Village of Limoges
Potable Water and Wastewater Master Plan

Amendment Report – Water Supply

Final

January 13, 2020

Prepared for:

arva

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January 13, 2020 RVA 194568

The Nation Municipality
1752 Innovation Road
Limoges, Ontario, K0A 2M0

Attention: Doug Renaud, Director of Water and Wastewater

Dear Doug:

Re: Village of Limoges Potable Water and Wastewater Master Plan
FINAL Amendment Report – Water Supply

R.V. Anderson Associates Limited (RVA) is pleased to submit the Amendment Report to the Village of Limoges Potable Water and Wastewater Master Plan. This amendment covers Water Supply and has been completed in accordance with the Municipal Class Environmental Assessment (MCEA) process.

This amendment was prepared to document the planning process followed in identifying and evaluating additional options for water supply for the Village of Limoges. The report should be read in conjunction with the Village of Limoges Potable Water and Wastewater Master Plan (January 2013).

Alternative design concepts for water supply were reviewed and evaluated based on their ability to meet the estimated maximum day water supply demand of 7,076 m^3/day at full build-out in year 2042. The recommended solution is to obtain treated water from the City of Clarence-Rockland with a connection from the Cheney Elevated Tank to Limoges.

Should you have any questions, please feel free to contact the undersigned at 1-613-226-1844.

Yours very truly,

R.V. ANDERSON ASSOCIATES LIMITED

Trevor Kealey, P.Eng.
Principal, Regional Manager

Beth Rodgers, P.Eng.
Associate, Project Engineer

Village of Limoges Potable Water and Wastewater Master Plan

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FINAL

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Village of Limoges Potable Water and Wastewater Master Plan Amendment Report - Water Supply

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EXECUTIVE SUMMARY

In 2013, the Nation Municipality completed the Village of Limoges Potable Water and Wastewater Master Plan to identify the additional water and wastewater infrastructure required to service future growth in the Village. The preferred solution for water supply included additional wells, expansion of the Limoges Water Treatment Plant (WTP), and other related upgrades. During the confirmatory investigation conducted in 2014, the test wells yielded lower flow than expected and this solution was determined to no longer be feasible. Given the results of this investigation, The Nation Municipality needed to explore other options for water supply.

In 2019, R.V. Anderson Associates Limited (RVA) was retained by the Nation Municipality to review water supply alternatives for the Village of Limoges. This amendment report was prepared to document the planning process followed to identify and evaluate solutions. The amendment should be read in conjunction with the Village of Limoges Potable Water and Wastewater Master Plan (January 2013); however, water supply is the only component of the 2013 Master Plan that is being reviewed in this amendment.

The existing Village of Limoges water supply is from two wells, with a total permitted flow of 2,080 m^3/day. Based on current growth projections for the Village of Limoges, it is estimated that the maximum day demand on the water system at full build-out (year 2042) will be 7,076 m^3/day (82 L/s).

As presented in the 2013 Master Plan, the solutions carried forward as the preliminary preferred water servicing solutions were: (a) Groundwater Source; and, (b) Piped Water from a Neighbouring Municipality.

In this amendment, eight alternatives were evaluated. This includes two new alternatives being considered as part of this amendment:

- **Alternative 7 (NEW)- Partial Water Supply from Clarence-Rockland:** This option consists of a connection to the Clarence-Rockland water distribution system via a 9.8km watermain from the Cheney Elevated Tank to the Limoges Water Reservoir located at the existing WTP. This includes an allocated 30-year max day demand for Limoges of 6,257 m^3/day from Clarence-Rockland. When combined with the capacity of the existing water supply for Limoges, there is sufficient water supply available for the projected growth (total max day demand up to 7,076 m^3/day).
- **Alternative 8 (NEW): Partial Water Supply from Russell Township:** This alternative for obtaining treated water from Russell Township consists of a new

connection between the Russell and the Nation water distribution systems. The existing Limoges water supply and treatment system would remain as is, and the connection to Russell system would augment the treated water supply deficit for Limoges. The Township of Russell has surplus capacity to supply water for approximately 1000 units. Based on the future water demand, the available water supply from Russell does not meet the capacity requirements to service the Village of Limoges in the long term. As such, this option is not a viable alternative to augment the water supply for the Village of Limoges.

Based on evaluation of the options using the evaluation criteria from the 2013 Master Plan, the recommended solution is Alternative 7, to obtain treated water from the City of Clarence-Rockland with a connection to the Clarence-Rockland water distribution system via a 9.8km watermain from the Cheney Elevated Tank to the Limoges Water Reservoir located at the WTP. This alternative will provide partial capacity of up to 6,257 m^3/d for the Village of Limoges, which will be combined with the existing water supply to meet the ultimate required capacity of 7,076 m^3/day.

Consultation with the public was done through an open house style Public Information Centre (PIC). Notices of the PIC and filing of the Amendment were posted on the Municipality's website, in local papers, and sent to agencies and stakeholders previously identified during the Master Plan process.

Impacts of the recommended solution and mitigation measures are generally consistent with those presented in the Master Plan with no significant impacts. In general, the recommended solution will have similar impacts as both projects involve construction of new watermains.

Construction of the recommended solution will support the servicing needs of the Village of Limoges based on its planned growth. Upon completion of the Amendment process, the project classified as Schedule C may proceed to Phase 5, Implementation, subject to finalization of the 30-day review period and assuming no Part II Order is received. The first step in implementation is preliminary and detailed design.

1.0 INTRODUCTION & BACKGROUND

1.1 Study Background

In 2013, the Nation Municipality completed the Village of Limoges Potable Water and Wastewater Master Plan (2013 Master Plan) to identify the additional water and wastewater infrastructure required to service future growth in the Village.

The preferred solution for water supply included the following:

- Additional wells in the Vars/Winchester esker
- New 5.5km 400mm dia. raw water feeder main to the existing wells
- Upsizing or twinning of the existing 5km feeder main from existing wells to the Limoges Water Treatment Plant (WTP)
- Expansion of the Limoges Water Treatment Plant

An excerpt from the 2013 Master Plan summarizing the preferred solution for water supply is included in **Appendix 1**.

The 2013 Master Plan recommended a confirmatory investigation on the quantity and quality of the water from new wells to ensure the existing WTP could properly treat the water for potable water use. In 2014, the Municipality proceeded with a hydrogeological investigation by Golder Associates Ltd to identify the exact location for the additional groundwater supply and to test water quantity and quality. Three test wells were drilled as part of this investigation and pumping tests were conducted to further characterize the local aquifer in support of a new water supply for the Village of Limoges. The test wells yielded lower flow than expected, which would be inadequate for the municipality's future water supply needs. This solution was determined to no longer be feasible. Refer to **Appendix 2** for the full report.

Given the results of this investigation, The Nation Municipality needed to explore other options for water supply.

In 2019, R.V. Anderson Associates Limited (RVA) was retained by the Nation Municipality to review water supply alternatives for the Village of Limoges. This amendment report was prepared to document the planning process followed to identify and evaluate solutions.

1.2 Municipal Class Environmental Assessment Process

The Municipal Class Environmental Assessment (October 2000 as amended in 2007, 2011 and 2015) is the planning process that municipal proponents must follow to meet the requirements of the Ontario Environmental Assessment Act. The Municipal Class

Environmental Assessment (MCEA) approach includes the evaluation of alternative solutions to a defined problem and mandatory requirements for public and agency input.

The water supply component of the Master Plan is considered a Schedule C project. As such, it is subject to the full Five Phase Planning Process of the MCEA in which the problem is defined, alternative solutions are presented, a preferred solution is selected, alternative methods of implementing the preferred solution are examined, and an Environmental Study Report (ESR) is completed to document the rationale, planning, design and consultation process (**Figure 1-1**).

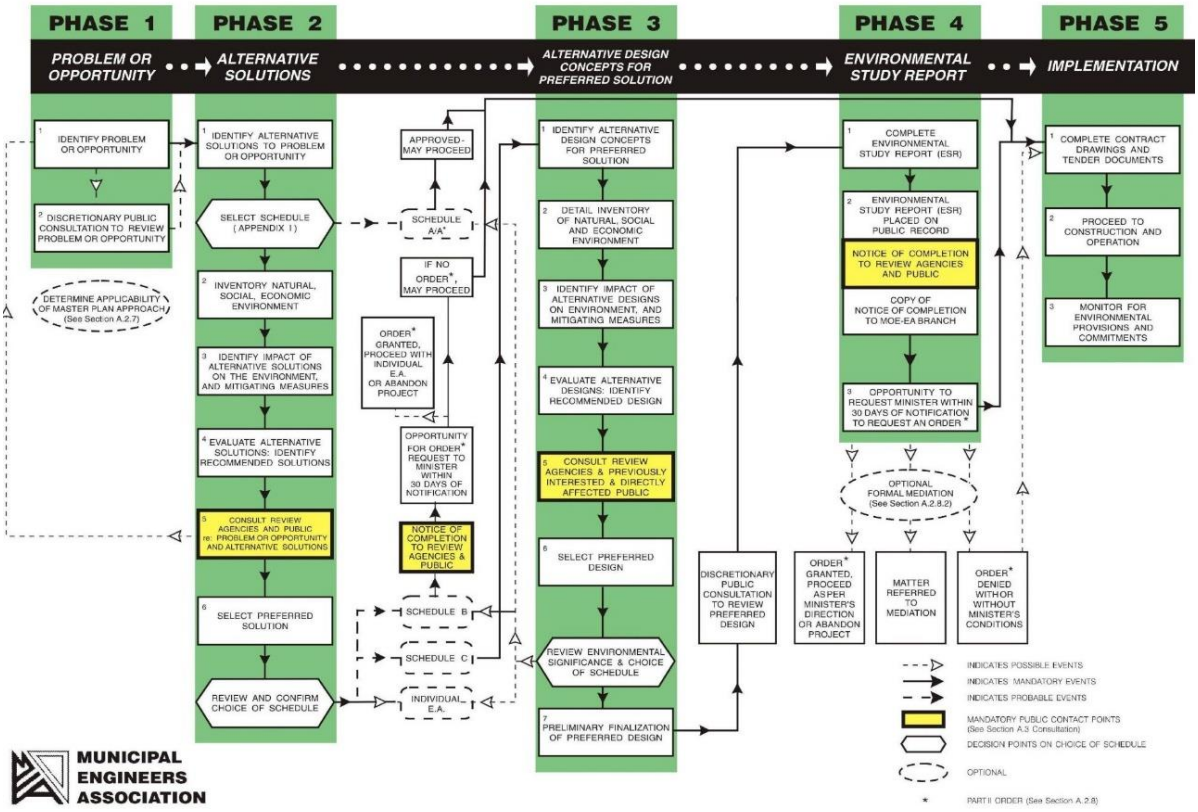


Figure 1-1: Municipal Class Environmental Assessment Process
(Municipal Engineers Association, 2015)

1.3 Justification for Amendment

Per the MCEA, an Amendment can be filed when circumstances render the recommended project unfeasible and the proponent is considering additional alternatives.

Given that the preferred water supply solution presented in the 2013 Master Plan is no longer feasible, an amendment was prepared to review water supply options.

This MCEA Amendment Study was completed in accordance with requirements of the MCEA process. Subject to comments received and necessary approvals, the Municipality intends to proceed with the design and construction of the recommended solution.

1.4 Scope of Amendment

The scope of the amendment is to review and re-evaluate water supply options for the Village of Limoges, given new information that is available since completion of the 2013 Master Plan. The following components of the 2013 Master Plan remain unchanged:

- the project definition;
- the existing environmental conditions; and,
- the alternative solutions (MCEA Phase 2).

This amendment reviews alternative design concepts (MCEA Phase 3) for the Village of Limoges water supply and includes evaluation of new concepts.

The amendment should be read in conjunction with the Village of Limoges Potable Water and Wastewater Master Plan (January 2013); however, water supply is the only component of the 2013 Master Plan that is being reviewed in this amendment.

2.0 PROBLEM DEFINITION

2.1 Problem/Opportunity Statement

There is no change to the project need and justification presented in the 2013 Master Plan, which can be summarized as follows:

> *"The existing water and wastewater systems are at or near capacity now and only limited growth can be accommodated. Additional infrastructure capacity is required to service future growth."*

Additional water supply capacity for the Village of Limoges system has not been implemented, since completion of the 2013 Master Plan.

For the purposes of this amendment, the problem definition is limited to water supply:

> *"The existing water supply is insufficient to service planned growth in the Village of Limoges. Therefore, additional water supply capacity is required to service future growth."*

2.2 Technical requirements

2.2.1 Existing Capacity

Currently there are approximately 1,400 residential connections and 30 ha of Industrial, Commercial, Institutional (ICI) land serviced with municipal water in the Village of Limoges. The Village of Limoges water supply is from two wells located approximately 4km west of the village. The existing Permit to Take Water (1106-968LAR) allows for a total flow of 2,080 m^3/day (24.1 L/s) drawn from the two wells. The average day demand in 2018 was 932 m^3/day and the maximum day flow was 1735 m^3/day (83% capacity).

2.2.2 Future Demand

Current growth projections for the Village of Limoges are based on a 2% population growth, plus additional growth of 85 residential units per year (until the year 2042) at an average density of 2.7 persons per unit. By year 2042, it is projected that approximately 4,500 units will be serviced with municipal water in the Village of Limoges (exp., 2017).

The estimated average day demand for the water system at full build-out (year 2042) is 3,755 m^3 (43 L/s). Using a maximum day peaking factor of 1.9, the maximum day demand on the water system at full build-out is estimated to be 7,076 m^3/day (82 L/s).

NOTE: The growth projections for the Village of Limoges presented herein differ from those presented in the 2013 Master Plan. The current projections are based on recent studies and updated information received from Municipal planning staff.

3.0 EXISTING CONDITIONS

3.1 Study Area

The study area for the 2013 Master Plan includes all areas considered in this amendment (**Figure 3-1**).

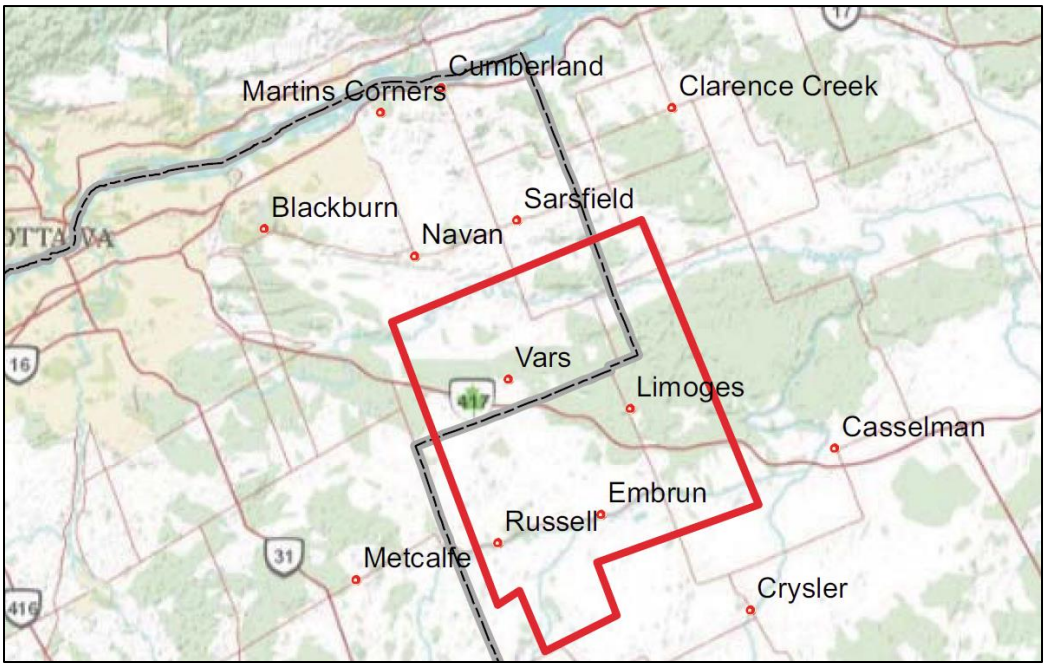


Figure 3-1: Study Area, 2013 Master Plan (Delcan, 2013)

3.2 Environmental Conditions

The existing environmental conditions for the study area presented in Section 3.0 of the 2013 Master Plan are still valid as there have been no changes to the study area as it relates to water supply.

3.3 Hydrogeological Investigation

In Section 5.2 of the 2013 Master Plan, results of a groundwater resource evaluation conducted in 2011 were summarized. This evaluation indicated that the Vars-Winchester esker would be capable of producing sufficient groundwater to supply the Village of Limoges.

Since completion of the 2013 Master Plan, additional testing was conducted and is summarized below.

In 2014, the Nation Municipality retained Golder Associates to complete a hydrogeological investigation to gather more information in support of a new groundwater source to augment the Village of Limoges water supply. Three test wells

were drilled as part of this investigation and pumping tests were conducted to further characterize the local aquifer. Based on the pumping tests, it was concluded that two wells each capable of producing 11.2 L/s over the long term was feasible, for a total of 22.4 L/s Additional wells would be required to meet the remaining demand for the Village of Limoges. The full report is included in **Appendix 2**.

Based on the pumping tests completed in 2014, it was determined that the required flow for the Village of Limoges cannot be sourced from this location, in the long term.

3.4 Source Protection

The existing source protection areas within the EA study area are shown below in **Figure 3-2**. The wellhead protection area (WHPA) for the existing Limoges wells is approximately 3km west of the Village of Limoges. Other source protection areas in the area of study include the Casselman intake protection zone (IPZ) and the Rockland IPZ. The Casselman IPZ includes parts of the South Nation River and Castor River and their tributaries, upstream of Casselman (approx. 7km south east of the Village of Limoges). The Rockland IPZ includes part of the Ottawa River and its tributaries upstream of Clarence-Rockland (approx. 20km north of the Village of Limoges).

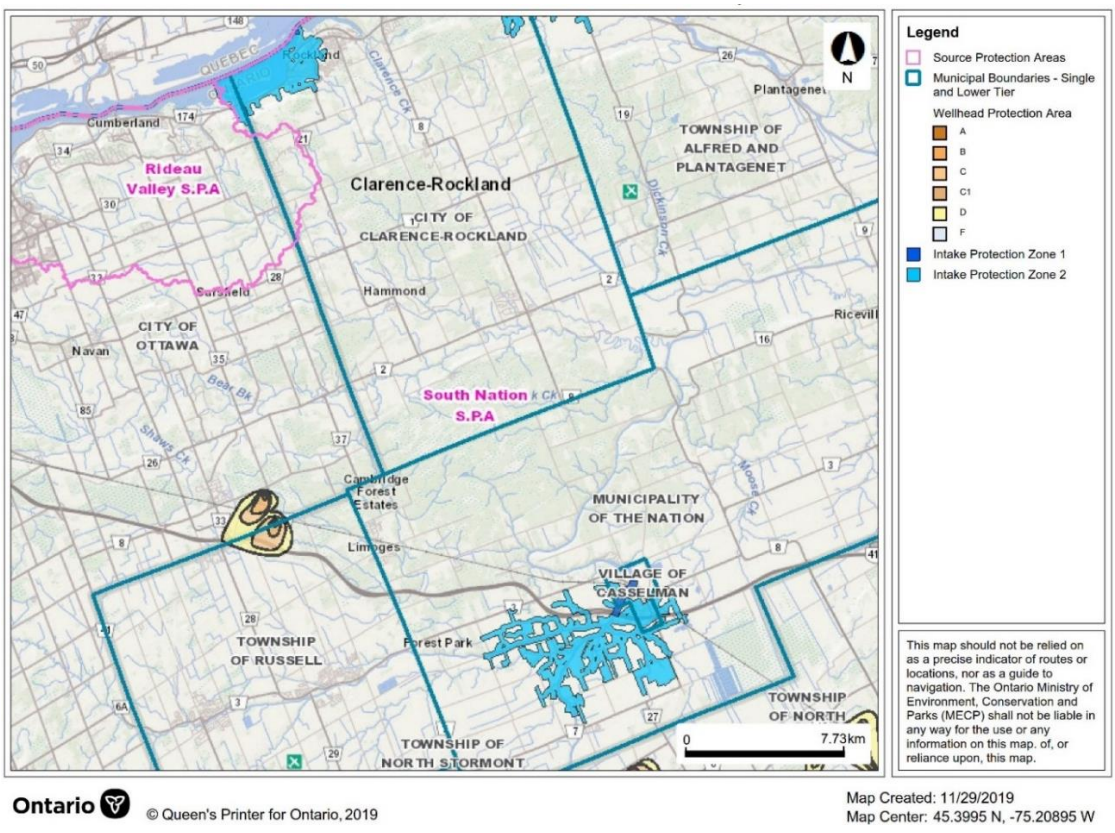


Figure 3-2: Source Water Protection Vulnerable Areas within the Study Area
(Source: Ontario Source Protection Information Atlas)

4.0 REVIEW OF PREVIOUS STUDIES

4.1 Village of Limoges Potable Water and Wastewater Master Plan (Delcan, 2013)

In 2013, the Nation Municipality completed the Village of Limoges Potable Water and Wastewater Master Plan (2013 Master Plan) to identify the additional water and wastewater infrastructure required to service future growth in the Village. Solutions were identified for all components of the water and wastewater systems, from collection and treatment of wastewater, to water supply and storage of drinking water to service the Village of Limoges.

The preferred solution for water supply included the following:

- Additional wells in the Vars/Winchester esker
- New 5.5km 400mm dia. raw water feeder main to the existing wells
- Upsizing or twinning of the existing 5km feeder main from existing wells to the Limoges Water Treatment Plant (WTP)
- Expansion of the Limoges Water Treatment Plant

At the time of the 2013 Master Plan, it was estimated that the average water demand at full build out would be 6,575 m^3/d (76 L/s), with a maximum day demand of 12,493 m^3/d (145 L/s). As noted in Section 2.2.2, the growth projections for the Village of Limoges presented in this amendment differ from those presented in the 2013 Master Plan. The current projections are based on recent studies and updated information received from Municipal planning staff.

4.1.1 Amendment for Wastewater Treatment (RVA, 2016)

The recommended wastewater treatment solution in the 2013 Master Plan was a new mechanical wastewater treatment plant (WWTP), which later proved to be unaffordable. In 2016, The Nation initiated an amendment to the 2013 Master Plan to review wastewater treatment alternatives. At that time, only the changes to wastewater treatment proposed in the amendment were open for review.

The Amendment considered additional options to increase capacity of the treatment system to 3,500 m^3/day. The solution recommended in the amendment was the addition of an Attached Growth BioCord™ Pre-Treatment Cell to the lagoon.

Subsequently, the Nation commissioned RVA to complete the design, tender and provide services during construction to implement the preferred option, as per the MCEA Amendment. This project is currently in construction and construction is expected to be completed in 2020.

4.2 Township of Russell Water and Wastewater Master Plan Update (2016)

The Township of Russell updated their Water and Wastewater Master Plan in 2016, which outlines future infrastructure requirements over the study period of 25 years. The main objectives of the study were to provide reliable water and wastewater services in the communities of Russell, Embrun and Marionville; provide water and wastewater servicing to the Highway 417 Industrial Park. Note that this study did not consider servicing for the Village of Limoges within the boundaries of the Township of Russell.

The preferred solution for water servicing identified in the Master Plan includes: a new watermain from the Eadie Road Metering Station to the 417 Industrial Park; new reservoir/booster station within the Industrial Park; and, a new watermain from the reservoir/booster station to the Embrun Reservoir.

4.2.1 Township of Russell Highway 417 Industrial Park Schedule 'B' Class Environmental Assessment (WSP, March 2019)

In 2019, the Township of Russell completed an EA to specifically address servicing of the Highway 417 industrial park. The recommended solution was to service the industrial park from the existing Eadie Road feeder main, as presented in the 2016 Master Plan.

4.3 Feasibility Study, Limoges Water Supply Alternative Cheney (exp., 2017)

The Nation Municipality completed a feasibility study in 2017 to review the option of a new connection between the Clarence-Rockland water distribution system and the Limoges water system. Specifically, the feasibility of a connection between the Cheney elevated reservoir and the Limoges at grade reservoir was reviewed from a hydraulic standpoint.

The study concludes that such a connection is feasible without need for a booster pumping station. Preliminary sizing was reviewed for a maximum day flow of 7,076 m^3/d for the Village of Limoges in the year 2042, based on updated population projections

4.4 Clarence-Rockland and Limoges Water Servicing Study (CH2M HILL Canada Ltd., April 2018)

This report was prepared for the City of Clarence-Rockland to review their existing water distribution system and the ability to supply projected future water demands. This included a review of potential expansion of the Clarence-Rockland water distribution system to supply water for the Village of Limoges, as a result of the Feasibility Study referenced in Section 4.3.

Requirements for future upgrades to meet projected future water demand for Clarence-Rockland, as well as requirements for future upgrades to meet the combined projected future water demands for Clarence-Rockland and Limoges, are outlined in the report.

A phased approach to system upgrades, in both The Nation and Clarence-Rockland, is proposed in the report to expand the system as development occurs and the water demand increases.

4.5 Township of Russell MCEA Study – Limoges Water and Wastewater Servicing

The Township of Russell is currently conducting an EA to study the municipal water and sanitary servicing for the community of Limoges within the boundaries of the Township of Russell. **Figure 4-1** shows the study area for the Township of Russell Limoges Water and Wastewater Servicing MCEA. Note that this area is currently serviced by the Nation Municipality's Village of Limoges water distribution system.

The study is reviewing options to service the west part of Limoges (within Russell Township) from the Embrun water and wastewater systems. The results of this study were not available at the time of this amendment.

For the purposes of this amendment, it was assumed that The Nation would continue to supply water for the community of Limoges that is within the boundaries of the Township of Russell and currently has water servicing. Changes to water distribution were not reviewed as part of this amendment.

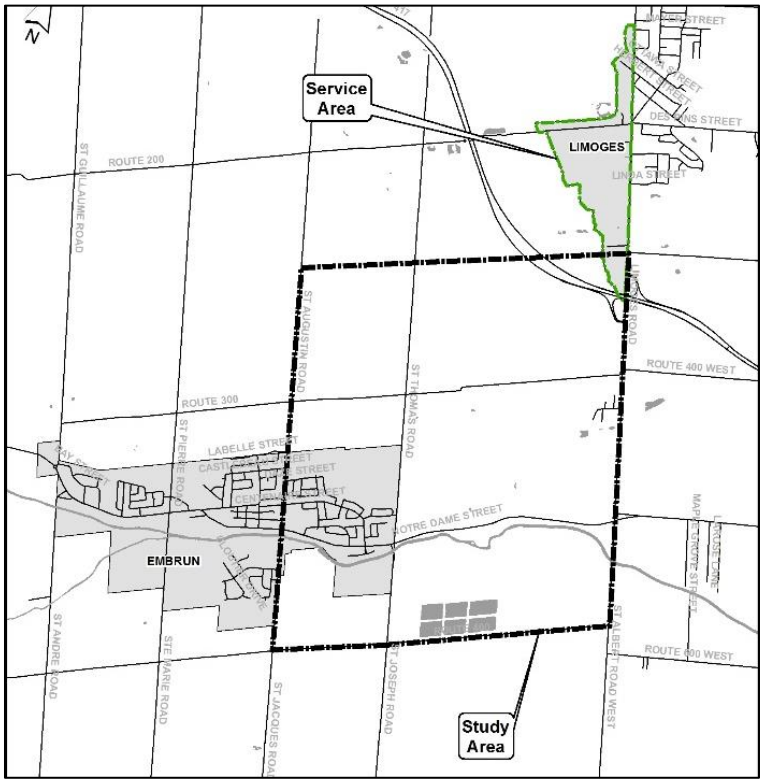


Figure 4-1: Study Area for the Township of Russell Limoges W/WW Servicing EA (WSP, 2019)

5.0 ALTERNATIVE SOLUTIONS

As presented in the 2013 Master Plan, the alternative solutions considered were as follows:

- Alternative 1: Do Nothing
- Alternative 2: Groundwater Source
- Alternative 3: Surface Water Source (piped services)
- Alternative 4: Municipal Water Source (piped services)

Alternative 2 (Groundwater Source) and Alternative 4 (Piped Water from Neighbouring Municipality) were carried forward as the preliminary preferred water servicing solutions in the 2013 Master Plan, based on the evaluation of alternatives and the impact assessment conducted at that time. The evaluation of alternatives was not revisited as part of this amendment report.

Refer to **Appendix 1** which includes the evaluation tables from the 2013 Master Plan. **Figure 5-1** below shows the preferred water supply alternatives carried forward.

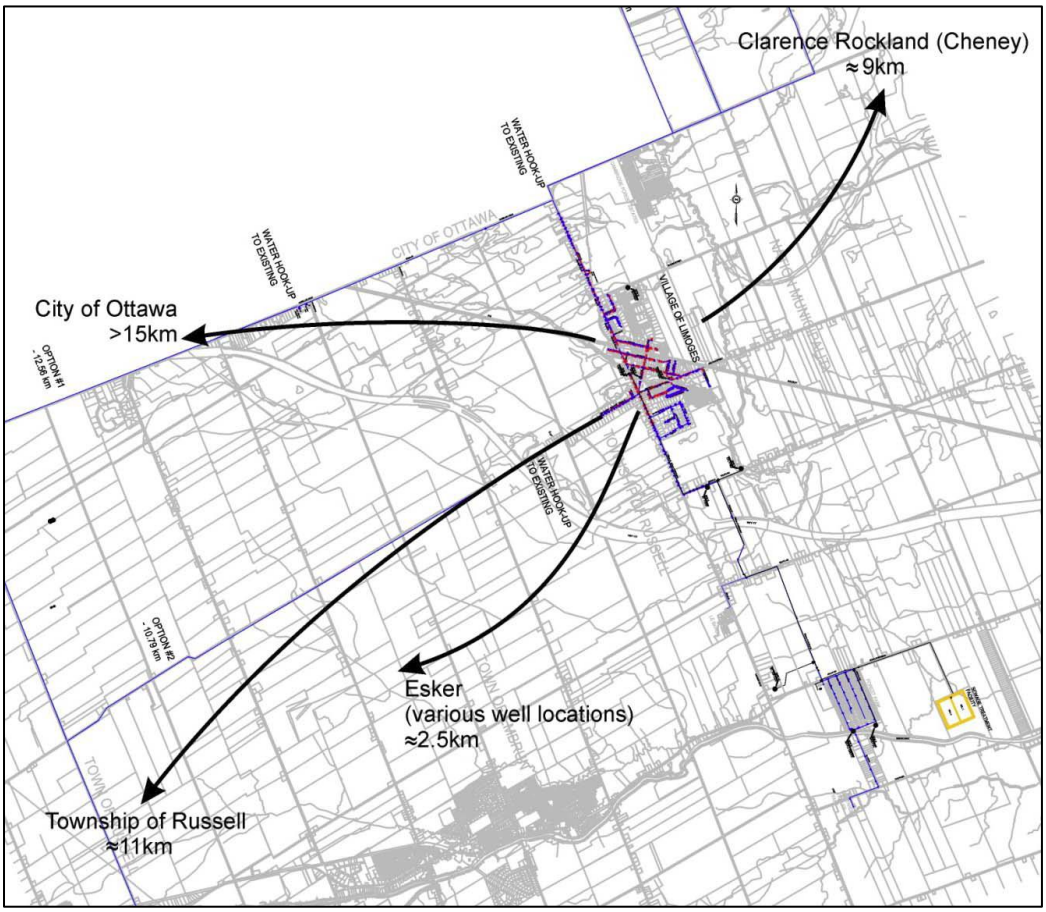


Figure 5-1: 2013 Master Plan Preferred Water Supply Solutions (Delcan, 2013)

6.0 ALTERNATIVE DESIGN CONCEPTS

6.1 Alternative Concepts

Alternatives 1 through 6 were evaluated in the 2013 Master Plan. Given new information available, the evaluation of these alternatives was updated. Alternatives 7 and 8 are new alternatives being considered as part of this amendment. A brief description of each alternative is presented below, and the evaluation is in the sections that follow.

6.1.1 Alternative 1: New Groundwater Source – New Wells

This alternative, as presented in the 2013 Master Plan, included the addition of new wells in the Vars/Winchester Esker to meet the ultimate demand for the Village of Limoges. A new watermain approximately 5.5 km long would be required to connect the new well site to the Limoges Water Treatment Plant (WTP). Upgrades to the Limoges WTP would be required to increase treatment capacity.

This alternative is no longer considered feasible given the results of the pumping tests conducted in 2014 (as summarized in Section 3.3).

6.1.2 Alternative 2: New Groundwater Source – Embrun/Marionville WTP

This alternative as presented in the 2013 Master Plan included acquiring the existing Embrun/Marionville Water Treatment Plant (WTP), which was for sale at the time of the study, and use the existing wells to augment the water supply and use the Embrun/Marionville WTP for pre-treatment to reduce upgrades/modifications at the Limoges treatment plant. This alternative also included a 12 km watermain from the Limoges wells to the Embrun Reservoir.

A constraint that was identified in the 2013 Master Plan was the possibility that the Embrun/Marionville wells could be permanently shut down if the aquifer becomes contaminated by the nearby landfill site. Furthermore, this alternative is for a limited capacity, as it does not provide additional water supply to meet the ultimate demand for the Village of Limoges.

Based on comments received from the Township of Russell, wells in Embrun/Marionwille are no longer available. As such, this alternative is not feasible.

6.1.3 Alternative 3: Piped Water from a Neighboring Municipality – Clarence Rockland

This alternative as presented in the 2013 Master Plan consisted of connecting the Limoges water distribution system to the Clarence-Rockland water distribution system and decommissioning the existing Limoges water supply wells. This would require doubling the capacity of the Clarence-Rockland WTP to accommodate the Limoges

demand and several distribution system upgrades in Clarence-Rockland. At the time of study, this option was considered cost prohibitive.

6.1.4 Alternative 4: Piped Water from a Neighboring Municipality – Russell Township

This alternative, as presented in the 2013 Master Plan, consisted of a new connection to the Russell Township feeder main to supply all water for the Village of Limoges. The Township of Russell obtains its water from the City of Ottawa and re-chlorinates it.

This alternative includes: addition of a booster station in the Township of Russell; 6 km of new watermain to connect to the existing watermain from the Limoges wells to the Limoges WTP; upsize or twin existing watermain (once the capacity of the existing watermain is reached); abandon the existing Limoges wells; and, scale back the Limoges WTP to provide disinfection only.

At the time of evaluation, this option was not able to meet the ultimate demand for the Village of Limoges.

NOTE: This option is not addressed in the Township of Russell Water and Wastewater Master Plan Update (WSP, 2016).

6.1.5 Alternative 5: Piped Water from a Neighboring Municipality – Russell Township

This alternative, as presented in the 2013 Master Plan, is similar to Alternative 4, except the booster station would be at a different location and 11.5 km of new watermain would connect directly to the Limoges WTP. As with Alternative 4, this approach would not be able to meet the ultimate demand for the Village of Limoges.

6.1.6 Alternative 6: Piped Water from a Neighboring Municipality – City of Ottawa

This alternative, as presented in the 2013 Master Plan, consisted of a connection to the City of Ottawa Distribution System to supply all water for the Village of Limoges. This would include: connecting near the intersection of Innes Road and Trim Road; adding a water booster station; constructing a 23 km long watermain to connect to the existing watermain from the Limoges wells to the Limoges WTP; upsize or twin existing watermain (once the capacity of the existing watermain is reached); abandon the existing Limoges wells; and, scale back the Limoges WTP to provide disinfection only.

6.1.7 Alternative 7 (NEW): Partial Water Supply from Clarence-Rockland

Following completion of the 2013 Master Plan and the hydrogeological investigation in 2014, The Nation Municipality explored new alternatives for augmenting the water supply. Discussions between The Nation Municipality and the City of Clarence-Rockland

have resulted in the development of a new alternative to augment the Limoges water, which was not previously considered in the Master Plan.

This new alternative for obtaining treated water from the City of Clarence-Rockland includes connection to the Clarence-Rockland water distribution system via a 9.8km watermain from the Cheney Elevated Tank to the Limoges Water Reservoir located at the existing WTP. Expansion to the Limoges WTP would not be required.

The existing Limoges water supply and treatment system would remain as is, and the connection to the Clarence-Rockland watermain system would augment the treated water supply which would go directly into Limoges' water distribution network.

Clarence-Rockland has studied the feasibility of this concept and the ability to meet future water demands for both Clarence-Rockland and Limoges, as summarized in the Clarence-Rockland and Limoges Water Servicing Study, by CH2M (April 2018). Timing of system upgrades and cost sharing was also studied. A memorandum of understanding (MOU) between the two municipalities has been signed, declaring agreement in principle (refer to **Appendix 4**).

The allocated 30-year max day demand for Limoges is 6,257 m^3/day from Clarence-Rockland. When combined with the capacity of the existing water supply for Limoges, there is sufficient water supply available for the projected growth (total max day demand up to 7,076 m^3/day).

6.1.8 Alternative 8 (NEW): Partial Water Supply from Russell Township

This new alternative for obtaining treated water from Russell Township includes a new connection between the Russell and the Nation water distribution systems and maintaining the existing Limoges water supply and WTP unchanged.

This is similar to Alternative 4 that was originally considered in the 2013 Master Plan; however, the existing Limoges water supply and treatment system would remain as is, and the connection to Russell system would fully augment the treated water supply deficit for Limoges.

From past discussions between The Nation Municipality and Russell Township, the Township of Russell has surplus capacity to supply water for approximately 1000 units (equivalent population of approximately 2,700 persons) based on the current agreement for water supply with the City of Ottawa and Russell's projected water needs. The existing agreement between Ottawa and Russell stipulates that the water supply infrastructure is intended solely for the use and benefit of Russell Township residents.

Based on the future growth in Limoges outlined in Section 2.2.2 and the corresponding water demand, the available water supply from Russell does not meet the capacity requirements to service the Village of Limoges in the long term. As such, this option is not a viable alternative to augment the water supply for the Village of Limoges.

Furthermore, the Consumptive Charge to Russell for the Ottawa water supply is approximately $2 per cubic metre, according to the Russell Water and Wastewater Financial Plan (WSP, 2015), which is high for the Nation.

Note that no official request to the Township of Russell was made to initiate negotiations with the City of Ottawa to review restrictions in the existing agreement. The logistics of entering into an agreement as a third party limits The Nation's negotiating power and input in the agreement with the water supplier (i.e. City of Ottawa). The Nation would be bound to conditions negotiated between Ottawa and Russell, which may not be in the best interest of The Nation's water rate payers. As such, this option was not explored further.

6.2 Screening of Alternatives

The alternatives presented in Section 6.1 were first screened based on the ability to meet future water demand given the current growth projections (flow up to 7,076 m^3/d). Alternatives that could not meet the ultimate water demand were not carried forward for further evaluation.

The evaluation screening is summarized in **Table 6.1**.

Table 6.1 – Evaluation Screening

Alternative	Justification	Screening (Y/N)
1 New Groundwater Source – New Wells	Based on 2014 pumping tests: Max flow of 1,935 m3/d available.	NO ABILITY TO MEET ULTIMATE WATER DEMAND.
2 New Groundwater Source – Embrun/ Marionville WTP	Max flow of 5,633 m3/d from decommissioned Embrun/ Marionville wells. Additional well required to meet ultimate demand. This option is no longer available based on comments received from Township of Russell.	NO ABILITY TO MEET ULTIMATE WATER DEMAND.
3 Piped Water from Clarence Rockland (Full Supply)	Clarence-Rockland is not offering full water supply at the time of this amendment.	NO ABILITY TO MEET ULTIMATE WATER DEMAND.
4 Piped Water from Russell (A)	Agreement between Twp of Russell and the City of Ottawa does not allow connections and distribution to other users.	NO ABILITY TO MEET ULTIMATE WATER DEMAND.
5 Piped Water from Russell (B)	Agreement between Twp of Russell and the City of Ottawa does not allow connections and distribution to other users.	NO ABILITY TO MEET ULTIMATE WATER DEMAND.
6 Piped Water from Ottawa	Based on 2014 pumping tests: Max flow of 1,935 m3/d available.	ABILITY TO MEET ULTIMATE WATER DEMAND
7 Piped Water from Clarence Rockland (Partial Supply)	Allocated 30-year max day demand for Limoges is 6,257 m3/day, based on discussions and MOU. Combined with the capacity of the existing water supply there is sufficient water supply available for the projected growth.	ABILITY TO MEET ULTIMATE WATER DEMAND
8 Piped Water from Russell (Partial Supply)	"Agreement between Twp of Russell and the City of Ottawa does not allow connections and distribution to other users. Servicing available to Russell residents only. Water supply of approximately 1000 m3/d available.	NO ABILITY TO MEET ULTIMATE WATER DEMAND.

6.3 Evaluation of Alternatives

Alternatives 2, 6 and 7 passed the screening evaluation and were carried forward in the study for further evaluation. The evaluation is summarized in Section 6.3.2.

6.3.1 Assessment Criteria and Evaluation Methodology

For consistency, the alternative design concepts are evaluated using the criteria presented in the 2013 Master Plan (**Table 6.2**).

Table 6.2 – Evaluation Criteria (Delcan, 2013)

CRITERIA (Value)		RATIONALE	INDICATORS
Biological Environment	Natural Heritage	Minimize disruption to natural heritage features	Loss of natural heritage features (i.e., woodlots, ANSI) Effect on rare species
	Surface Water	Minimize impacts to surface water quality and quantity related to conveyance from source	Disruption of surface watercourses Loss of fish habitat Degradation of water quality
Physical Environment	Groundwater	Minimize impacts to groundwater quality and quantity	Assessment of predicted changes to water quality and quantity
	Geotechnical	Recognize geotechnical constraints to constructability and design requirements related to conveyance from source	Presence of bedrock Presence of clay
Social Environment	Agricultural	Protect high quality / active agricultural lands	Loss of agricultural land
	Archaeology	Minimize disruption of potential cultural resources	Disturbance in areas of archaeological potential
	Property Requirements	Minimize land requirements	Requirement for land, easements, agreements
Economic	Capital Cost	Ensure long term funding and economic sustainability	Class D capital cost estimates
	Operational and Maintenance Costs	Ensure long term funding and economic sustainability	Operation and Maintenance cost estimates
Technical	Constructability	Ease of construction and integration with the existing system	Length of construction period, complexity of the construction, ease of phasing
	Reliability	Implement a dependable and consistent system	Demand, malfunctions, system failures, constancy in technology and water quality
	Expansion potential	Implement a system which is capable of growth consistent with the development plans	Ability of the system to be expanded
	Permit and approvals	Minimize the cost and time of required approvals and permits needed for construction	Permit and approval requirements
	Source water protection	Protect drinking water sources	Source Water Protection Requirements
	Drinking Water Quality	Minimize treatment requirements	Treatment requirements of water supply source

6.3.2 Evaluation

The detailed evaluation of the alternatives that passed the evaluation screening is summarized in **Table 6.3**.

Table 6.3 – Evaluation of Alternatives

		Alternative 6 Piped Water from Ottawa	Alternative 7 (NEW ALTERNATIVE) Piped Water from Clarence Rockland (Partial Supply)
Natural Env.	**Natural Heritage**	Low-Slight	Slight
	Surface Water	Low-Slight	Low-Slight
	Groundwater	Low	Low
	Geotechnical	Low	Low
Social Env.	**Agricultural**	No impact to agricultural land	No impact to agricultural land
	Archaeological	Low	Slight
	Property Requirements	Slight property requirements for the required booster station. All piped infrastructure will be located within existing ROW. The upgrading of the existing piped infrastructure will not require additional property.	Proposed routing for new watermain is all within existing ROW. No property required.
Economic	**Capital Cost**	$26.4M *Note: 2013 Master Plan estimate not updated*	$12.6M (Phase 1) + $6.3M (phase 2) + $9.0M (phase 3) + $7.6M (phase 4)
	Operational and Maintenance Costs	Significant O&M cost. Must pay supply rate established by Ottawa plus up to a 50% surcharge for local users.	Proposed bulk water rate of $1.28 per m^3. Some O&M cost for regular system operations.
Technical	**Constructability**	Significant construction period. Low complexity. No phasing opportunity	Good phasing opportunity for both Limoges and Clarence-Rockland.
	Reliability	Proven technology.	Proven technology.
	Expansion Potential	Limited expansion opportunity due to infrastructure size / capacity. Agreement negotiation with Ottawa. Competing interest for increased capacity.	Good expansion potential due to infrastructure size/capacity and proposed phasing approach. Competing interest for increased capacity; however, MOU has been signed between C/R and Limoges indicating dedicated capacity for full build-out in Limoges with a phasing plan.
	Permit and Approvals	Significant approval requirement. Requires MECP approval for pipes and booster station. Requires agreement from Ottawa for water supply and Feasibility analysis of Ottawa pressure zones required.	Approvals required for upgrades and expansion works in both Clarence Rockland and Limoges. Draft agreement prepared (ready to proceed).
	Source Water Protection	No impact, surface water source	No impact, surface water source
	Drinking Water Quality	Low treatment requirement (disinfection)	Low treatment requirement. No changes to existing Limoges WTP. Surface water quality is good.

7.0 PREFERED ALTERNATIVE

The preferred alternative is Alternative 7, as per the evaluation presented in **Table 6.3**. This solution includes obtaining treated water from the City of Clarence-Rockland with a connection to the Clarence-Rockland water distribution system via a 9.8km watermain from the Cheney Elevated Tank to the Limoges Water Reservoir located at the WTP.

This alternative will provide partial capacity of up to 6,257 m^3/d which will be combined with the existing water supply (up to 2,080 m^3/d) to meet the ultimate required capacity of 7,076 m^3/day, for growth up to year 2042.

7.1 Project Description

The preferred alternative can be summarized as connecting the water systems of the City of Clarence-Rockland and the Village of Limoges in order to supplement the water supply for Limoges. A new connection will be made via a new watermain from the Cheney Elevated Tank (ET) to the reservoir at the Limoges Water Treatment Plant. Refer to **Figure 7-1** for a schematic of this concept.

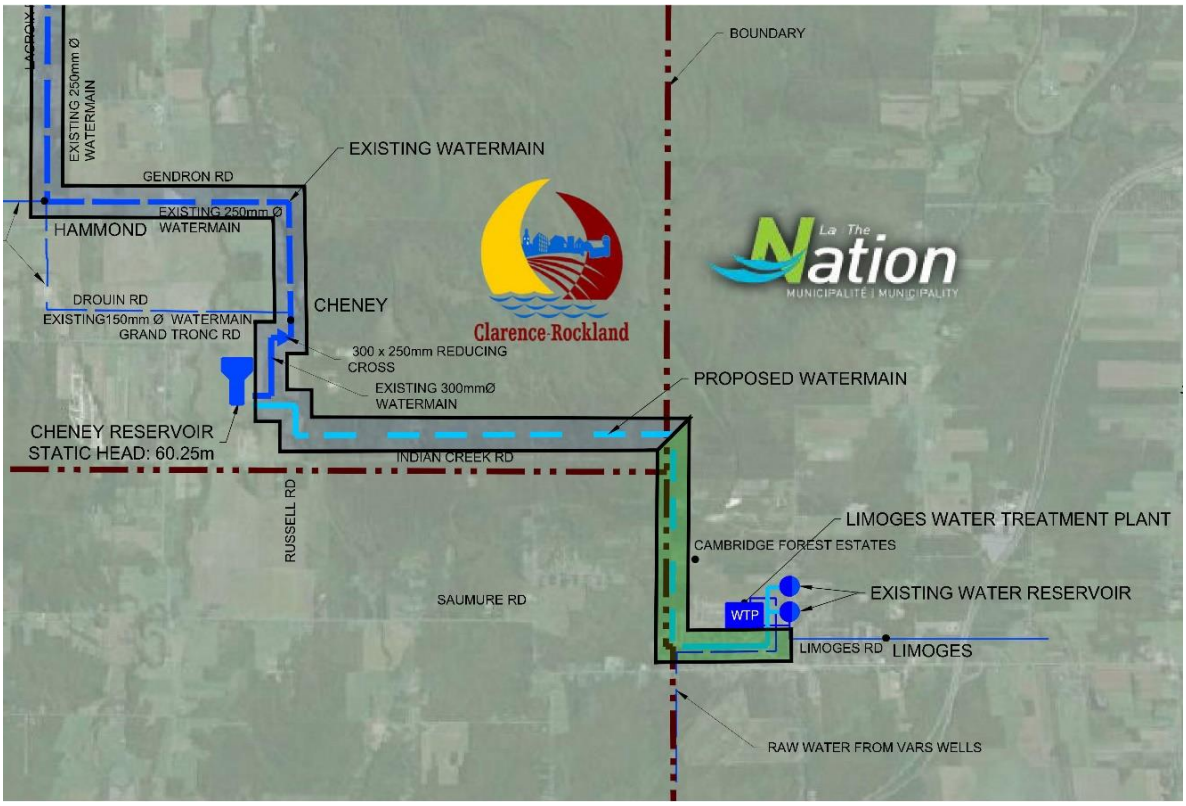


Figure 7-1: Proposed connection to Clarence-Rockland water system at Cheney

The existing Limoges well water supply and WTP will be maintained as is, to supply a maximum of 2,080 m^3/day, as per the current permit to take water (PTTW).

It is estimated that the maximum day demand on the water system will be 7,076 m^3/day (82 L/s) based on the following assumptions:

- Growth projections to the year 2042.
- The number of units to be served by the water system in the Village of Limoges is 4,500 units (Section 2.2), at full build-out.
- The estimated average day demand for the water system at full build-out is 3,755 m^3/d (43 L/s).
- The maximum day peaking factor of 1.9.

As the water supply demand for the Village of Limoges increases, various upgrades will be required throughout the City of Clarence-Rockland's distribution system. The upgrades will be phased as needed, to accommodate actual growth and development (based on actual water demand).

To meet projected future water demand (full build-out) for both Clarence-Rockland and Limoges to the year 2042, the following upgrades and related timing will be required, as outlined in **Table 7.1** below.

Table 7.1 – Upgrades Required to Service Limoges from Clarence-Rockland (Phased Approach)

Timing	Upgrades Required
2020-2021	– New Watermain: Cheney ET to Limoges Reservoir – New Watermain: St. Jean St. (Patricia St. to Dr. Corbeil Blvd)
2024-2025	– Caron BS Upgrades – Replace Watermain: Caron St. (Dr. Corbeil Blvd. to Caron BS) – Rockland WTP Upgrades
2030-2031	– Replace Watermain: St. Joseph St (Patricia St. to Des Pins Ave) – New Watermain: Bouvier BS to Cheney ET – Replace Watermain: Edwards St (Rockland WTP to County Rd 17)
2035-2036	– New Watermain: Caron BS to Bouvier Rd. and Labonte St. – Replace Watermain: Edwards St. (Hwy 17 to McCall St.) – New Watermain: Bouvier Rd. and Labonte St. to Bouvier ET – New Bouvier BS

7.2 Costs & Timeline

Preliminary costs and timing for all phases of the project were developed by the City of Clarence-Rockland and The Nation Municipality. **Table 7.2** includes the cost estimates from the Memorandum of Understanding between The Nation and Clarence-Rockland, dated Feb 28, 2019 (refer to **Appendix 4**). The costs will be reviewed and the estimates will be updated during detailed design.

Note that the details of agreement between The Nation Municipality and the City of Clarence-Rockland have not been finalized. An agreement between the two parties will be prepared and finalized upon successful completion of the amendment to the Master Plan, prior to detailed design and implementation of the recommended project.

Table 7.2 – Preliminary Cost Estimates (Memorandum of Understanding, The Nation Municipality & City of Clarence-Rockland, Feb 2019)

	(B) Infrastructure Description	(C) Water demand Trigger (ADD) (m3/d)		(D) Cost Share (%)		(E) Total ($ M)	(F) Cost Share ($)	
		CCR	Limoges	CCR	Limoges		CCR	Limoges
2019-2020	Existing infrastructure	-	350	0	100	$2.62	0	$2.62
2019-2020	New Watermain – Cheney ET to Limoges	-	350	5%	95%	$10.28	$0.49	$9.79
2019-2020	New Watermain – St. Jean St: Patricia St. to Docteur Corbeil Blvd.	-	350	58%	42%	$0.40	$0.23	$0.17
						$13.30	**$0.72**	**$12.58**
2024-2025	Caron BS Upgrades	5631	1000	51%	49%	$2.18	$1.11	$1.07
2024-2025	New Watermain – Caron St: Docteur Corbeil Blvd. to the Caron BS	5631	1000	51%	49%	$0.17	$0.09	$0.08
2024-2025	Rockland WTP Upgrades	5631	1000	66%	34%	$14.97	$9.85	$5.12
	2024-2025					**$17.32**	**$11.05**	**$6.27**
2030-2031	Replace Watermain – St. Joseph St: Patricia St. to Des Pins Ave.	6518	1500	55%	45%	$0.14	$0.08	$0.06
2030-2031	New Watermain – Bouvier BS to Cheney ET	6518	1500	5%	95%	$9.25	$0.44	$8.81
2030-2031	Replace Watermain – Edwards St: Rockland WTP to Highway 17 (east side pipe)	6518	1500	77%	23%	$0.45	$0.35	$0.10
	2030-2031					**$9.84**	**$0.87**	**$8.97**
2035-2036	New Watermain – Caron BS to Bouvier Rd. and Labonte St.	7259	2500	38%	62%	$5.17	$1.96	$3.21
2035-2036	Replace Watermain – Edwards St: Highway 17 (east side pipe) to McCall St.	7259	2500	64%	36%	$0.34	$0.21	$0.13
2035-2036	New Watermain – Bouvier Rd. and Labonte St. to Bouvier ET	7259	2500	38%	62%	$2.97	$1.13	$1.84
2035-2036	New Bouvier BS	7259	2500	23%	77%	$3.17	$0.72	$2.45
	2035-2036					**$11.65**	**$4.02**	**$7.63**

The Nation's water system is funded through a full cost recovery user pay system, meaning that the water system is paid for in full by water users and not the general tax base. The Nation Municipality will maintain this rate structure. Capital costs will be funded using the water reserve fund and common charges will be collected as development occurs and surplus funds will replenish the reserves to fund future capital upgrades. Changes to The Nation Municipality's rate structure are not proposed at this time.

8.0 CONSULTATION SUMMARY

Schedule 'C' EA projects are subject to the full five phase planning process, in accordance with the Municipal Class Environmental Assessment (October 2000, amended in 2007, 2011 & 2015). As such, public and technical agency consultation plays a key role in developing the study recommendations. Public consultation was undertaken as part of this amendment to present the initial recommendations of the study and to gather input from residents and other stakeholders.

8.1 Key Stakeholders, Interest Groups & Technical Agencies

Various First Nation communities, government agencies, neighbouring municipalities, authorities and interest groups were informed of the EA Study, as well as the Public Information Centre via direct electronic mailings or regular mailing. A complete list of stakeholders who were contacted is provided in **Appendix 3**.

Comments from members of the public, technical agencies and interest groups received at the public consultation centre are discussed in Section 8.2.

8.2 Public Consultation

Per the MCEA, notification to the public and stakeholders was provided in advance of key consultation opportunities, as follows:

- Notice of Commencement of Amendment first published on September 19, 2019.
- Notice of Public Information Centre was first published on October 31, 2019.

All notices were published on The Nation's website, social media, and in the local newspaper. Key stakeholders were sent the notice directly by email or mail.

One Public Information Centre (PIC) was held during the EA amendment study, on November 20, 2019. The purpose of the PIC was to present the material from the amendment and preliminary recommendations, and to receive input from the public on the key issues and constraints within the study area.

The format of the PIC was an "Open House" with materials pertaining to the study on display for the public to review. A presentation summarizing the amendment process and the study was also provided, including an opportunity for participants to ask questions in a public forum. Several members of the project team were available to discuss the project with attendees and to answer questions.

The material prepared for the PIC is included in **Appendix 3**.

Based on the sign-in sheet, there were 27 attendees. All attendees were encouraged to provide comments and feedback on the material presented and the study in general.

Comments and questions are summarized in **Table 8.1** below with comments on how they were addressed in the study.

Table 8.1 – Comment Summary

Comment / Question	Consideration of Comments in EA Amendment
How will this affect the rate I pay for water?	– The Nation's water system is fully funded through a user pay system, meaning that the water system is paid for in full by water charges and not through municipal taxes. The Nation Municipality will maintain their existing rate structure.
Will the water servicing area be expanded to areas without existing water service?	– Changes to the water distribution network are not covered in this EA amendment. New service connections will be reviewed for feasibility during detailed design.
Servicing from other municipalities (e.g. Russell) was not addressed at the same level of detail as the Clarence-Rockland option.	– Servicing from Russell was screened out due to availability of sufficient water at the time of this study. Other municipalities were not approached for discussion.
Is the municipality considering abandoning the existing well system altogether?	– This is not part of the recommended solution. Maintaining both water supply systems provides additional redundancy and flexibility. This could be considered by the municipality in the future.
Was water supply for adjacent municipalities considered (e.g. Casselman)?	– The Nation has initiated discussions with the Municipality of Casselman to gauge potential interest in getting water from Clarence-Rockland. To be reviewed further and considered in detailed design. This would require a separate EA by Casselman to review their water supply needs.
Alternative #2 -Wells in Embrun / Marionville are no longer available.	– Comment noted and the evaluation of alternatives was updated to reflect this.

Comment / Question	Consideration of Comments in EA Amendment
Clarification requested on timing of upgrades, phasing and financial agreement details.	– Details on the timing of upgrades and phasing are included in the Memorandum of Understanding (MOU) between The Nation Municipality and the City of Clarence-Rockland. An agreement between The Nation Municipality and the City of Clarence-Rockland has not been finalized. An agreement will be prepared and finalized upon successful completion of the amendment, prior to detailed design and implementation of the recommended project.
Alternative #8 - There should be a mention that there has been no official request or resolution made from Nation to Russell to initiate negotiations with Ottawa to review the current restriction in the agreement and potentially determine an increased capacity to supply water to Limoges. Consequently, we believe the assessment of this alternative is only partially completed.	– The evaluation of the option was based on information from past discussions between the two parties regarding surplus capacity and details of the existing water supply agreement. This information resulted in this alternative being screened out. – Other factors were also considered in the review of alternatives including the estimated bulk unit rate, technical requirements, and water quality. – It is acknowledged in the amendment that no official request was made to Russell for re-negotiation of their existing agreement with Ottawa. The Nation would be bound to conditions negotiated between Ottawa and Russell, which may not be in the best interest of The Nation's water rate payers.

9.0 IMPACTS, MITIGATION AND MONITORING

The impacts, mitigation and monitoring presented in Section 7.1.1 of the 2013 Master Plan are generally consistent with the impacts and mitigation measures for the recommended solution presented herein. **Table 9.1** presents a summary of the impacts considered in the 2013 Master Plan and how they differ when applied to the recommended solution of this amendment. In general, the recommended solution will have similar impacts as both projects involve construction of new watermains, however the location of construction is different. Refer to **Appendix 1** for an excerpt from the 2013 Master Plan including the original table of *Water System Impacts and Mitigation*.

Table 9.1 – Impact Analysis Summary

Environmental Value		Change from MP	Comments
Social	Regulatory Planning and Policy	No	
	Land Use	**Yes**	Easements may be required along the proposed route from Cheney to Limoges, though every effort should be made during design to use the public right-of-way for routing. No significant impacts expected. No construction is proposed within Source Water Protection Vulnerable Areas.
	Noise	No	
	Vibration	No	
	Air Quality	No	
	Archaeological Resources	No	
	Registered Archaeological Sites	No	No documented or registered archaeological sites within the study area.
	Areas of Potential Environmental Concern	**Yes**	No expected impacts to soil and groundwater quality due to construction activities area. No waste disposal sites within the area of construction.
	Views	**Yes**	No anticipated impact as there are no new elevated structures proposed.
Bio. Env.	Species at Risk (SAR)	No	
	Aquatic Habitat / Surface Water	No	
	Provincially Significant Wetlands	No	
	Significant Habitat	No	
Phys.	Surficial Geology	No	
	Bedrock Geology	No	
	Hydrogeology	No	
Tech.	Well Development	**Yes**	No new wells proposed as part of recommended solution. No impact.
	Traffic Volumes and Capacities	No	
	Structures and Utilities	No	

9.1 Social Impacts

Social environment impacts are expected to be similar to those presented in the 2013 Master Plan as the recommended project has a similar scope (construction of a new watermain) and similar period of construction. No additional land easements or property acquisition are required, so there will be no changes to land use. The effect on regulatory planning and policies are consistent with those presented in the 2013 Master Plan. There are no documented or registered archaeological sites within the study area; however, there is potential for discovering additional sites based on the proximity to waterways and other features. Construction work for the recommended solution will take place primarily within the municipal ROW, which is previously disturbed area from road construction. Therefore, the impact is classified as insignificant. The potential for disruption or disturbance of archaeological resources during construction remains unchanged.

9.2 Natural Environment

Impacts on the biological and physical environment, such as the potential for disturbing species at risk or habitats, remains the same as the study area is unchanged. The potential for negative impacts on aquatic habitat is the same and the mitigation measures outlined in the Master Plan will be implemented. Similarly, there are no changes to the potential for impacts on the physical environment. Geotechnical conditions will be confirmed in detailed design.

9.2.1 Areas of Contamination

There are no known areas of contamination within the work zone for the proposed solution. There are no waste disposal sites within the area of construction; therefore, impacts are expected to be negligible.

9.2.2 Source Water Protection

The recommended solution does not include work within a source water protection vulnerable area. Given that there is no new water intake or modification to an existing intake, the recommended solution does not create any new vulnerable areas or change an existing one. The existing protection areas for the Limoges wells and the Rockland WTP intake will remain as is; therefore, no additional monitoring related to source water projection is required.

9.2.3 Climate Change Considerations

Climate change has the potential to affect aquifer recharge rates, reducing groundwater availability in some areas.

The recommended solution increases the municipality's resiliency to climate change as the system will be sourcing water from two independent water sources. In the event that the groundwater source for the Limoges wells were to degrade in quality or if the quantity available was reduced, the proposed connection to Clarence-Rockland provides a secondary water source. Similarly, if the Rockland WTP was unable to produce water due to flooding for example, then Limoges would be able to continue to draw water from the wells to supply a baseline amount of water (2,080 m^3/day).

The impacts on climate change resulting from implementation of the recommended solution will include increased greenhouse gas (GHG) emissions during the construction period from operation of heavy equipment and material hauling; however, this is a short-term impact. The resulting GHG emissions from regular operation and maintenance of the proposed infrastructure are considered to be negligible compared to the water system as a whole.

The long-term resiliency and social benefits outweigh the short-term impacts of the recommended solution. In general, the impact of the proposed project on climate change is minor and considered to be acceptable for infrastructure that will protect human health through improved and reliable water supply and service. The risks related to climate change that may arise from the proposed project are minor and can be further mitigated through design and O&M approaches.

10.0 FUTURE WORK AND NEXT STEPS

Construction of the recommended solution will support the servicing needs of the Village of Limoges based on its planned growth. Upon completion of the Amendment process, the project classified as Schedule C may proceed to Phase 5, Implementation, subject to finalization of the 30-day review period and assuming no Part II Order is received.

The first step in implementation is preliminary and detailed design.

10.1 Detailed Design Commitments

In addition to the mitigation measures described in Section 8.0, additional work is required to be completed following the Class EA amendment. During detailed design the following work is needed to confirm findings from this study and to further refine the design:

- Undertake a geotechnical investigation, including borehole drilling, hydrogeological testing, and geotechnical analysis.
- Obtain legal survey, confirm property requirements and obtain landowner agreements, if required.
- Confirm utility impacts and relocation requirements (e.g. Bell fibre optic, Enbridge gas main, utility poles) and coordinate with utility agencies.
- Review feasibility of additional servicing opportunities and incorporate into design if appropriate (review pipe sizing)
- Confirm construction staging and traffic management plans for detours
- Finalize capital cost estimate of the project, including property requirements.
- Finalize mitigation measures and requirements for construction work as detailed in Section 8.0.
- Consult with adjacent property owners to discuss impacts during construction.
- Finalize agreements between the City of Clarence-Rockland and The Nation Municipality
- Confirm and obtain required approvals and necessary permits as outlined in Section 10.2.

10.1.1 Additional Servicing Opportunities

The Municipality of Casselman has expressed interest in future servicing opportunities for its residents from the Village of Limoges water supply system. The Municipality of Casselman, located adjacent to the Nation Municipality, draws water from the South Nation River. Casselman's water system currently serves approximately 1,000 service connections (population of approx. 3,600). In recent discussions between The Nation

Municipality and the Municipality of Casselman, Casselman has indicated that given the poor raw water quality of the South Nation River, there is interest in exploring other options for water supply for the Municipality of Casselman.

When sizing the water supply transmission main from Cheney to Limoges, opportunities for additional servicing and expansion will be considered and reviewed, in consultation with the City of Clarence-Rockland.

10.2 Permits & Approvals

The following approvals have been identified as potentially being required prior to the implementation of the proposed works.

- A Permit to Take Water from the MECP if dewatering exceeds 50,000 L/d.
- A Water Works permit and ECA amendments from the MECP.

APPENDIX 1

2013 Master Plan Excerpts

APPENDIX 1-1

Water Supply Alternative Solutions (Section 4.1)

4.0 ALTERNATIVE SOLUTIONS

An understanding of growth objectives, existing conditions, and an analysis of technical considerations were utilized in developing alternative solutions. Water and wastewater servicing alternatives are described in the following sections.

4.1 Water Supply

4.1.1 Description of Alternatives

- Do Nothing
- Groundwater
- Existing surface water sources (piped services)
- New Surface water sources (piped services)

Alternative 1: Do Nothing

The "Do Nothing" alternative would involve leaving the existing water supply system in its current state and would not implement any additional measures to increase water capacity to accommodate additional growth. Since the current system is at capacity, further development is restricted.

Alternative 2: Groundwater Source

The "Groundwater Source" alternative would include various ways to expand the existing groundwater supply system and increase the production of existing municipal wells within or beyond existing regulated rates. This could take the form of expanding existing wells or the development of new municipal wells. Existing wells would remain in operation. Water treatment facilities would need to be expanded to accommodate the additional volumes and additional storage facilities would also be required to allow for additional growth and development within the Village limits or serviced area.

Alternative 3: Surface Water Source (piped services)

The "Surface Water Source" alternative would include the provision for piped surface water sources located within the municipality or from outside of the municipalities including the City of Ottawa, Township of Russell and the Municipality of Clarence-Rockland. In addition to the requirement for a water feedermain to transport the water, water storage facilities would also be required and could be in the form of above ground / at-grade storage tanks or cisterns, and the requirement for a new municipal treatment facility. All other current water sources and supporting infrastructure would be decommissioned to allow for additional growth and development within the Village limits or serviced area.

Alternative 4: Municipal Water Source (piped services)

The "Municipal Water Source" alternative would include the extension of a water forcemain to connect to existing City of Ottawa treated water system. Water storage facilities would also be required to store water. The existing Treatment Plant would be downsized to provide disinfection only. All other current water sources and supporting infrastructure would be decommissioned to allow for additional growth and development within the Village limits or serviced area.

4.1.2 Evaluation of Alternatives

The evaluation of alternative solutions involved an impact assessment of each alternative with respect to the criteria and indicators developed by the Study Team (Table 4-1).

Table 4-1: Evaluation of Water Supply Alternatives

Criteria	Alternatives			
	Do Nothing	New Groundwater Source	New Surface Water Source	Piped Water from Neighbouring Municipality
Environmental Criteria: • Natural Heritage Features • Surface Water • Groundwater	• No physical works result in no effect • No surface water effects • Potential settlement surrounding existing well requires continued monitoring	• Localized effect on area surrounding wells • No surface water effects • Suitable groundwater quality and quantity available	• Extensive feedermain construction effects • Reduction in surface water quantity from sources • Additional wastewater from treatment plant requires discharge to surface • No groundwater effects	• Extensive forcemain construction effects • No local surface water effects • Dewatering will be required during construction
Land Use Policy Criteria: • Growth in Settlement Areas	• Does not permit growth	• Permits growth in development areas	• Permits growth in development areas	• Permits growth in development areas
Cost Criteria: • Capital Cost • Operational Cost	• None • Lowest operational costs	• Moderate capital cost • Moderate operational costs	• High capital cost for new treatment plant • High operational costs	• High capital cost • Low operational costs
Technical Criteria: • Constructability • Reliability	• No physical works • Does not improve the reliability or provide contingencies	• Simple to construct • Expansion of existing system can be easily phased • Reliable technology • Reliable water quality	• Complex to construct • Difficult transition • Can be phased • Technology dependant on raw water quality	• Moderate construction complexities • Can be easily phased • Reliable water quality
Totals		**Carried Forward**		**Carried Forward**

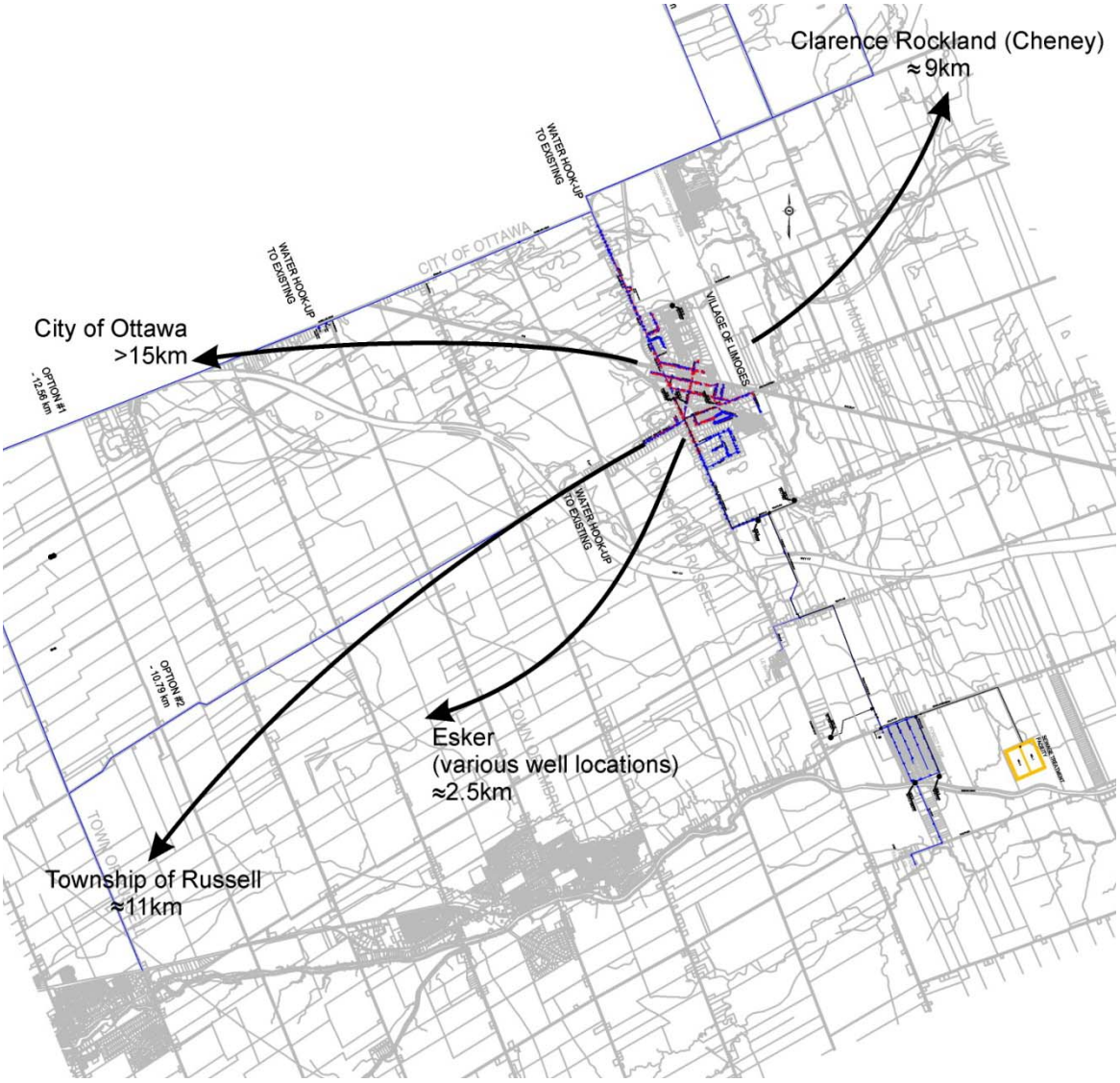
Preferred

Not acceptable

4.1.3 Preferred Water Supply Alternatives Carried Forward

The 'new groundwater source' and 'piped water from a neighbouring municipality' options were carried forward as the preliminary preferred water servicing solutions (Figure 4-1).

Figure 4-1: Preferred Water Supply Solutions



4.1.3.1 Groundwater Source Alternative

The groundwater source alternative would include various ways to expand the existing groundwater supply system and increase the production of existing municipal wells within or beyond existing regulated rates. This could take the form of expanding existing wells or the development of new municipal wells. Existing wells would remain in operation. Water treatment facilities would need to be expanded to accommodate the additional volumes. Additional storage facilities would also be required.

A new groundwater source was carried forward as a preliminary preferred alternative based on the following evaluation:

- No surface water effects
- Suitable groundwater quality and quantity available
- Permits growth in development areas
- Moderate capital and operation cost
- Simple to construct and expansion can be easily phased
- Reliable technology
- Reliable water quality requiring less treatment

4.1.3.2 Piped Water Alternative

The piped surface water alternative would include the provision for piped surface water sources located within the municipality or from outside municipalities including the City of Ottawa, Township of Russell and the Municipality of Clarence-Rockland. In addition to the requirement for a water feedermain to transport the water, water storage facilities would also be required and could be in the form of above ground or at-grade storage tanks or cisterns, and the requirement for a new municipal treatment facility. Piped water from a neighbouring municipality was carried forward as a preliminary preferred alternative based on the following evaluation:

- No local surface water effects
- Permits growth in development areas
- Low operational cost
- Moderate construction complexities and can be easily phased
- Reliable water quality

4.2 Wastewater System

4.2.1 Description of Alternative Solutions

- Do Nothing
- New Treatment Cell (Lagoon)
- Mechanical Treatment Plan
- Connect to Adjoining Municipalities

Alternative 1: Do Nothing

The “Do Nothing” alternative would leave the existing sewage collection and treatment capacity in its current state and would not implement additional measures to increase sewage capacity to accommodate additional growth. The wastewater treatment system for the Village of Limoges is at capacity, and planned development is not able to continue.

Alternative 2: New Treatment Cell (Lagoon)

The “New Treatment Cell” alternative would require the design and development of additional retention lagoon(s) located within the municipality. The existing sewage lagoons would remain operational to allow growth to continue at an existing rate or and allow for additional development.

Alternative 3: Mechanical Treatment Plant

The “Mechanical Treatment Plant” Alternative would include the construction of a stand-alone sewage treatment facility on or near the site of the existing sewage lagoons. The existing lagoons would provide short term storage capacity once the new treatment facility

APPENDIX 1-2

Water Supply Alternative Design Concepts (Section 6.1)

6.0 ALTERNATIVE DESIGN CONCEPTS

6.1 Water Supply Alternative Concepts

Alternative 1: New Groundwater Source – New Wells

The current groundwater supply system could be expanded by adding more wells to meet the ultimate demand. A pilot well was drilled within the Vars/Winchester Esker at the intersection of Route 200 and St. Pierre Road in the Township of Russell. Results from the pilot well confirmed that a single well could have the potential of supplying a flow rate of 24 L/s. The flow rate of about 24 L/s from the existing wells No. 1 and 2 could be supplemented by additional wells within the esker to meet the ultimate demand within the current village boundary. The Limoges WTP would be expanded as required. It is assumed that the water quality from the new well(s) would be of similar quality to the existing ground water source and as such, the existing WTP process would be appropriate. A new watermain to the pilot well site would be 5.5 km long and would connect at the existing Limoges well site (Figure 6-1). The existing watermain from the Limoges wells to the Limoges WTP would have to be upsized or twinned once the capacity of the existing watermain is reached.

Alternative 2: New Groundwater Source – Embrun/Marionville WTP

The current groundwater supply system could be expanded by adding more wells to meet the ultimate demand. When Russell Township connected to the City of Ottawa water distribution system as part of their Source Water Replacement Project, the existing Embrun/Marionville Water Treatment Plant (WTP) was taken off-line and is currently for sale. Lower flow rates from the Embrun Wells in the range of 45 L/s would reduce raw water iron and manganese concentrations which would lower treatment costs. The existing Embrun/Marionville WTP could remain operational as a pre-treatment process to reduce upgrades/modifications at the Limoges treatment plant. There is also an opportunity to partner with the Township of Russell as part of their plans to service the business park located near the 417/Rockdale Road interchange. A 12 km long watermain would be required from the existing Limoges well No. 1 and No. 2 location to the Embrun Reservoir, where the pipe would be connected to the existing watermain from the Embrun/Marionville Treatment Plant (Figure 6-1). The constraint associated with this well is that these wells could have to be permanently shut down, if the aquifer becomes contaminated by the landfill site located nearby. In addition to the existing Embrun/Marionville well, there would be a need to add wells to meet the ultimate demand in Limoges.

Alternative 3: Piped Water from a Neighboring Municipality – Clarence Rockland

This option consists of connecting the Limoges water distribution system to the Clarence-Rockland water distribution system (Figure 6-1). The existing Clarence-Rockland WTP would have to be doubled in size to accommodate the Limoges demand. The existing transmission main from Rockland to Hammond would have to be twinned and the existing booster station in Rockland would have to be tripled in size. A new booster station would be needed on Bouvier Road. The Limoges WTP plant would be scaled back to provide disinfection only. This option was seen as cost prohibitive; therefore, no costing was developed for this option.

Alternative 4: Piped Water from a Neighboring Municipality – Russell Township

As part of this option, a new connection to the Russell Township feedermain would be made to supply water to Limoges. A booster station at the intersection of Eadie Road and Burton

Road, in the Township of Russell, would be required, along with a 6 km long watermain that would connect at the existing Limoges wells No. 1 and No. 2 site (Figure 6-1). The existing watermain from the Limoges wells to the Limoges WTP would have to be upsized or twinned once the capacity of the existing watermain is reached. The Limoges WTP plant would be scaled back to provide disinfection only and the Limoges wells would be abandoned.

Alternative 5: Piped Water from a Neighboring Municipality – Russell Township

This option is similar to alternative 4; however, the booster station would be located at the intersection of Eadie Road and Route 200, in the Township of Russell (Figure 6-1). A 11.5 km watermain would be required as this pipe would have to be connected directly at the Limoges WTP. The Limoges WTP plant would be scaled back to provide disinfection only and the Limoges wells would be abandoned, including the existing raw water feedermain.

Alternative 6: Piped Water from a Neighboring Municipality – City of Ottawa

Under this option, a connection to the City of Ottawa Distribution System would be made near the intersection of Innes Road and Trim Road in Orleans. A water booster station would be required, along with a 23 km long watermain that would be connected to the existing Limoges wells No. 1 and No. 2 site (Figure 6-1). The existing raw-water feedermain from the Limoges wells to the Limoges WTP would have to be upsized or twinned once its capacity was reached. Similar to Alternatives 4 & 5, the Limoges WTP would be scaled back to provide disinfection only and the Limoges wells would be abandoned.

6.1.1 Evaluation of Alternative Concepts

Five categories of evaluation criteria were developed with consideration of the existing environment conditions that may be impacted by the proposed alternatives. These criteria were used to analyse and evaluate the relative preference of each alternative. The criteria are explained in Table 6-1 along with the rationale for the selection of the criteria and the indicators used to assess the potential impacts.

Figure 6-1: Water Supply Alternatives

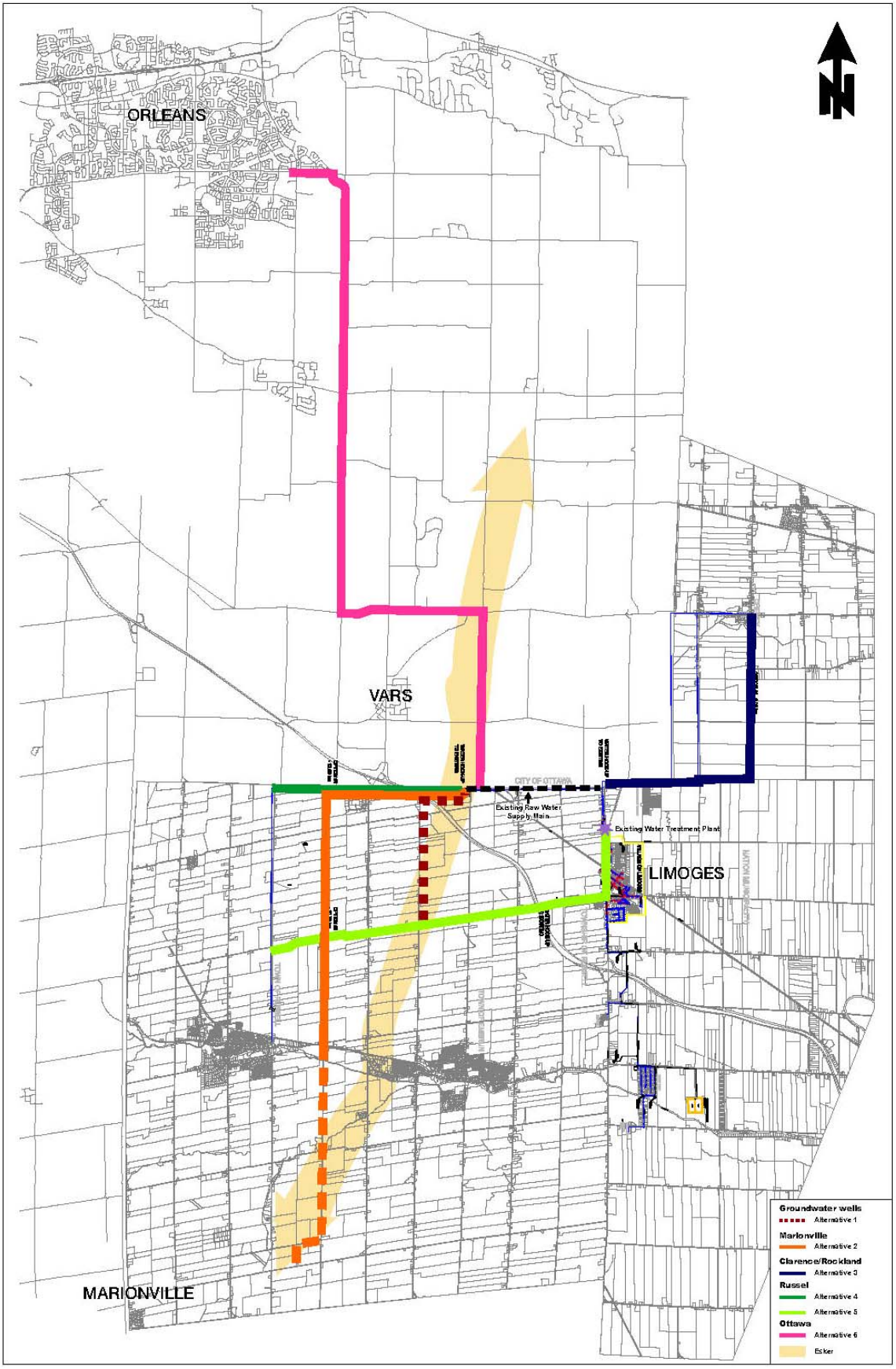


Table 6-1: Water Supply Source Evaluation Criteria

CRITERIA (Value)		RATIONALE	INDICATORS
Biological Environment	Natural Heritage	Minimize disruption to natural heritage features	Loss of natural heritage features (i.e., woodlots, ANSI) Effect on rare species
	Surface Water	Minimize impacts to surface water quality and quantity related to conveyance from source	Disruption of surface watercourses Loss of fish habitat Degradation of water quality
Physical Environment	Groundwater	Minimize impacts to groundwater quality and quantity	Assessment of predicted changes to water quality and quantity
	Geotechnical	Recognize geotechnical constraints to constructability and design requirements related to conveyance from source	Presence of bedrock Presence of clay
Social Environment	Agricultural	Protect high quality / active agricultural lands	Loss of agricultural land
	Archaeology	Minimize disruption of potential cultural resources	Disturbance in areas of archaeological potential
	Property Requirements	Minimize land requirements	Requirement for land, easements, agreements
Economic	Capital Cost	Ensure long term funding and economic sustainability	Class D capital cost estimates
	Operational and Maintenance Costs	Ensure long term funding and economic sustainability	Operation and Maintenance cost estimates
Technical	Constructability	Ease of construction and integration with the existing system	Length of construction period, complexity of the construction, ease of phasing
	Reliability	Implement a dependable and consistent system	Demand, malfunctions, system failures, constancy in technology and water quality
	Expansion potential	Implement a system which is capable of growth consistent with the development plans	Ability of the system to be expanded
	Permit and approvals	Minimize the cost and time of required approvals and permits needed for construction	Permit and approval requirements
	Source water protection	Protect drinking water sources	Source Water Protection Requirements
	Drinking Water Quality	Minimize treatment requirements	Treatment requirements of water supply source

The evaluation involves the ranking of each alternative solution relative to one another for each of the criteria (Table 6-2). The environmental impacts were predicted considering the interaction of all phases of the alternative solutions with the existing environment. The ranking considered the order of preference amongst the alternatives as well as the degree of impact based on professional judgment. This ranking was done by members on the consulting team responsible for the various aspects of the study.

Table 6-2: Water Supply Source Evaluation of Alternatives

	CRITERIA (Value)	Option 1 (New Groundwater Source – New wells)	Option 2 (New Groundwater Source – Embrun/Marionville WTP)	Option 3 (Piped water from a neighboring municipality – Clarence Rockland)	Option 4 (Piped water from a neighboring municipality – Russell Township)	Option 5 (Piped water from a neighboring municipality – Russell Township)	Option 6 (Piped water from a neighboring municipality – City of Ottawa)
Natural Environment	Natural Heritage	Low	Low-Slight	Slight	Low	Low-Slight	Low-Slight
	Surface Water	Low	Low	Low-Slight	Low	Low-Slight	Low-Slight
	Groundwater	Slight	Slight	Low	Low	Low	Low
	Geotechnical	Slight-Some	Slight	Low	Slight	Slight	Low
Social environment	Agricultural	Slight impact to agricultural land for the well location and feedermain	No impact to agricultural land	No impact to agricultural land	Slight impact to agricultural land near the intersection of Burton Road and Eadie Road	No impact to agricultural land	No impact to agricultural land
	Archaeology	Low	Low-Slight	Slight	Low	Low	Low
	Property Requirements	Slight-Some requirement for additional property to accommodate new pump houses, well(s), and piped connections. Easements likely required to tunnel under Hwy 417 New watermain to the pilot well site and upsizing or twinning of the existing watermain from the existing Limoges well site will be constructed within the existing ROW. No property will be required.	Slight-Some requirement for additional property to accommodate well(s) to meet ultimate future demand. Piped infrastructure will be located within the existing ROW. Easements likely required to tunnel under Hwy 417.		Slight property requirement at the intersection of Burton and Eadie Road to accommodate the required pumping station. The required upsizing or twinning of the watermain from the existing Limoges well site does not require additional property as the piped infrastructure would be constructed within the ROW.	Slight property requirement at the Eadie Road Route 200 intersection to accommodate the required booster station. All piped infrastructure will be located within existing ROW.	Slight property requirements for the required booster station. All piped infrastructure will be located within existing ROW. The upgrading of the existing piped infrastructure will not require additional property.
Economic	Capital Cost	$23.5M	$20.6M	>30.0M	$10.3M	$10.6M	$26.4M
	Operational and Maintenance Costs	Some O&M cost	Some O&M cost	Significant O&M cost. Must first pay supply rate established by Clarence-Rockland	Significant O&M cost. Must first pay supply rate established by City of Ottawa plus up to a 50% surcharge for local users	Significant O&M cost. Must first pay supply rate established by City of Ottawa plus up to a 50% surcharge for local users	Significant O&M cost. Must first pay supply rate established by City of Ottawa plus up to a 50% surcharge for local users.

	CRITERIA (Value)	Option 1 (New Groundwater Source – New wells)	Option 2 (New Groundwater Source – Embrun/Marionville WTP)	Option 3 (Piped water from a neighboring municipality – Clarence Rockland)	Option 4 (Piped water from a neighboring municipality – Russell Township)	Option 5 (Piped water from a neighboring municipality – Russell Township)	Option 6 (Piped water from a neighboring municipality – City of Ottawa)
Technical	Constructability	Some construction period. Slight complexity (i.e. water treatment plant) Best phasing opportunity	Some construction period. Slight complexity (water treatment plant). Good phasing opportunity.	Some construction period, slight complexity, no phasing opportunity	Some construction period, low complexity. Limited phasing opportunity	Some construction period. Low complexity. No phasing opportunity	Significant construction period. Low complexity. No phasing opportunity
	Reliability	Good water quality Multiple supply lines provide improved redundancy Proven technology	Reasonable water quality Proven technology Condition assessment required for existing infrastructure	Best water quality Proven technology	Does not meet ultimate demand Proven technology demand capacity Best water quality	Does not meet ultimate demand Proven technology Best water quality	Proven technology Best water quality
	Expansion potential	Best expansion opportunity	Best expansion opportunity	Limited expansion potential due to infrastructure size/capacity Competing interest for increased capacity	Limited expansion opportunity due to infrastructure size / capacity Agreement renegotiation with Ottawa Competing interest for increased capacity	Limited expansion opportunity due to infrastructure size / capacity Agreement renegotiation with Ottawa Competing interest for increased capacity	Limited expansion opportunity due to infrastructure size / capacity Agreement renegotiation with Ottawa Competing interest for increased capacity
	Permit and approvals	Some approval requirement. Requires MOE approval for new wells and WTP expansion. Need agreement with Russell for new infrastructure within road allowance	Some approval requirement. Existing plant has approval. Requires MOE approval for additional wells and WTP expansion. Requires agreement with Russell for infrastructure within road allowance and purchase of existing infrastructure	Some approval requirement. Requires MOE approval for Clarence Rockland WTP expansion.	Significant Approval requirement. Requires MOE approval for pipes and booster station Requires agreement from Russell for infrastructure Russell currently prohibited from allowing a new connection	Significant Approval requirement. Requires MOE approval for pipes and booster station Requires agreement from Russell for infrastructure Russell currently prohibited from allowing a new connection	Significant approval requirement. Requires MOE approval for pipes and booster station Requires agreement from Ottawa for water supply and Feasibility analysis of Ottawa pressure zones required
	Source water protection	Source within Source Water Protection Area. The new well field would require a WHPA.	New source within Source Water Protection Area Potential influence of water quality from existing municipal landfill	No impact, surface water source	No impact, surface water source	No impact, surface water source	No impact, surface water source
	Water Quality	Slight treatment requirement	Some treatment requirement. Also potential contamination from existing municipal landfill	Low treatment requirement (disinfection)	Low treatment requirement (disinfection)	Low treatment requirement (disinfection)	Low treatment requirement (disinfection)

Preferred

Not acceptable

APPENDIX 1-3

Description of Preferred Alternative for Water Supply (Section 7.1)

7.0 PREFERRED ALTERNATIVES

7.1 Potable Water

The preferred water supply solution is Alternative 1 (Figure 7-1). This involves adding additional wells into the Vars/Winchester esker near the intersection of Route 200 and St. Pierre Road. It is assumed that the water quality from the new wells will be similar to the existing wells with respect to treatment needs at the WTP. The process flow diagram for the existing WTP as provided in the First Engineers Report (2004) is shown in Figure 7-2. A new 400 mm diameter raw water feedermain from the new well site to the existing wells would be 5.5 km long. The existing raw water feedermain from the Limoges wells to the Limoges WTP would have to be upsized or twinned once the capacity of the existing watermain is reached. The Limoges WTP would be expanded as required (Figure 7-3).

It was estimated that the residential population to be served by the water system is 11,650 people (Section 1.4). The Trade and Industry Policy Area is 89.2 ha. Assuming an average day demand of 28 m^3/ha/d for ICI and 350 L/p/d for residential demand, then the Trade & Industry Policy Area is equivalent to 7,136 people (80 p/ha). The total equivalent population to be serviced by the water system is 18,786. The average day demand for the water system would be 6,575 m3 (76 L/s). Using a maximum day peaking factor of 1.9 (per Table 8-2 of the MOE Design Guidelines for Drinking Water Systems – 2008), the maximum day demand on the water system would be 12,493 (145 L/s).

Figure 7-1: Preferred Water Supply Alternative

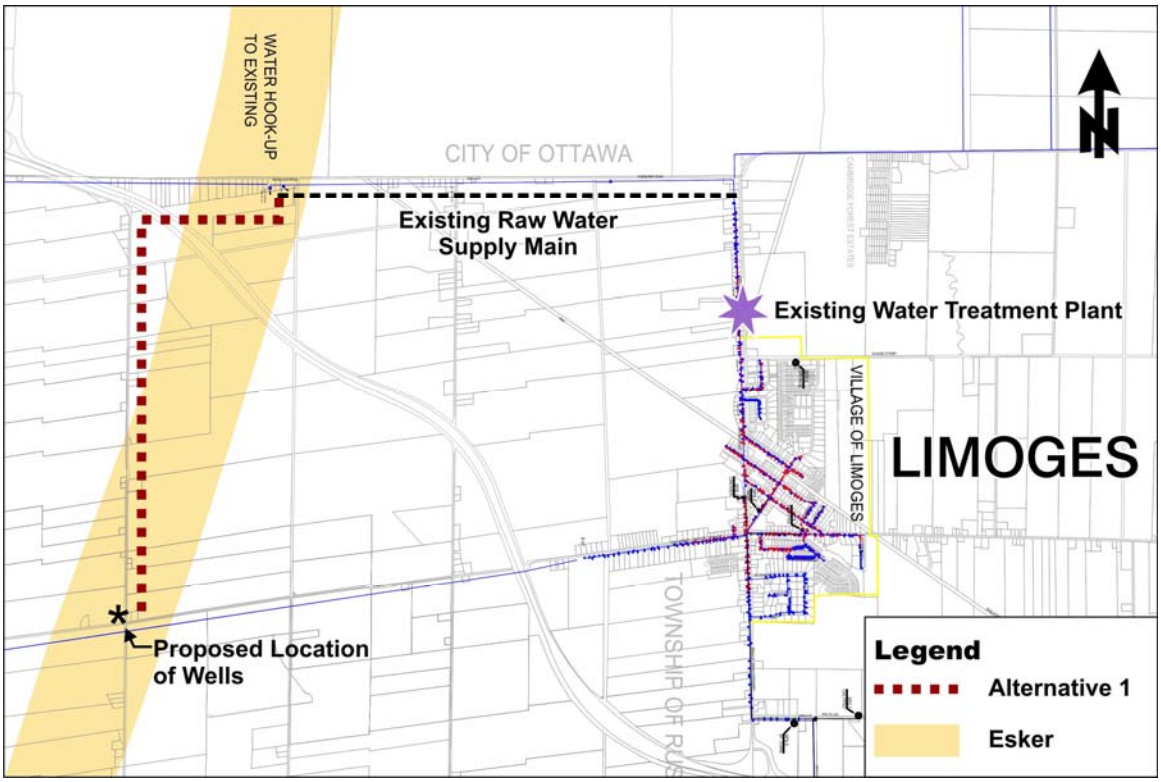


Figure 7-2: Existing Water Treatment Plant Process Flow Diagram

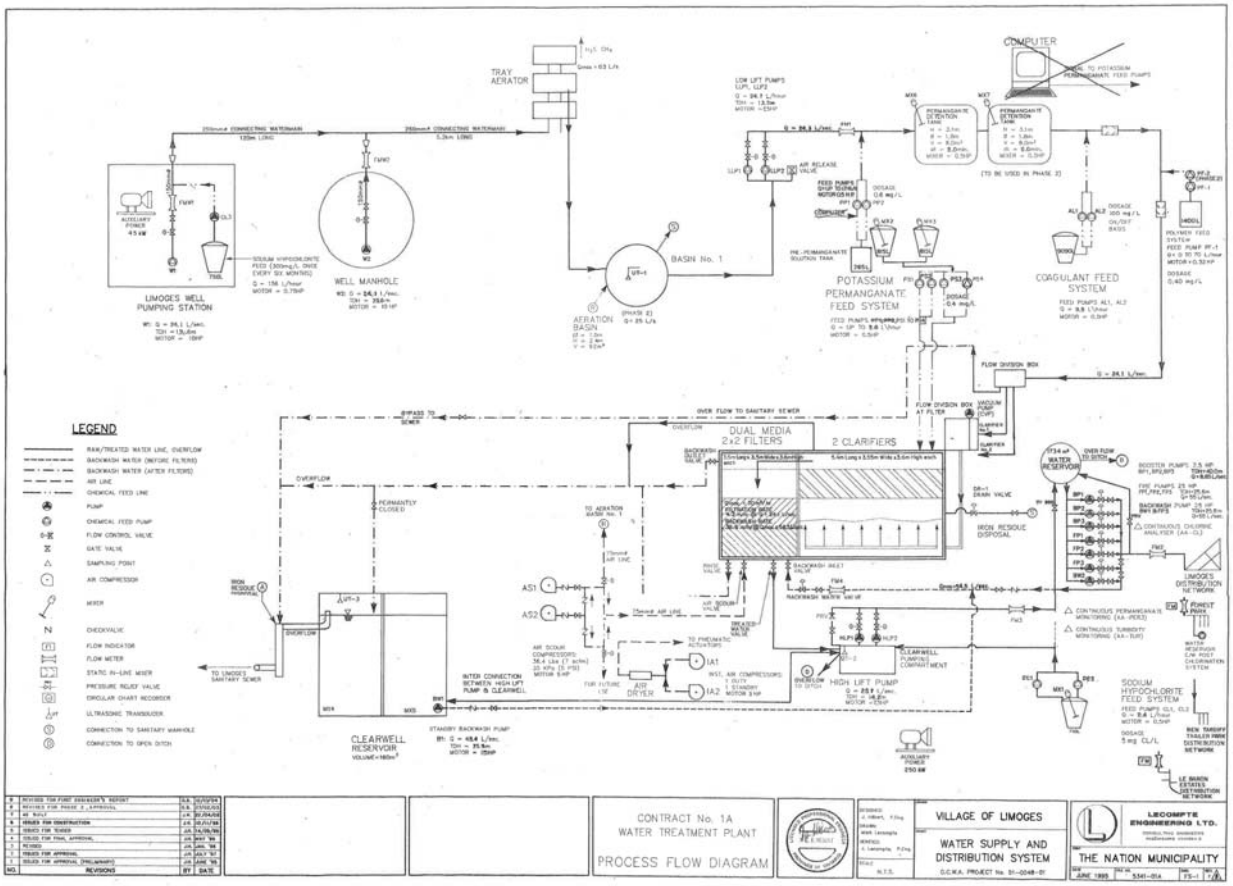
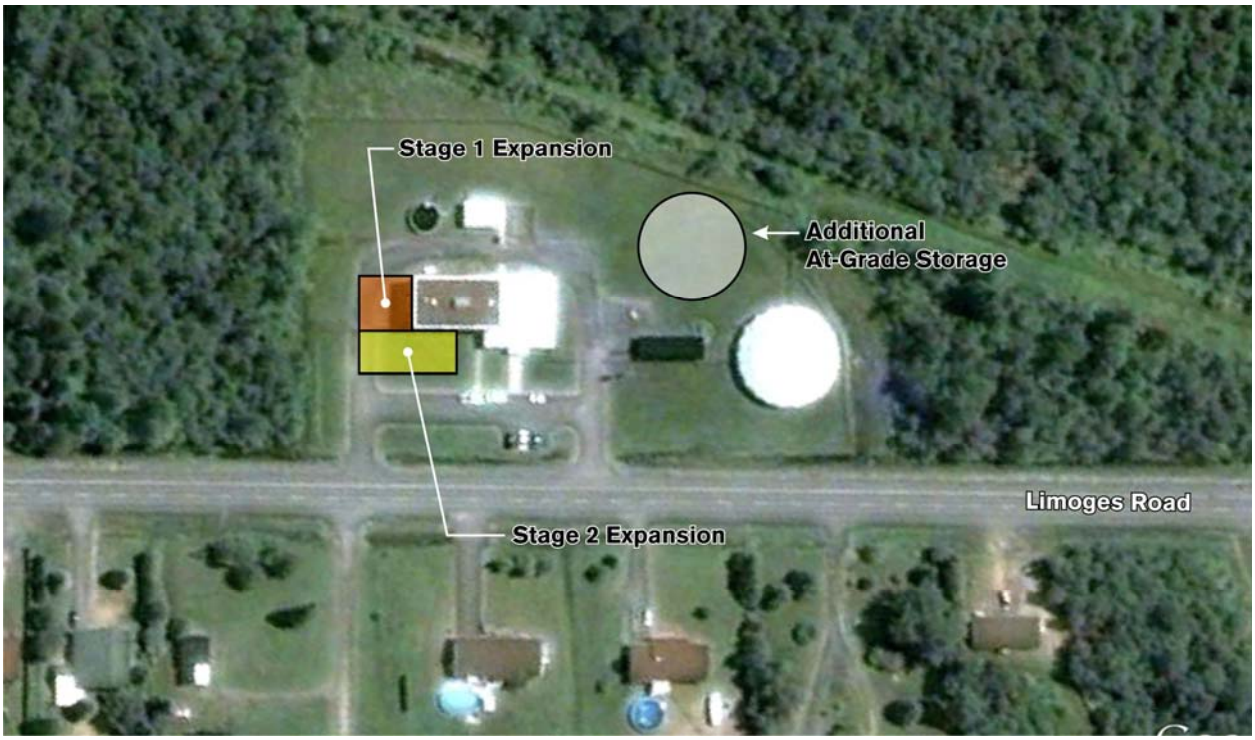


Figure 7-3: Water Treatment Plant Staging



The preferred water distribution & storage solution is Alternative 2. This involves adding elevated storage in the vicinity of Highway 417. At-grade storage would also be added at the water treatment plant. The storage requirements were determined per section 8.4.2 in the MOE Design Guidelines (MOE, 2008). The Fire Storage requirement was determined to be 3,600 m^3. The equalization storage was determined to be 3,178 m^3 while emergency storage was determined to be 1,695 m^3 for a total storage requirement of 8,473 m^3. The existing storage capacity is 1,734 m^3 at the water treatment plant and 717 m^3 at the Forest Park pump station. Therefore the total additional storage required is 6,022 m^3. This could be achieved with a 3,200 m^3 elevated tank and 2,800 m^3 of at-grade storage.

The following recommendations should also be considered as part of the preferred solution:

1. It is recommended that two new wells be provided to augment the amount of raw water supply to the WTP. Confirmation on the quantity and quality of the water from the new wells is required to make certain that the existing WTP can properly treat the water for potable water use.
2. It is recommended that the WTP process be evaluated to confirm that the treatment process is appropriate for the new raw water supply from the new wells.
3. It is recommended that an additional watermain link (300 mm dia.) be provided from the water treatment plant to Savage Drive, possibly at Giroux, as a means of increasing redundancy. Currently nearly the entire village would be without water if the watermain on Limoges Road, between the water plant and Savage Drive, were to break.
4. It is recommended that an additional watermain link (300 mm dia.) be made between King Street and Lacroix Street. This could possibly be made within the future development lands in the Township of Russell (west side of Limoges Rd.) This is necessary to improve the hydraulic performance as demand increases. It will also provide redundancy as currently the Limoges Rd watermain is the sole north/south connection south of Linda Street and is therefore a source of vulnerability.
5. It is recommended that the WTP be expanded in phases to meet the water supply needs as per the growth plans of the community.
6. An additional crossing (300 mm dia.) of the Via Rail railroad at Andrew Street is recommended to improve redundancy as development in the northeast progresses. Consideration should also be given to providing a crossing near Des Benevoles Street when development approaches this location.
7. In the short-term, the areas south of Highway 417 are vulnerable to low pressure during peak hour demand as it only has one connecting watermain. It is recommended that pressure in this area be monitored by operations personnel. Should pressure conditions become unacceptable, an in-line booster pump or an additional watermain (300 mm dia.) crossing of Highway 417 may be necessary. When the Trade & Industry Policy Areas south of Highway 417 are to be developed, the additional watermain (300 mm dia.) crossing of Highway 417 will be necessary to satisfy flow and pressure requirements.
8. An additional watermain link (300 mm) should be made on Calypso Street in order to improve the hydraulic performance and improve redundancy from the proposed elevated storage tank location.

It is anticipated that the first stage of water supply will involve an expansion of the existing capacity by 40 L/s to 64.1 L/s. This will provide for a growth in equivalent population of

4,800 people. This will involve the installation of wells at the identified source location (St. Pierre Road at Route 200) as well as the installation of a 5.5 km 400 mm diameter raw water feedermain from the new wells to the existing well site. The existing raw water feedermain will be twinned. The WTP and booster pump station would also be expanded to meet the growing needs of the municipality. The intent would be to expand the WTP in appropriate stages based on the treatment processes needed and their individual treatment capacities, with the plan to have an overall capacity of 64.1 L/s (5,540 m^3/d) for Stage 1. It is anticipated that the first stage of water distribution will involve the installation of the elevated storage tank, the link between the WTP and Savage Drive and the link on Calypso Road (Figure 7-4). The remaining work may be completed in subsequent stage(s) as necessary (Figure 7-5).

Figure 7-4: Stage 1 Potable Water Distribution System

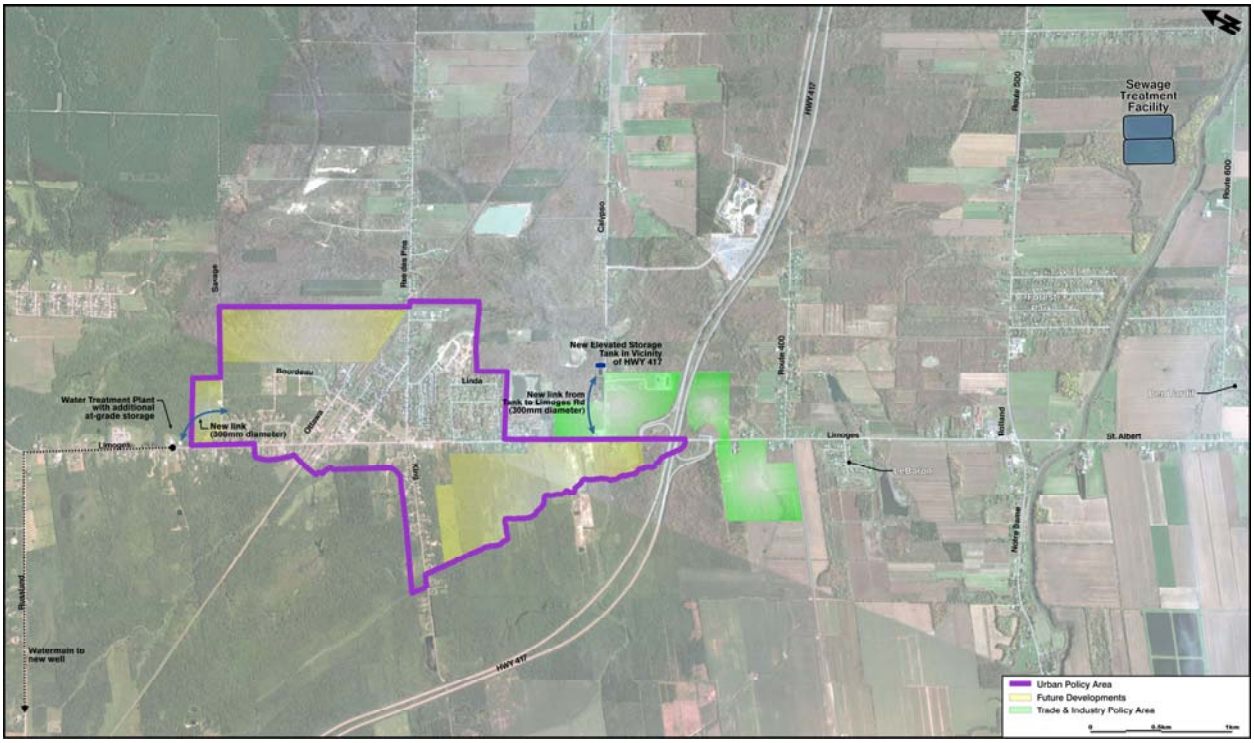
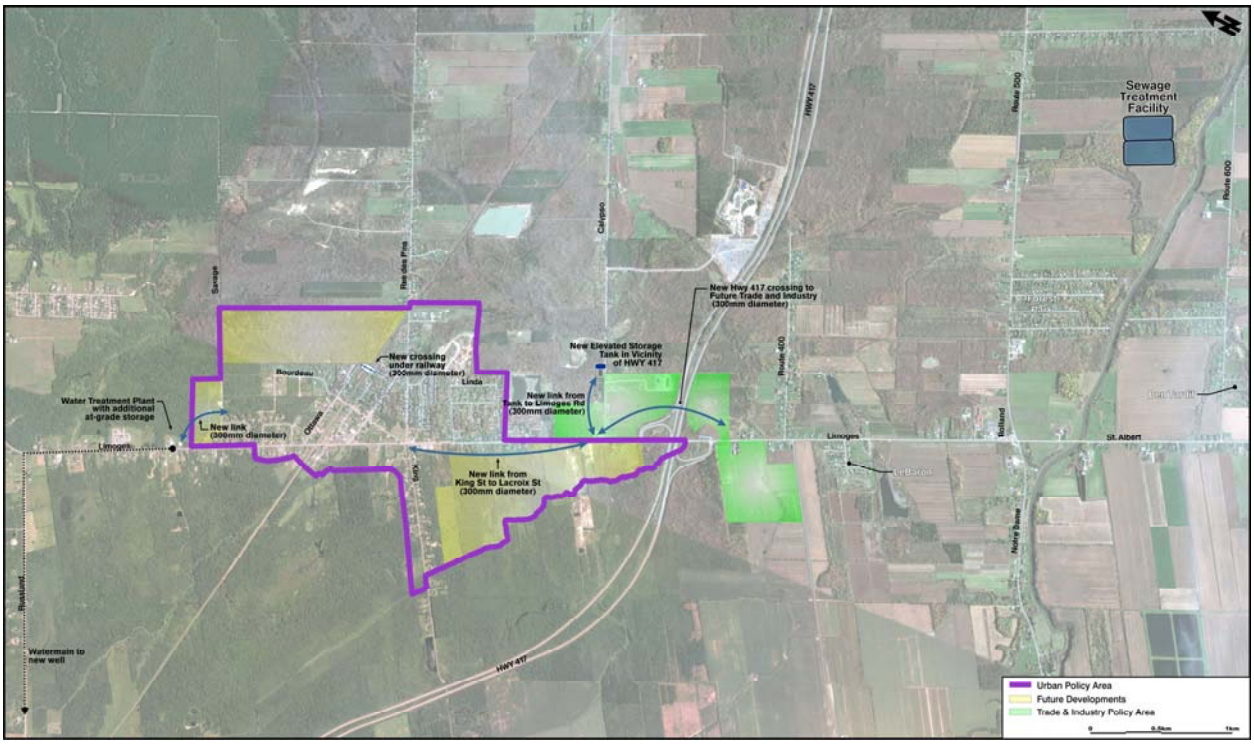


Figure 7-5: Stage 2 Potable Water Distribution System



7.1.1 Impacts and Mitigation – Water System

The values and conditions identified in the documentation of existing conditions were used as the basis for assessing the effects of the preferred alternative on the transportation, social, physical and biological environments. The impact analysis involved applying the following steps:

- Identify and analyse instances where the project may interact with existing environmental conditions.
- Acknowledge predetermined project activities that act as *built-in mitigation* measures.
- Identify opportunities for further *mitigation of residual* effects, if possible/practical.
- Determine the *significance of the residual* environmental effects, after further mitigation.

In order to understand the project interactions with the environment it is necessary to consider all phases of the project: pre-construction/design (P); construction (C); and operation (O).

7.1.1.1 Best Management Practices (BMPs)

In this assessment, “built-in mitigation” is defined as actions and design features incorporated in the pre-construction, construction, and operational phases that have the specific objective of lessening the significance or severity of environmental effects which may be caused by the project.

The expanded Limoges Water System will be designed and implemented with the benefit of contemporary planning, engineering, and environmental management practices. Regard

shall be had for the legislation, policies, regulations, guidelines, and best practices of the day. Where possible, mitigation measures will be prescribed in the construction contracts and specifications. Examples of practices that should be employed, based on current standards, are described below. These measures can be considered "built into" the preferred design. They will be updated and refined during the pre-construction, construction, and operation phases of the project.

Erosion and Sediment Control Plan

The purpose of the Erosion and Sediment Control Plan is to determine the degree of erosion and sedimentation that would occur under normally anticipated weather conditions during the life of the project, and to develop and implement mitigative strategies to control any foreseen areas determined to have a pre-disposition to the problem. This may include: the identification of planting and slope rounding specifications within the contract tender; identifying and specifying seeding and sodding locations; identifying areas requiring slope benching or retaining structures in the detailed design process; and post construction monitoring and mitigative practises.

Construction and Traffic Management Plan

A Construction and Traffic Management Plan will be developed to manage the road's transportation function for all travel modes including equipment and material deliverables at various times during the construction period. The objective of the plan will be to maintain safe and clear pedestrian routes, maintain existing traffic as close as possible to its current conditions, and outline the road signage program.

Unexpected Discovery of Archaeological Resources

If during the course of construction archaeological resources are discovered, the site should be protected from further disturbance until a licensed archaeologist has completed an assessment and any necessary mitigation has been completed.

If unexpected archaeological resources are encountered, construction must cease and a licensed consultant archaeologist engaged to carry out field work, in compliance with Section 48 (1) of the Ontario Heritage Act. Should deeply buried deposits be found during any construction activities, the Ministry of Tourism, Culture and Sport (416) 314-7148, shall be notified immediately. In the event that human remains are encountered during construction activities, local law enforcement authorities and/or the coroner will be notified immediately, followed by the Ministry of Tourism, Culture and Sport, and the Registrar of Cemeteries at the Ministry of Consumer Services (416) 326-8393.

Emergency Response Plan

The preparation of an Emergency Response Plan, to be used by the contractor, will be included to allow full access to emergency services during the construction period, so that at any given time there is a method to access all adjacent land uses. Additionally, the Emergency Response Plan should include provisions for providing temporary services to end users in the event of a construction related service outage or other service disruption. A spills response and reporting plan will be prepared and adhered to by the contractor. Spills or discharges of pollutants or contaminants will be reported immediately. Clean up shall be initiated quickly to ensure protection of the environment.

Environmental Protection

It will be the responsibility of the contractor to ensure that no contamination, waste or other substances, which may be detrimental to aquatic life or water quality, will enter a watercourse as either a direct or indirect result of construction. In this regard, any floating debris resulting from construction which accumulates on watercourse beds and watercourse banks is to be immediately cleaned up and disposed of. Any spills or contamination, waste or other substances which may be detrimental to aquatic life or water quality will also be immediately cleaned up.

Any work which will cause or be the cause of discharge to watercourses is to be prohibited. At all times, construction activities are to be controlled in a manner that will prevent entry of deleterious materials to watercourses. In particular, construction material, excess material, construction debris and empty containers are to be stored away from watercourses and the banks of watercourses.

Management of Contaminated Materials

The MOE and the Construction Manager are to be notified immediately upon discovery of any contaminated material encountered within the construction area. If contaminated materials or contaminated groundwater are encountered within the construction limits, these are to be removed and disposed of in accordance with all applicable Acts and Regulations. Treatment and discharge of contaminated groundwater are also to be in accordance with applicable legislation and regulations.

Geotechnical Investigations

Geotechnical investigations will be required to confirm groundwater and subsurface conditions and potential impacts that will need to be considered in the detailed design phase of the project. Geotechnical investigations will also be required to undertake the pavement design. Foundation investigation will be required for structural design of new structures.

Public Communications Plan

The purpose of the Public Communications Plan is to keep the public informed about the work in progress and the end result of the construction activities. Residents and other stakeholders should be kept aware of scheduled road disruptions, interruption to other services and other construction related details ahead of time so that their activities can be planned with minimum disruption. The plans should detail how to communicate the information to the public, what information should be disseminated, and at which project stages the communications should take place.

7.1.1.2 Site Specific Mitigation Measures

Once potential effects were predicted, mitigation measures were identified. Often these mitigation measures were sufficient to reduce potential negative effects to an insignificant or negligible status. Mitigation included environment rehabilitation and replacement.

Fisheries Compensation

The SNC have an agreement with DFO and are responsible for the evaluation of any proposed works regarding their impact on fish habitat. Fisheries assessments should be undertaken in the area of water crossings to determine the presence of fish/fish habitat. If required, mitigation or compensation plans will need to be prepared for SNC approval.

Bird Survey and Management Plans

Any works/ activities (including vegetation removal) with the potential to disturb or destroy migratory birds or their nests shall occur outside of the breeding bird season (May 1st to July 31st) or whatever season within which birds are frequenting the project area and may be impacted. If work is proposed to occur within the breeding bird season, a bird nest survey shall be conducted to avoid the disruption of migratory birds or their nests.

Stage 1/2 Archaeological Assessments

Stage 1/2 Archaeological Assessments should be conducted in construction areas identified with archaeological potential in accordance with Ministry of Tourism, Culture and Sport guidelines.

Property Impact

Costs associated with acquiring property and property rights on which to build or provide construction easements for the construction of the well fields and watermains includes, in addition to actual property value; right-of-way preparation, legal and appraisal services and land survey.

Land use

Areas adjacent to the proposed water system are in various stages of developement and redevelopment. The planned land use of these future development areas will need to be considered and integrated during staging of the water system. Land use in the area of the well field will be subject to the Source Water Protection Act.

7.1.2 Impact Assessment – Water System

As described in the methodology, an environmental effect requires consideration of the interaction of the project (i.e. project activities) with the environment. Pre-construction, construction and operational activities have been assessed.

Professional judgement and experience formed the basis for identifying environmental effects and mitigation measures. The analysis was based primarily on comparing the existing environment with the anticipated future environment, during and after construction. Consideration was given to:

- the magnitude, spatial extent, and duration of effects;
- the proportion of a species population or the number of people affected;
- direct or indirect effects;
- the degree to which the effect responds to mitigation; and
- the level of uncertainty about the possible effect.

In this assessment, "residual" environmental effects are defined as changes to the environment caused by the project, and vice versa, when compared to existing conditions and taking into account all mitigation measures. Potential residual environmental effects are assessed with regards to their significance, including spatial and temporal considerations, and are categorized according to the following definitions:

"Negligible" *means an effect that may exhibit one or more of the following characteristics:*

- nearly-zero or hardly discernible effect; or

- affecting a population or a specific group of individuals at a localized area and/or over a short period.

"Insignificant" *means an effect that may exhibit one or more of the following characteristics:*

- not widespread;
- temporary or short-term duration (i.e., only during construction phase);
- recurring effect lasting for short periods of time during or after project implementation;
- affecting a specific group of individuals in a population or community at a localized area or over a short period; or
- not permanent, so that after the stimulus (i.e., project activity) is removed, the integrity of the environmental component would be resumed.

"Significant" *means an effect that may exhibit one or more of the following characteristics:*

- widespread;
- permanent transcendence or contravention of legislation, standards, or environmental guidelines or objectives;
- permanent reduction in species diversity or population of a species;
- permanent alteration to groundwater flow direction or available groundwater quantity and quality;
- permanent loss of critical/productive habitat;
- permanent loss of important community archaeological/heritage resources; or
- permanent alteration to community characteristics or services, established land use patterns, which is severe and undesirable to the community as a whole.

"Positive" means an effect which results in an improvement to the existing or future conditions.

The above definitions of significance were adopted for use in this assessment because many of the impacts cannot be quantified in absolute terms, although changes and trends can be predicted. The definitions provide guidance and are intended to minimize personal bias.

Monitoring is important to verify the accuracy of effects predictions. Monitoring measures were recommended to determine which effects actually occurred with project implementation, and may result in the modification of mitigation measures to improve their effectiveness. Identified monitoring measures included inspection and surveillance, and compliance monitoring.

Table 7-1 describes the potential effects, mitigation, residual effects and their significance, and monitoring recommendations for the preferred alternative.

Table 7-1: Water System Impacts and Mitigation

Environmental Value		Project Activity / Environmental Interaction	Phase[13]			Specific Location	Mitigation Measures *Built-in Mitigation Measures*	Potential Residual Effect	Level of Significance	Monitoring Recommendation
			P	C	O					
Social Environment	Regulatory Planning and Policy	The project has been incorporated into planned development to provide the ability for the community to develop according to the Official Plan and Provincial Planning Policy	•				• Construct in accordance with demand from developing communities	Water supply to developing communities	Positive	Monitor development applications to determine timing of construction
	Land Use	Lands required for the easements will be assessed with consideration for land use and landowner interests	•			Well field and watermain / feedermain routes	• Fair market value for lands that are required to construct the water supply and distribution system	Transfer of required lands to municipality	Insignificant	None required
		Some land uses in the vicinity of the new municipal wells may be prescribed as drinking water threats through the *Clean Water Act*, *2006* regulations			•	Well field	• Land use management in accordance with the Nutrient Management Act, 2002 (as amended), Clean Water Act, 2006 and other regulations a prescribed by the Raisin-South Nation Source Protection Region	Applications for development in the vulnerable areas will be flagged for review by the Risk Management Official	Insignificant	As per the Raisin-South Nation Source Protection Region *Proposed Source Protection Plan*
	Noise	Noise levels produced by stationary and moving construction equipment (dozers, trucks, loaders, scrapers) will occasionally be disruptive		•		Construction areas	• Contractor to ensure that the municipal by-laws are not contravened, equipment is well tuned, lubrication of moving parts, restrict unnecessary idling	Effects from construction activities will be heard	Insignificant	Monitor complaints during construction
	Vibration	Construction activities will generate noticeable vibrations		•		Construction areas	• Contractor to ensure that accepted vibration limits are maintained	Minimal vibrations	Insignificant	Monitor complaints during construction
	Air Quality	Dust and equipment exhausts will increase pollution locally during the construction period		•		Throughout Corridor	• Termination of operations during periods of high winds • Use of temporary enclosures, and use of water/dust suppressants as necessary	Dust may be an irritant to adjacent residents and pedestrians	Insignificant	Monitor complaints during construction
	Archaeological Resources	Potential for disruption/ disturbance of archaeological resources during construction		•		Areas of archaeological potential	• Undertake Archaeological Assessment in areas of identified archaeological potential • Unexpected discoveries will require the contacting of appropriate authorities	None expected	Negligible	As per Archaeological Assessment recommendations
	Registered Archaeological Sites	No documented or registered archaeological sites within the study area		•		Construction areas	• Unexpected discoveries will require the contacting of appropriate authorities	None expected	Negligible	As per Heritage Assessment recommendations
	Areas of Potential Environmental Concern	Active and closed waste disposal sites have the potential to cause impacts to soil and groundwater quality	•	•	•	New well field	• Wells have been located in the esker with a source water protection area and should not be affected by the active or closed landfills	None expected	Negligible	As per the Raisin-South Nation Source Protection Region, *Proposed Source Protection Plan*
	Views	Elevated water tower will introduce a new element into the viewscape		•	•	Highway 417	• Design tower to be visually aesthetic and to promote the Village	Change in the viewscape with an opportunity to identify the Village to roadway users	Positive	None required

[13] **P** -Pre-construction/Design
C - Construction
O - Operation

Environmental Value		Project Activity / Environmental Interaction	Phase[13] P	Phase[13] C	Phase[13] O	Specific Location	Mitigation Measures *Built-in Mitigation Measures*	Potential Residual Effect	Level of Significance	Monitoring Recommendation
Biological Environment	Species at Risk (SAR)	Potential for disruption/ disturbance of SAR and/or their habitat		•	•		• Undertake SAR inventory prior to construction in areas of potential SAR habitat and identify mitigation measures if required	Potential short term minor disruptions to localized populations following mitigation	Insignificant	As per *Ontario Endangered Species Act* mitigation plan if required
	Aquatic Habitat / Surface Water	Decrease in water quality due to accidental spills during construction refueling and accidents during operation, resulting in pollutants entering the watercourses		•	•	Entire Corridor	• No refueling within 30 m of a watercourse • *Emergency Response Plan*	Some contaminants within stormwater system	Insignificant	As per Emergency Response Plan
		Decrease in water quality from sedimentation due to construction activities in the vicinity of water crossings		•		Water crossings	• Construction fencing at work areas near watercourses to limit the area of disturbance • *Erosion and Sedimentation Control Plan*	Minor short-term localized degradation of water quality	Insignificant	Monitoring of baseline water quality may be required during detail design
		Potential loss of fish habitat as a result of new water crossings for infrastructure		•		Water crossings	• Design cross-sections to avoid modifications at crossings • Avoid in-water work to the extent possible • Minimize the area of in-water alteration to the extent possible • Follow in-water construction timing restriction • If in-water work is anticipated, develop mitigation plan to manage potential loss of fish habitat	Potential for short-term localized disruption of fish habitat	Insignificant	As per mitigation plan, if required
	Provincially significant Wetlands (PSW)	No PSW in the immediate vicinity of the proposed system					• None required	None anticipated	Negligible	None required
	Significant Habitat	No significant habitat has been identified, however, existing urban wildlife may be displaced or disturbed during the construction of the project		•		At water edges	• Design a *Landscaping Plan* which will replace some of the habitat lost • Protection of identified features and individual specimens with exclusion fencing • Replacements –native varieties	Replacement of existing landscape features	Insignificant	Monitor health of new plantings
Physical Environment	Surficial Geology	The potential for soft ground conditions or excess groundwater pressures that may impact the stability of excavations.	•				• No unusual problems are anticipated in trenching in the overburden materials using large conventional hydraulic excavating equipment. • Side slopes should be stabilized in the short term at 1 horizontal to 1 vertical to depths of approximately 4 metres if the water table is not encountered. • If excavations extend below the water table in sandy soils then side slopes of 3 horizontal to 1 vertical may be required. • Undertake detailed geotechnical investigation during detailed design	Some of the excavations would need to be carried out within shoring/sheeting generally consisting of trench boxes if trench stability is an issue	Insignificant	None required
	Bedrock Geology	Bedrock excavation is not expected for excavations in the vicinity of the Village	•				• Undertake detailed geotechnical investigation during detailed design	None anticipated	Negligible	None required

Environmental Value		Project Activity / Environmental Interaction	Phase[13] P	Phase[13] C	Phase[13] O	Specific Location	Mitigation Measures *Built-in Mitigation Measures*	Potential Residual Effect	Level of Significance	Monitoring Recommendation
	Hydrogeology	Groundwater inflow is expected for essentially all excavations within the study area and temporary excavations may require dewatering		•		Areas of new infrastructure / replacement	• Hydrogeology assessment of anticipated inflow and need for MOE Permit-to-Take-Water (PTTW) • Removal of groundwater by well filtered sumps in the excavations • Contractor to develop and implement an *Erosion and Sediment Control Plan*	Potential for increased sedimentation down stream	Negligible	Monitor effectiveness of Erosion and Sediment Control Plan Monitor PTTW requirements carried out by contractor for conformance to application
Technical Conditions	Well Development	Introduction of new wells could result in groundwater level lowering	•	•	•	Well field	• Locate communal wells within the esker based on water balance to avoid interference with other wells • Site-specific hydrogeological assessment to confirm the available groundwater quantity and quality for a municipal well	Pumping rate modifications / reductions if settlement occurs	Insignificant	Monitoring wells exist around the proposed well location and are currently being monitored quarterly to assess the natural fluctuations of the aquifer prior to the installation of a communal well.
	Road Traffic Volumes and Capacities	Detours will be required during construction, particularly where the watermains will cross existing roads. This will potentially slow traffic and affect existing bus routes, being a possible irritant to drivers and pedestrians		•		Roadway /intersections	• Construction phasing to minimize effects to traffic • A *Construction and Traffic Management Plan* will be prepared and adhered to by the contractor. Standard traffic control measures will be used to manage traffic flow • A *Public Communications Plan* will be implemented by the contractor. Detours will provide a minimum of two traffic lanes for their duration	Possible traffic delays during construction	Insignificant	Ongoing monitoring of Construction and Traffic Management Plan
	Structures and Utilities	Pumping from permeable layers could cause groundwater level lowering for a significant zone of influence around excavations		•			• Undertake detailed geotechnical investigation during detailed design	None expected	Insignificant	None required
		Ground movements may affect utilities and buildings in the immediate vicinity of excavations		•			• Undertake detailed geotechnical investigation during detailed design	Localized temporary settlement where excavations would extend within the 1H:1V (horizontal: vertical) zone of influence of building foundations	Insignificant	Settlement monitoring

APPENDIX 2

Hydrogeological Investigation Report

APPENDIX 3

Public Consultation

APPENDIX 3-1

Notices

Village of Limoges Potable Water and Wastewater Master Plan –
Drinking Water Supply

NOTICE OF AMENDMENT

In 2013, The Nation Municipality completed the Potable Water and Wastewater Master Plan for the Village of Limoges, which reviewed water and wastewater infrastructure requirements to satisfy long term development and growth. The preferred alternative for drinking water supply included: addition of two wells at a new site with a 5.5km feeder main to connect to the existing feeder main; expansion of the Limoges WTP and pumping station; new water storage facility; and, expansion of the water distribution network. The new water storage facility (at grade water reservoir) was completed in 2018. The other recommendations relating to water supply and treatment have not been implemented.

Recent discussions between The Nation Municipality and the City of Clarence-Rockland have resulted in the development of a new option to augment the water supply to the Village of Limoges, which was not previously considered in the Master Plan. An amendment to the Master Plan has been initiated to evaluate this new option.

The Master Plan amendment will be limited to water supply alternatives and only these changes will be open for review. Water distribution and storage alternatives will not be reviewed through the amendment.

The water supply component of the Master Plan is considered a Schedule C project and is subject to the full Five Phase Planning Process as specified by the Ministry of the Environment, Conservation and Parks. No changes are proposed to Phases 1 and 2 of the Environment Assessment (EA) process. The amendment will cover Phases 3 and 4 of the EA process only to review and evaluate the newly identified Alternative Design Concept.

A public open house will be held in Fall 2019 to present the amendment information.

Public consultation is an important part of the process and we are interested in hearing any comments that you may have about this study. Please send any comments or information requests to:

Nation Municipality
Doug Renaud
Director of Water and Wastewater
Phone: 613.443.1425 x300
E-mail: DRenaud@nationmun.ca

R.V. Anderson Associates Limited
Beth Hamley, P.Eng.
EA Coordinator
Phone: 613.226.1844
E-mail: EHamley@rvanderson.com

Plan directeur de l'eau potable et des eaux usées du Village de Limoges – Approvisionnement en eau potable

AVIS DE MODIFICATION

En 2013, la Municipalité de La Nation a complété le Plan directeur de l'eau potable et des eaux usées du village de Limoges. Ce plan examinait les besoins des infrastructures d'eau potable et d'eaux usées pour satisfaire au développement et à la croissance à long terme. La solution privilégiée pour l'approvisionnement en eau potable incluait : l'ajout de deux puits sur un nouveau site avec un réseau principal de 5.5 km pour se connecter au réseau principal existant; l'expansion de la station d'épuration de Limoges et de la station de pompage; un nouveau réservoir d'eau; et l'expansion du réseau de distribution d'eau. Le nouveau réservoir d'eau a été complété en 2018. Les autres recommandations liées à l'approvisionnement et au traitement de l'eau n'ont pas encore été mises en œuvre.

De récentes discussions entre la Municipalité de La Nation et la Cité de Clarence-Rockland ont mené vers une nouvelle option pour augmenter l'approvisionnement en eau au Village de Limoges, ce qui n'était pas auparavant considéré dans le Plan directeur. Une modification au Plan directeur a été entreprise afin d'évaluer cette nouvelle option.

La modification au Plan directeur sera limitée aux options pour l'approvisionnement en eau et seulement ces changements feront l'objet d'une révision. Les options pour la distribution et le stockage de l'eau ne seront pas revues par la modification.

La composante du Plan directeur pour l'approvisionnement en eau est considérée comme un projet Annexe C et est assujettie au Processus de planification en 5 phases complet, tel que défini par le Ministère de l'Environnement, de la Protection de la nature et des Parcs. Aucune modification n'est proposée pour les phases 1 et 2 du processus d'évaluation environnementale (EE). La modification couvrira seulement les phases 3 et 4 du processus EE pour réviser et évaluer le Concept de design alternatif nouvellement identifié.

Une journée portes ouvertes publique sera organisée à l'automne 2019 pour présenter les renseignements relatifs à la modification.

La consultation publique est une étape importante du processus et nous tenons à prendre connaissance de tout commentaire que vous souhaitez formuler au sujet de cette étude. Veuillez faire parvenir vos commentaires ou vos questions à :

Municipalité de La Nation
Doug Renaud
Directeur de l'eau et des eaux usées
Téléphone : 613.443.1425 x300
Courriel : DRenaud@nationmun.ca

R.V. Anderson Associates Limited
Beth Hamley, P.Eng.
Coordinateur Environnemental
Téléphone : 613.226.1844
Courriel : EHamley@rvanderson.com

Village of Limoges Drinking Water and Wastewater Master Plan – Drinking Water Supply

NOTICE OF PUBLIC OPEN HOUSE

In 2013, The Nation Municipality completed the Drinking Water and Wastewater Master Plan for the Village of Limoges, which reviewed water and wastewater infrastructure requirements to satisfy long term development and growth. The preferred alternative for drinking water supply included: addition of two wells; expansion of the Limoges treatment plant and pumping station; new water storage facility; and, expansion of the water distribution network. The new water storage facility was completed in 2018. The other recommendations relating to water supply and treatment have not been implemented.

Recent discussions between The Nation Municipality and the City of Clarence-Rockland have resulted in the development of a new option to augment the water supply to the Village of Limoges, which was not previously considered in the Master Plan. An amendment to the Master Plan has been initiated to evaluate this new option. The Master Plan amendment will be limited to water supply alternatives and only these changes will be open for review. Water distribution and storage alternatives will not be reviewed through the amendment.

A public open house will be held to share the amendment information, as follows:

PUBLIC OPEN HOUSE

Date: Wednesday, November 20, 2019
6:30 P.M. – 8:30 P.M.
Location: Limoges Community Centre (205 Limoges Road)

Following the public open house, the study team will finalize the preferred design and prepare the Amendment Report. The report will be placed on the public record for review in accordance with the requirements of the Municipal Class Environmental Assessment.

Public consultation is an important part of the process and we are interested in hearing any comments that you may have about this study. Please send any comments or information requests to:

The Nation Municipality
Doug Renaud
Director of Water and Wastewater
Phone: 613.443.1425, x300
DRenaud@nationmun.ca

R.V. Anderson Associates LTD.
Beth Hamley, P. Eng.
EA Coordinator
Phone: 613.226.1844
EHamley@rvanderson.com

City of Clarence-Rockland
Julian Lenhart
Director Infrastructure & Planning
Phone: 613.446.6022, x2270
JLenhart@clarence-rockland.com

Plan directeur de l'eau potable et des eaux usées du Village de Limoges – Approvisionnement en eau potable

AVIS JOURNÉE PORTES OUVERTES PUBLIQUE

En 2013, la Municipalité de La Nation a complété le Plan directeur de l'eau potable et des eaux usées du Village de Limoges. Ce plan examinait les besoins des infrastructures d'eau potable et d'eaux usées pour satisfaire au développement et à la croissance à long terme. La solution privilégiée pour l'approvisionnement en eau potable incluait : l'ajout de deux puits; l'expansion de la station d'épuration de Limoges et de la station de pompage; un nouveau réservoir d'eau; et l'expansion du réseau de distribution d'eau. Le nouveau réservoir d'eau a été complété en 2018. Les autres recommandations liées à l'approvisionnement et au traitement de l'eau n'ont pas encore été mises en œuvre.

De récentes discussions entre la Municipalité de La Nation et la Cité de Clarence-Rockland ont mené vers une nouvelle option pour augmenter l'approvisionnement en eau au Village de Limoges, ce qui n'était pas auparavant considéré dans le Plan directeur. Une modification au Plan directeur a été entreprise afin d'évaluer cette nouvelle option. La modification au Plan directeur sera limitée aux options pour l'approvisionnement en eau et seulement ces changements feront l'objet d'une révision. Les options pour la distribution et le stockage de l'eau ne seront pas revues par la modification.

Une journée portes ouvertes publique sera tenue pour présenter l'information sur la modification comme suit :

JOURNÉE PORTES OUVERTES PUBLIQUE

Date: Le mercredi 20 novembre 2019
18 h 30 – 20 h 30
Endroit: Centre communautaire de Limoges (205, chemin Limoges)

Suite à la journée portes ouvertes publique, l'équipe responsable de l'étude finalisera le concept retenu et préparera un rapport sur la modification. Ce rapport sera mis à la disposition du public aux fins d'examen et conformément aux exigences de l'évaluation environnementale municipale de portée générale.

La consultation publique est une étape importante du processus et nous tenons à prendre connaissance de tout commentaire que vous souhaitez formuler au sujet de cette étude. Veuillez faire parvenir vos commentaires ou vos questions à :

La Municipalité de la Nation
Doug Renaud
Directeur de l'eau et des eaux usées
Téléphone: 613.443.1425, x300
DRenaud@nationmun.ca

R.V. Anderson Associates LTD.
Beth Hamley, P. Eng.
Coordinateur Environnemental
Téléphone: 613.226.1844
EHamley@rvanderson.com

Cité de Clarence-Rockland
Julian Lenhart
Director Infrastructure & Planning
Téléphone: 613.446.6022, x2270
JLenhart@clarence-rockland.com

APPENDIX 3-2

Stakeholder List

Village of Limoges - Master Plan Amendment Water Source			
Stakeholder Contact List			
Agency	**Contact**	**Title**	**Email**
City of Ottawa	Tammy Rose	Mgr Drinking Water Srvc	tammy.rose@ottawa.ca
City of Ottawa	Rick O'Connor	City Clerk & Solicitor	rick.oconnor@ottawa.ca
City of Ottawa	Kevin Wylie	General Manager, Public Works and Environmental Services Department	Kevin.Wylie@ottawa.ca
MECP	Charlie Primeau	Supervisor Water Compliance	Charlie.Primeau@ontario.ca
MECP	Vicki Mitchell	Environmental Resource Planner & EA Coordinator	Vicki.Mitchell@ontario.ca
MECP	Victor Castro	Group Leader, Surface Water	Victor.Castro@ontario.ca
MECP	Patrick Lalonde	Water Inspector	Patrick.Lalonde@ontario.ca
MECP	Jon Orpana	Environmental Resource Planner & EA Coordinator	jon.orpana@ontario.ca
Russell Township	Jean Leduc	Chief Administrative Officer	jeanleduc@russell.ca
South Nation Conservation	Angela Coleman	General Manager	acoleman@nation.on.ca
United Counties of Prescott and Russell	Stéphane P. Parisien	Directeur général / CAO	spparisien@prescott-russell.on.ca
South Nation Conservation	Sandra Mancini	Senior Water Resources Engineer	smancini@nation.on.ca
City of Clarence Rockland	Helen Collier	Chief Administrative Officer / Directrice générale	hcollier@clarence-rockland.com
Ministry of Natural Resources and Forestry (MNRF) - Kemptville District	Dan L Thompson	District Manager	dan.l.thompson@ontario.ca
Ministry of Tourism, Culture and Sport	Karla Barboza	Team Lead - Heritage (Acting)	karla.barboza@ontario.ca
Algonquins of Ontario	Algonquins of Ontario Consultation Office		algonquins@tanakiwin.com
Algonquin Anishinabeg Nation			info@anishinabenation.ca
Metis Nation of Ontario			Métis Consultation Unit Métis Nation of Ontario Head Office Suite 1100 – 66 Slater Street Ottawa, ON K1P 5H1
Mohawks of the Bay of Quinte	Lisa Maracle	Community Services (Consultation Unit Contact)	lisam@mbq-tmt.org
Mohawk Council of Akwesasne			Mohawk Council of Akwesasne PO Box 90 Akwesasne, QC H0M 1A0
Ottawa Region Métis Council			president.ormc@gmail.com 214 Montreal Road Suite 400 Ottawa, ON K1L 6C9

APPENDIX 3-3

Public Open House Material

WELCOME

Public Meeting
November 20, 2019
6:30 pm - 8:30 pm

The Nation Municipality and the City of Clarence-Rockland welcome you to this Public Open House regarding the Amendment to the 2013 Village of Limoges Potable Water and Wastewater Master Plan.

This amendment considers additional alternatives for water supply for the Village of Limoges. Only the changes to water supply addressed in the amendment are open for review.

Please review the materials and provide your comments on the forms available. Staff are available to answer your questions.

PLEASE SIGN IN

BIENVENUE

Assemblée publique
20 novembre 2019
18 h 30 - 20 h 30

La municipalité de La Nation et la Cité de Clarence-Rockland vous souhaitent la bienvenue à cette journée portes ouvertes publique concernant la modification au Plan directeur de l'eau potable et des eaux usées du village de Limoges de 2013.

La présente modification tient compte de solutions additionnelles pour l'approvisionnement en eau du village de Limoges. Seuls les changements au système d'approvisionnement en eau abordés dans la modification pourront faire l'objet d'examen.

Veuillez examiner les documents fournis et formuler vos commentaires sur les formulaires mis à votre disposition. Des représentants sont présents pour répondre à vos questions.

VEUILLEZ VOUS INSCRIRE

BACKGROUND

Existing Water Supply:

- 2 wells (4 km west of Limoges Water Treatment Plant)
  - Existing capacity: 2,080 m^3/day
- 2018 Average Demand: 932 m^3/day
- 2018 Max Day Demand: 1,735 m^3/day *(83% capacity)*

Future Growth & Water Demand:

- 2% population growth + 85 residential units per year
- Population projection (year 2042): 12,670 persons
  - Estimated max day demand (2042): 7,076 m^3/day

2013 Master Plan Solution (Water Supply):

- New wells in the Vars/Winchester esker
- New 5.5 km 400 mm dia. water main to existing wells
- Upsizing or twinning of existing 5 km feeder main from existing well site to the Water Treatment Plant (WTP)
- Expansion of the Limoges WTP

CONTEXTE

Système d'approvisionnement en eau existant :

- 2 puits (4 km à l'ouest de la Centrale de traitement des eaux de Limoges).
  - Capacité actuelle : 2 080 m^3 par jour
- Demande moyenne en 2018 : 932 m^3 par jour
- Demande max. par j., en 2018 : 1 735 m^3 par jour *(83 % de la capacité)*

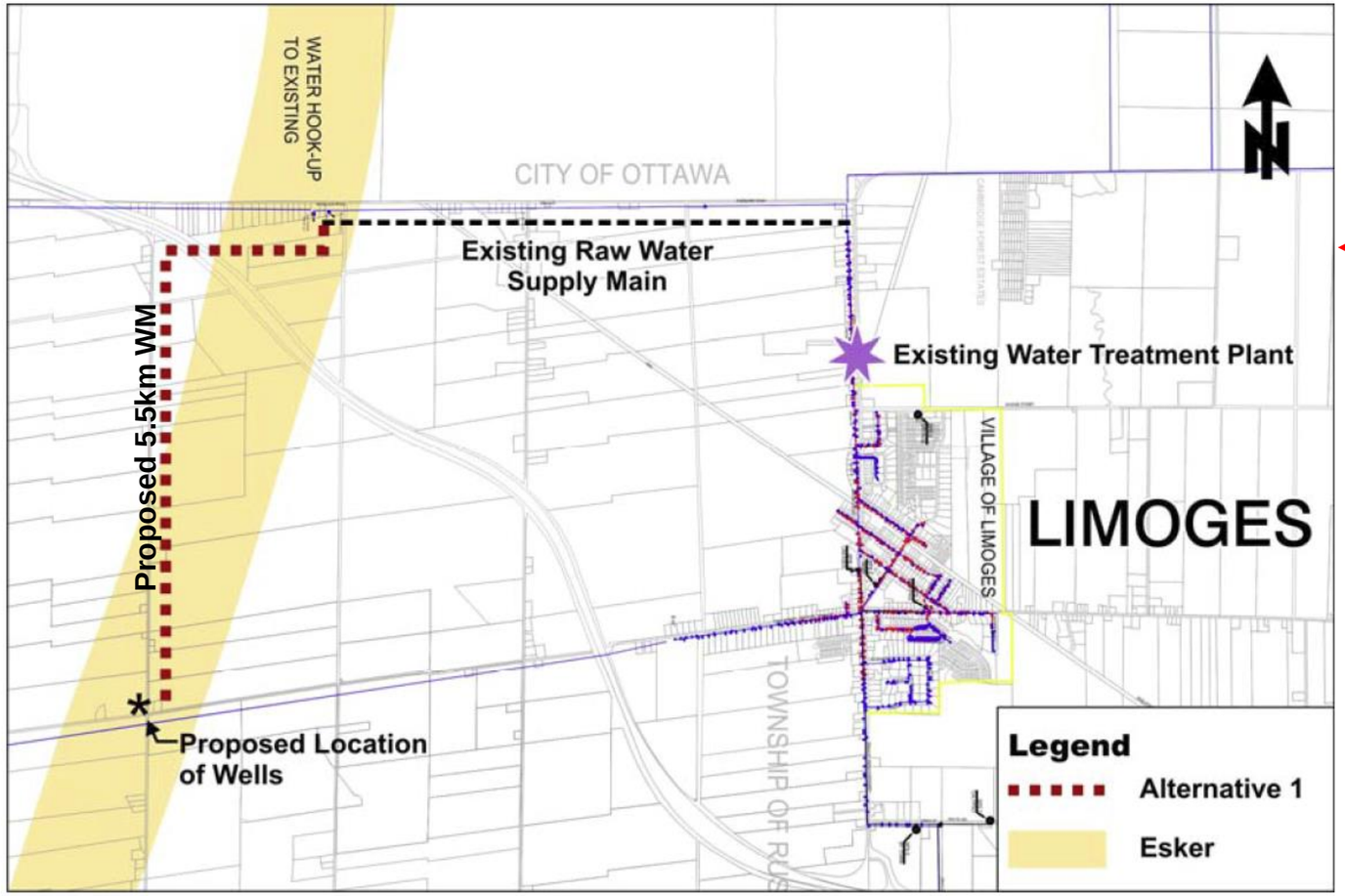
Croissance et demande d'eau éventuelles :

- Croissance de la population, à 2 p. 100 + 85 unités résidentielles par année
- Population projetée, en 2042 : 12 670 personnes
  - Éval. de la demande max. par jour (2042) : 7 076 m^3 par jour

Solution Plan directeur de 2013 (Approvisionnement en eau) :

- Nouveaux puits dans l'esker de Vars et (ou) de Winchester.
- Nouvelle conduite principale d'eau de 400 mm de diamètre et à 5,5 km des puits existants.
- Augmentation du diamètre ou jumelage de la principale canalisation existante d'amenée d'eau de 5 km, du site des puits existants jusqu'à la Centrale de traitement des eaux.
- Agrandissement de la Centrale de traitement des eaux de Limoges.

2013 Master Plan – Recommended Solution (Water Supply)
Plan directeur de 2013 – Solution recommandée en rapport avec l'amenée d'eau



Preferred Water Supply Alternative, 2013 Master Plan (Delcan, 2013) / Solution de premier choix pour l'amenée d'eau (Plan directeur de 2013, Delcan).

2014 Hydrogeological Investigation:

- 3 new test wells & pumping tests conducted
- Max flow of 22.4 L/s (1,935 m^3/d) available

This option cannot supply enough water for future growth in Limoges

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Enquête hydrogéologique de 2014 :

- 3 nouveaux puits d'essai et tenue d'essais de pompage.
- Débit maximum disponible : 22.4 L/s (1 935 m3 par jour).

Cette option ne suffit pas à tenir compte des besoins en eau pour la croissance éventuelle de Limoges.

REVIEW OF ALTERNATIVES

Alternatives evaluated in the 2013 Master Plan:

New Groundwater Source:

1. New wells in Vars/Winchester Esker
2. Wells in Embrun/Marionville (existing WTP site)

Piped Water from a Neighboring Municipality:

(full water supply, abandon Limoges wells & scale back WTP)

3. Clarence-Rockland
4. Russell Township (connect at Eadie/Burton)
5. Russell Township (connect at Eadie/Route 200)
6. City of Ottawa

Additional Alternatives *(2019 Amendment)*:

(partial water supply, maintain existing wells & Limoges WTP)

7. Piped Water from Clarence-Rockland (Partial)

- New connection to C/R at Cheney ET

8. Piped Water from Russell Township (Partial)

- New connection to Russell from Embrun

EXAMEN DES SOLUTIONS DE RECHANGE

Solutions de rechange évaluées dans le Plan directeur de 2013 :

Nouvelle source d'eau souterraine :

1. Nouveaux puits dans l'Esker de Vars et (ou) de Winchester.
2. Puits à Embrun et (ou) Marionville (site actuel de la Centrale de traitement des eaux).

Eau courante d'une municipalité avoisinante :

(pleine amenée d'eau, abandon des puits de Limoges et diminution de l'ampleur de la Centrale de traitement des eaux de Limoges).

3. Clarence-Rockland
4. Canton de Russell (connexion à Eadie/Burton)
5. Canton de Russell (connexion à Eadie/Route 200)
6. Ville d'Ottawa

Solutions additionnelles (modification de 2019)

(amenée partielle d'eau et maintien des puits actuels et de la Centrale existante de traitement des eaux de Limoges)

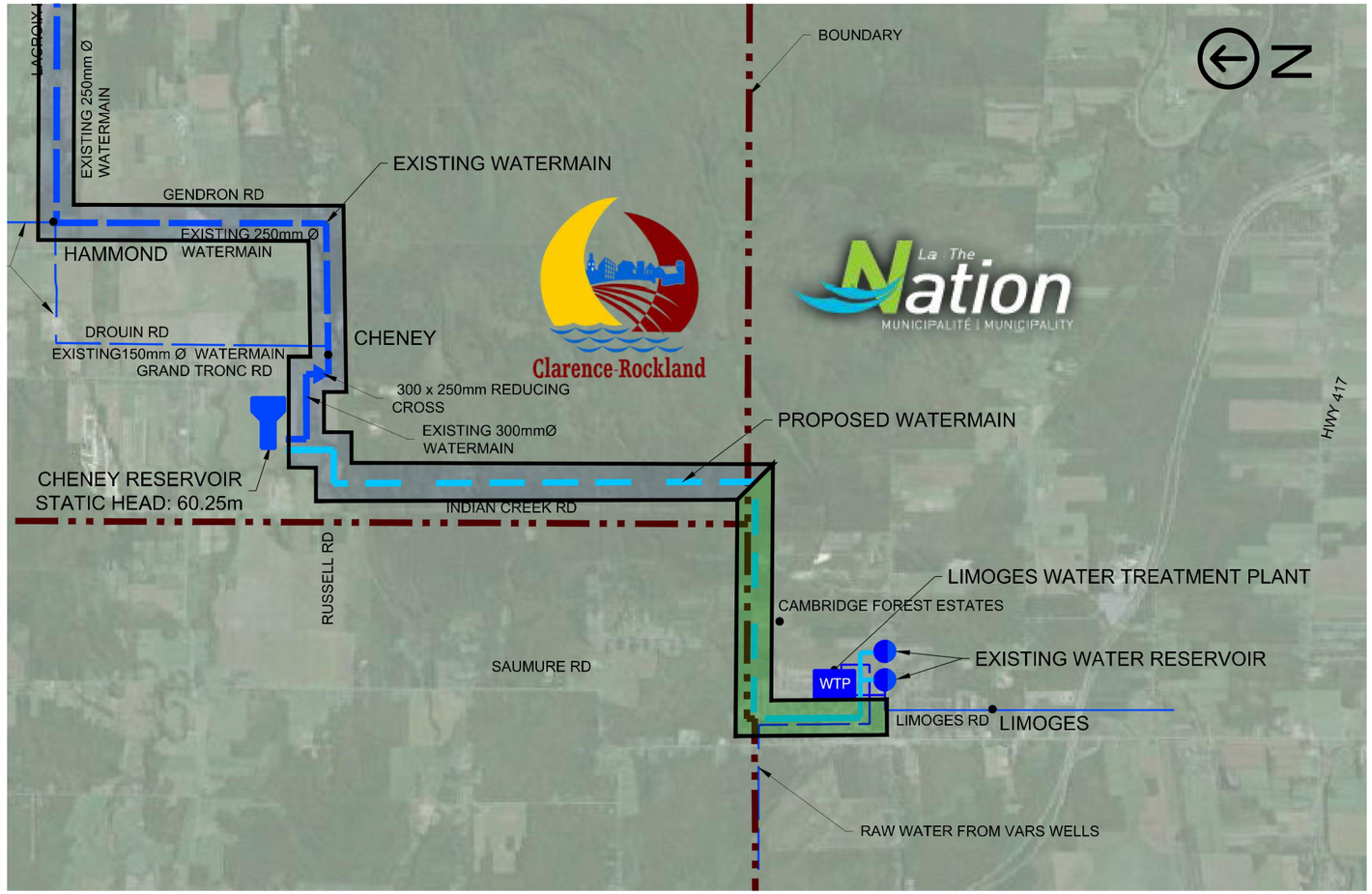
7. Eau courante de Clarence-Rockland (à titre partiel seulement)

- Nouvelle connexion aux installations de C/R et ce, au réservoir Cheney.

8. Eau courante du canton de Russell (à titre partiel seulement)

- Nouvelle connexion aux installations de Russell, et ce, à partir d'Embrun.

ALTERNATIVE 7 – CONNECT TO CLARENCE-ROCKLAND AT CHENEY



Proposed connection to Clarence-Rockland water system at Cheney

Connexion proposée au système d'eau de Clarence-Rockland et ce, au point de raccordement Cheney

NOTE: *New water service connections are not reviewed as part of this amendment.*

NOTE: *Aux termes de la modification en cours, aucun nouveau branchement d'eau ne sera examiné.*

- Maintain existing Limoges water supply and treatment system
- New connection to Clarence-Rockland water system at Cheney ET (9.8 km WM)
- Phased approach, upgrades to be completed at defined points based on actual demand
- Max Day Demand allocated for Limoges at build-out: 6,257 m^3/d
  + existing water supply capacity of 2,080 m^3/d

SOLUTION 7 – SE RACCORDER AUX INSTALLATIONS DE CLARENCE-ROCKLAND ET CE, AU POINT DE RACCORDEMENT CHENEY

- Maintien du système existant d'approvisionnement en eau et de traitement des eaux de Limoges.
- Nouvelle connexion au système d'eau de Clarence-Rockland à l'emplacement du réservoir allongé ou surélevé Cheney (conduite d'eau principale de 9,8 km).
- Approche progressive; améliorations à réaliser à des intervalles définis en fonction de la demande réelle.
- Demande quotidienne maximale assignée au point de l'installation de sortie de Limoges : 6 257 m^3 par jour.
  + la capacité actuelle d'approvisionnement en eau, établie à 2 080 m^3 par jour.

ALTERNATIVE 7 – CONNECT TO CLARENCE-ROCKLAND AT CHENEY

Timing	Proposed Upgrades	Améliorations proposées
2021	- New WM (Cheney to Limoges) - New WM (St. Jean St)	- Nouvelle conduite principale d'eau (entre Cheney et Limoges) - Nouvelle conduite principale d'eau (rue St-Jean)
2025	- Caron BS Upgrades - New WM (Caron St) - Rockland WTP Upgrades	- Modernisation du poste de relais de la rue Caron - Nouvelle conduite principale d'eau (rue Caron) - Modernisations à la Centrale de traitement des eaux de Rockland
2031	- Replace WM (St. Joseph St) - New WM (Bouvier BS to Cheney) - Replace WM (Edwards St)	- Remplacement de la conduite principale d'eau (rue St-Joseph) - Nouvelle conduite principale d'eau (entre le poste de relais du chemin Bouvier et Cheney) - Remplacement de la conduite principale d'eau (rue Edwards)
2036	- New WM (Caron BS to Bouvier Rd) - Replace WM (Edwards St) - New WM (Bouvier Rd & Labonte St) - Upgrade Bouvier BS	- Nouvelle conduite principale d'eau (entre le poste de relais de la rue Caron et le chemin Bouvier) - Remplacement de la conduite principale d'eau (rue Edwards) - Nouvelle conduite principale d'eau (entre le chemin Bouvier et la rue Labonté) - Modernisation du poste de relais du chemin Bouvier

NOTE: *New water service connections are not reviewed as part of this amendment. This amendment does not address water distribution within the Village of Limoges. Allocation of water within the urban area is addressed separately.*

NOTE : *Aux termes de la modification en cours, aucun nouveau branchement d'eau ne sera examiné. En outre, il s'agit ici d'une modification qui ne tient pas compte de la distribution de l'eau à l'intérieur du village de Limoges. La répartition de l'eau à l'intérieur de la zone urbaine sera examinée séparément.*

ALTERNATIVE 8 – CONNECT TO RUSSELL

EA ongoing by Russell Township for W/WW servicing to Limoges

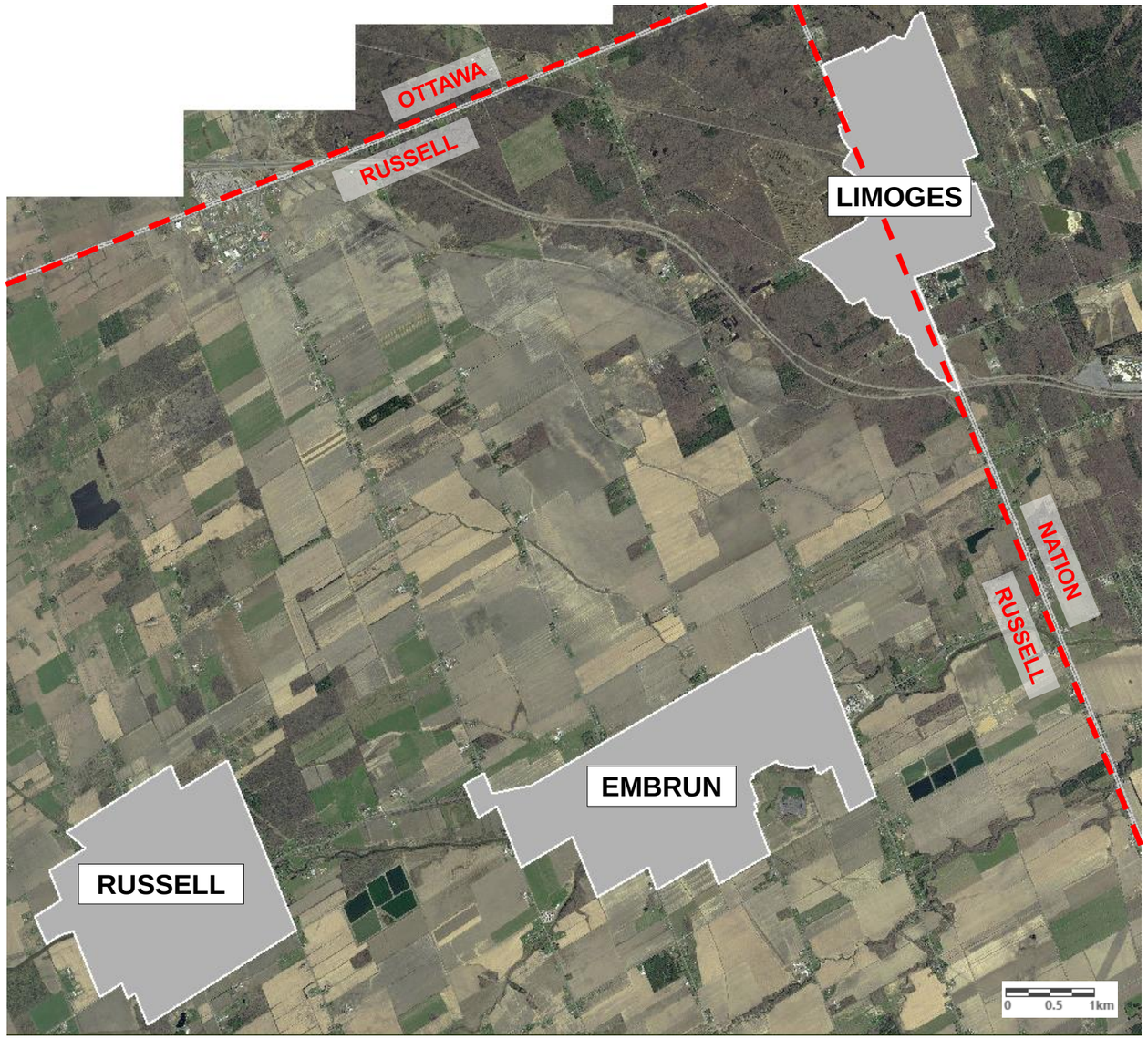
- Water supply available: approx. 1000 units (~2700 persons)

→ **Not enough water supply for future growth in the Village of Limoges**

SOLUTION DE RECHANGE 8 – RACCORDEMENT AUX INSTALLATIONS DE RUSSELL

- Évaluation environnementale en cours menée par le canton de Russell pour desservir les installations d'alimentation en eau et (ou) d'eaux usées de Limoges.
- Disponibilité d'alimentation en eau, d'environ 1 000 unités (~2700 personnes)

→ **L'approvisionnement en eau n'est pas suffisant pour la croissance éventuelle du village de Limoges.**



EVALUATION OF ALTERNATIVES – SCREENING (Y/N)

	ALTERNATIVE		SCREENING CRITERIA (Y / N)	
			ABILITY TO MEET FUTURE WATER DEMAND BASED ON CURRENT PROJECTIONS (up to 7,076 m^3/d)	
ALTERNATIVES CONSIDERED IN 2013 MASTER PLAN (DELCAN, 2013)	**Alt 1**	**New Groundwater Source – New Wells**	Based on 2014 pumping tests: Max flow of 1,935 m^3/d available.	**NO ABILITY TO MEET ULTIMATE WATER DEMAND.**
	Alt 2	**New Groundwater Source – Embrun/ Marionville WTP**	Max flow of 5,633 m^3/d from decommissioned Embrun/ Marionville wells. Additional well required to meet ultimate demand.	**ABILITY TO MEET ULTIMATE WATER DEMAND**
	Alt 3	**Piped Water from Clarence Rockland (Full Supply)**	Clarence-Rockland is not offering full water supply at the time of this amendment.	**NO ABILITY TO MEET ULTIMATE WATER DEMAND.**
	Alt 4	**Piped Water from Russell (A)**	Agreement between Twp of Russell and the City of Ottawa does not allow connections and distribution to other users.	**NO ABILITY TO MEET ULTIMATE WATER DEMAND.**
	Alt 5	**Piped Water from Russell (B)**	Agreement between Twp of Russell and the City of Ottawa does not allow connections and distribution to other users.	**NO ABILITY TO MEET ULTIMATE WATER DEMAND.**
	Alt 6	**Piped Water from Ottawa**	New agreement required between Nation and City of Ottawa. No recent negotiations/discussion between the two parties. Assume sufficient water supply is available.	**ABILITY TO MEET ULTIMATE WATER DEMAND**
NEW ALTERNATIVES (2019)	**Alt 7**	**Piped Water from Clarence Rockland (Partial Supply)**	Allocated 30-year max day demand for Limoges is 6,257 m^3/day, based on discussions and MOU. Combined with the capacity of the existing water supply (2,080 m^3/d) there is sufficient water supply available for the projected growth.	**ABILITY TO MEET ULTIMATE WATER DEMAND**
	Alt 8	**Piped Water from Russell (Partial Supply)**	Agreement between Russell and Ottawa does not allow connections and distribution to other users. Servicing available to Russell residents only. Water supply capacity of approx. 1000 m^3/d available. *NOTE: Township of Russell is completing a separate EA to study servicing options for Russell residents in Limoges.*	**NO ABILITY TO MEET ULTIMATE WATER DEMAND.**

ÉVALUATION DES SOLUTIONS DE RECHANGE – EXAMEN PRÉLIMINAIRE (OUI/NON)

	SOLUTION DE RECHANGE		CRITÈRE DE SÉLECTION (OUI/NON) CAPACITÉ DE RÉPONDRE À LA DEMANDE ÉVENTUELLE EN EAU (7,076 m^3 par jour)	
Solutions de rechange considérées dans le Plan directeur de 2013 (DELCAN, 2013)	**Sol 1**	**Nouvelle source d'eau souterraine – Nouveaux puits**	Selon les essais de pompage de 2014 : Disponibilité d'un débit maximum de 1 935 m^3 par jour.	**AUCUNE CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**
	Sol 2	**Nouvelle source d'eau souterraine – Centrale de traitement des eaux d'Embrun et (ou) de Marionville**	Débit maximum de 5 633 m3 par jour et ce, à partir des puits mis hors service d'Embrun et (ou) de Marionville. Besoin d'un puits additionnel pour répondre à la demande ultime.	**CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**
	Sol 3	**Eau courante depuis Clarence Rockland (amenée complète d'eau)**	Au moment de la présente modification, Clarence-Rockland n'offre pas ce qui constitue un approvisionnement complet en eau.	**AUCUNE CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**
	Sol 4	**Eau courante à partir de Russell (A)**	L'accord entre le canton de Russell et la ville d'Ottawa ne permet pas les branchements et la distribution d'eau à d'autres utilisateurs.	**AUCUNE CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**
	Sol 5	**Eau courante à partir de Russell (B)**	L'accord entre le canton de Russell et la ville d'Ottawa ne permet pas les branchements et la distribution d'eau à d'autres utilisateurs.	**AUCUNE CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**
	Sol 6	**Eau courante à partir d'Ottawa**	Besoin d'un nouvel accord entre Nation et la ville d'Ottawa. Aucune négociation/discussion récente entre les deux parties. On sous-entend ici que l'approvisionnement en eau disponible s'avère suffisant.	**CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**
NOUVELLES SOLUTIONS DE RECHANGE (2019)	**Sol 7**	**Eau courante à partir de Clarence Rockland (amenée partielle d'eau)**	Si l'on se fonde sur les discussions ainsi que sur le protocole d'entente pour Limoges, la demande maximale en eau est établie à 6 257 m3 par jour, et ce, au cours des 30 prochaines années. En combinant cette hypothèse à la capacité de l'approvisionnement en eau existant (2 080 m3 par jour), l'approvisionnement en eau disponible est suffisant pour la croissance projetée du secteur.	**CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**
	Sol 8	**Eau courante depuis Russell (amenée partielle d'eau)**	L'accord entre Russell et Ottawa ne permet pas les branchements et la distribution d'eau à d'autres utilisateurs. L'entretien courant n'est disponible qu'aux résidents de Russell. La capacité disponible d'alimentation en eau correspond environ à ce qui suit : 1 000 m3 par jour. *NOTE : Le canton de Russell est en train de compléter une évaluation environnementale distincte examinant les options d'entretien courant pour les résidents de Russell dans Limoges.*	**AUCUNE CAPACITÉ DE RÉPONDRE À LA DEMANDE ULTIME D'EAU.**

EVALUATION OF ALTERNATIVES

		Alt 2 New Groundwater Source – Embrun/ Marionville WTP	Alt 6 Piped Water from Ottawa	Alt 7 (NEW) Piped Water from Clarence Rockland (Partial Supply)
Natural Env.	**Natural Heritage**	Low-Slight	Low-Slight	Slight
	Surface Water	Low	Low-Slight	Low-Slight
	Groundwater	Slight	Low	Low
	Geotechnical	Slight	Low	Low
Social Environment	**Agricultural**	No impact to agricultural land	No impact to agricultural land	No impact to agricultural land
	Archaeological	Low-Slight	Low	Slight
	Property Requirements	Slight-Some requirement for additional property to accommodate well(s) to meet ultimate future demand. Piped infrastructure will be located within the existing ROW. Easements likely required to tunnel under Hwy 417. New watermain to the pilot well site and upsizing or twinning of the existing watermain from the existing Limoges well site will be constructed within the existing ROW. No property will be required.	Slight property requirements for the required booster station. All piped infrastructure will be located within existing ROW. The upgrading of the existing piped infrastructure will not require additional property.	Proposed routing for new watermain is all within existing ROW. No property required.
Economic	**Capital Cost**	$20.6M *Note: 2013 Master Plan estimate (not updated)*	$26.4M (*Note: 2013 Master Plan estimate not updated)*	$12.6M (Phase 1) + $6.3M (phase 2) + $9.0M (phase 3) + $7.6M (phase 4)
	Operational and Maintenance Costs	Some O&M cost	Significant O&M cost. Must first pay supply rate established by City of Ottawa plus up to a 50% surcharge for local users.	Proposed bulk water rate of $1.28 per m^3. Some O&M cost for regular system operations.

ÉVALUATION DES SOLUTIONS DE RECHANGE

		Solution de rechange 2 Nouvelle source d'eau souterraine – Centrale de traitement des eaux d'Embrun et (ou) de Marionville	Solution de rechange 6 Eau courante à partir d'Ottawa	(NOUVELLE) Solution de rechange 7 Eau courante à partir de Clarence-Rockland (Amenée partielle d'eau)
Env. naturel	**Héritage naturel**	Faible-léger	Faible-léger	Léger
	Eau de surface	Faible	Faible-léger	Faible-léger
	Eau souterraine	Léger	Faible	Faible
	Aspect géotechnique	Léger	Faible	Faible
Environnement social	**Aspect agricole**	Aucun impact sur les terres agricoles	Aucun impact sur les terres agricoles	Aucun impact sur les terres agricoles
	Aspect archéologique	Faible-léger	Faible	Léger
	Exigences en matière de propriété	Léger – Certains besoins d'acquisition de propriétés additionnelles, pour ainsi tenir compte de l'apport de puits, et ce, afin de pouvoir répondre à la demande éventuelle ultime. Une infrastructure d'eau courante se trouvera à l'intérieur du droit de passage existant. Besoin probable de servitudes de tunnel en dessous de la 417. Amenée d'une conduite principale d'eau jusqu'au site de puits témoin et augmentation du diamètre ou jumelage de la conduite principale d'eau existante, et ce, à partir du site de puits existant de Limoges; ici, il s'agit d'une construction à l'intérieur du droit de passage existant et aucune acquisition de propriété ne sera requise.	Légers besoins d'acquisition de propriété pour le poste de relais requis. L'ensemble de l'infrastructure d'eau courante se trouvera à l'intérieur du droit de passage existant. La modernisation de l'infrastructure d'eau courante et existante ne nécessitera aucune acquisition additionnelle de propriété.	Le tracé proposé pour la nouvelle conduite d'eau se trouve complètement à l'intérieur du droit de passage. Aucune acquisition de propriété ne sera requise ici.
Aspect économique	**Coût en capital**	20,6 millions de dollars Nota : Évaluation tirée du Plan directeur de 2013, lequel n'ayant pas été mis à jour.	26,4 millions de dollars *(Note : Estimation provenant du Plan directeur de 2013 – pas mis à jour)*	12,6 millions de dollars (Phase 1) + 6,3 millions de $ (Phase 2) + 9,0 millions de dollars (Phase 3) + 7,6 millions de dollars (Phase 4).
	Coûts rattachés à l'exploitation et à l'entretien des installations	Certains coûts rattachés à l'exploitation et à l'entretien des installations	Coût d'importance rattaché à l'exploitation et à l'entretien des installations. Ici, il faut d'abord payer le taux d'amenée d'eau établi par la ville d'Ottawa, plus une surcharge pouvant aller jusqu'à 50 p. 100 pour les utilisateurs locaux.	Taux proposé d'eau en vrac établi à 1,28 $ au m3. Certains coûts viennent se rattacher à l'exploitation et à l'entretien courants.

EVALUATION OF ALTERNATIVES

		Alt 2 New Groundwater Source – Embrun/ Marionville WTP	Alt 6 Piped Water from Ottawa	Alt 7 (NEW) Piped Water from Clarence Rockland (Partial Supply)
Technical	**Constructability**	Some construction period. Slight complexity (i.e. water treatment plant). Good phasing opportunity	Significant construction period. Low complexity. No phasing opportunity	Good phasing opportunity for both Limoges and Clarence-Rockland.
	Reliability	Proven technology. Condition assessment required for existing infrastructure.	Proven technology.	Proven technology.
	Expansion Potential	Best expansion opportunity	Limited expansion opportunity due to infrastructure size / capacity. Agreement negotiation with Ottawa. Competing interest for increased capacity.	Good expansion potential due to infrastructure size/capacity and proposed phasing approach. Competing interest for increased capacity; however, MOU has been signed between C/R and Limoges indicating dedicated capacity for full build-out in Limoges with a phasing plan.
	Permit and Approvals	Some approval requirement. Existing plant has approval. Requires MECP approval for additional wells and WTP expansion. Requires agreement with Russell for infrastructure and purchase of existing infrastructure. Timing unknown.	Significant approval requirement. Requires MECP approval for pipes and booster station. Requires agreement from Ottawa for water supply and Feasibility analysis of Ottawa pressure zones required.	Approvals required for upgrades and expansion works in both Clarence Rockland and Limoges. Draft agreement prepared (ready to proceed).
	Source Water Protection	New source within Source Water Protection Area. Potential influence of water quality from existing municipal landfill.	No impact, surface water source	No impact, surface water source
	Drinking Water Quality	New treatment system required. Potential contamination from existing municipal landfill. Water quality may be a concern.	Low treatment requirement (disinfection)	Low treatment requirement. No changes to existing Limoges WTP. No new facility required. Surface water quality good.
				RECOMMENDED OPTION

ÉVALUATION DES SOLUTIONS DE RECHANGE

		Solution de rechange 2 Nouvelle source d'eau souterraine – Centrale de traitement des eaux d'Embrun/Marionville	Solution de rechange 6 Eau courante à partir d'Ottawa	(NOUVELLE) Solution de rechange 7 Eau courante à partir de Clarence Rockland (Amenée partielle d'eau)
Aspects techniques	**Constructibilité**	Période de construction non négligeable. De légère complexité (par exemple, la Centrale de traitement des eaux). Bonne occasion de mise en phases.	Période de construction importante. De faible complexité. Aucune occasion de mise en phases.	Bonne occasion de mise en phases pour Limoges et pour Clarence-Rockland.
	Fiabilité	Technologie éprouvée. Ici, on se devra d'évaluer l'état de l'infrastructure actuelle.	Technologie éprouvée.	Technologie éprouvée.
	Potentiel d'agrandissement	Meilleure occasion ou opportunité d'agrandissement	Opportunité d'agrandissement limitée et ce, en raison de la grosseur et (ou) de la capacité de l'infrastructure. Besoin de négociation d'un accord avec Ottawa. Intérêts opposés du point de vue de la capacité accrue.	Bon potentiel d'agrandissement, en raison de la grosseur et (ou) de la capacité de l'infrastructure; aussi, à cause de l'approche proposée de mise en phases. Intérêts opposés du point de vue de la capacité accrue; par contre, un protocole d'entente a été signé entre C/R et Limoges, lequel indiquant une capacité spécifique pour une construction de pleine envergure à Limoges et ce, compte tenu d'un plan de mise en phases.
	Permis et approbations	Certains besoins d'approbation. La centrale existante est approuvée. Besoin d'une approbation du MECP pour des puits additionnels et pour l'agrandissement de la Centrale de traitement des eaux. Besoin d'un accord avec Russell en rapport avec l'infrastructure, ainsi qu'avec l'achat de l'infrastructure existante. Ici, le facteur temps est inconnu.	Besoin important d'approbations. Besoin d'une approbation du MECP pour des tuyaux et un poste de relais. Besoin d'un accord d'Ottawa et ce, en rapport avec une amenée d'eau et une Analyse de faisabilité des zones requises de pression d'Ottawa.	Approbations requises en rapport avec des améliorations et des travaux d'agrandissement pour Clarence Rockland et pour Limoges. L'ébauche d'entente est préparée et le tout est prêt pour une mise en route.
	Protection de l'eau de source	Nouvelle source d'eau à l'intérieur de la zone de protection de l'eau de source. Influence potentielle de la qualité de l'eau et ce, en raison ou à partir du site d'enfouissement municipal existant.	Aucun impact en rapport avec la source d'eau de surface.	Aucun impact en rapport avec la source d'eau de surface.
	Qualité de l'eau potable	Besoin d'un nouveau système de traitement. Contamination potentielle à partir du site d'enfouissement municipal existant. La qualité de l'eau peut s'avérer problématique.	Besoin de traitement de faible importance (désinfection).	Besoin de traitement de faible importance. Aucun changement à la Centrale existante de traitement des eaux de Limoges. Aucun besoin de montage d'une nouvelle installation. La qualité de l'eau de surface est bonne.
				OPTION RECOMMANDÉE

NEXT STEPS

No.	Task	Anticipated Completion Date
1	Incorporate Comments and Prepare Amendment Report	November - December 2019
2	Notice of Amendment Filing	December 2019
3	30-day Review & Comment Period	December 2019 - January 2020
4	Design & Approvals	2020
5	Construction Completion	2021

PROCHAINES ÉTAPES

Nº	Tâche	Achèvement prévu
1	Intégrer les commentaires et Préparer le rapport de modification	Novembre / décembre 2019
2	Dépôt de l’avis de modification	Décembre 2019
3	Période d’examen et de commentaires de 30 jours	Décembre 2019 / janvier 2020
4	Conception et approbations	2020
5	Construction terminée	2021

APPENDIX 4

Memorandum of Understanding

Clarence-Rockland/Nation Joint Water System

Memorandum of Understanding

The purpose of this memorandum of understanding (MoU) is to define the general terms for the allocation and management of the new joint water system between the City of Clarence-Rockland and the Nation Municipality to meet immediate and projected water demands in both municipalities.

1. Joint Water System

1.1 The joint water system is described as the existing and future water production and transmission infrastructure required to deliver water to Limoges in the Nation Municipality, while maintaining existing and projected water demands in the City of Clarence-Rockland.

Generally, most of the existing and future joint water system infrastructure is in the City of Clarence-Rockland, however sections of the new water transmission main from Cheney to Limoges will be located in both municipalities.

The following main infrastructure elements compose the joint water system:

- Water treatment Plant
- Feeder watermains
- Transmission mains
- Metering stations
- Raw water intake / piping
- Booster pump stations
- Control valve structures
- Associated mechanical and electrical works

1.2 In order to simplify the joint water system required for both municipalities, it is understood only main production and transmission elements including all associated works shall describe the joint water system. The attached plan, preliminary Joint Water System Layout (C01), shows the proposed main infrastructure elements. It is also understood the feeder watermains from the Rockland Water Treatment Plant to the Caron Booster Station shall consist of the following local infrastructure (including isolation valves, but excludes water services):

- Edwards Street Watermain
- McCall Street Watermain
- Gareau Street Watermain
- St-Joseph Street Watermain
- Caron Street Watermain
- Wallace Street Watermain
- Pouliotte Street Watermain
- Laurier Street Watermain
- Docteur Corbeil Blvd Watermain

It is important to note that future infrastructure improvements for the Joint Water System may be different from the recommendations provided in the CH2M Report. Growth revisions in each municipality should be analysed annually to plan optimal infrastructure improvements. All Alternate infrastructure solutions affecting the Joint Water System shall be presented to the Joint Management Committee.

2. Residual and Allocated Capacity

2.1 It is understood that the existing water system in Clarence-Rockland is likely capable of delivering initial demands to Limoges with the construction of a new transmission main between Cheney and Limoges, and with minor improvements to the existing water system. The initial capacity available for delivery to Limoges is estimated to be: 350 m^3 per day (average day demand), which translates approximately to a system delivery capacity of 8.1 l/s (maximum day demand).

2.2 The allocated capacity can be defined as the percentage of total water production and transmission capacity of the Joint Water System allocated to each Municipality. Based on the projected growth in each municipality, ultimate maximum day demands (MDD) as provided below shall be used to determine the allocated capacity percentages:

Infrastructure Recommendation Description	Allocated Demand (MDD) (m3/d)		**Capacity Allocation (%)**	
	CCR	**Limoges**	**CCR**	**Limoges**
New transmission main – Cheney ET to Limoges	313	6,257	5%	95%
Caron BS Upgrades	7,168	6,994	51%	49%
New transmission main – Caron BS to Bouvier Rd. and Labonte St.	4,265	6,987	38%	62%
New transmission main – Bouvier Rd. and Labonte St. to Bouvier ET	4,265	6,987	38%	62%
Rockland WTP Upgrades	13,087	6,798	66%	34%
Feeder watermains from WTP to Caron BS - Edwards St, Wallace St, McCall St, Poulliotte St, Gareau St, Laurier St, St-Joseph St, Docteur Corbeil Blvd, Caron St	(see note 1)	(see note 1)	69%	31%
New Bouvier BS	2,047	6,992	23%	77%
New transmission main – Bouvier BS to Cheney ET	313	6,257	5%	95%

- Note 1: The feeder watermains of the joint water system were selected based on the main conveyance path identified in Ch2m report.

3. Cost Sharing – Production and Transmission of Potable Water

It is understood that the cost sharing for the required infrastructure to produce and deliver potable water shall be based on the "Apportioned Costs by Recommended Infrastructure Upgrade" option as described in the CH2M Report (Section 6.2).

4. Compensation - Existing Infrastructure

The Nation Municipality will provide compensation to the City of Clarence-Rockland for existing infrastructure, and as detailed in the CH2M report, Section 6.2.3.2, the apportioned costs for the use of existing infrastructure in Clarence-Rockland is 2.62 million dollars. It is understood that payment will be due at commissioning of the transmission main between Cheney and Limoges.

5. Bulk Rate (Operation & Maintenance)

The Joint Water System shall be operated with water rates reflecting the actual cost of production, transmission and such additional operating costs as deemed necessary by the Joint Management Committee and/or required by legislative authority. Although the bulk rate could be adjusted annually based on actual Operation & Maintenance (O&M) costs, the initial bulk rate to be charged to the Nation Municipality shall be 1.2811 $ per cubic meter of potable water delivered to Limoges. The Nation Municipality will commit to purchasing a minimum of 350 m^3 per day (average day demand) from initial delivery of potable water to Limoges, provided the joint water system can deliver the flow.

The City of Clarence-Rockland will be responsible for all O&M costs to deliver potable water (with defined chlorine residual) to the Nation Municipality (Limoges). Independent of the Management Agreement, each municipality will be responsible for the funding (reserve) of joint water system repairs and/or replacement not normally included in O&M.

6. Implementation and Financing

The proponent for the improvements to produce and deliver the projected water demands shall be responsible for the implementation and initial funding of the project. In accordance with the cost sharing principle, repayment of all infrastructure allocated costs shall be due when the applicable water demand trigger is reached. The water demand trigger shall be defined for each municipality as a projected average day demand, or a maximum day demand associated with the infrastructure improvement. Water demand triggers could be modified based on annual reviews and based on alternate solutions as described in section 1.2 above.

If both municipalities are considered to have reached a trigger, the Joint Management Committee shall name the appropriate proponent.

Debt financing (front-ending) by the proponent on behalf of the other municipality shall not exceed **2 years.**

Summary of Recommended Infrastructure Cost Sharing and Implementation – Aggressive Cost Estimate (joint system)

Implementation Year	Infrastructure Description	Water demand Trigger (ADD) (m3/d)		Cost Share (%)		Total ($ M)	Cost Share ($)	
		CCR	Limoges	CCR	Limoges		CCR	Limoges
2019-2020	Existing infrastructure	-	350	0	100	$2.62	0	$2.62
2019-2020	New Watermain – Cheney ET to Limoges	-	350	5%	95%	$10.28	$0.49	$9.79
2019-2020	New Watermain – St. Jean St: Patricia St. to Docteur Corbeil Blvd.	-	350	58%	42%	$0.40	$0.23	$0.17
						$13.30	**$0.72**	**$12.58**
2024-2025	Caron BS Upgrades	5631	1000	51%	49%	$2.18	$1.11	$1.07
2024-2025	New Watermain – Caron St: Docteur Corbeil Blvd. to the Caron BS	5631	1000	51%	49%	$0.17	$0.09	$0.08
2024-2025	Rockland WTP Upgrades	5631	1000	66%	34%	$14.97	$9.85	$5.12
	2024-2025					**$17.32**	**$11.05**	**$6.27**
2030-2031	Replace Watermain – St. Joseph St: Patricia St. to Des Pins Ave.	6518	1500	55%	45%	$0.14	$0.08	$0.06
2030-2031	New Watermain – Bouvier BS to Cheney ET	6518	1500	5%	95%	$9.25	$0.44	$8.81
2030-2031	Replace Watermain – Edwards St: Rockland WTP to Highway 17 (east side pipe)	6518	1500	77%	23%	$0.45	$0.35	$0.10
	2030-2031					**$9.84**	**$0.87**	**$8.97**
2035-2036	New Watermain – Caron BS to Bouvier Rd. and Labonte St.	7259	2500	38%	62%	$5.17	$1.96	$3.21
2035-2036	Replace Watermain – Edwards St: Highway 17 (east side pipe) to McCall St.	7259	2500	64%	36%	$0.34	$0.21	$0.13
2035-2036	New Watermain – Bouvier Rd. and Labonte St. to Bouvier ET	7259	2500	38%	62%	$2.97	$1.13	$1.84
2035-2036	New Bouvier BS	7259	2500	23%	77%	$3.17	$0.72	$2.45
	2035-2036					**$11.65**	**$4.02**	**$7.63**

7. Joint Management Committee

The role of the Joint Management Committee is to share information and make recommendations to one or both Councils for approval on issues related to the Joint Water System. It is understood that an equal number of members from each municipality shall form the Joint Management Committee.

8. Legal Review – DRAFT MOU

Both municipalities completed a preliminary legal review of the Draft MOU. The legal comments have been responded to by email and/or in revisions to the Draft MOU. For reference, the following attached documents are provided in complement to the MOU:

- City of Clarence-Rockland legal review comments and responses by EXP
- Letter from SKS Law LLP/SRL dated December 12th 2018 – MOU legal review comments
- Email from EXP dated December 21st 2018 – responses to SKS legal review comments

IN WITNESS WHEREOF the parties hereto have hereunto affixed their respective corporate seals duly attested by the hands of their respective proper officers duly authorized in that behalf.

The Corporation of the City of Clarence-Rockland

March 20, 2019
Date of Signing

By: _____
Guy Desjardins, Mayor

March 20, 2019
Date of Signing

By: _____
Monique Ouellet, Clerk

The Corporation of The Nation Municipality

MARCH 26, 2019
Date of Signing

By: _____
François St-Amour, Mayor

March 26/2019
Date of Signing

By: _____
Josée Brizard, Clerk