Land Use Compatibility - MECP D-2 Study

150 & 160 King Street

Town of The Blue Mountains, Ontario

Prepared for:
2706499 Ontario Limited
&
Thornbury Hills Limited

Prepared by:
Azimuth Environmental
Consulting, Inc.

May 2022

AEC 19-089

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Environmental Assessments & Approvals

May 27, 2022 AEC 19-089b

2706499 Ontario Limited &
Thornbury Hills Limited
12 Totten Drive
Brampton ON
L6R 0P8

Attention: Mr. Charanjit Aneja, CPA, CA, CPA (IL), CFF
Project Manager

Re: Land Use Compatibility - MECP D-2 Study
Proposed Commercial / Residential Development
150 & 160 King Street
Village of
Thornbury, Town of the Blue Mountains, ON

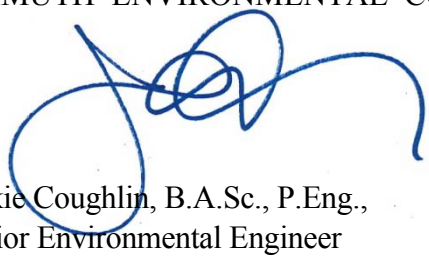
Dear Mr. Aneja:

Azimuth Environmental Consulting, Inc. (Azimuth) is pleased to provide you (the "Client") with the following report documenting the Land Use Compatibility - MECP D-2 Study ("D-2 Study") conducted at 150 and 160 King Street within the Town of The Blue Mountains, Ontario (the "Site"). A D-2 Study is required since the Site is located inside a 400 meter boundary of the Thornbury wastewater treatment plant (WWPT) and an active lagoon system.

The inherent risk associated with the Thornbury WWTP is interpreted to be negligible given the physical and hydrogeological characteristics of the Site (i.e., prevailing winds, forest/ vegetation buffers, ground water gradient). It is our opinion from the review of the available documentation that there is no meaningful risk created by the WWTP system for the proposed commercial development.

We trust this report is sufficient for your current requirements and would like to thank you for the opportunity to work with you on this project. Please do not hesitate to contact us if you have any questions.

Yours truly,
AZIMUTH ENVIRONMENTAL CONSULTING, INC.



Jackie Coughlin, B.A.Sc., P.Eng.,
Senior Environmental Engineer

Attach

M:\Projects3\19 Projects\19-089 Phase I ESA - Blue Mountains\05.0 - Reporting\D-2 Study\19-089 D2 Study 150 King St Thornbury (220527) Final.docx

Table of Contents

List of In-Text Tables

List of Figures

List of Appendices

1.0 INTRODUCTION

Azimuth Environmental Consulting Inc. was retained to complete a Land Use Compatibility - Study for a commercial property located at 150 and 160 King Street within the Town of The Blue Mountains, Ontario (the "Site"). Development concepts include a 3-storey building with the first floor proposed for commercial uses and the second and third floor proposed for residential apartments.

The Site is located inside a 400 meter boundary of the Thornbury wastewater treatment plant (WWPT) and an active lagoon system. Guideline D-2 (Section 3) states that "where practical, sensitive land uses should not be placed adjacent to treatment facilities." According to Guideline D-2, the minimum distance from a WWTP varies between 100-400m.

Our evaluation has been completed on the basis of our interpretation of the local environmental and physical setting, Site observations and a review of available resources and supporting documentation as outlined in below:

- Land Use compatibility - D-2 Assessment, 171 King St. East, Thornbury (Ortech, 2020);
- Noise Feasibility Study, 171 King St. East, Thornbury (HGC Engineering, 2020);
- Phase I Environmental Site Assessment, 150 King St. East, Thornbury (Azimuth, 2021);
- Phase I Environmental Site Assessment, 160 King St. East, Thornbury (Azimuth, 2021);
- 2021 Annual Performance Report, Thornbury Waste Water Treatment Plant (Wastewater Operations, 2022)

As illustrated above, a Land Use Compatibility - D-2 Assessment and a Noise Feasibility Study has been completed for a property adjacent the Thornbury WWTP (i.e., 171 King St. East). Given the proximity of the Site to the 171 King St. East property, this information has been relied upon for the completion of a Land Use compatibility - D-2 Assessment for the Site

1.1 Planning Context

The study follows the Ministry of the Environment, Conservation and Parks (MECP) Guideline D-2 Compatibility between Sewage Treatment facilities and Sensitive Use, which is also required as per Section 8.9.1(16) of the Grey County Official Plan (2019):

"Local municipalities must comply with recommended buffer separation guidelines as presented in the Ministry of the Environment, Conservation and Parks D-2 Guideline or its successor document, for compatibility between wastewater treatment facilities/sewage treatment works as shown on Appendix A and those outside of but within 400 metres of the Grey County boundaries, and sensitive land uses...."

The Town Official Plan (Section C11) also states the following:

"Land uses and development which may be sensitive to the effects of odour, noise, and other contaminants including residences, day care centres, or commercial, industrial and health facilities shall generally not be permitted within 100 metres of a municipal sewage treatment plant property line. This buffer area for the Thornbury and Craigleith sewage treatment plant is shown on the Constraint Mapping. All land uses and development within the buffer setback shall be subject to a relevant study submitted for review by the County of Grind Town of The Blue Mountains to address the current and future impacts, and to assess appropriate design, buffering and separation distances in conformity with Ministry of Environment and Climate Change guidelines and information requirements. Implementation of the study's recommendations may be required under an agreement between the proponent and the municipality"

Further to the above, Section 10.2.5 (Holding Provisions [h5]) of the Town of Blue Mountains Zoning Bylaw (20185-65) regulates the following:

The Holding (h5) provision applies to land uses and development which may be sensitive to the odours, noise and other contaminants within 100 metres of a municipal wastewater facility (sewage treatment plant). The Holding Provision (h5) may be lifted once it is determined through relevant study to address the current and future impacts and to assess appropriate design, buffering and separation distances in conformity with the Ministry of Environment and Climate Change guidelines to the satisfaction of the County of Grey and Town of The Blue Mountains.

2.0 SITE BACKGROUND

The Site is located at 150 and 160 King Street East in the Village of Thornbury, in the Town of Blue Mountains, Ontario (Figure 1). This group of properties includes a portion of the unopened right-of-way for Wellington Street that lies between these two parcels in the Town of Blue Mountains, Ontario (Figure 2).

The 150 King Street East parcel is situated at the western extent of the Site. The unopened right-of-way (ROW) is immediately adjacent to this parcel and the eastern parcel represents a portion of 160 King Street. The 150 King Street East parcel is rectangular in shape and is 8,049.97 m^2 in size. This parcel is bound by King Street East to the south, Elgin Street North to the west, the Georgian Trail to the north and the Wellington Street ROW to the east. The unopened Wellington Street ROW sits between the 150 and 160 King Street lands and is 796.24 m^2 in size. The 160 King Street East parcel is a slightly narrowed rectangular in shape and is 4,200.79 m^2 in size. This parcel is bound by King Street East to the south, the Georgian Trail to the north and the Wellington Street ROW to the west. Collectively, the Site is 13,047 m^2 in size.

The Site is currently undeveloped meadow and successional forest land. According to the Town of The Blue Mountains Draft Zoning By-Law #2018-65, the Site is zoned C1 – Village Commercial. The Land Use and Zoning map for the Site and surrounding properties is provided on Figure 3.

3.0 ENVIRONMENTAL SETTING

3.1 Physiography, Topography and Soils

The Site is located within the Beaver Valley Physiographic Region of Ontario (Chapman & Putnam, 1984). The Beaver Valley is a small but well defined area between Griersville Rock to the west and the Blue Mountains Peaks to the east. The area was eroded by a pre-glacial river into Georgian Bay, which carved a deep valley into the subsurface.

The Site is found at an approximate elevation of 187 masl. The study area gently slopes from south to north, toward Georgian Bay. Given the granular sediments, precipitation would percolate into the underlying soils at the Site. If excess water existed then it would either be directed to the roadside swale or the ditching along the former railway corridor.

The soils at the Site are classified as Brighton sand (Hoffman *et al*, 1962). This soil is a well sorted sandy outwash material with good drainage. Brighton sand is classified within hydrologic soil group "A". Group A soils have low runoff potential and high infiltration rates even when thoroughly wet, and consist of deep, well to excessively drained sand or gravel.

According to Barnett *et al* (1991) the surficial material at the Site consists of glaciolacustrine deposits composed of sand, gravelly sand, and gravel associated with near shore and beach deposits. As noted in the EXP (2020) geotechnical report, a sandy silt till horizon exists below this surficial deposition and may extend to the bedrock contact.

The underlying bedrock geology has been described by the Ontario Geologic Survey (OGS) as being composed of shale and minor limestone of the Blue Mountain Formation (OGS, 2016). The Blue Mountain Formation is Upper Ordovician in age. The bedrock is found at a depth of approximately 30 mbgs.

Although the Site is currently serviced with municipal water, the MECP Water Well Records were referenced for any recorded well information within the vicinity (~250 m) of the centre of the Site. Water Well Records can be used to gain subsurface information which can provide insight into geological formations within the area.Several wells were drilled to the bedrock contact which was reported to be a shale formation. The shale bedrock contact was reported to be between 27.4 and 34.1 mbgs. Overburden material descriptions for these wells varied from sand & gravel & boulders to clay hardpan. The monitoring wells installed across King Street East reported silty sand to sandy silt with some gravel. The on-Site boreholes report a loose to compact sandy silt unit overlying a very dense sandy silt till.

3.2 Prevailing Winds

Prevailing winds typically come from the southwest in the summer and northwest in the winter however in south-western and northern Ontario winds are generally from the northwest (Nav

Canada, 2002). An interview with a Town Water Treatment Plant Operator indicates that the prevailing winds for the study area are more from the southwest.

4.0 STUDY AREA

4.1 Thornbury WWTP and Water Reservoir

The WWTP (headworks and tanks) and Water Reservoir are located at Grey Street South immediately south of Highway 26. The southeast corner of the proposed commercial development (the Site) is located ~180 m from the WWTP operations and ~160 m from the Water Reservoir (Figure 4).

The WWTP was originally a lagoon system that was constructed in 1975 however was upgraded in 1994 to include nitrification/ dentrification, phosphorus removal and UV disinfection. The plant consists of an extended aeration treatment system rated for a capacity of 3,580 m^3/day with a future capacity of 5,330 m^3/day. The WWTS system consist of the headworks with screen and grit removal, biological treatment comprised of two (2) aeration tanks, secondary sedimentation comprised of two (2) clarifiers, phosphorus removal, UV disinfection, and three (2) waste stabilization ponds with discharge of the treated effluent to the Beaver River. The WWTP operates under an amended MECP Environmental Compliance Approval (ECA No.: 0597-8XEJ7Y) which provides the conditions for the effluent limits, monitoring and reporting requirements. Based on the background information, it is understood that while the WWTP is a 24 hours per day operation; sludge material haulage during the night-time hours is not expected. A tanker truck delivery of alum could potentially occur once every 3 to 4 weeks.

The Water Reservoir and associated building contains the water distribution pumps and a 500kW emergency diesel generator and office.

The WWTP property slopes at an elevation of 195masl to 190 masl and slopes from south to north, toward Georgian Bay. An approximately 3 m high berm is located along the eastern boundary of the WWTP property (along Highway 26) and the north and west property boundary contain dense bush and tree cover, all of which provide visual cover and a sound barrier to the WWTP and Water Reservoir.

Surrounding land use consists of vacant land and residential uses to the north and east of the Site and further east closer to the lake, existing commercial uses on the east side of King Street East including a storage facility(SOS) and a Home Hardware with outdoor storage.

5.0 IMPACT ASSESSSMENT

In general, impacts to sensitive receptors depend on the characteristics of the wastewater and setback distances from the point of impingement. Potential impacts could include foul odors cause by mechanical upsets and/ or lagoon failure (e.g., overloading, short circuiting, algae growth), nuisance impacts associated with mechanical equipment (noise disturbances) and/ or

aesthetics (visual impacts). Other impacts relate to the pollution of water resources (ground water and/ or surface water) from lagoon failure (e.g., spills, liner or embankment failure). Impacts to water resources would depend on the level of advanced treatment, the contaminant concentrations, and nutrient loading contained within the treated effluent being discharged. Notwithstanding, impacts to water resources from any WWTP are addressed during the design stages of the facilities and mitigated through conditions of the MECP ECA approval process.

Regarding separation distances to the point of impingement, it is stipulated in the D-2 Guideline that the separation distance will be measured from the periphery of the noise/ odour producing source structure to the property line of the sensitive land use. It is our interpretation that the point of impingement would be from the WWTP headworks and/ or the Water Reservoir building.

5.1 D-2 Compatibility between Sewage Treatment and Sensitive Land Use

As per MECP Guideline D-2 (MECP, 1996 as amended), WWTP's are recommended to have a 100m to 400m buffer from a property line of a sensitive receptor depending on the degree and type of odours, noise sources and or other contaminants of concern (i.e. aerosols). Plants are categorized into three classes: those with a design capacity equal to or less than 500 cubic metres of sewage per day (m^3/d), those with a design capacity greater than 500 m^3/d but less than 25,000 m^3/d, and those with a capacity greater than 25,000 m^3/d. Table 1 provides the minimum and recommended separation distance for a give facility capacity.

Table 1 - Minimum and Recommended Separation Distance for Facility Capacity

Capacity (m^3/day)	Minimum Separation Distance (m)	Recommended Separation Distance (m)
<500	TBD	100
>500 to <25,000	100	150
>25,000	see Note 1	>150 (Note 1)

1. These plants will be dealt with on an individual basis. A separation distance of greater than 150 metres may be required.

Based on Guideline D-2 and given the current capacity of the WWTP (3,580 m^3/day), a minimum separation distance of 100m with a recommended 150 m setback from Water Reservoir facilities would be more than sufficient. As shown on Figure 5, the southeast corner of the Site is not within 150 m of the WWTP and is not within 100 m of the Water Reservoir building.

Various criteria are used to evaluate impacts including prevailing winds, landscape elements (e.g. building arrangement, buffers, berms, trees, setbacks, topography) and the physical /hydrogeology characteristics of the study area. A summary of our findings is provided in the following sections.

5.1.1 Odours

A site walk around the periphery of the WWTP property was completed on April 29, 2022 at 2:00PM. The temperature during the Site walk was 9.5°C and the winds were low and from the NNW according to Windy App (Windy.com). During the Site walk no odours were observed. An interview with the Towns water treatment plant operator indicated that odours are rare due to a number of ongoing upgrades at the WWTP.

According to the ECA, the WWTS provides nitrification and denitrification for the control of ammonia and hydrogen sulphide in waste stabilization lagoon effluents. A high nitrified effluent is obtained from an extended aeration activated sludge process which provides a high sludge and high solids level in the aeration cells. The high concentration of nitrates in the secondary effluent prevents the reduction of sulphates to hydrogen sulphide in the lagoon. A review of the 2021 WWTP annual report indicates that the average monthly effluent limits have been met and the WWTP in compliance with the ECA permit.

Prevailing winds reportedly come from the southwest most days. The Site is located to the north and is not downwind of the WWTP for the prevailing winds, therefore there should be little impact by odours from the WWTP property.

Based on the above and given that the ECA effluent limits are fairly stringent, odours associated with the WWTP should be minimal. Notwithstanding, and as part of an ECA condition for the sewage works, all odors issues are addressed through a planned maintenance program to ensure that the sewage works and related equipment are properly operated and maintained. According to the annual report, licensed operators perform routine maintenance on all equipment including pumps, monitoring equipment, alarm systems, safety equipment, and other treatment components. Both routine and non-routine (emergency) maintenance activities are conducted in accordance with manufacturers' instructions.

5.1.2 Visual Impacts

An approximately 3 m high berm is located along the eastern boundary of the WWTP property (along Highway 26) and the north and west property boundary contain dense bush and tree cover, all of which provide visual cover to the WWTP. Given the above, there are no perceived visual impacts associated with the WWTP and lagoons.

5.1.3 Noise

Noise emissions could be related to WWTP equipment and / or the water reservoir which contains a generator. Give the distance of these works to the Site (>150m) and given that mechanical equipment (pumps and blower) are housed in a concrete building, this would be sufficient to mitigate any noise impacts.

A Noise Feasibility Study was completed by Howe Gastmeier Chapnik (HGC, 2020) for the adjacent property located at 171 King Street. This property is significant closer to the WWTP and Water Reservoir compared to the Site and is therefore relevant to the current assessment. The results of this analysis indicated that the predicted stationary sources of sound met the applicable sound level limits at 171 King Street under an assumed worst-case operating scenario. Given that the Site is located further away, the outcome of the Noise Feasibility Study would be the same for the Site.

6.0 CLOSURE

Given the physical/ hydrogeological conditions of the study area (i.e., topography, soils, prevailing winds, forest buffers, berms) there would be no significant negative impacts to the Site from the WWTP or Water Reservoir. The WWTP headworks are currently being upgraded and as part of the WWTP expansion and the extended aeration treatment system is being upgraded to accommodate a capacity of 5330m^3/day. Further, the WWTP was previously upgraded with advanced technology to improve the overall treatment performance which would mitigate any issues related to environmental, odour and/ or noise impacts.

Based on the above and given the recommended STP setbacks provided in Guideline D-2, the current setback between the Site and the Thornbury WWTP and Water Reservoir is sufficient to minimize potential impacts.

7.0 LIMITATIONS AND USE OF THIS REPORT

This report has been prepared for the sole benefit of 2706499 Ontario Limited and Thornbury Hills Limited, represented by Charanjit Aneja (the 'Client'). Azimuth Environmental Consulting, Inc. (the 'Consultant) understands that this report may be provided to and relied upon by others. Any other person or entity without the express written consent of the Consultant and the Client may not rely upon the report. Any use that a party makes of this report, or any reliance on decisions made based on it, is the responsibility of such parties. The Consultant accepts no responsibility for damages, if any, suffered by any party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices current at the time the work was performed. This report should in no way be construed as a definitive representation of any or all environmental impacts on the site resulting from past or current practices. The information contained within this report should be evaluated, interpreted, and implemented only in light of this assignment.

The Consultant makes no other representation whatsoever, including those concerning the legal significance of its findings, or as to the other legal matters addressed incidentally in this report, including but not limited to the application of any law to the facts set forth herein. With respect

to regulatory compliance issues, regulatory statutes are subject to interpretation. These interpretations may change over time, thus the Client should review such issues with appropriate legal counsel.

8.0 REFERENCES

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Report No. 29 of the Ontario Soil Survey. Scale 1:63,300.

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OGS Earth
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APPENDICES

Appendix A: **Figures**
Appendix B: **2021 Thornbury WWTP Annual Report**

APPENDIX A

Figures

LEGEND:

Approx. Property Boundary

Regional Map

250m 0 750m

HORIZONTAL SCALE 1:25,000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.

Study Area Location

150 / 160 King St. E.,
Thornbury, ON

DATE ISSUED: *April 2022*	Figure No.
CREATED BY: *JLM*	
PROJECT NO.: *19-089*	1
REFERENCE: *MNRF*	

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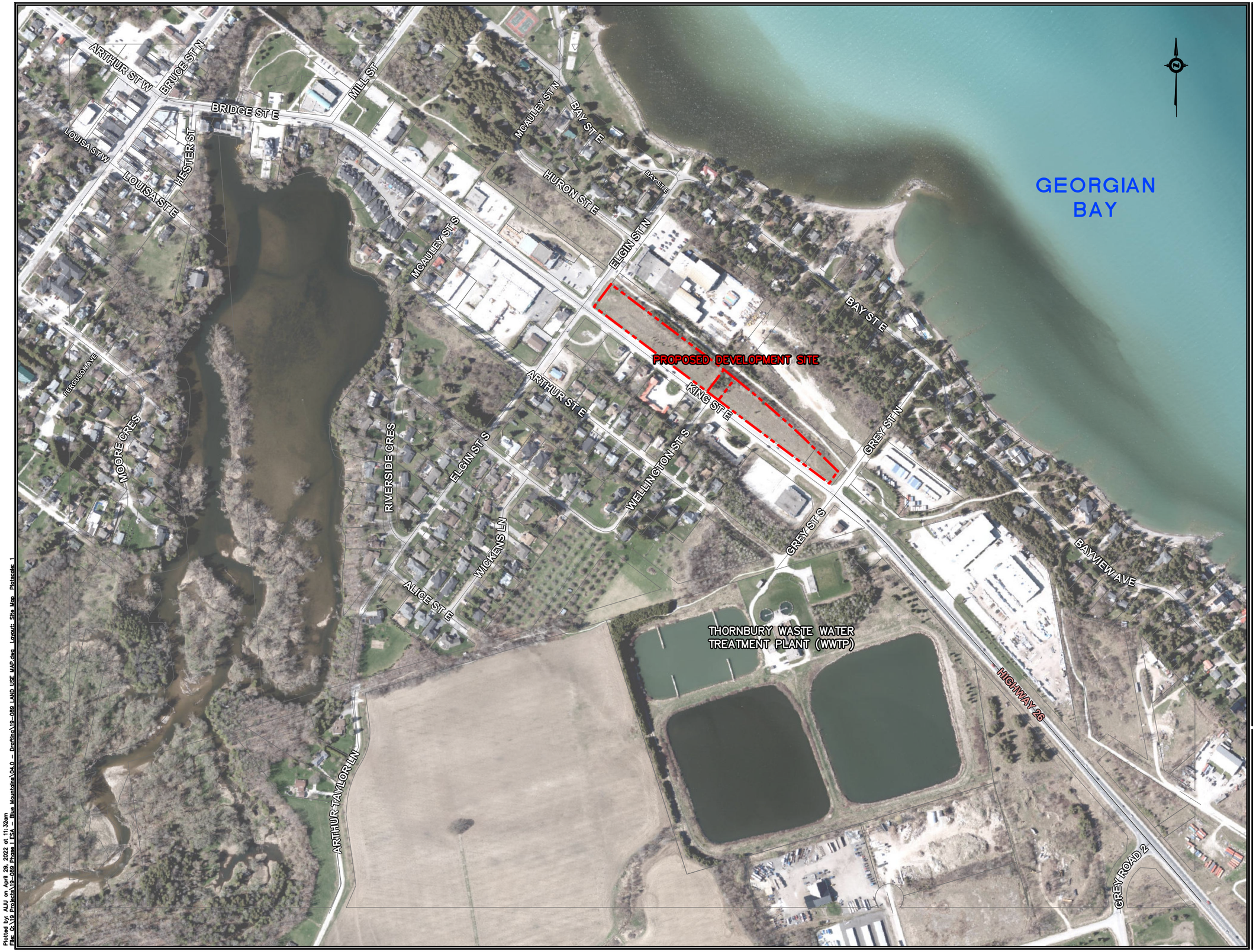

LEGEND:

APPROX. PROPERTY BOUNDARY

0 125.00 250.0

HORIZONTAL SCALE 1:5000

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

SITE MAP AND THORNBURY WASTE WATER TREATMENT PLANT

150 / 160 KING ST. E.,
THORNBURY, ON

DATE ISSUED:	*APRIL 2022*	Figure No. 2
CREATED BY:	*A.L.*	
PROJECT NO.:	*19-089*	
REFERENCE:	*THE BLUE MOUNTAINS*	

Plotted by: AUI on April 29, 2022 at 11:32am
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LEGEND:

APPROX. PROPERTY BOUNDARY

LAND USE MAPPING:

- A – AGRICULTURAL
- CLA – COMMUNITY LIVING AREA
- DA – DOWNTOWN AREA
- H – HAZARD
- IA – INSTITUTIONAL AREA
- SA – SPECIAL AGRICULTURAL
- UE – URBAN EMPLOYMENT AREA

0 87.50 175.0

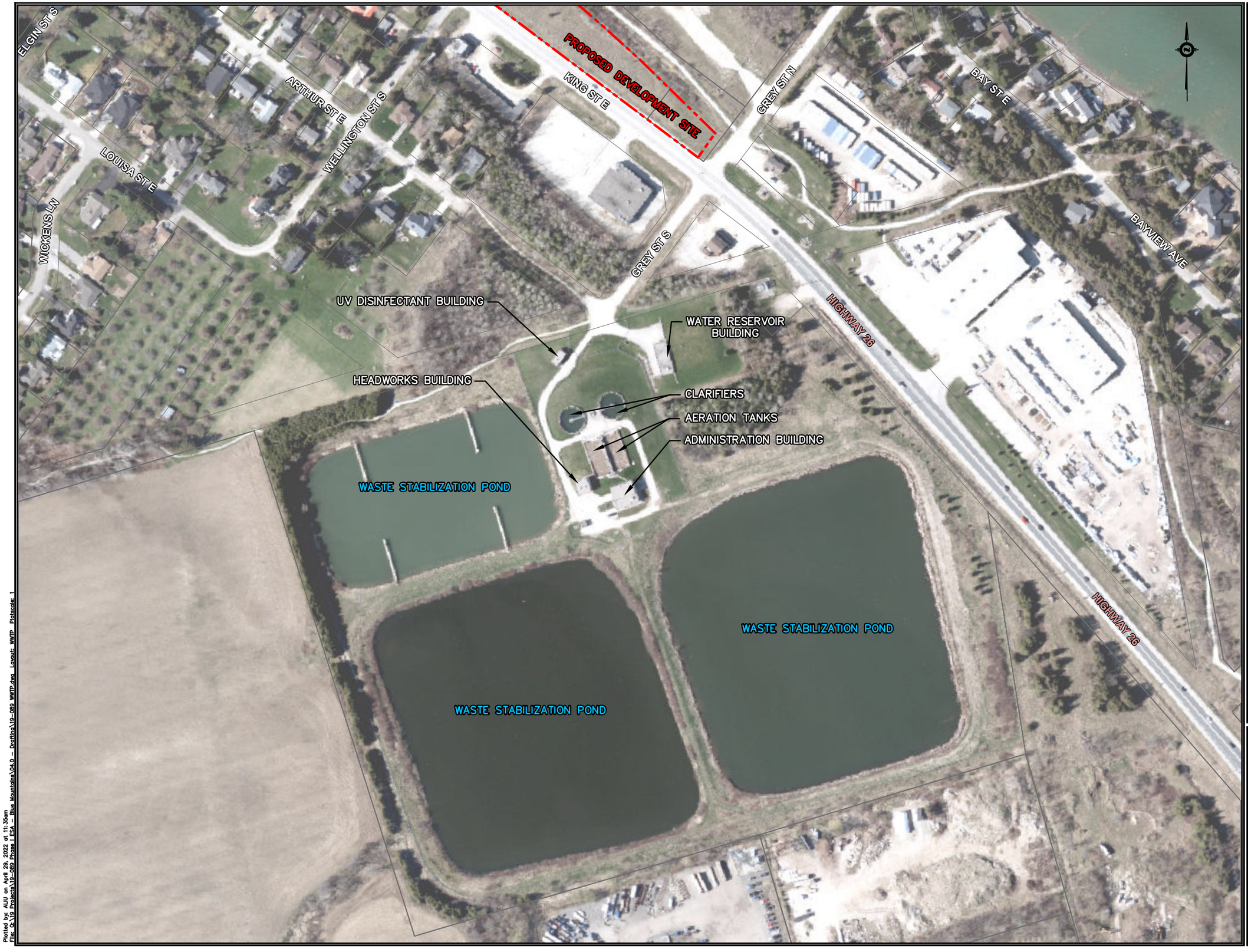
HORIZONTAL SCALE 1:3500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

LAND USE MAP

150 / 160 KING ST. E.,
THORNBURY, ON

DATE ISSUED:	*APRIL 2022*	Figure No. 3
CREATED BY:	*A.L.*	
PROJECT NO.:	*19-089*	
REFERENCE:	*THE BLUE MOUNTAINS*	



LEGEND:

APPROX. PROPERTY BOUNDARY

0 62.50 125.0

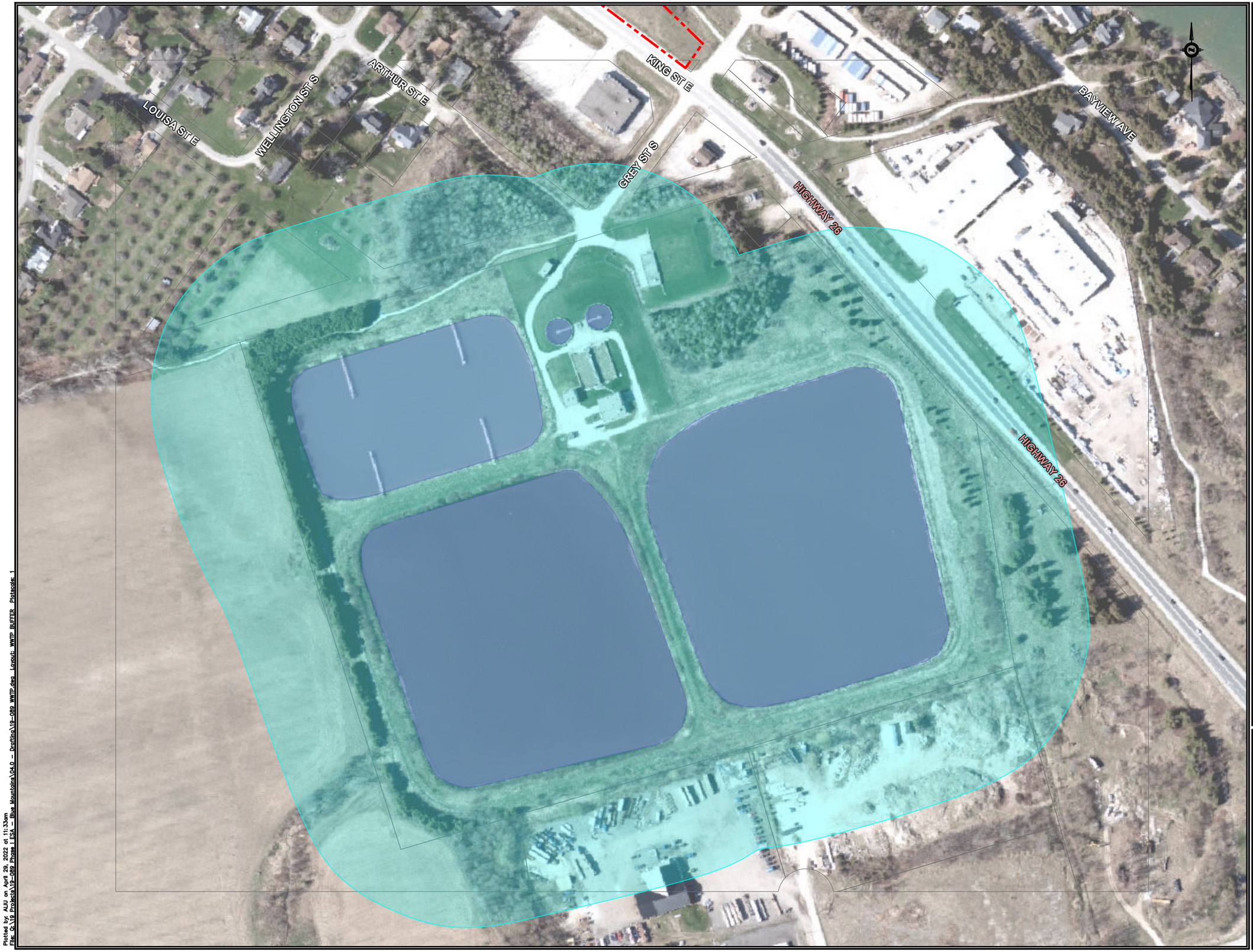
HORIZONTAL SCALE 1:2500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

WASTE WATER TREATMENT PLANT

150 / 160 KING ST. E.,
THORNBURY, ON

DATE ISSUED:	*APRIL 2022*	Figure No. 4
CREATED BY:	*A.L.*	
PROJECT NO.:	*19-089*	
REFERENCE:	*THE BLUE MOUNTAINS*	



LEGEND:

- APPROX. PROPERTY BOUNDARY
- WWTP FEATURES OF INTEREST
- 100m FEATURES OF INTEREST BUFFER

0 62.50 125.0

HORIZONTAL SCALE 1:2500

AZIMUTH ENVIRONMENTAL CONSULTING, INC.
ENVIRONMENTAL ASSESSMENTS & APPROVALS

THORNBURY WASTE WATER TREATMENT PLANT
100m BUFFER DISTANCE

150 / 160 KING ST. E.,
THORNBURY, ON

DATE ISSUED:	*APRIL 2022*	Figure No.
CREATED BY:	*A.L.*	5
PROJECT NO.:	*19-089*	
REFERENCE:	*THE BLUE MOUNTAINS*	

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APPENDIX B

2021 Thornbury WWTP Annual Report

This document can be made available in other accessible formats as soon as practicable and upon request

2021 Annual Performance Report

Thornbury Wastewater Treatment Plant

Prepared by: Wastewater Operations

Date: March 8, 2022

Table of Contents

Executive Summary

This report has been prepared as required by Amended Environmental Compliance Approval 1640-BAFFX5, Section 11 issued to the Thornbury Wastewater Treatment Plant.

Section 11 (4) requires the Owner to prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The report shall contain, but shall not be limited to, the following information pertaining to the reporting period:

a. Summary and interpretation of all Influent and Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
b. Summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;
c. Summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;
d. Summary of all operating issues encountered and corrective actions taken;
e. Summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;
f. Summary of any effluent quality assurance or control measures undertaken;
g. Summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;
h. Summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
    i. When any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;
    ii. When the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;
i. Estimate of the sludge volumes in the lagoon cells. Sludge volume is to be measured every five (5) years, but may be estimated in the interim years. A summary of disposal locations and volumes of sludge disposed of must also be provided if sludge was disposed of during the reporting period;
j. Summary of any complaints received and any steps taken to address the complaints;
k. Summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;
l. Summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d of Condition 10, including a report on status of implementation of all modification
m. Summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that

result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the following year following that for which the report is submitted;

n. Any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Proposed Works

All the requirements listed in Section 11 (4) have been met and will be further explored throughout the report.

Facility Information

The TWWP is a modification of the extended aeration treatment process. The original plant was a lagoon system constructed in 1975.

In 1993 the plant was extended to a mechanical facility utilizing the "Sutton Concept" for sludge disposal. The plant design included provision for phosphorus removal facilities and U.V. disinfection with continued use of existing outfall to the Beaver River on a continuous basis.

The Sutton process was developed in the early 1980's following a research project which involved installing a package treatment facility in line with active lagoons.

The system provides nitrification and denitrification for the control of ammonia and hydrogen sulphide in waste stabilization lagoon effluents. A high nitrified effluent is obtained from an extended aeration activated sludge process which provides a high sludge and high solids level in the aeration cells (low F/Mv ratio).

The high concentration of nitrates in the secondary effluent prevents the reduction of sulphates to hydrogen sulphide in the lagoon.

The TWWP is currently rated at 3,580 m^3/d operating under Amended Environmental Compliance Approval # 1640-BAFFX5.

Monitoring and Compliance

Town Staff ensure that the sewage works and related equipment and appurtenances which are installed or used to achieve compliance are properly operated and maintained.

A. Interpretation of Monitoring and Analytical Data

A comprehensive interpretation of all monitoring and analytical data collected during the reporting period, in comparison to the effluent quality and quantity criteria, is outlined below:

Capacity Assessment with Historical Trending– Table No. 1

Year	2021	2020	2019	2018	2017
Average Day Flow (m^3/d)	2,567	3,123	2,780	2,660	2,773
Average Design Capacity (m^3/d)	3,580	3,580	3,580	3,580	3,580
% of capacity (based on average daily flows)	72%	87%	78%	74%	77%
Five Year Rolling Average	78%	76%	69%	65%	64%
Peak Day Flow (m^3/d)	9,118	8,397	6,696	7,656	7,617
Peak Design Capacity	7,196	7,196	7,196	7,196	7,196
Raw Sewage Total Flow (m^3)	937,066	1,142,934	1,013,577	951,371	1,010,180

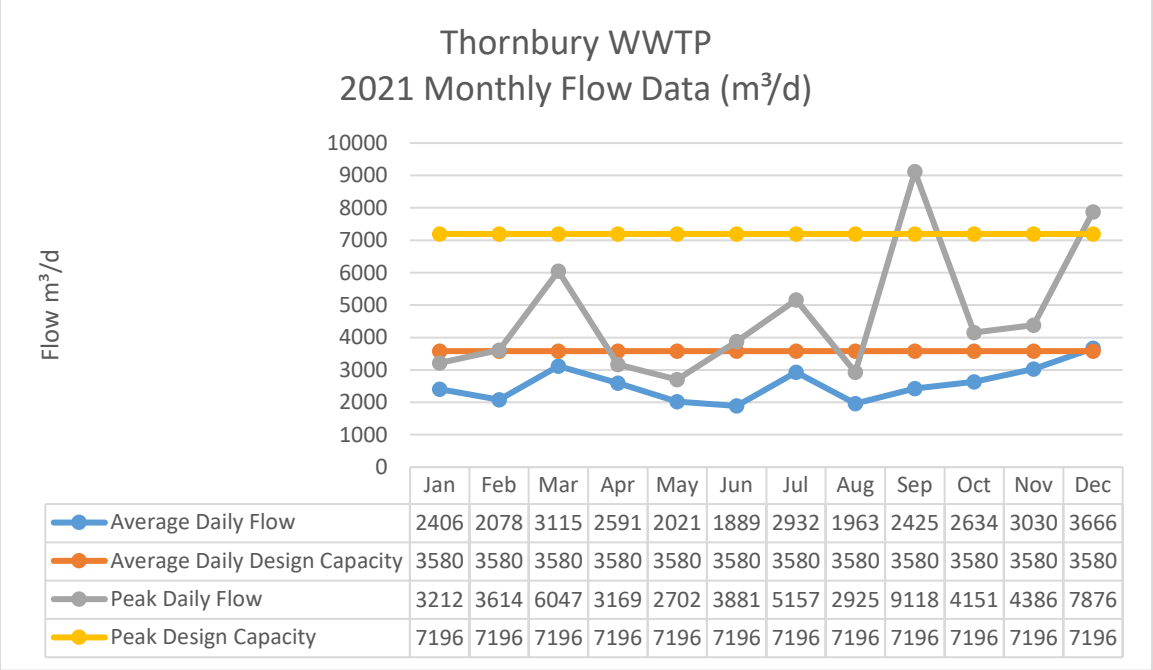
Capacity rating is based on Annual Flow Data. There was no imported sewage hauled in.

2021 Raw Sewage Loading Objectives (kg/d)

Table No. 2

Influent Parameter	Design	Annual Average Loading	% of Design	Was Design Exceeded?
BOD	537	154	29%	No
Total Suspended Solids	651	187	29%	No
Total Phosphorus	25	3.5	14%	No
Total Kjeldahl Nitrogen	86	33.9	39%	No

Chart No. 1: Thornbury Wastewater Treatment Plant 2021 Monthly Flow Data

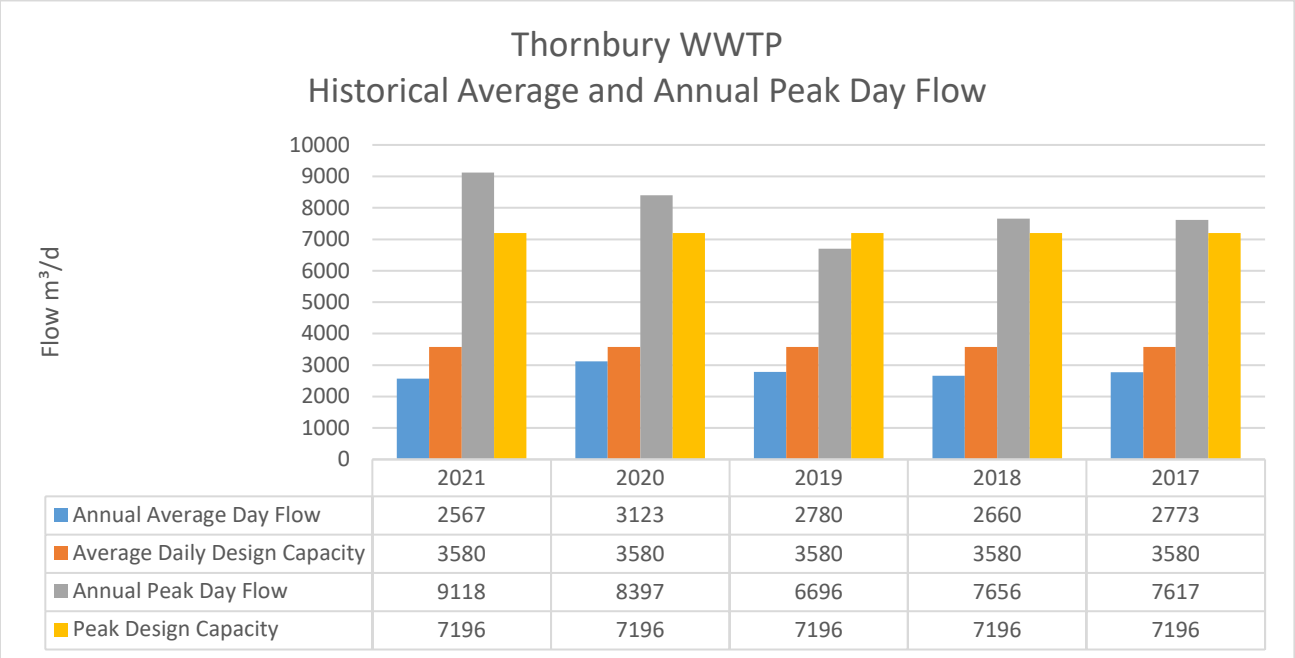


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Average Daily Flow	2406	2078	3115	2591	2021	1889	2932	1963	2425	2634	3030	3666
Average Daily Design Capacity	3580	3580	3580	3580	3580	3580	3580	3580	3580	3580	3580	3580
Peak Daily Flow	3212	3614	6047	3169	2702	3881	5157	2925	9118	4151	4386	7876
Peak Design Capacity	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196	7196

Upgrades to the headworks started in 2020. Influent flow was introduced to the new headworks in the fall 2021 which encompassed new grit and rag removal and separate flow meters for incoming force mains. The upgrades will divert to the lagoons in emergency or maintenance events. The headworks will have substantial completion in spring 2022.

Expansion 1A final design had been awarded to IBI Engineering and is proposed to start in 2022.

Chart No 2: Thornbury WWTP Historical Average and Peak Day Flow



	2021	2020	2019	2018	2017
Annual Average Day Flow	2567	3123	2780	2660	2773
Average Daily Design Capacity	3580	3580	3580	3580	3580
Annual Peak Day Flow	9118	8397	6696	7656	7617
Peak Design Capacity	7196	7196	7196	7196	7196

The Annual Peak Day Flow is calculated using the average of the monthly Peak Day Flow events.

B. Summary and Interpretation of Final Effluent Monitoring Data

2021 Plant Performance

Table No. 3

Effluent Parameter Average Daily Effluent Flow 2,574	Annual Average Loading (kg/d)	Design (kg/d)	Was Design Exceeded?
CBOD	9.9	18	No
Total Suspended Solids	13.9	18	No
Total Phosphorus	0.25	0.89	No
Ammonia Freezing Period November 1 – March 31	2.0	11	No
Ammonia Non-Freezing Period April 1 – October 31	0.30	3.6	No

The Town receives regular laboratory analysis and monitors pH levels from discharge of an Industrial user. On occasion, the Industrial user is exceeding BOD, pH and Total Phosphorus limits outlined in the Town's Sewer Use By-law. The Industrial user is required to provide regular sampling data to the Town to demonstrate compliance with the limits outlined.

2021 Final Effluent Compliance Limits

Table No. 4

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
CBOD5	January	4.29	12.0	10.0	Yes	5.0	Yes
	February	3.60	10.0	10.0	Yes	5.0	Yes
	March	2.40	3.0	10.0	Yes	5.0	Yes

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
	April	2.00	2.0	10.0	Yes	5.0	Yes
	May	3.80	6.0	10.0	Yes	5.0	Yes
	June	3.40	7.0	10.0	Yes	5.0	Yes
	July	5.50	16.0	10.0	Yes	5.0	No
	August	2.25	3.0	10.0	Yes	5.0	Yes
	September	4.40	7.0	10.0	Yes	5.0	Yes
	October	2.50	4.0	10.0	Yes	5.0	Yes
	November	3.42	9.0	10.0	Yes	5.0	Yes
	December	4.17	9.0	10.0	Yes	5.0	Yes

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
Total Suspended Solids	January	3.57	6.0	15.0	Yes	5.0	Yes
	February	5.80	10.0	15.0	Yes	5.0	No
	March	2.60	4.0	15.0	Yes	5.0	Yes
	April	3.0	4.0	15.0	Yes	5.0	Yes
	May	5.30	7.0	15.0	Yes	5.0	No
	June	5.70	10.0	15.0	Yes	5.0	No

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
	July	5.30	8.0	15.0	Yes	5.0	No
	August	3.50	7.0	15.0	Yes	5.0	Yes
	September	5.80	7.0	15.0	Yes	5.0	No
	October	5.00	8.0	15.0	Yes	5.0	Yes
	November	6.14	10.0	15.0	Yes	5.0	No
	December	8.17	11.0	15.0	Yes	5.0	No

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
Total Phosphorus	January	0.08	0.10	0.30	Yes	0.25	Yes
	February	0.10	0.13	0.30	Yes	0.25	Yes
	March	0.09	0.12	0.30	Yes	0.25	Yes
	April	0.07	0.09	0.30	Yes	0.25	Yes
	May	0.07	0.12	0.30	Yes	0.25	Yes
	June	0.06	0.10	0.30	Yes	0.25	Yes
	July	0.06	0.09	0.30	Yes	0.25	Yes
	August	0.08	0.10	0.30	Yes	0.25	Yes
	September	0.15	0.31	0.30	Yes	0.25	Yes

Final Effluent Parameter	Date Sampled	Average Monthly Effluent Conc'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
	October	0.11	0.18	0.30	Yes	0.25	Yes
	November	0.11	0.16	0.30	Yes	0.25	Yes
	December	0.10	0.16	0.30	Yes	0.25	Yes

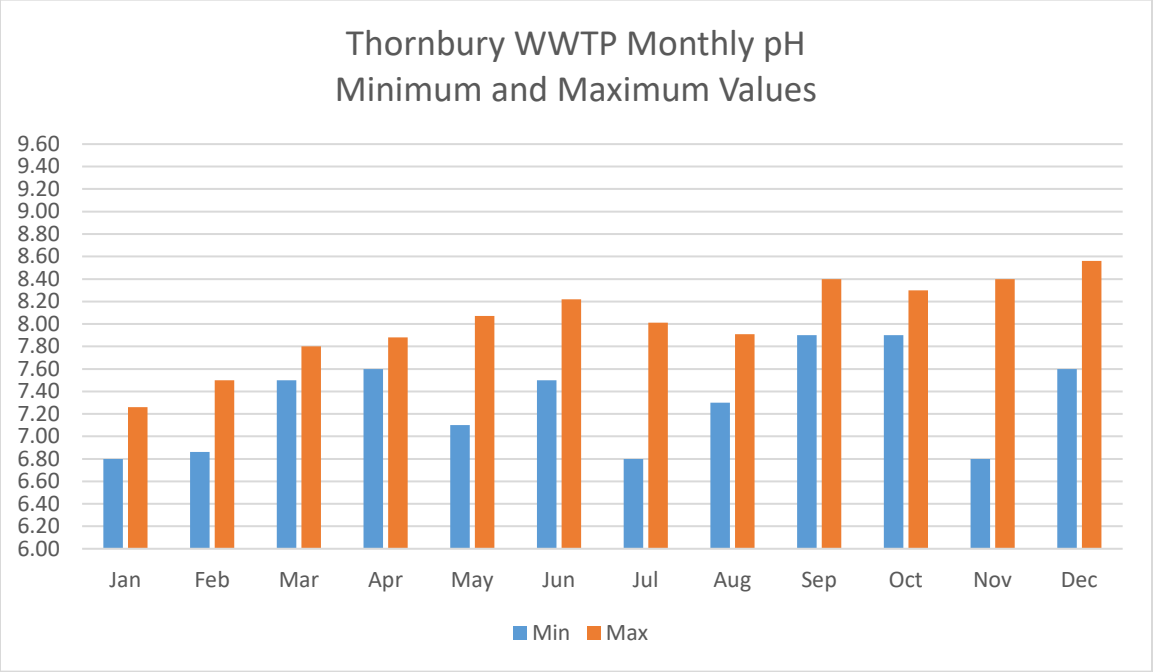
Final Effluent Parameter	Date Sampled	Average Monthly Effluent Con'n result mg/L	Maximum Monthly Conc'n mg/L	Average Monthly Effluent Conc'n Limit mg/L	Average Monthly Effluent Conc'n Limit Met? Y/N	Average Monthly Effluent Conc'n Objective	Average Monthly Effluent Conc'n Objective Met? Y/N
Total Ammonia Nitrogen (Nov 1 to March 31)	January	1.49	Yes	5.0	Yes	3.0	Yes
	February	0.20	Yes	5.0	Yes	3.0	Yes
	March	0.10	Yes	5.0	Yes	3.0	Yes
	November	0.98	Yes	5.0	Yes	3.0	Yes
	December	0.33	Yes	5.0	Yes	3.0	Yes
Total Ammonia Nitrogen (Apr 1 to Oct 31)	April	0.10	Yes	2.0	Yes	1.0	Yes
	May	0.13	Yes	2.0	Yes	1.0	Yes
	June	0.10	Yes	2.0	Yes	1.0	Yes
	July	0.10	Yes	2.0	Yes	1.0	Yes
	August	0.15	Yes	2.0	Yes	1.0	Yes
	September	0.10	Yes	2.0	Yes	1.0	Yes
	October	0.10	Yes	2.0	Yes	1.0	Yes

Final Effluent Parameter	Date Sampled	Result	Concentration Limit	Number of Exceedances	Was Objective Met?
Acute Lethality to Rainbow Trout and Daphnia Magna	March	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes
	June	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes
	September	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes
	December	0 Mortality	Non-acutely lethal (no more than 50% mortality)	0	Yes

Final Effluent Parameter	Date Sampled	Monthly Mean Geometric Density CFU/100 mL	Max Monthly Mean Geometric Density Limit	Max Monthly Effluent Conc'n Limit Met? Y/N	Monthly Mean Geometric Density Conc'n Objective	Monthly Mean Geometric Density Conc'n Objective Met? Y/N
E. coli	January	4.60	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	February	2.30	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	March	2.40	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	April	9.60	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes

Final Effluent Parameter	Date Sampled	Monthly Mean Geometric Density CFU/100 mL	Max Monthly Mean Geometric Density Limit	Max Monthly Effluent Conc'n Limit Met? Y/N	Monthly Mean Geometric Density Conc'n Objective	Monthly Mean Geometric Density Conc'n Objective Met? Y/N
	May	4.80	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	June	4.20	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	July	7.40	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	August	3.10	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	September	2.30	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	October	1.70	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	November	3.40	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes
	December	2.20	200 CFU/100 mL	Yes	100 CFU/100 mL	Yes

Chart No. 3 – Thornbury WWTP Monthly pH Values



C. Summary of Deviation from Monitoring Schedule

Raw samples are collected twice monthly and sent to an accredited laboratory for analysis. This enables a better understanding of incoming raw sewage flow loadings. The influent and effluent samples are taken with an automated composite sampler. The composite samplers are located at the plant headworks and effluent channel after U.V. The raw sampler was moved to the temporary discharge pipe located at the beginning of the aeration tanks until the headworks upgrade was put into service in the Fall 2021.

The monitoring schedule will continue in 2022.

D. Summary of Operating Issues Encountered and Corrective Actions Taken

- There were no operating issues encountered during this reporting period.

E. Summary of Normal and Emergency Repairs and Maintenance Activities Performed

- Annual inspection of all safety equipment
- Bi-annual inspection of all gas monitors
- Surge Protection Devices were installed in all Motor Control Centre (MCC) at WWTP and Pump Stations
- All building ventilation was serviced
- UV lamps replaced as needed

- (4) Four backflow preventers were tested
- (4) Four pumps at (2) two Sewage Pump Stations were serviced
- Pumps were replaced at Elgin and Moore Pump Stations, like for like
- (2) Two large sewage pumps at Sunset Sewage Pump Station were rebuilt
- Isolation valves were replaced at (2) two Sewage Pump Stations
- (4) Four compressors were serviced
- Multiple small horsepower pumps had annual inspection and service performed
- Quarterly samples were collected for acute lethality analysis
- 200 manholes were inspected
- 9,719 meters of collection system was flushed within the Town
- 21,645 meters of sewer mains and 4,515 meters of laterals were assessed during the sewer main condition assessment

On August 10, 2021 benthic field work was completed by StraightUp Environmental Consulting following the OBBN protocols for the Beaver River Benthic Water Quality Report. Three samples were taken from the same locations as the 2005-2006 effluent study performed by AWS. The samples were taken to the lab and identified to family level.

The results found a 1.2% decline in water quality from upstream of the effluent pipe to downstream of the effluent pipe. This was considered an acceptable value.

In accordance with Condition (8) of the ECA, the Owner shall ensure that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained.

The Thornbury WWTP employs a planned maintenance program that ensures that the sewage works and related equipment that are installed or used to achieve compliance are properly operated and maintained. Licensed Operators perform routine maintenance on all equipment including pumps, monitoring equipment, alarm systems, safety equipment, and other treatment components. Both routine and non-routine (emergency) maintenance activities are conducted in accordance with manufacturers' instructions.

F. Effluent Quality Assurance or Control Measures Undertaken

Effluent quality assurance is controlled by monthly effluent concentrations and waste loading calculations which are submitted to the Ministry of the Environment, Conservation and Parks (MECP) Owen Sound District Office.

The Town strives to operate within the ECA design objectives, however on occasion the Plant was unable to achieve the design objectives.

Table No. 6

Effluent Parameter	% Removal Efficiency (Annual Average)
CBOD5	93.8%
Total Suspended Solids	92.9%
Total Phosphorus	91.8%
Total Ammonia Nitrogen (Nov 1 to Mar 31)	78.9%
Total Ammonia Nitrogen (Apr 1 to Oct 31)	96.8%

G. Evaluation of Calibration and Maintenance Conducted on Monitoring Equipment

The Town is required to provide a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required by the ECA or recommended by the manufacturer.

Calibration of the monitoring equipment was completed in May 2021 and is attached for reference as Appendix A. All calibration results received met the accuracy requirement.

H. Summary of Efforts Made to Achieve Design Objectives

In cases where the facility did not meet design objectives, the MECP District Office was notified. The design objectives were achieved more than 50% of the operating year for all, except TSS which will be addressed with design issues in 1A expansion.

To assist with meeting design objectives, the final effluent line from the clarifiers was flushed to maintain suspended solids in the final effluent within limits. In house lab work was performed once a week to monitor pH, suspended solids, and total phosphorus. The UV system is monitored daily to verify operation. Ongoing dialogue is being had with Industrial dischargers.

Due to design limitations, which will be addressed in the Phase 1 expansion, the final effluent line from the clarifiers to the UV line was flushed regularly to improve suspended solids in the final effluent.

The construction of the new headworks began in the 2020 construction season, raw influent was introduced to the new Headwork building in the fall of 2021. Substantial completion is due be complete in the spring 2022.

Staff undertook an optimization study of the Thornbury WWTP in 2021. The recommendations will be incorporated into the Phase 1A Expansion of TWWTP in order to optimize performance of the TWWTP.

The Phase 1A Expansion final design has been awarded to IBI Engineering and is proposed to start in 2022. The expansion is anticipated to be complete in 2024.

I. Volume of Sludge generated in 2021 / Anticipated Volumes in 2022

Sludge disposal incorporates the "Sutton concept" where a high sludge age and solids level combined with an increased concentration of nitrates in the secondary effluent, prevents the reduction of sulphates to hydrogen sulphide in the lagoon. There is approximately 2,500m³ left in the lagoon. There was 2640 m³ (243 Tonne) of Biosolids removed in September 2021 under NASM # 23699.

J. Summary of Complaints Received in 2021

Four (4) complaints were received in 2021. Three (3) complaints were from same resident in the vicinity of Grey Road 40 where the manhole from Delphi PS force main discharges into. Staff investigated and found no noticeable issues or odour in the area.

(1) one complaint received was as a result of an odour originating from the WWTP; however, it was received a day after the odor was observed. Staff investigated and found no noticeable odor at time the report was received.

K. Summary of Bypasses, Overflow, or other situations outside Normal Operating Conditions

In accordance with Condition 11 of the ECA, this report must provide a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events.

A by-pass refers to the diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flow being returned to the Sewage Treatment Plant treated train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities. By-passes are prohibited except in certain situations, and may be planned (i.e. for maintenance or research purposes) or unplanned (i.e. emergency situations or high flow conditions).

A plant overflow means a discharge to the environment from the sewage treatment facility at a location other than the plant outfall or into the plant outfall downstream of the final effluent sampling locations. Overflows are prohibited except in certain situations and special reporting,

sampling, and recording requirements apply in the event of an overflow. Overflows may be generally the result of heavy rainfall or snow melt events, such that the system becomes hydraulically overloaded.

Spills are releases of pollutants into the natural environment from or out of a structure, vehicle or other container that is abnormal in quality or quantity in light of all the circumstances of the discharge. Spills are generally the result of mechanical, electrical, automation or process failures. Abnormal discharge events include any other abnormal events not otherwise classified as a bypass, overflow, or spill.

The headworks construction was delayed in both 2020 and 2021. With COVID restraints in place, the commencement of the construction was not only delayed but also extended due to the ability to procure the required equipment and construct during lockdown conditions. Additionally, the record drawings for the facility were not accurate. There were a lot of unknown buried surprises that appeared when the construction commenced. Yard piping was not in the anticipated location, and a significant amount of grout/concrete was dumped in the area needed to install pipes to support the new building. These discoveries significantly slowed the construction as they were addressed and corrected.

The Town made the decision to install a by-pass of the existing pre-treatment and direct the flow to the aeration basins. This decision was made because the existing headworks had not been operational for a number of years and there is commitment to clean the aerations basins at the completion of the project. This was changed from original construction plans for better treatment of sewage. The original plan was to send all sewage to cell # 1. Notification of this change was communicated to the local MECP office in January 2021.

L. Summary of Notice of Modifications to Sewage Works Completed

There were no Notice of Modification to Sewage Works completed in 2021 for the Thornbury Wastewater Treatment Plant.

M. Summary of Efforts Made to Achieve Conformance with Procedure F-5-1

Not applicable.

N. Changes or Updates to Schedule for Completion of Construction for Proposed Works

The Town hired hired J.L. Richards and Associates Limited (JLR) to provide engineering services for the preliminary and detailed design and construction administration for the construction of upgrades to the existing headworks facility at the Thornbury Wastewater Treatment Plant. Raw influent was introduced into new Headworks in fall 2021, with substantial completion expected spring 2022.

The Town hired IBI Engineering for the design and construction of Phase 1A Expansion which is expected to commence in 2022 and be complete in 2024.

The Town currently holds Environmental Compliance Approval (ECA) No. 1640-BAFFX5 issued on May 24, 2019, for the operations of the Thornbury Wastewater Treatment Plant.

Parshall Flume
Verification/Calibration Report

SCG FLOWMETRIX

AS LEFT CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER Town of Blue Mountains
CONTACT Craigleith WWTP
Steve Rimmer
Operator
146 Long Point Road,
Blue Mountains, ON
T: 705-444-4877
E: srimmer@thebluemountains.ca

VER. BY - FM Michael Jorrin

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Milltronics
MODEL	Multiranger Plus
CONVERTER SERIAL NUMBER	105-23
PLANT ID	Thornbury WWTP
METER ID	Effluent
FIT ID	FIT 01
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	
VERIFICATION DATE	May 5th 2021
CAL. FREQUENCY	Annual
CAL. DUE DATE	May 2022

PROGRAMMING PARAMETERS

THROAT DIMENSION (DN)	inches	12
EMPTY DISTANCE	m	1.128
MAX. HEAD	m	0.298
DEAD ZONE	m	0.830
BLANKING DISTANCE	m	0.105
MAX. FLOW	M3/D	9474.9
F.S. RANGE - O/P	M3/D	10972.8

TOTALIZER

AS FOUND	401	M3
AS LEFT	410	M3
DIFFERENCE	9	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	no
ALLOWABLE [%] ERROR	15

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	Yes

Ultrasonic sensor installed to ensure full scale flow condition

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

AS FOUND TEST RESULTS

				0.0	12.1	34.8	70.9	100.0	% F.S. Range
				0.000	0.075	0.149	0.238	0.298	m
REF. FLOW RATE				**0.000**	**1148.781**	**3299.173**	**6715.511**	**9474.859**	M3/D
MUT [Reading]				0.010	1216.210	3543.230	5960.960	10272.000	M3/D
MUT [Difference]				0.010	67.429	244.057	-754.551	797.141	M3/D
MUT [% Error]				n/a	5.87	7.40	-11.24	8.41	%
mA OUTPUT				**4.000**	**5.940**	**9.571**	**15.340**	**20.000**	mA
MUT [Reading]	min.	4.000	mA	4.000	6.210	10.022	15.682	19.120	mA
MUT [Difference]	max.	20.000	mA	0.000	0.270	0.451	0.342	-0.880	mA
MUT [% Error]				0.00	4.55	4.71	2.23	-4.40	%
TOTALIZER - REF. FLOW RATE								**9474.859**	M3/D
TOTALIZER [MUT]								9	M3
TEST TIME								72.55	SECONDS
CALC. TOTALIZER								7.956	M3
ERROR								11.60	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	n/a
PROCESS METER	DMM	11
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	2.61	PASS
mA OUTPUT	1.42	PASS
TOTALIZER	11.60	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

Parshall Flume
Verification/Calibration Report

SCG FLOWMETRIX

AS LEFT CERTIFICATION

PASS

CLIENT DETAIL

CUSTOMER Town of Blue Mountains
CONTACT Craigleith WWTP
Steve Rimmer
Operator
146 Long Point Road,
Blue Mountains, ON
T: 705-444-4877
E: srimmer@thebluemountains.ca

VER. BY - FM Michael Jorrin

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Milltronics
MODEL	MultiRanger Plus
CONVERTER SERIAL NUMBER	13323
PLANT ID	Thornbury WWTP
METER ID	RAS FLOW
FIT ID	FIT 03
CLIENT TAG	N/A
OTHER	N/A
GPS COORDINATES	
VERIFICATION DATE	May 5th 2021
CAL. FREQUENCY	Annual
CAL. DUE DATE	May 2022

PROGRAMMING PARAMETERS

THROAT DIMENSION (DN)	inches	6
EMPTY DISTANCE	m	1.101
MAX. HEAD	m	0.470
DEAD ZONE	m	0.631
BLANKING DISTANCE	m	0.305
MAX. FLOW	M3/D	9990.4
F.S. RANGE - O/P	M3/D	9504.0

TOTALIZER

AS FOUND	5998278	M3
AS LEFT	5998332	M3
DIFFERENCE	54	M3

TEST CRITERIA

AS FOUND CERTIFICATION TEST	no
ALLOWABLE [%] ERROR	15

COMPONENTS TESTED

CONVERTER DISPLAY	yes
mA OUTPUT	yes
TOTALIZER	yes
ACCURACY BASED ON [% o.r.]	Yes

Ultrasonic sensor installed to ensure full scale flow condition

ERROR DOCUMENTED IN THIS REPORT; BASED ON % o.r.

AS FOUND TEST RESULTS

				0.0	10.0	33.4	66.2	100.0	% F.S. Range
				0.000	0.109	0.235	0.362	0.470	m
REF. FLOW RATE				**0.000**	**996.980**	**3341.595**	**6613.421**	**9990.363**	M3/D
MUT [Reading]				0.010	1044.000	3420.000	6703.000	9034.000	M3/D
MUT [Difference]				0.010	47.020	78.405	89.579	-956.363	M3/D
MUT [% Error]				n/a	4.72	2.35	1.35	-9.57	%
mA OUTPUT				**4.000**	**5.597**	**9.352**	**14.592**	**20.000**	mA
MUT [Reading]	min.	4.000	mA	4.000	6.210	10.022	15.948	19.994	mA
MUT [Difference]	max.	20.000	mA	0.000	0.613	0.670	1.356	-0.006	mA
MUT [% Error]				0.00	10.96	7.17	9.30	-0.03	%
TOTALIZER - REF. FLOW RATE								**9990.363**	M3/D
TOTALIZER [MUT]								8	M3
TEST TIME								72.51	SECONDS
CALC. TOTALIZER								8.384	M3
ERROR								-4.80	%

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] LEVEL	Sim. BOARD	n/a
PROCESS METER	DMM	11
STOP WATCH	SW	Yes

RESULTS

TEST	AVG % o.r.	PASS FAIL
DISPLAY	-0.29	PASS
mA OUTPUT	5.48	PASS
TOTALIZER	-4.80	PASS

This report reflects the test results of the overall accuracy for the above flow converter using the specified manufacturers flow tube simulator to within the specified tolerance as identified within this report.

Flow Rate Comparison
Verification Report

FLOWMETRIX

VERIFICATION RESULTS

AS FOUND **PASS**

AS LEFT **PASS**

CLIENT DETAIL

CUSTOMER Town of Blue Mountains
CONTACT Craigleith WWTP
Steve Rimmer
Operator
146 Long Point Road,
Blue Mountains, ON
T: 705-444-4877
E: srimmer@thebluemountains.ca

VER. BY - FM Michael Jorrin

Quality Management Standards Information - Reference equipment and instrumentation used to conduct this verification test is found in our AC-QMS document at the time this test was

EQUIPMENT DETAIL

[MUT] MANUFACTURER	Khrone
MODEL	Optisonic
CONVERTER SERIAL NUMBER	CG4011100
PLANT ID	Thornbury WWTP
METER ID	Influent
FIT ID	NA
CLIENT TAG	NA
OTHER	NA
GPS COORDINATES	
VERIFICATION DATE	May 6th 2021
CAL. FREQUENCY	Annual
CAL. DUE DATE	May 2022

[MUT] PROGRAMMING PARAMETERS

DIAMETER (DN-mm)	80
FLOW RATE UNITS	LPS
TUBE CAL. FACTOR [AF]	n/a
TUBE CAL. FACTOR [AL]	n/a

REFERENCE METER

MANUFACTURER	Endress+Hauser
MODEL	Prosonic 90P
SERIAL NUMBER	77015a16000

INSTALLATION DETAIL

PIPE TYPE		PVC
PIPE CIRCUMFERENCE	mm	1030
PIPE OD	mm	328
PIPE ID	mm	300
WALL THICKNESS	mm	12.91
# TRAVERSES		2
SEP. DISTANCE	mm	386
ZERO FLOW RATE	lps	0
SIGNAL STRENGTH		86

FLOW RATE COMPARISON

TEST #	BEFORE REF VALUE LPS	BEFORE MUT VALUE LPS	BEFORE DIFF VALUE LPS	BEFORE ERROR % o.r.
1	31.6	33	1.4	4.43
2	58.4	61.1	2.7	4.62
3	90.0	91	1	1.11
AVG	60.0	61.7	1.7	3.39
STD (+/-)	16.878	16.746	0.513	1.14

TEST #	AFTER REF VALUE LPS	AFTER MUT VALUE LPS	AFTER DIFF VALUE LPS	AFTER ERROR % o.r.
1	31.6	33	1.45	4.60
2	58.4	61.1	2.7	4.62
3	90.0	91	1	1.11
AVG	60.0	61.7	1.7	3.44
STD (+/-)	16.892	16.746	0.509	1.17

FORWARD TOTALIZER INFORMATION

AS FOUND	N/A	L
AS LEFT	N/A	L
DIFFERENCE	n/a	L

TEST CRITERIA

AS FOUND CERTIFICATION TEST	no
FORWARD FLOW DIRECTION	Yes
ALLOWABLE [%] ERROR	15

COMMENTS

QUALITY MANAGEMENT STANDARDS INFO.

[QMS] INFORMATION	IDENT.	ID #
[REFERENCE] METER	TRANSIT TIME	1
PROCESS METER	PM	n/a

This report reflects the comparison test results at a constant test flow rate. This report reflects the "AS FOUND" and AS LEFT" results based on the test results observed.