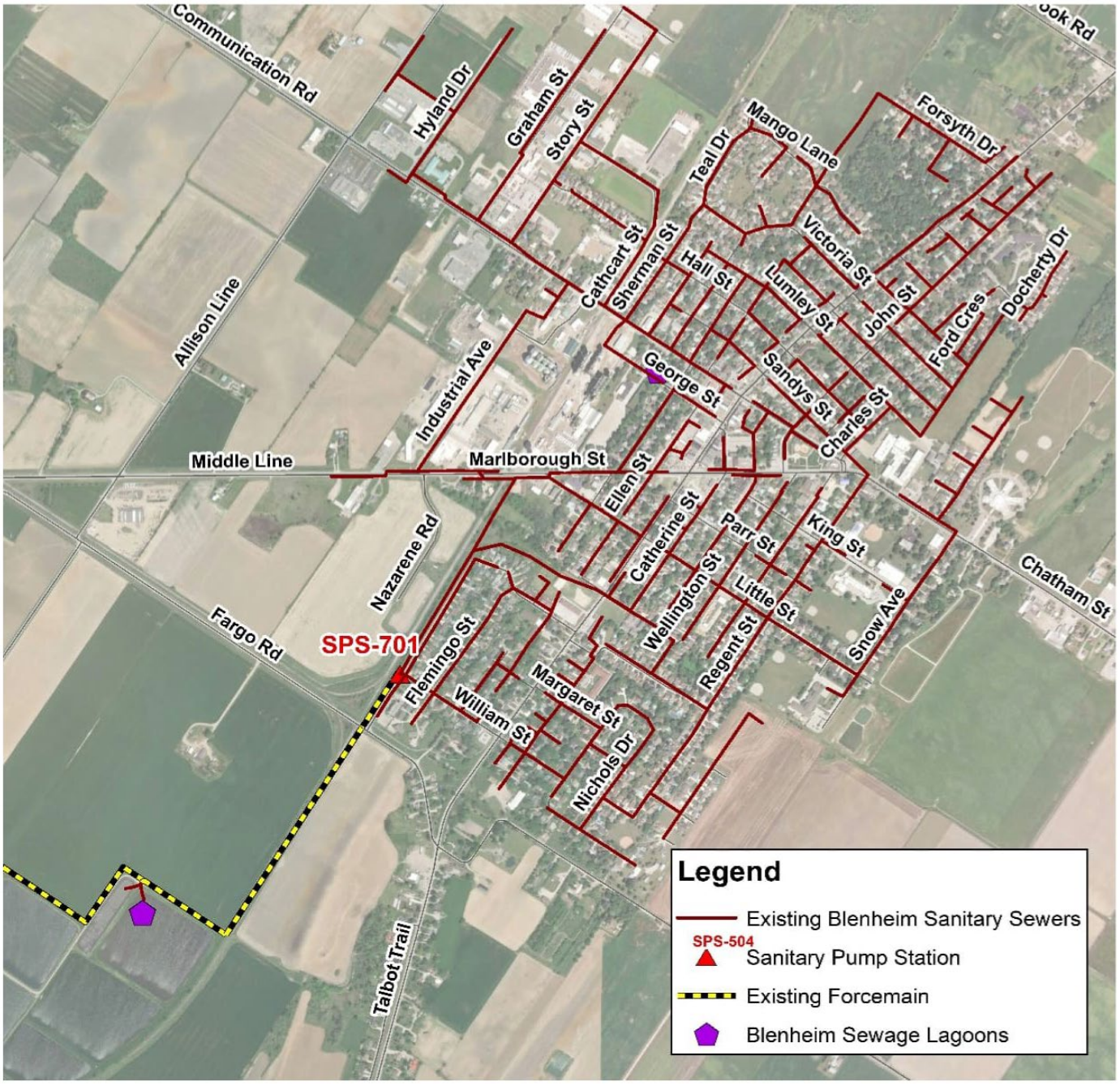
CK PUC Wastewater effluent meets and exceeds all prescribed provincial and federal effluent regulatory and standard limits by reducing pollutants and contaminants, thereby protecting human health, preserving cyclical water use, protecting aquatic ecosystems, and maintaining the quality of water resources, making them suitable for drinking, recreation, and other uses.

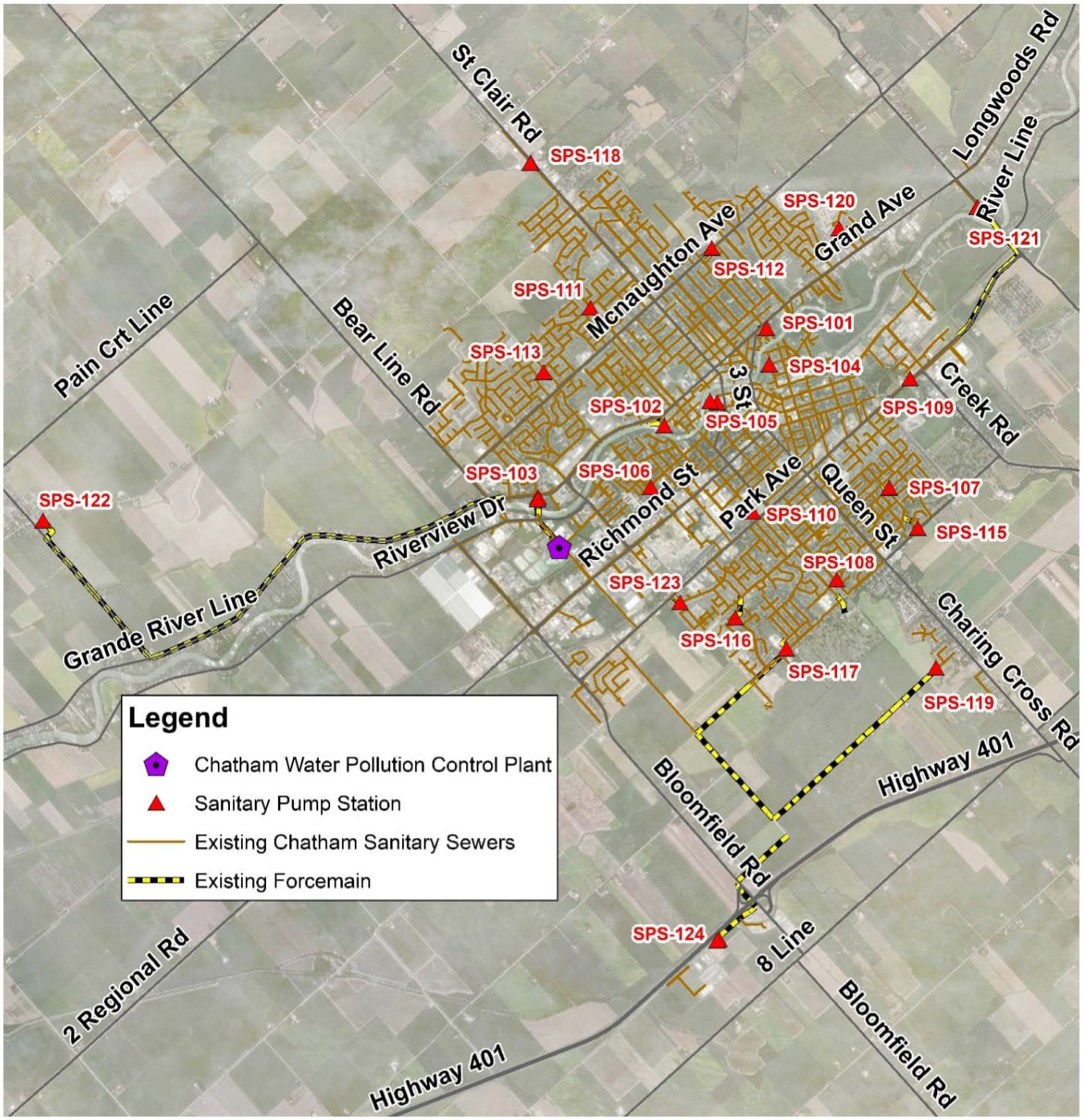
Appendix B- Wastewater Collection Area Maps

Map 1: Chatham -Kent Wastewater Collection Area



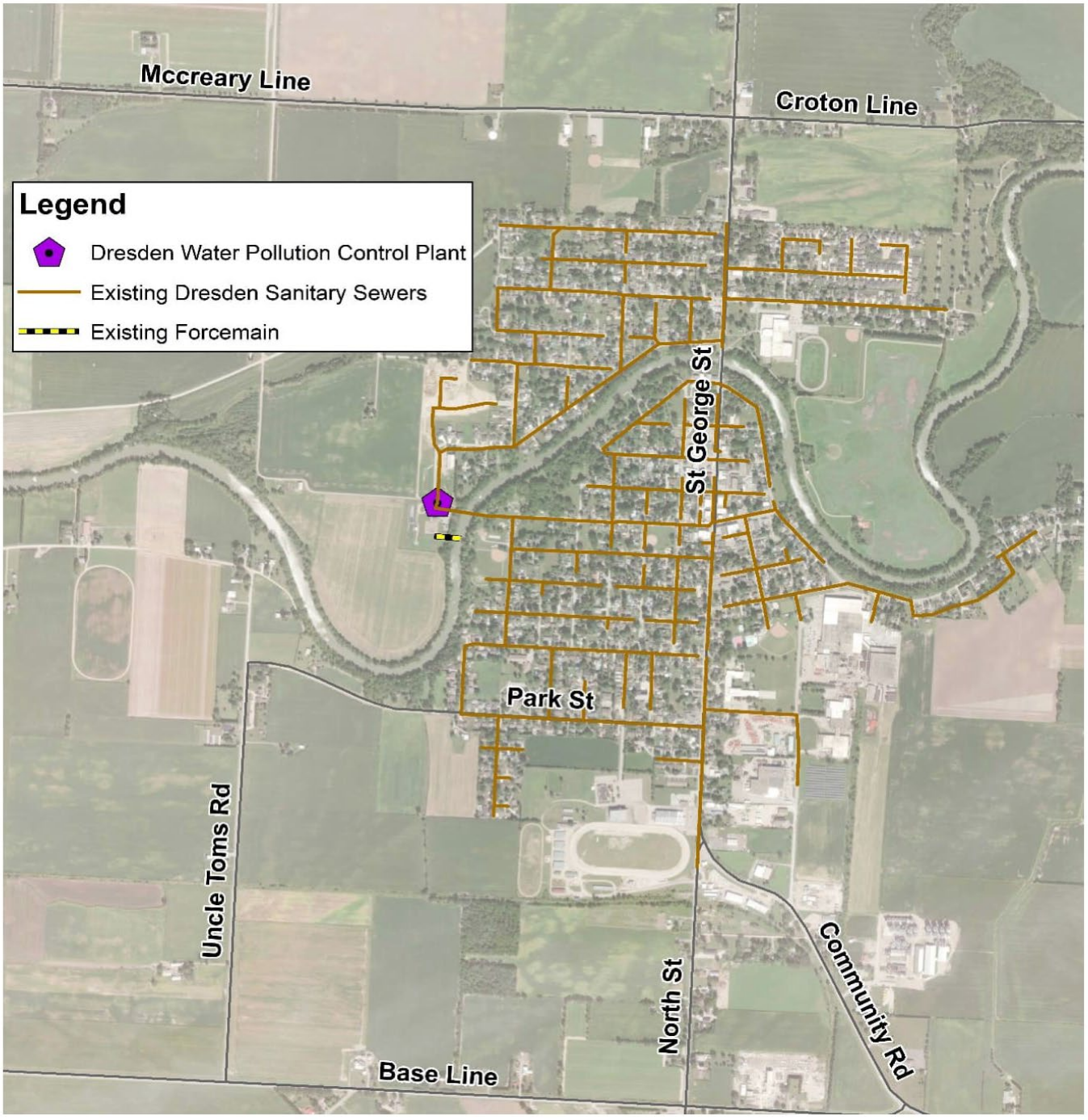
Map 2: Blenheim Wastewater Collection Area





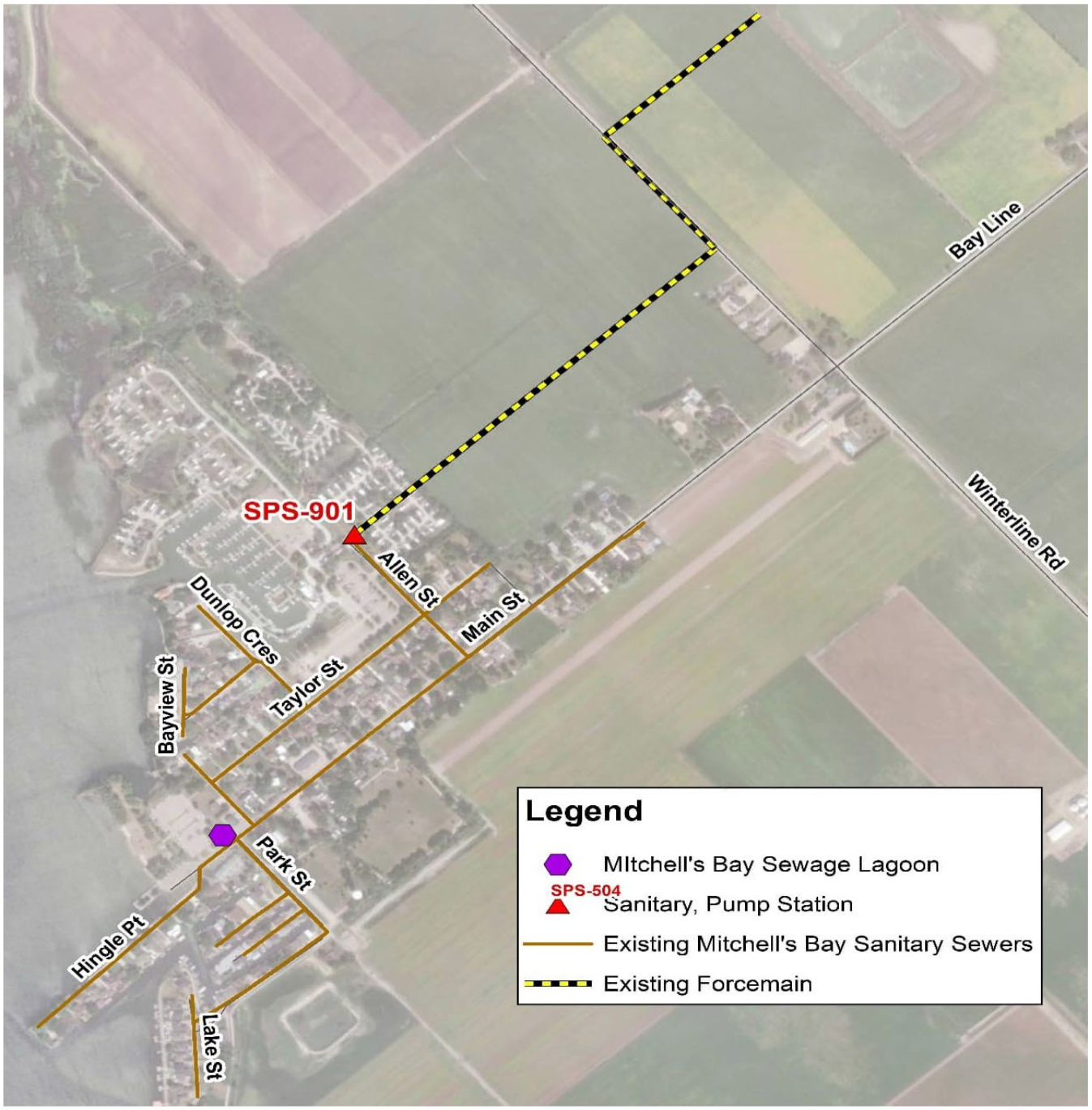
Map 3: Chatham Wastewater Collection Area

Map 4: Dresden Wastewater Collection Area

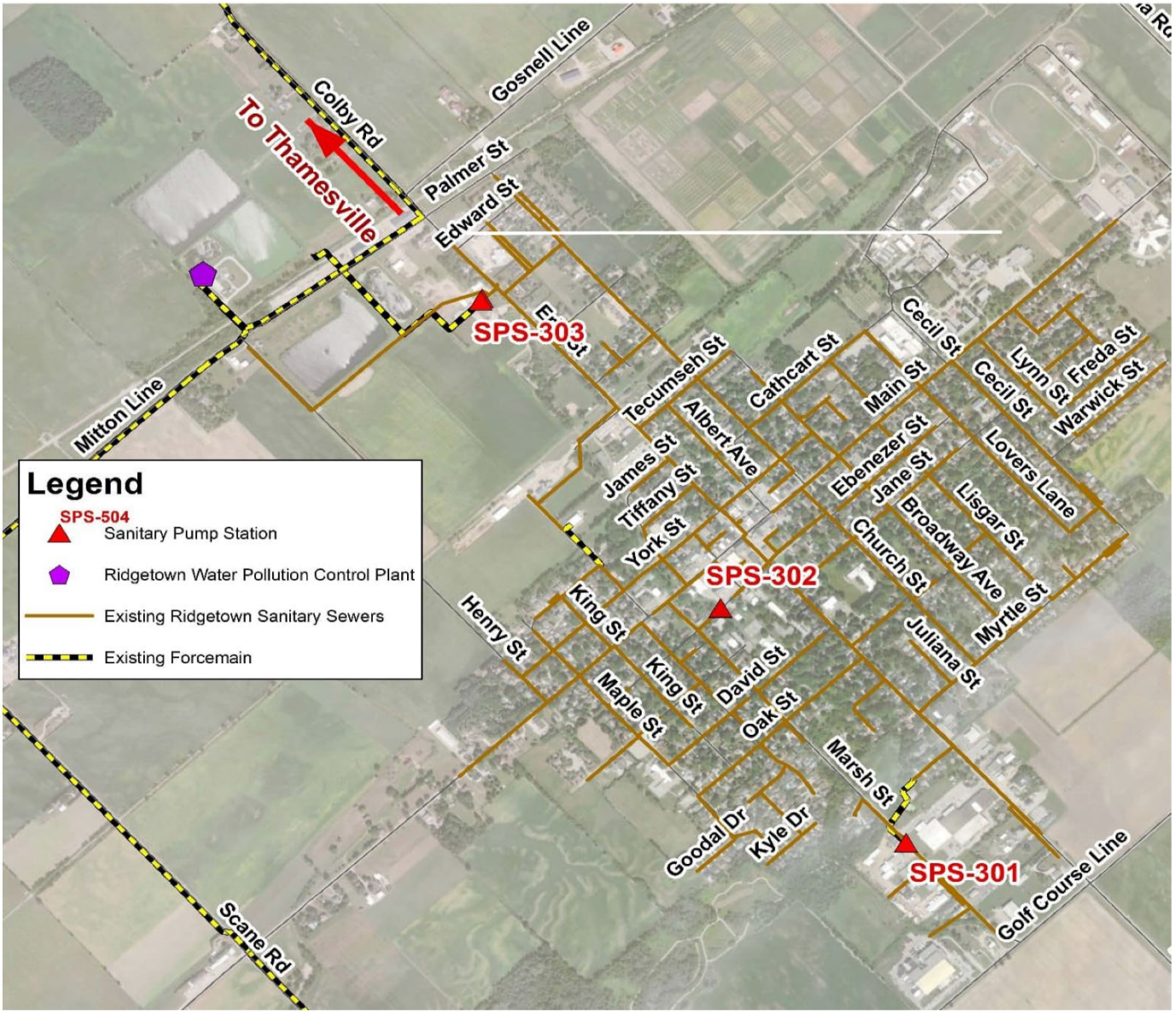


Map 5: Merlin Wastewater Collection Area

Map 6: Mitchell's Bay Wastewater Collection Area

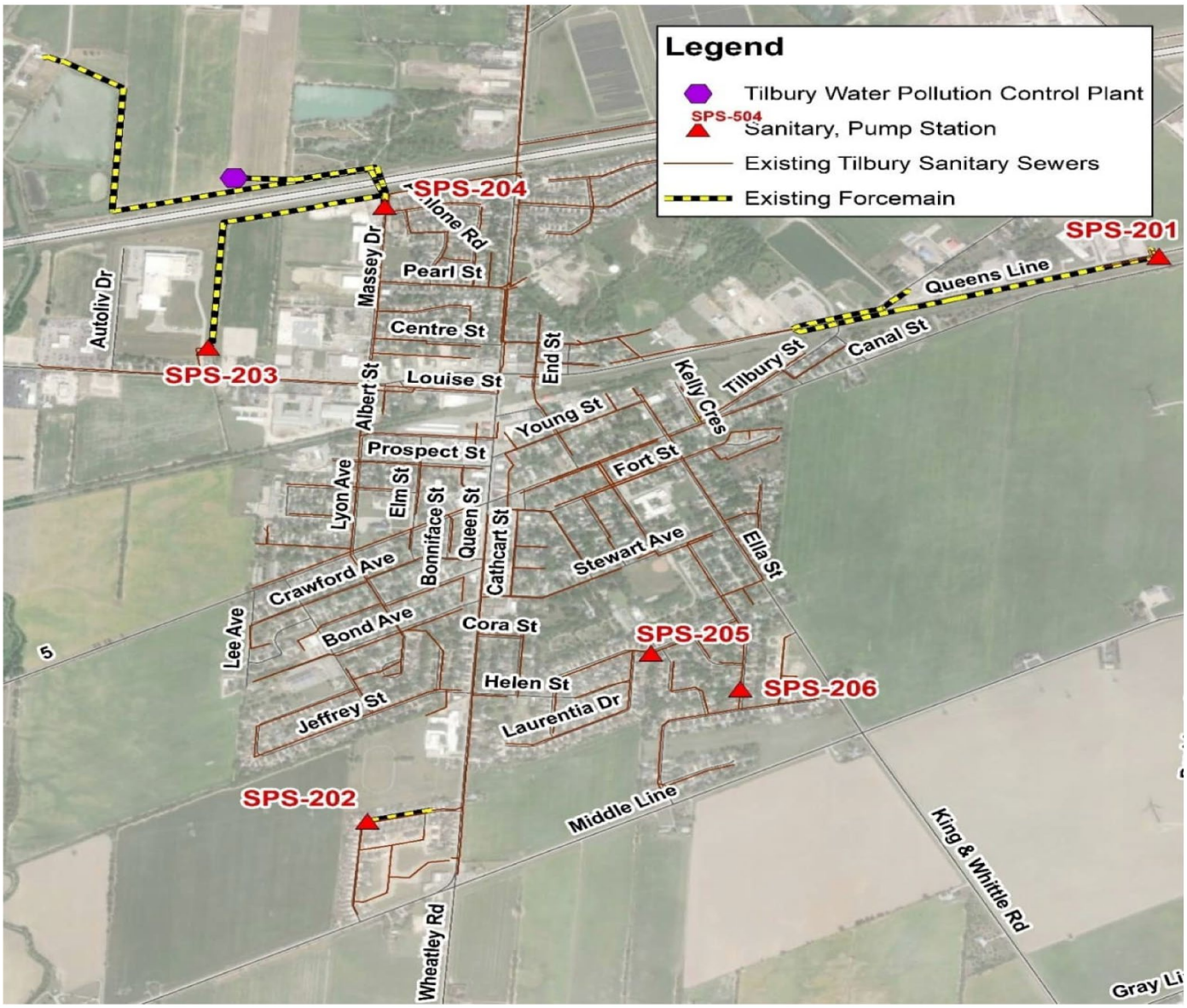


Map 7: Ridgetown Wastewater Collection Area

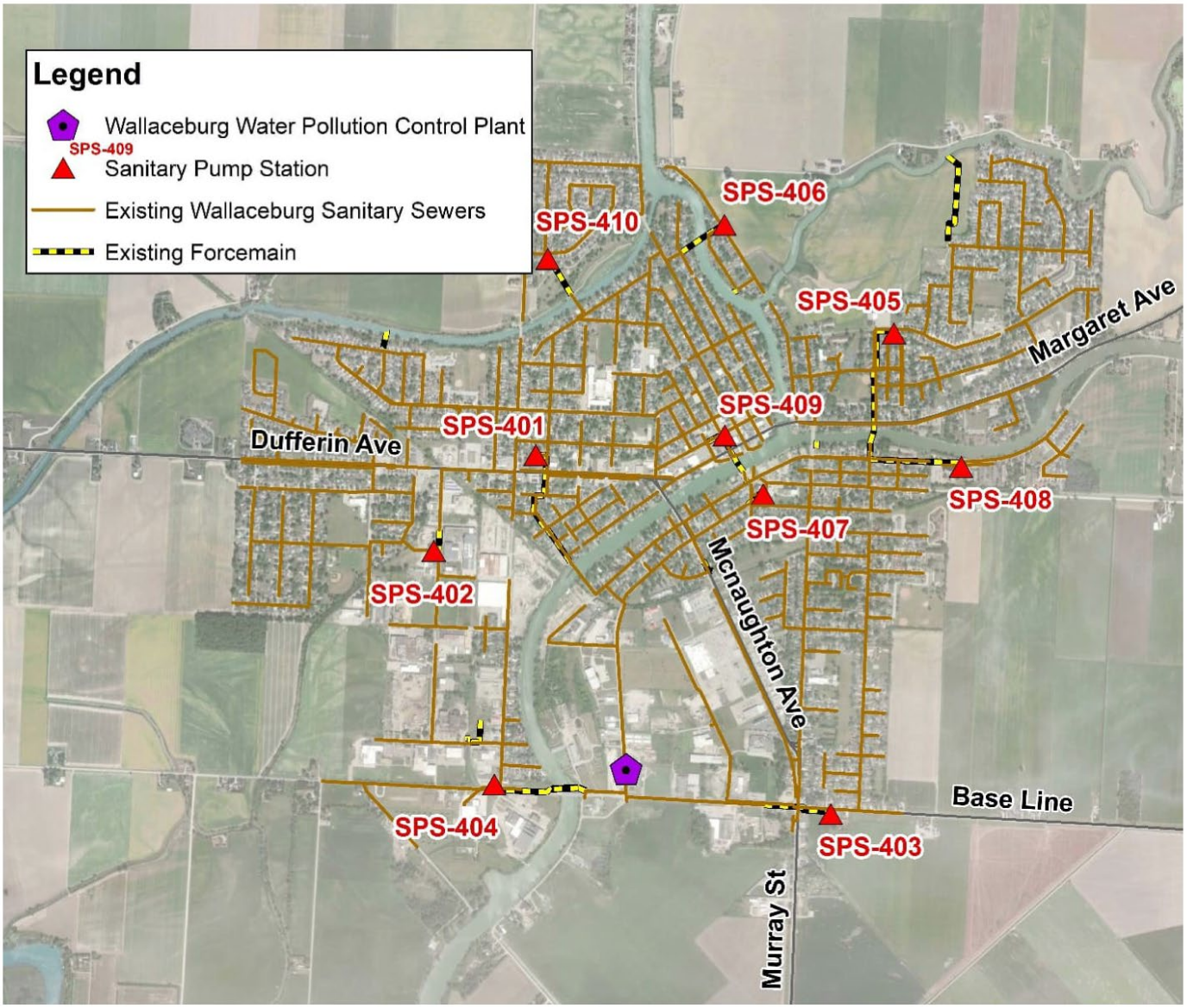


Map 8: Thamesville Wastewater Collection Area

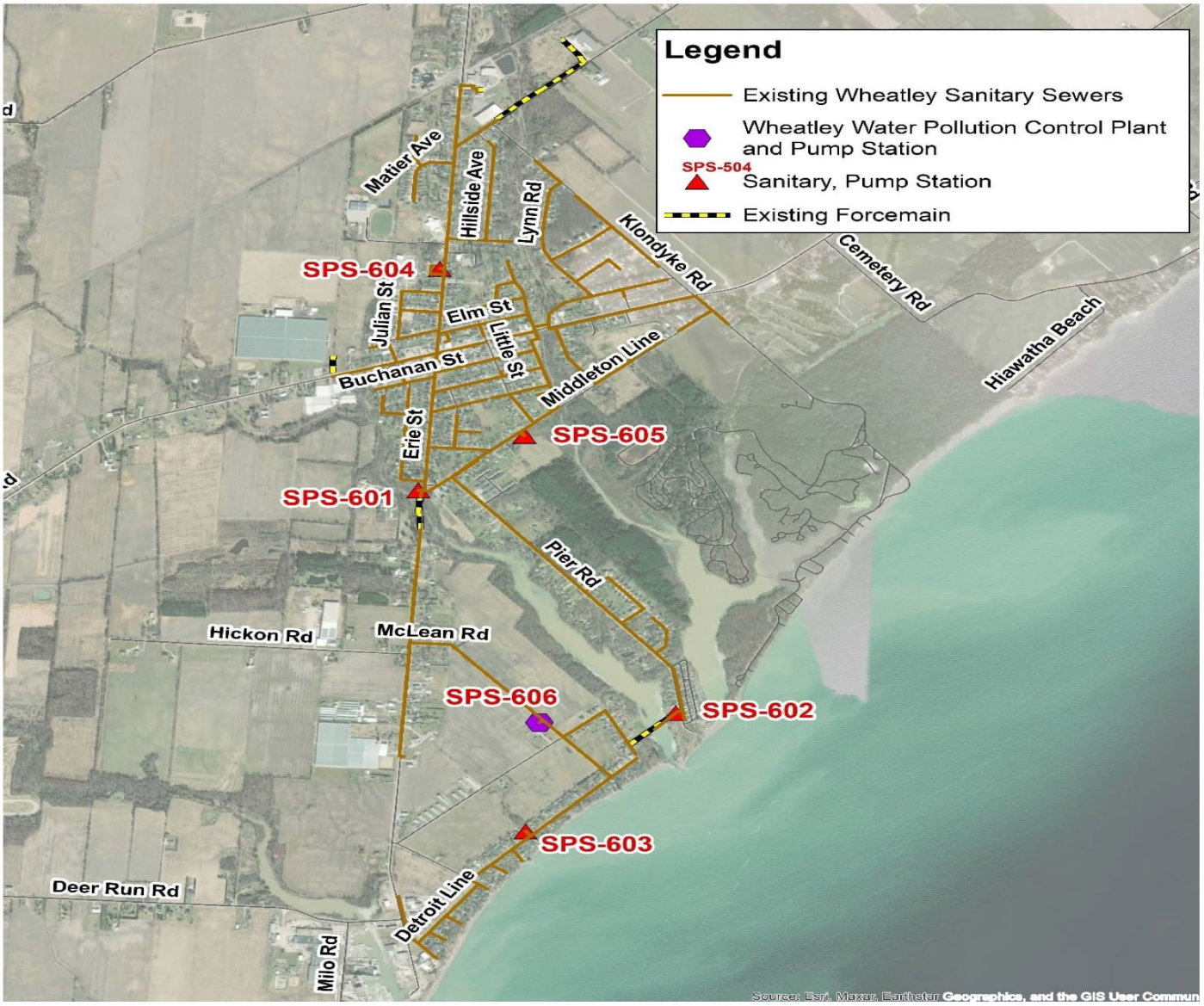
Map 9: Tilbury Wastewater Collection Area



Map 10: Wallaceburg Wastewater Collection Area



Map 11: Wheatley Wastewater Collection Area



Document Control

Rev No.	Date	Revision Details	Author	Reviewer	Approver
1	March 2025	Rev 1	Satyam C		