City of Guelph

Water and Wastewater Servicing Master Plan

Volume II – Technical Memorandum 2: Model Assessment and Software Recommendation

February 2023

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Making a Difference

To:	**Colleen Gammie, P.Eng**	Company:	**City of Guelph**
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From:	**Sam Ziemann, P.Eng**	Project Ref. #:	**75-41-191370**
Copy:		Date:	**February 2, 2023**
Subject:	**TM#2 Model Assessment and Software Recommendation**		

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City of Guelph
Water and Wastewater Servicing Master Plan

TM#2 Model Assessment and Software Recommendation

C3 WATER INC.
STANTEC CONSULTING LTD.

February 2, 2023

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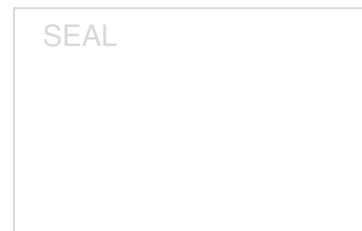| VERSION	DATE	DESCRIPTION OF REVISIONS	REVISED BY	REVIEWED BY
1	March 23, 2020	First Draft	Michelle Scott, Marc Telmosse	Sam Ziemann, Dave Eadie, Arun Hindupur, Colleen Gammie
2	February 2, 2023	Final	Michelle Scott, Marc Telmosse	Sam Ziemann, Dave Eadie

SIGN OFF

This document, entitled "*TM#2 Model Assessment and Software Recommendation*", was prepared by C3 Water Inc. (C3W) and Stantec Consulting Ltd. (Stantec) for the **City of Guelph.**

C3W and Stantec certify that the information contained in this report is accurate, complete and in accordance to the terms of our engagement. This assessment is based, in part, on information provided by others. Unless specifically noted, C3W and Stantec have assumed that this information is correct, and has relied on it in the development of conclusions.

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DATE: February 2, 2023

SEAL
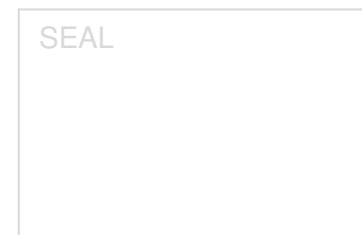
Prepared by: **Sam Ziemann, P.Eng, President**

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1.0   INTRODUCTION

Hydraulic models are analytical tools used to assist the planning, assessment, design and operation of water distribution and wastewater collection systems. For the City of Guelph (City), hydraulic modelling tools are not new to the organization. The City currently uses Innovyze InfoWater modelling software for its water supply and distribution system. The City also has a license for IWLive which is an InfoWater add-on for real-time modelling and has an InfoWater add-on tool Unidirectional Flushing (UDF), although, these tools are not currently being used. A variety of software systems are used on a project-by-project basis for wastewater modelling including InfoSWMM, PCSWMM and InfoWorks ICM. The City currently only owns a license for InfoSWMM.

The purpose of this technical memorandum (TM) is to assess select modelling software platforms for both water and wastewater servicing, and to provide recommendation for preferred software that best meet the needs of the City over the long-term resulting in consistency in future application. The modelling software assessed are summarized in Table 1.1 below.

Table 1.1 Models under Consideration

Vendor	Contact(s)	Software	Type
Bentley Systems, Inc.	Bryan Martinez Product Sales Representative Mike Rosh Water Solutions Consultant Bentley Systems, Incorporated 685 Stockton Drive Exton, PA 19341 United States Tel: (610) 321-6453 Email: Mike.Rosh@bentley.com	WaterGEMS	Potable Water
		SewerGEMS	Wastewater
Innovyze	Christopher W. Baxter, Ph.D. President HYDRANNT Consulting Inc. Suite 108, 2133-2850 Shaughnessy St. Port Coquitlam, BC V3C 6K5 Tel: (604) 639-7167 Email: cwbaxter@hydrannt.com	InfoWorks WS Pro	Potable Water
		InfoWater Pro	Potable Water
		InfoSWMM Suite	Wastewater
		InfoWorks ICM	Wastewater
DHI Water & Environment Inc.	Pat Delaney President DHI Water & Environment Inc. 423 King St E Cambridge, ON N3H 3M9 Email: pad@dhigroup.com	MIKE Urban	Potable Water & Wastewater
CHI Water	Rob James, B.Sc., P.Eng. President Computational Hydraulics International (CHI) 202-147 Wyndham St. N. Guelph, ON N1H 4E9 Email: info@chiwater.com	PCSWMM	Potable Water & Wastewater

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2.0   WATER MODEL

2.1   Water Hydraulic Models

The hydraulic modelling needs identified by the City, were used to shortlist industry accepted water modelling software. Table 1.1 provides a summary of the software under consideration. The evaluated water modelling software packages are the following:

1. WaterGEMS
2. InfoWorks WS Pro
3. InfoWater Pro
4. MIKE Urban
5. PCSWMM

The City requires that the hydraulic model is GIS based and can be used as an asset management, infrastructure planning and operational tool. It is important to note that all software reviewed meets the basic analytical needs of the City. Therefore, the evaluation process requires a qualitative approach to identify factors that differentiate one package from the other. Some decisions are less tangible where users will have different opinions which need to be considered.

2.2   Water Hydraulic Model Evaluation

The following section presents an evaluation of the hydraulic models considered for potable water. Hydraulic model recommendations are made based on results of the evaluation and a comparison of software features.

2.2.1   Evaluation Criteria

Table 2.1 presents the criteria used to compare the different software packages.

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Table 2.1 Water Model Evaluation Criteria

Criteria	Description
Functionality	• *Data exchange between model and GIS* • *Compare updated GIS with model data* • *Model results / GIS mapping capabilities* • *Scenario Management* • *AMI/AMR Integration* • *Version Control* • *SCADA Integration* • *Asset Management Integration* • *Comparing Scenarios* • *Real-Time Control Capability* • *HGL Comparison* • *Data exchange between model and Excel* • *Model Validation and Error Check* • *Group Editing* • *Pressure Zone Delineation/Design* • *System Curve Development* • *Hazen-Williams vs. Darcy Weisbach*
User Preference	• *Ease of use* • *Workspace display* • *Standalone or ArcMap Needed*
Technical Support	• *Software Support* • *Software Sustainability* • *Model Documentation* • *Troubleshoot support* • *Training*
Cost	• *Initial and ongoing maintenance costs (10-year life cycle).*

2.2.1.1   Long-Term Goals

The model evaluation considers not only the current modelling needs of the City but also the long-term modelling goals. Long term goals include the following:

1. Implementation and maintenance of a real-time modeling tool.

2. Ongoing online model accuracy validation tool.

3. Create an accurate chlorine residual model.

4. Energy consumption model for energy optimization.

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2.2.2   Evaluation

2.2.2.1   Functionalities

All platforms considered must integrate with GIS. The purpose of the integration is that water models can be constructed and/or updated directly from an existing GIS database and have the ability to generate contour mapping, graphs and tables of results for presentation purposes.

WaterGEMS can either be used as a standalone software or within ArcGIS. If using the standalone software, the Model Building tool can be used to exchange data between the model and GIS. InfoWater Pro is based in an ArcGIS Pro platform and is able to exchange information between GIS and the modelling software and report on modelling or GIS information through ArcGIS Pro. Data can be exchanged between GIS and InfoWorks WS Pro using the Open Data Import Centre. Using MIKE Urban, the entire network can be uploaded to ArcGIS Pro where data can be manipulated and processed and then imported back into the MIKE URBAN+ database. The PCSWMM platform allows GIS integration for both model building and for background layers.

InfoWater & WaterGEMS use modified versions of the EPANET solver to add new features, such as variable speed pumps (VSP) and float/altitude valves, while PCSWMM uses the original EPANET solver. Float/attitude valves can be mimicked using EPANET simple controls while using variable speed pumps have no direct equivalent in the original solver. Workarounds such as pumping at a higher head and using a pressure reducing valve (PRV) directly downstream to maintain a set pressure are available, however, this will cause incorrect power use calculations. CHI has stated that VSP will most likely be included in verison 2.3 of the EPANET engine.

Both WaterGEMS and InfoWater Pro have the ability to integrate with advanced metering infrastructure (AMI) data, however WaterGEMS lacks preprocessing data tools for such data. Guelph currently does not have plans to move to an AMI system. WaterObjects.net can be used with WaterGEMS to create a program to manipulate data inputs and automate routines and tools to customize the software to read source files automatically. However, this requires the user to have a background in programming. InfoWater has a module Demand Analyst for this purpose, although it is an extra add-on. InfoWorks cannot consume bulk AMI data, though similar to WaterGems, custom Ruby scripts can be used to process bulk data and assign demands individually to consumers. A Demand Analysis tool is included in InfoWorks which combines SCADA information and makes DMA/Pressure zone curves. Mike Urban does not have the ability to automatically process real-time AMI data but the demand allocation module can be used to develop a representation of meter locations in the model which can be manually updated as required. PCSWMM does not have a tool for processing AMI data but custom tools can be developed to read source files through scripting. Again, this would require the user or model developer to have a background in programming. As the City's live data is available through e.RIS, there is an option for a script to be written in e.RIS to convert AMI data to a format that is compatible with specific software packages.

WaterGEMS, InfoWater Pro and InfoWorks are capable of real-time simulation and control and provide an on-line SCADA interface. Innovyze products (InfoWater Pro and InfoWorks) use IWLive for real-time modelling. It should be noted that Innovyze is discontinuing support for IWLive for InfoWater. If the City choses to transition to InfoWorks, the existing IWLive license for InfoWater could be converted to InfoWorks. Real-time modelling is available using MIKE Urban through the WD Online software package which is an intermediate system configuration tool that connects real-time data to the model. The WD Online package is not included in the standard license cost. PCSWMM allows the user to manually import SCADA data to compare to model results.

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In general, Innovyze as a water industry company appears to be setting the industry standard when it comes to developing new and innovative tools. PCSWMM is a new tool on the water side that shows a lot of potential with the ability to script and develop unique tools.

2.2.2.2   User Preferences

Opinions on the ease of use of a given software will vary based on an individual's experience and preferences. It should be noted the City staff have experience with InfoWater which has slight user differences to InfoWater Pro.

WaterGEMS is available as either a standalone platform or within ArcGIS. InfoWater Pro requires the user have a full ArcGIS Pro license installed to operate the software. The addition of a new ArcGIS Pro license has not been considered in the cost portion of this TM since the City currently utilizes ArcGIS. InfoWorks WS Pro is a standalone product that does not integrate directly within ArcGIS, though its geospatial display can utilize the ArcGIS engine if a license is available or it can use the included MapInfo MapXtreme spatial engine. MIKE Urban and PCSWMM are both standalone platforms.

2.2.2.3   Technical Support

All vendors provide a range of support services. InfoWater and WaterGEMS are the most widely used in Canada. PCSWMM is widely used in Ontario for storm and wastewater modelling but water modeling (EPANET framework) capabilities are relatively new. All models offer free access to established technical support teams with a yearly maintenance fee. Innovyze support is based on the West Coast and therefore, due to the time difference, support is not typically readily available in the morning in Ontario. Training will be required for all considered software to fully appreciate the features offered. All vendors offer on-site training services. It should be noted that City staff participated in InfoWater Pro training in Fall 2019.

2.2.2.4   Cost

The following section provides an overview of software costs. The costs presented are current 2020 costs, listed in Canadian dollars (CAD) in Table 2.2 below, as provided by the software vendors. The costs are subject to change based on currency exchange rates and may not represent all possible software suites and options available.   For consistency and based on C3W's understanding of the City's models and needs, the following is a summary of costs based on an unlimited network pipe license. Certain software providers offer a reduced price for limited number of pipes; however, it is understood that the City wishes to convert the existing model to include all valves and hydrants. Therefore, it is assumed that an unlimited pipe license is required. All costs are exclusive of applicable taxes.

A 10-year cost cycle has been utilized to effectively consider the annual maintenance costs and to understand the full cost implications.

As the City currently owns an InfoWater license. The license fee for InfoWater Pro and InfoWorks WS Pro includes the cost to update the existing 6,000 pipe license to an unlimited pipe license. The InfoWater Pro and InfoWorks WS Pro are for a single fixed-seat (one machine) license. Floating-seat licenses, which allow the software to be installed on many machines and checked out by one user at a time carry a 50% premium on purchase price and annual maintenance fees.

Innovyze allows users to separately license the user interface and simulation engine of InfoWorks, or bundle it together as "full license". The prices shown are for a single fixed-seat (one machine) "full license". If the City was to purchase multiple licenses and configure InfoWorks in a network workgroup with a dedicated

simulation server then it can be beneficial to purchase more user interface licenses and fewer simulation engine licenses.

The MIKE Urban license includes the first year of annual fees. The WD Online software is an additional $7,200 per year.

PCSWMM has an annual cost for a license that can be used for both water modelling using EPANET and wastewater modelling.

Table 2.2 Water Model License Fees (2020)

Software	Licensing	Annual Fees	10-year cost
WaterGEMS	$ 40,475.00	$ 9,715.00	$ 137,625.00
InfoWater Pro*	$ 19,301.63	$ 5,586.00	$ 75,161.63
InfoWorks WS Pro	$ 37,539.25	$ 8,485.40	$ 122,393.25
MIKE Urban	$ 11,000.00	$ 2,000.00	$ 29,000.00
PCSWMM**	-	$ 1,440.00	$ 12,960.00

*Upgrade from existing license cost.
**Includes both water and wastewater software packages.

It should be noted that Innovyze that previously provided InfoWater and InfoWorks software packages has been sold to AutoDesk who has introduced a new pricing format and schedule.

2.2.2.5 Other

Additional software suites and modules are available for each of the models considered to expand their capabilities. InfoWater and WaterGEMS are used by many other municipalities and have the largest user base. InfoWater is the most commonly used hydraulic model in Ontario. In addition, a number of neighbouring or nearby municipalities utilize InfoWater including City of London, Region of Waterloo, Norfolk County, Region of Halton, Region of York, Region of Peel, City of Toronto.

InfoWorks WS Pro has minimal usage in North America and none in Canada, with its primary use found in the UK, Europe and Australia. Most local consultants would not have access to licenses or experience with the software which could lead to higher costs for the City during the build, calibration and use of the model if work is outsourced to external parties.

PCSWMM is widely used for wastewater and stormwater modelling. The EPANET functionality has been developed in the last 2-years. PCSWMM lacks the scenario structure for different development horizons using queries that is common with other modelling software. The software does have the ability for the user to develop custom tools using scripts. PCSWMM has the ability to complete the same types of analysis that are typically used in InfoWater such as fire flow, water quality and energy analysis but requires more custom script development. Common scripts for PCSWMM are available online.

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2.3   Water Model Evaluation Summary

Each of the categories above were evaluated based on the scoring summarized in Table 2.3 below for a maximum score of sixteen (16).

Table 2.3 Water Model Evaluation Criteria Scoring

Score	Descriptions
4	Fully satisfy the criteria.
3	Mostly satisfy the criteria.
2	Partly satisfies the criteria, more to be desired.
1	Satisfies a small portion of the criteria.
0	Does not satisfy the criteria.

Table 2.4 below is a summary of scoring based on the analysis in section 2.2. For the potable water software evaluation, all criteria were weighted equally. Scoring for functionalities, user preferences and technical support is subjective and based on C3W experience. The rankings could change based on individual or corporate preferences. Cost category scoring is based on a quantitative analysis and are linearly interpolated between the highest and lowest cost.

Table 2.4 Evaluation Summary

Criteria	WaterGEMS	InfoWater Pro	InfoWorks PS Pro	MIKE Urban	PCSWMM
Functionalities	4.0	4.0	4.0	3.0	3.5
User Preferences	3.0	4.0	3.5	2.5	3.5
Technical Support	4.0	3.5	3.5	4.0	4.0
Cost	1.0	2.5	1.4	3.6	4.0
Total	**12.0**	**14.0**	**12.4**	**13.1**	**15.0**

Evaluation results suggest that both InfoWater Pro by Innovyze and PCSWMM by CHI provide the highest scores. It is recommended that the City maintains InfoWater but considers trialing PCSWMM in the future.

Since the City internally mainly uses the model for development approvals, the capabilities of PCSWMM will effectively provide this capability. Before transitioning to PCSWMM, testing should be completed to confirm the feasibility of transitioning between InfoWater and PCSWMM. This would allow the City to maintain only a PCSWMM license for in-house modelling needs while consultants may continue to use InfoWater to support the City, if needed. InfoWater still provides more advanced modeling capabilities which consultants can utilize for specific studies. PCSWMM has developed a direct import tool from InfoWater to ensure any updates by consultants in InfoWater can be incorporated.

Utilizing the open source scripting capabilities of PCSWMM will allow the City to more easily share modeling results and potentially real time modeling with other City departments. InfoWater does not provide the ability of scripting as Innovyze is transitioning towards the InfoWorks WS platform for more open source and real-time modeling capabilities through IW Live.

C3W understands that the transition to new software packages can be somewhat daunting but based on the following believes that PCSWMM could be trialed;

- Built in Guelph solution,

- Locally developed, maintained and supported,

- Supports all the City's technical needs,

- The same software and user interface as the recommended wastewater software,

- Cost is very reasonable and the cheapest of all those reviewed,

- Provides the opportunity to program new tools and capabilities and develop future linkages with operations for analysis and dashboards.

The downside is limited to the;

- Limited user-base of the water software. If the City is unhappy with the software after a trial period, transition back to InfoWater should be considered and additional costs would not be charged as both packages are based in EPANET.

- Scenario structure of the software which CHI is currently working on.

To train City users to use PSCWMM for water modelling, CHI offers in-house, 2-day training workshops for approximately $5,000.

3.0   WASTEWATER MODEL

3.1   Wastewater Hydraulic Models

The hydraulic modelling needs identified by the City were used to shortlist industry accepted wastewater modelling software. Five software options were selected for the detailed evaluation.

Most selected software options provide the same basic functionalities that are essential for the assessment of a municipal wastewater network. They provide hydraulic modeling features used to route runoff and flow through a network of pipes, channels, pumps, storage units and diversion structures. These models account for various hydrologic and hydraulic processes to represent flow, including time-varying rainfall, infiltration, evaporation, snow melt, groundwater, dry weather sanitary flows and wet weather sanitary flows. The models can be run for single event or for long-term continuous period under various flow regimes, such as surcharge and pressurized flow conditions, and surface ponding. All software reviewed meet these analytical needs. Therefore, the evaluation process requires a qualitative approach to identify factors that differentiate one package from the other. Table 1.1 provides a summary of the software under consideration. The evaluated wastewater modelling software are the following:

1. SewerGEMS
2. PCSWMM
3. InfoSWMM Suite
4. InfoWorks ICM
5. MIKE Urban

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Two more software options were considered (XPSWMM and InfoSewer) but were eliminated because the vendor will stop the distribution and the maintenance in the near future.

The software suite developed by Civica was also eliminated from this list as their offerings do not meet the analytical needs of the City.

- Data Current is an on-line flow monitoring host with integrated flow analysis tools;

- Visual OTTHYMO (Version 6.0) is a hydrologic modelling software, however, is not suited for network modeling.

The two Civica software options combined meet some of the needs of the City but are not considered adequate or appropriate for use in a wastewater masterplan.

3.1.1   Versioning Considerations

The InfoSWMM *Suite* version will be reviewed because the City has already upgraded to this version. The other software options are reviewed in their base version, even if most vendors propose charging add-ons to upgrade the technical capacity of the software.

3.2 Wastewater Hydraulic Model Evaluation

The following section presents the weighted criteria matrix used to evaluate the wastewater hydraulic models considered. Wastewater hydraulic model recommendations are made based on results of the evaluation and a comparison of software features.

3.2.1 Evaluation Criteria

Table 3.1 presents the criteria used to compare the different software options. They are divided into four categories.

Table 3.1 Wastewater Model Evaluation Criteria

Criteria	Description
Functionalities	• *Data exchange between model and GIS* • *Compare updated GIS with model data* • *Model results / GIS mapping capabilities* • *Data exchange between model and CAD* • *Merging network models* • *Create sub models* • *Input field data flag* • *Version Control* • *Asset management integration* • *Scenario Management* • *Comparing Scenarios* • *HGL Comparison* • *Data exchange between model and EXCEL* • *Rainfall and Flow Data Analysis* • *Automated sensitivity analysis* • *Automated design* • *Model Validation and Error Check* • *Group Editing* • *RTC Compatibility*
User Preferences	• *Ease of use* • *Workspace display*
Technical Support	• *Software Support* • *Software Sustainability* • *Troubleshoot support* • *Training*
Cost	• *Initial and ongoing maintenance costs (10-year life cycle).*

Each criterion was graded based on our knowledge of each software. Table 3.2 presents the scoring approach.

Table 3.2 Wastewater Model Evaluation Criteria Scoring

Score	Descriptions
4	Fully satisfy the criteria.
3	Mostly satisfy the criteria.
2	Partly satisfies the criteria, more to be desired.
1	Satisfies a small portion of the criteria.
0	Does not satisfy the criteria.

3.2.2   Evaluation

3.2.2.1   Functionalities

Nineteen advanced technical requirements were selected based on our team's experience with the modelling and analysis of large-scale wastewater networks.

The GIS capabilities of the software option are assessed based on their abilities to exchange data between GIS and the modeling software, to compare GIS data to an existing model and to use GIS mapping tools. All platforms selected integrate with GIS, either with an in-house GIS interface or with the use of ArcGIS.

The model building capabilities are assessed based on the presence of version control, group editing, model validation, error checking and field data flag.

The scenario management capabilities of the modelling software options are assessed based on their abilities to create sub-models, to manage scenario, to compare both scenario and results.

Other requirements will make modelling easier as some software options have implemented automated tools to help with the rainfall and data flow analysis, as well as the calibration process or the network design.

3.2.2.2   User Preferences

The user experience was divided into two criteria: ease of use and workspace display. Opinions on the ease of use of a given software will vary based on an individual's experience and preferences. Workspace display is presently very similar for all software, because they are all based on a GIS interface.

3.2.2.3   Technical Support

Technical Support is important to select a modelling software as proper support will help the modeler use the software more efficiently. All vendors provide a range of support services. All models offer free access to established technical support teams. Training will be required for all considered software to fully appreciate the features offered. All vendors offer on-site training services. CHI (PCSWMM) also offers a range of online free training materials.

3.2.2.4   Cost

The following section provides an overview of software costs. The costs presented are current 2020 costs, listed in Canadian dollars (CAD), as provided by the software vendors exclusive of applicable taxes. The costs are subject to change based on currency exchange rates and may not represent all possible software suites and options available. Prices can change based on the number of pipes in a model. For consistency and based on our team's understanding of the City's current model the following is a summary of costs based on a 9,000 pipe license. Table 3.3 presents the cost associated for each model.

A 10-year cost cycle has been used to consider the annual maintenance costs and to understand the full cost implications. DHI proposes for MIKE Urban a subscription license but based on a 10-year cost, buying a perpetual license is more economical. Also, this license could be used for water and wastewater modelling. The City of Guelph has already in its possession a InfoSWMM Suite license. As a result, the cost associated with the use of InfoSWMM Suite would only be the annual fees.

Table 3.3 Cost Summary (2020)

Software	Licensing	Annual Fees	10-year cost
SewerGEMS	$40,475	$9,715	$137,625
PCSWMM	-	$1,440	$14,400
InfoSWMM Suite	-	$3,575	$35,750
InfoWorks ICM	$50,125	$10,025	$150,375
MIKE Urban	$18,600	$3,355	$52,150

3.3   Wastewater Model Evaluation Summary

The following is a summary of scoring based on the analysis in section 3.2. Scoring for functionalities, user preferences, technical support is subjective and based on our team experience. Cost category scoring is based on a quantitative analysis.

Table 3.4 Evaluation Summary

Criteria	Evaluation Score				
	SewerGEMS	*PCSWMM*	*InfoSWMM*	*InfoWorks ICM*	*MIKE Urban*
Functionalities	2.9	3.2	2.9	3.4	2.8
User Preferences	3.0	3.5	3.0	2.5	3.0
Technical Support	2.5	3.8	3.5	3.8	3.8
Cost	1.3	4.0	3.5	1.0	3.2
Total	**9.7**	**14.5**	**12.9**	**10.7**	**12.8**

InfoWorks ICM is the best software based on the functionality requirements, but the evaluation results suggest that PCSWMM is the recommended modelling software for the City. The cost difference between

PCSWMM and InfoWorks ICM over a 10-year period is approximately $136,000. Scoring in Table 3-6 provides a significant gap between PCSWMM and the second choices InfoSWMM and MIKE Urban. The City of Guelph already has in its possession a license for InfoSWMM Suite which expires in December 2020. Migrating the existing model to PCSWMM is assumed to be a relatively easy process as they are both EPASWMM based.

4.0 CONCLUSIONS & RECOMMENDATIONS

This TM documents the hydraulic modelling software packages under consideration for City implementation to meet technical, functional and business needs into the future. Evaluation criteria, analysis and results are provided for each package considered for both water and wastewater modelling.

The recommended software are:

Potable Water Modelling: It is recommended that the City continue to utilize InfoWater for their water modeling needs. Currently it is the most widely used package in the industry and the City has utilized it for more than 10 years.

PCSWMM is an interesting emerging water modeling tool that the City should consider trialing. CHI the software provider is located in Guelph and has been in existence for more than 30 years and is attempting to expand to the water industry from wastewater and stormwater. PCSWWM is the software package used for wastewater and stormwater and would provide a consistent platform with all models.

Wastewater Modelling: PCSWMM is recommended as it received the best score overall, fully satisfying the modelling needs of the City while offering the lowest cost. Migrating to PSWMM is expected to be a simple process and many consultants working with the City have access to it as it is widely used for wastewater and stormwater modelling. The added benefit of both the water and wastewater operating on the same platform will ease the transition of the City modelers.

4.1 2023 Update

Since the development of this TM, Innovyze has been purchased by Autodesk and pricing/licensing has changed.