

**Baden – New Hamburg Water
and Wastewater System
Servicing Review**

Project File Report - Executive Summary



Prepared for:
Region of Waterloo

Prepared by:
Stantec Consulting Ltd.
300 Hagey Blvd., Suite 100
Waterloo, ON N2L 0A4

and

C3 Water Inc.
350 Woolwich Street South
Breslau, ON N0B 1M0

March 2023

Sign-off Sheet

This document entitled Baden – New Hamburg Water and Wastewater System Servicing Review was prepared by Stantec Consulting Ltd. (“Stantec”) for the account of Region of Waterloo (the “Client”). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec’s professional judgment in light of the scope, schedule and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use which a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Prepared by _____ Original Signed by: _____

(signature)

Sarah Micks, BES

Reviewed by _____ Original Signed by: _____

(signature)

Paula Hohner, MScPI, MCIP, RPP

Approved by _____ Original Signed by: _____

(signature)

Jeff Paul, P.Eng.

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Table of Contents

Executive Summary	i
Abbreviations	viii
1.0 Introduction.....	1
1.1 Study Area.....	1
1.2 Municipal Class Environmental Assessment Process	2
1.2.1 Planning Process.....	3
1.2.2 Class EA Project Classification	4
1.2.3 Comments and Request for Higher Level of Study	6
1.3 Communications and Consultation Plan.....	7
1.4 First Nation and Indigenous Community Consultation.....	8
1.5 Public Consultation.....	9
1.6 Agency Consultation.....	10
2.0 Policy, Planning and Design Documents	11
2.1 Federal Legislation	11
2.1.1 Canadian Environmental Assessment Act.....	11
2.1.2 Fisheries Act.....	11
2.1.3 Migratory Birds Act.....	12
2.1.4 Species at Risk Act.....	12
2.2 Provincial Policies and Legislation.....	13
2.2.1 The Planning Act.....	13
2.2.2 Provincial Policy Statement	13
2.2.3 Endangered Species Act.....	14
2.2.4 Climate Change.....	14
2.2.5 Grand River Conservation Authority	15
2.2.6 Grand River Source Protection Plan.....	15
2.2.7 MOE Guideline D-2: Compatibility between Sewage Treatment and Sensitive Land Use.....	16
2.3 Municipal Planning Policies	16
2.3.1 Region of Waterloo Official Plan.....	16
2.3.2 Township of Wilmot Official Plan (2019).....	18
3.0 Relevant Municipal Studies/Projects	19
3.1 Water Infrastructure.....	19
3.2 Wastewater Infrastructure	19
4.0 Existing Conditions.....	20
4.1 Socio-Economic.....	20
4.2 Natural Environment.....	23
4.2.1 Designated Natural Heritage Features	24
4.2.2 Fish and Fish Habitat.....	26

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

4.2.3	Significant Species	26
4.3	Cultural Environment	27
4.3.1	Cultural Heritage Resources	27
4.3.1	Archaeological Resources	27
5.0	Water and Wastewater Servicing	29
5.1	Water Supply and Distribution System	29
5.1.1	Existing Water Supply Infrastructure	29
5.1.2	Existing Water Pressure	30
5.1.3	Future Projections	30
5.1.4	Existing Fire Flow	31
5.1.5	Future Fire Flow	31
5.1.6	Revised Future Fire Flow	31
5.1.7	Foxboro Green Water Treatment Plant	32
5.2	Wastewater Collection and Treatment System.....	33
5.2.1	Existing Wastewater Infrastructure	33
5.2.2	Projected Average Daily Flows (Wastewater)	34
5.2.3	Foxboro Green Wastewater Treatment Plant.....	35
6.0	Problem and Opportunity Statement.....	36
7.0	Alternative Solutions.....	37
7.1.1	Water Supply.....	37
7.1.2	Wastewater Servicing.....	38
7.1.3	Foxboro Green Community	41
8.0	Evaluation of Alternative Solutions	45
8.1	Evaluation Criteria	45
8.2	Evaluation Methodology	48
8.3	Evaluation of Alternative Solutions	49
8.3.1	Water Supply Alternative Solutions	49
8.3.2	Evaluation of Wastewater Alternative Solutions	49
8.3.3	Evaluation of Foxboro Green Community Alternative Solutions	51
8.4	Evaluation Summary and Preliminary Preferred Alternative.....	51
8.4.1	Baden-New Hamburg Wastewater Servicing	51
8.4.2	Foxboro Green Water and Wastewater Servicing	56
9.0	Preliminary Cost Estimate	64
9.1	Implementation Timeframe and Schedule	65
9.2	Baden Well Decommissioning	65
10.0	Potential Environmental Impacts	65
10.1	Natural Environment.....	66
10.1.1	Significant Wildlife Habitat	66
10.1.2	Fish and Fish Habitat.....	67

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

10.2	Archaeological Resources	69
10.3	Cultural Heritage Resources	70
11.0	Proposed Environmental Mitigation and Monitoring Requirements.....	72
11.1.1	Protection of Fish.....	72
11.1.2	Erosion and Sediment Control.....	72
11.1.3	Protection of Migratory Birds	72
11.1.4	Protection of Wildlife.....	73
11.1.5	Standard Mitigation Measures for Construction.....	74
11.2	GRCA Mitigation Requirements.....	74
11.3	Archaeological Resources	75
11.4	Cultural Heritage Resources	75
11.5	Climate Change.....	76
11.6	Source Protection	76
11.7	Groundwater.....	77
11.8	Excess Materials and Waste	77
12.0	Approvals and Permits	78
12.1.1	Ministry of Transportation Public Transportation and Highway Improvement Act	78
12.1.2	Fisheries and Oceans Canada / Fisheries Act	78
12.1.3	Species at Risk Act.....	79
12.1.4	Grand River Conservation Authority / Conservation Authorities Act79	
12.1.5	Endangered Species Act.....	80
12.1.6	Additional Requirements for Impact Assessment and Refinement of Mitigation Measures	82
13.0	Commitments to Carry Forward to Detailed Design and Construction	83
14.0	Closing	94

List of Tables

Table 1: Baden Growth Projections.....	22
Table 2: New Hamburg Growth Projections	23
Table 3: Two-Tiered System: Water / Wastewater Infrastructure.....	29
Table 4: Proposed BNH Fire Flow Targets (GMBP, 2022)	32
Table 5: Projected Average Daily Flows.....	35
Table 6: Projected Peak Wet Weather Flows	35
Table 7: Evaluation Criteria	45
Table 8: Evaluation Scoring Criteria	49
Table 9 : Summary of Evaluation of Wastewater Alternative Solutions.....	50
Table 10: Summary of Evaluation of Foxboro Green Community Alternative Solutions.....	53
Table 11: Potential Impacts to Cultural Heritage Resources.....	71
Table 12: SAR potentially occurring within projects study areas within the Servicing Review Study Area	81

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Table 13: Baden-New Hamburg Wastewater Servicing (Alternative WW4) Design Commitments	84
Table 14: Foxboro Water and Wastewater Servicing (Alternative F3) Design Commitments	89

List of Figures

Figure 1: Wastewater Preferred Alternative.....	iv
Figure 2: Foxboro Green Community Preferred Alternative.....	v
Figure 3: Servicing Review Study Area	2
Figure 4: Municipal Class Environmental Assessment Process	5
Figure 5: Development Blocks within the Urban Boundary	21
Figure 6: Natural Heritage Existing Conditions	25
Figure 7: Existing Cultural Heritage Resources	28
Figure 8: Existing Water Supply System	30
Figure 9: Existing Wastewater System.....	34
Figure 10: Alternative WW2	39
Figure 11: Alternative WW3	40
Figure 12: Alternative WW4	41
Figure 13: Alternative F2.....	42
Figure 14: Alternative F3.....	43
Figure 15: Alternative F4.....	44
Figure 16: Baden-New Hamburg WW4 Preferred Alternative.....	56
Figure 17: Foxboro Green Water and Wastewater Servicing Sub-Option Alternatives	58
Figure 18: Foxboro Water and Wastewater Servicing Preferred Alternative	59
Figure 19: Revised Foxboro Water and Wastewater Servicing Preferred Alternative	62

List of Appendices

APPENDIX A	CONSULTATION
APPENDIX B	TECHNICAL MEMO #1 BACKGROUND REVIEW
APPENDIX C	TECHNICAL MEMO #2 EVALUATION CRITERIA
APPENDIX D	TECHNICAL MEMO #3 WATER INFRASTRUCTURE ALTERNATIVES & WATER ANALYSIS UPDATE
APPENDIX E	TECHNICAL MEMO #4 WASTEWATER INFRASTRUCTURE ALTERNATIVES
APPENDIX F	TECHNICAL MEMO #5 & #5A EVALUATION AND PREFERRED ALTERNATIVES
APPENDIX G	NATURAL HERITAGE MEMO
APPENDIX H	STAGE 1 ARCHAEOLOGICAL ASSESSMENT P390-0364-2022
APPENDIX I	CULTURAL HERITAGE REPORT

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Executive Summary

The Region of Waterloo (Region) retained Stantec Consulting Ltd. (Stantec) and C3 Water Inc. (C3W) to complete a System Servicing Review for the New Hamburg Water and Wastewater Systems. The study area for this servicing review includes the water and wastewater systems that serve the communities of Baden, New Hamburg and Foxboro Green within the Township of Wilmot, Region of Waterloo (see map). Future planned growth and development has been identified within the current Urban Area Boundaries for Baden, New Hamburg, and Foxboro Green, as defined in the Township of Wilmot Official Plan (2019). Prior to any development of planned growth, the water and wastewater servicing requirements for these areas need to be addressed.

This System Servicing Study is being undertaken in accordance with Approach #2 of the Master Planning Process, as outlined in Appendix 4 of the Municipal Class Environmental Assessment document (October 2000, as amended in 2007, 2011 and 2015). As such, the Study will address Phases 1 and 2 of the EA process to fulfill the requirements for the recommended Schedule B projects identified.

Consultation

A contact list was developed at the outset of the study, which includes relevant government and regulatory agencies, utilities, community organizations, interested members of the public, Indigenous communities, and First Nations. Project notices issued to date include the Notice of Study Commencement (February 2020), Notice of Public Consultation Centre (PCC) #1 (May 2021), Notice of PCC #2 (December 2021), and Notice of PCC #3 (May 2022). The Notice of Completion is anticipated to be issued in March 2023. All notices have been emailed to the contact list, emailed to First Nations, and published in the New Hamburg Independent and Ayr News newspapers in two consecutive editions.

Three PCC's were held throughout the study to ensure stakeholders had an understanding of the project, and to provide opportunities to provide input into the alternative solutions, evaluation criteria, and design alternatives. While the project information would typically be presented at a PCC event, adjustments were made to ensure public safety and COVID-19 restrictions on public gatherings. As a result, the Region of Waterloo provided the presentation materials on the Engage Waterloo Region website for public review.

All input from the public, review agencies, committees, and other stakeholders has been documented. All consultation with First Nations has also been documented in a Consultation Log.

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Phase 1 – Problem and Opportunities

Phase 1 of the MCEA process identifies the problem or opportunity that has led to the undertaking of the Class EA. The Problem and Opportunity statement for the Baden-New Hamburg Water and Wastewater System Servicing Review is as follows:

The communities of Baden and New Hamburg are currently serviced by a two-tier water and wastewater system run by the Township and the Region. This Servicing Review will assess those assets that are owned and operated by the Region of Waterloo that serve the communities of Baden, New Hamburg and Foxboro Green and assess current and future servicing needs within the community based on the Region's 2011 Master Plan Update, the Township of Wilmot's 2019 Official Plan, Recommendations from the Region's 2018 Wastewater Treatment Plan, and current development applications.

The purpose of this Servicing Review is intended to provide recommendations on the following:

- Capacity, quality, and any necessary upgrades of the existing water supply system
- Capacity, condition, and any necessary upgrades of the wastewater treatment and collection system
- Current industry standards and new technologies and/or infrastructure for water and wastewater servicing

This phase of the project identified three areas where upgrades were required to service existing and future growth:

- Additional water storage was identified as being required under the future growth scenarios
- The Baden Pumping Station was identified as having insufficient capacity under the future growth scenarios under wet weather conditions
- The Foxboro Green water and wastewater systems were identified as requiring significant maintenance and upgrades and required further study to review alternative servicing scenarios.

Phase 2 – Alternative Solutions

Alternative solutions are identified and evaluated based on their ability to reduce impacts to the socio-economic, natural, technical, and financial environments.

Alternative solutions were identified and evaluated for Water Supply, Wastewater, and the Foxboro Green community.

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Water Supply Alternative Solutions considered for the study area include:

- WS1 - Do Nothing
- WS2 - Provide increased storage at the New Hamburg Water Treatment Plant (WTP)
- WS3 Provide new storage at the Baden Wells site
- WS4 – Provide new storage at the Shingletown/K50 Wells site

Wastewater Alternative Solutions considered for the study area include:

- WW1 - Do Nothing
- WW2 – Upgrade system and maintain existing configuration
- WW3 – Upgrade system and convey directly to Morningside Pump Station
- WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant

Foxboro Green Community Alternative Solutions include:

- F1 – Do Nothing
- F2 – Connect Foxboro to Baden via existing rights-of-way
- F3 – Connect Foxboro to future expanded Baden service area using a direct route
- F4 – Connect Foxboro to New Hamburg via rights-of-way

Following the evaluation, the preliminary preferred alternatives for the Water Supply, Wastewater and Foxboro Green Community improvements were identified.

Preliminary Preferred Alternatives

Water Supply Preferred Alternative

Alternative WS2 – Construction of new storage at New Hamburg WTP, was originally identified as the preliminary preferred alternative. Since the completion of the system servicing review for this MCEA, the Region completed a more detailed investigation of the storage requirements using the Fire Underwriters Survey (FUS) guidelines. This was done as the data for analysis was available and is also part of an undertaking the Region is completing to standardize its approach to fire flow. As a result of this investigation, the water storage requirements previously identified have changed and the recommendation for expansion of storage at New Hamburg WTP is not required.

Wastewater Preferred Alternative

Alternative WW4 – Upgrade system and convey directly to New Hamburg Wastewater Treatment Plant, has been identified as the preliminary preferred alternative. As shown on the attached figure, this alternative involves constructing a new Baden Sanitary Pumping Station and constructing new twin forcemains to direct flow through road

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

allowances and easements to the Baden – New Hamburg Wastewater Treatment Plant. The Wastewater Preferred Alternative is displayed in **Figure 1**.

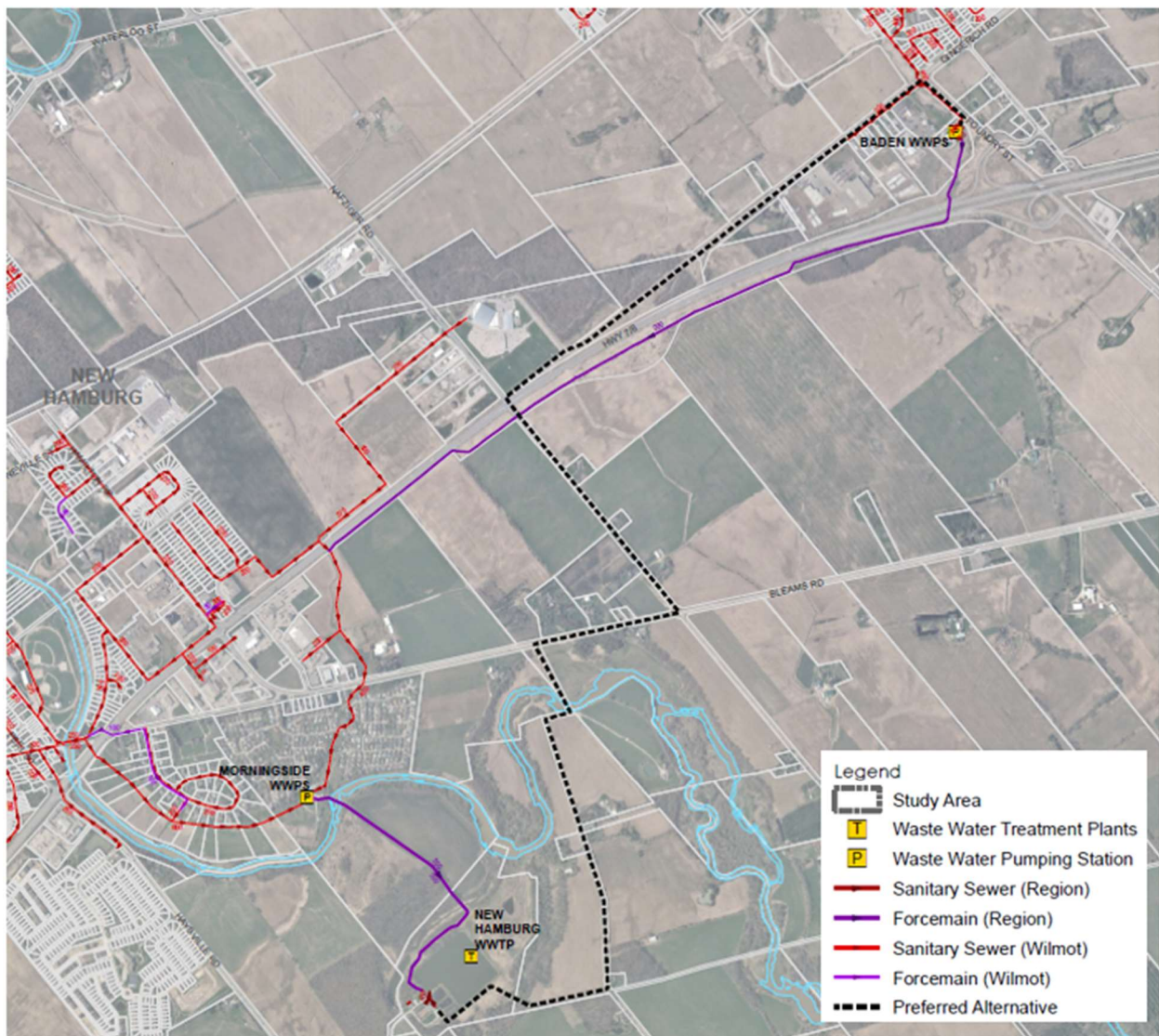


Figure 1: Wastewater Preferred Alternative

Foxboro Green Community Preferred Alternative

Alternative F3 – Connect Foxboro to future expanded Baden service area using a direct route, has been identified as the preliminary preferred alternative. As shown on the attached figure, this alternative involves converting the existing wastewater treatment facilities in Foxboro into sanitary pumping stations and then pumping flow from these facilities via forcemain to the proposed sanitary sewer system to be constructed in the new development area in the north-west corner of Baden. Similarly, the water supply system will also be connected to the proposed development and the existing water

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

supply system in Foxboro will be decommissioned. The Foxboro Green Community Preferred Alternative is displayed in **Figure 2**.

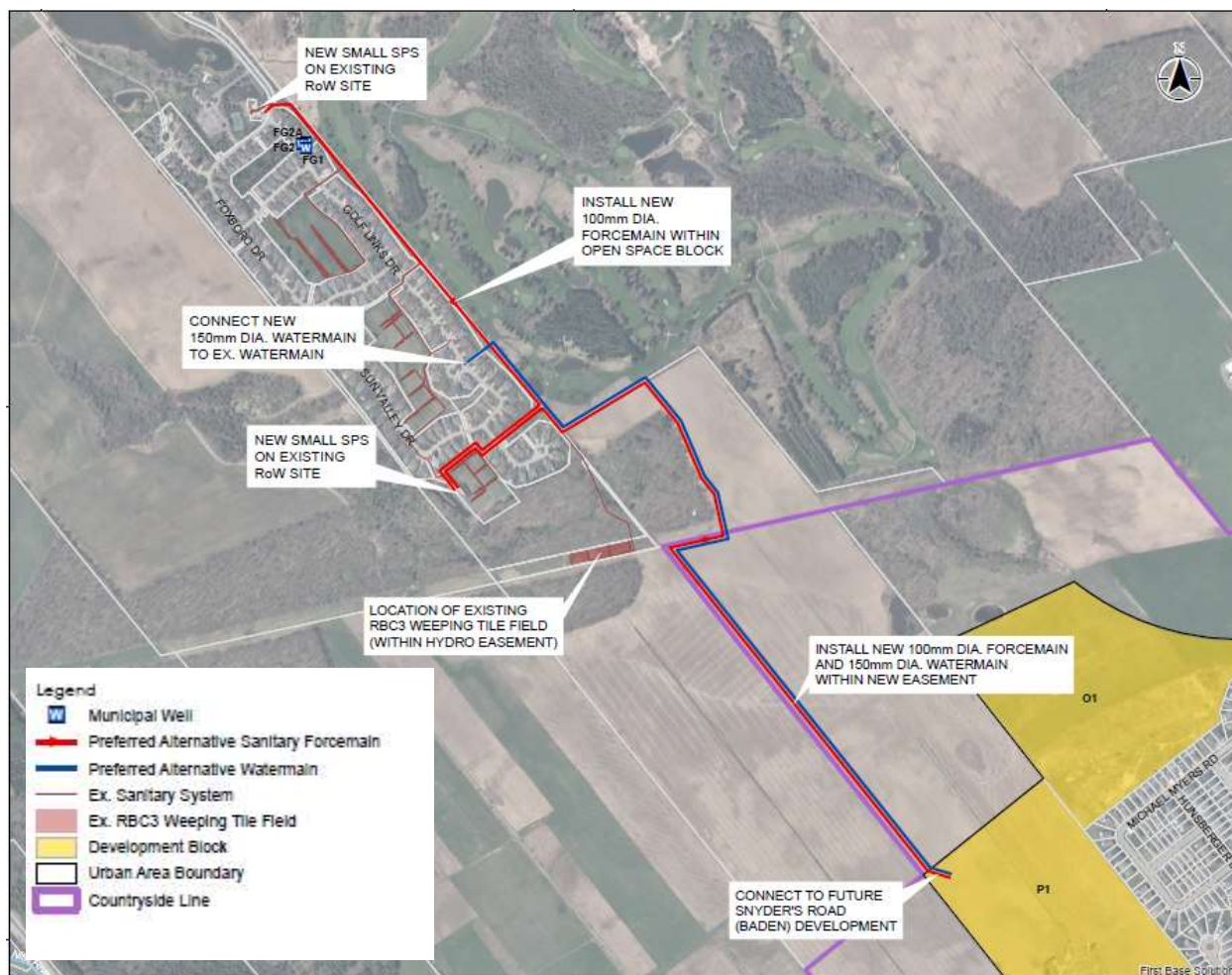


Figure 2: Foxboro Green Community Preferred Alternative

Implementation Timeframe and Schedule

The implementation of the preferred improvements is anticipated to commence in a staged manner with the initial project, the Baden Pumping Station upgrade, likely proceeding to construction in 2025, subject to available funding, and easement needs be met. Construction of the Foxboro Green connection requires the completion of servicing to the development limits of Baden and timing is thus predicated on completion of these works.

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Potential Impacts and Proposed Mitigation

Many of the environmental concerns related to this project have been mitigated through the process by which the preferred design was selected. The anticipated impacts and proposed mitigation measures have been described in Section 10 and 11 of this report. The Region of Waterloo will work with the Grand River Conservation Authority and the Ministry of Environment, Conservation and Parks during detailed design and prior to the start of construction to ensure that the proposed works are acceptable and to obtain required permits as discussed in Section 12 of the report.

Approvals and Permits

All permitting requirements should be identified during the detailed design. The following list is provided for guidance and may not include all of the required permits:

- Ministry of Transportation Public Transportation and Highway Improvement Act - any proposal crossing the designated highway limits (Highway 7/8) will require MTO review and approval (Encroachment Permit). Any portion of the proposal outside the highway designated limits but within MTO's Permit Control Area will require MTO review and approval (Building and Land Use Permit). This requirement will specifically apply to the construction of the twin forcemains from the Baden PS to the Baden – New Hamburg WWTP where these forcemains cross Highway 7/8.
- Fisheries and Oceans Canada - The Act prohibits activities that result in the death of fish or the harmful alteration, disruption or destruction (HADD) of fish habitat unless authorized by the Minister of Fisheries, Oceans and the Canadian Coast Guard. If it is determined that the death of fish or HADD of fish habitat is unavoidable as part of the Project, an authorization under the Fisheries Act may be required. Design plans are necessary to determine the potential for the death of fish or harmful alteration, disruption or destruction of fish habitat. This requirement will specifically apply to the construction of the twin forcemains from the Baden PS to the Baden – New Hamburg WWTP where these forcemains cross the Nith River. This river crossing is proposed to be accomplished by placing the forcemains on the side of the existing bridge to mitigate impacts, however, DFO approval will still be required due to the work being completed in proximity of the Nith River.
- Species at Risk Act (SARA) - Permits for prohibited activities may be issued under Section 73 of the SARA. Design plans are necessary to determine if a SAR Permit is needed for work at the Nith River due to the presence of SAR. This requirement will specifically apply to the construction of the twin forcemains from the Baden PS to the Baden – New Hamburg WWTP where these forcemains cross the Nith River. This river crossing is proposed to be accomplished by placing the forcemains on the side of the existing bridge to mitigate impacts, however, a SAR permit may still be required due to the work being completed in proximity of the Nith River.
- Grand River Conservation Authority - Regulated Areas Ontario Regulation 157/06 due to the potential to interfere with watercourses, valleys, wetlands and shorelines. If required, a permit application package may be required for submission to GRCA.

BADEN – NEW HAMBURG WATER AND WASTEWATER SYSTEM SERVICING REVIEW

Consultation with GRCA during detailed design is recommended to confirm permit application requirements. Regulated areas are associated with drainage features and/or wetlands in the Baden-New Hamburg Wastewater Servicing Areas, and the Foxboro Green Water and Wastewater Servicing Area.

- Endangered Species Act - A permit may be issued under Section 17(2) of the ESA or eligible activities can be registered under Ontario Regulation 242/08 to authorize work that is otherwise prohibited. A SAR Permit may be required for the Baden-New Hamburg Wastewater Servicing Area and the Foxboro Green Water and Wastewater Servicing Study Area associated within the alignment of the preferred alternatives.
- Township of Wilmot – The Region will work with the Township on aspects of the preferred alternatives including design of forcemain on their bridge crossing the Nith River and obtaining easements on their property.
- Foxboro Green Waterloo Standard Condominium Corporation 365 – The Region is required to consult with Foxboro Green on future stages of the design and construction stages as it pertains to their property and services.

Closing

The filing of this Project File Report represents the conclusion of Phase 1 and Phase 2 of the Municipal Class EA planning process as outlined in the MCEA document. Provided that no Section 16 Order requests are received and provided all appropriate environmental and engineering permitting and approvals are obtained, the Region may proceed with detailed design and implementation (Phase 5) 30 days following the completion of the public review period.